

Pacific Highway  
Upgrade – Brunswick  
Heads to Yelgun  
CLG Meeting 3 August  
2005



# Flood Frequency Analysis

Two main methods of design flow estimation:

1. **Flood Frequency Analysis** – statistical analysis of the historic flows at the site.
2. **Rainfall Runoff Modelling** – using a design storm to estimate runoff (eg RAFTS model).

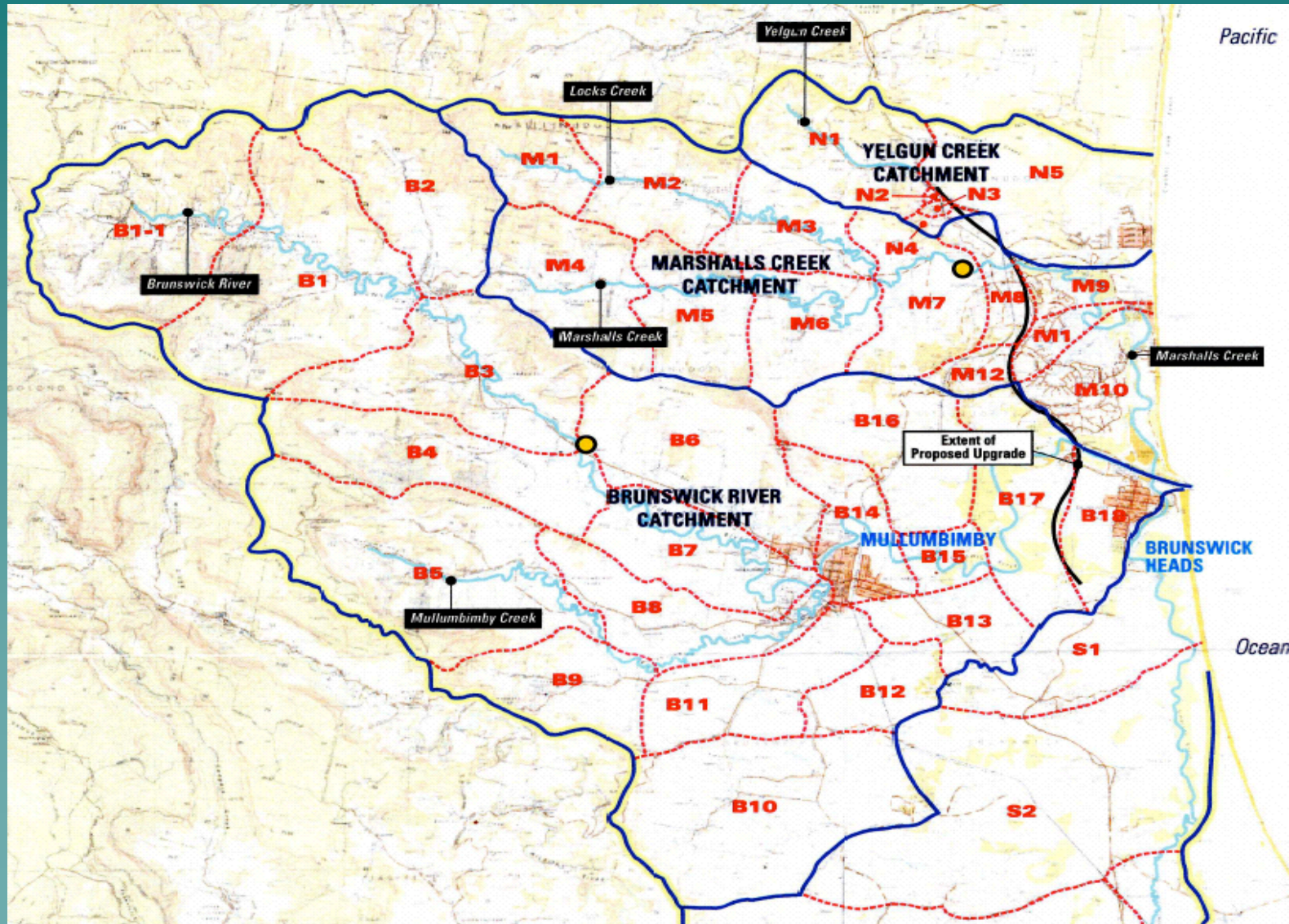
Rainfall runoff modelling is necessary when there is no available streamflow gauge at the site of interest, or if the record period is inadequate.

