

## EXECUTIVE SUMMARY

A flood study of the Burradoo BU2 catchment has been undertaken to define the nature and extent of flooding in the area for a range of design flood events. The flood study has been carried out for the existing catchment conditions at the time of the analysis. Data for the study was collated from various sources, including Wingecarribee Shire Council, and specific information, such as field survey, was obtained during the preparation of this study.

The Burradoo BU2 catchment is situated in the suburb of Burradoo, south of Bowral, and drains westwards to Mittagong Creek which is a tributary of the Wingecarribee River. The catchment has an area of 244 hectares and land-use is predominantly rural-residential properties. Moss Vale Road and the Southern Railway are the main north-south transport corridors in the catchment.

The primary flowpath is ephemeral and varies from a defined channel near Stratford Way, to a generally unformed depression west of Moss Vale Road. Two detention basins, known as Pony Club basin and Informal basin, are located just east of Moss Vale Road. In the past, flooding in the catchment has impacted on residents.

The collated information for the study included ground survey and hydraulic structure data, previous flood study reports, historical rainfall data, and cadastral and topographic data. A resident survey was undertaken to identify flood awareness and past flooding events. The data was used to undertake the various components of the study as well as for the presentation of the study results.

Estimation of flooding behaviour was undertaken by developing two computer models to simulate the hydrologic and hydraulic aspects of flooding. The hydrologic modelling package XP-RAFTS was utilised for routing flow through the catchment and to determine runoff from various parts of the catchment. Predicted hydrographs from RAFTS were then input to the TUFLOW hydraulic model for the determination of peak flood level, velocity and discharge for various design rainfall events. The design events investigated for this study were the 100 year, 50 year, 20 year, and 5 year Average Recurrence Interval (ARI) events together with the Probable Maximum Flood (PMF).

Flood behaviour was assessed using two-dimensional high definition hydraulic modelling for the floodplain. This detailed modelling provides better understanding of flooding processes in the flood affected area. The model was validated to responses received from residents for the June 2007 storm event.

The modelling results reflect the observed flooding behaviour in the Burradoo BU2 catchment. A storm duration of 2 hours was generally found to be critical in the catchment.

Moss Vale Road, Holly Road and Burradoo Road were shown as inundated by runoff in the 5 year ARI event. The models indicate the railway line is overtopped in the PMF event. Modelling shows an extensive flooded area, with the Informal detention basin spilling flows south along Moss Vale Road and the Pony Club basin overtopping in the 100 year ARI event.

The limits of predicted flood extents for the 100 year, 50 year, 20 year, and 5 year ARI events together with the PMF are mapped using geographic information system (GIS). Similarly, the flood hazard and hydraulic categories have been determined for the modelled events and appropriate figures have been provided in the report. All the above information has been prepared in a GIS.

The impact of variability of significant model parameters has been assessed by conducting a sensitivity analysis. Model parameters such as catchment roughness, catchment runoff, culvert blockage and downstream boundary condition have been checked for sensitivity. Detailed results of the analysis are provided and compared with the design flood levels for the adopted catchment conditions.

Increased sea levels and increased rainfall intensities are expected to result from climate change effects. Sea level rise is not expected to impact on the Burradoo catchment but the impact of increased rainfall intensities up to 30% have been modelled. A preliminary flood damages assessment and initial identification of remedial options for the catchment were completed.

This study has produced flood behaviour information and provides a management tool in the form of a hydraulic model for future assessment of floodplain risk management options in the study area.

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