# Stream Gauges

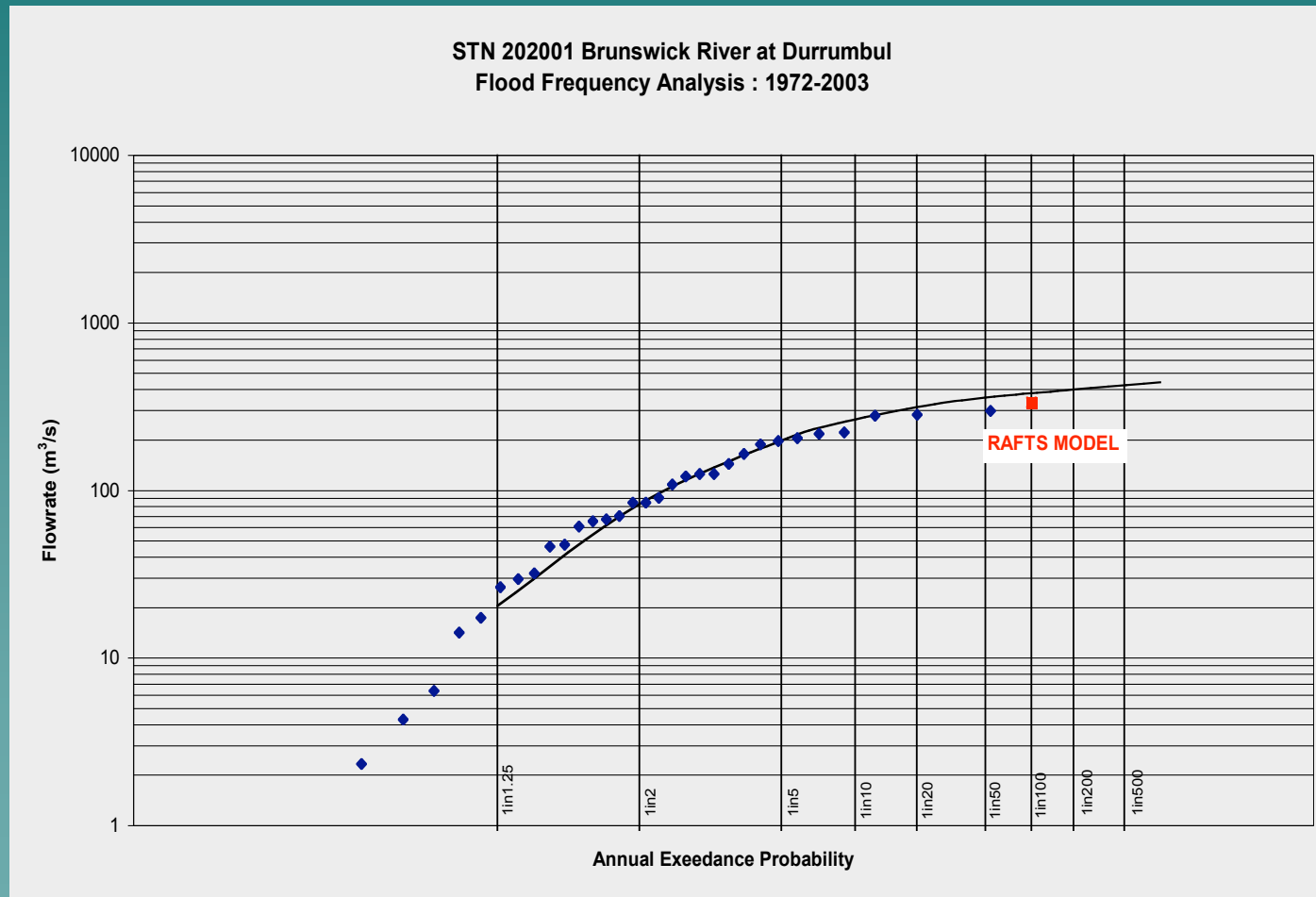
In the Marshalls Ck and Brunswick River catchments, there are two stream gauging stations:

- ◆ **Brunswick River at Durrumbul** – flood discharge measurement
- ◆ **Marshalls Ck at Billinudgel** – flood height measurement only

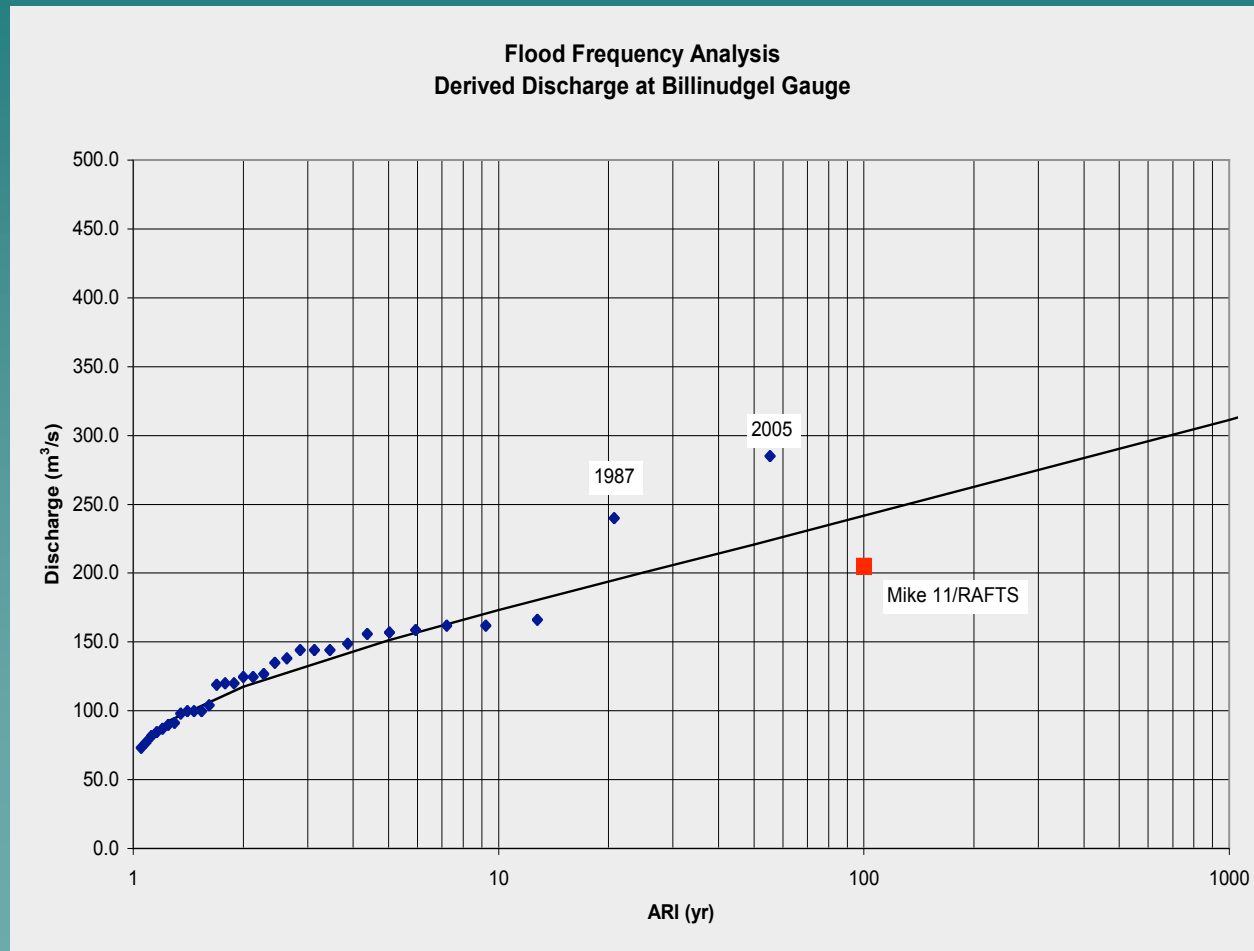
# Catchment Plan



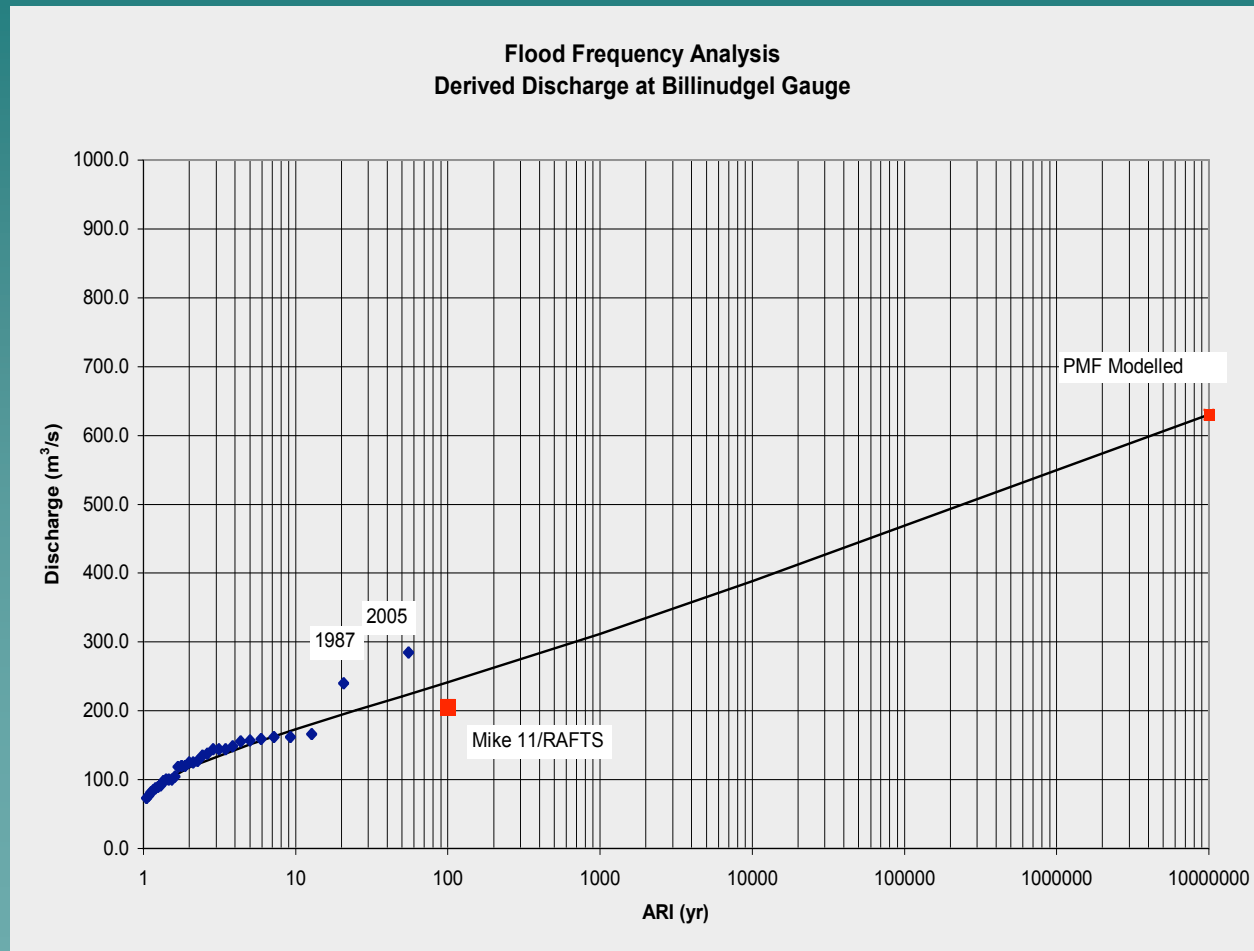
# Brunswick River at Durrumbul



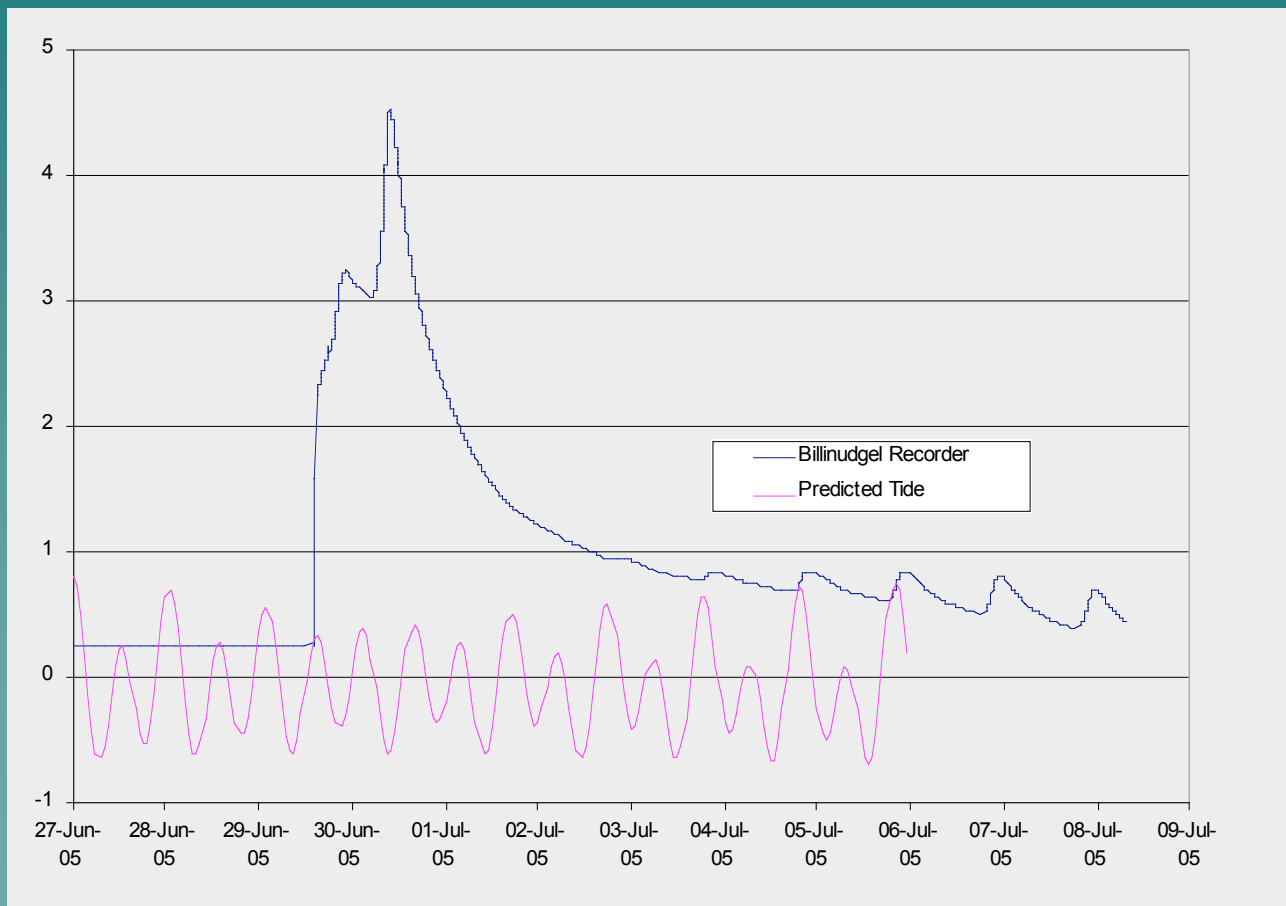
# Marshalls Ck at Billinudgel

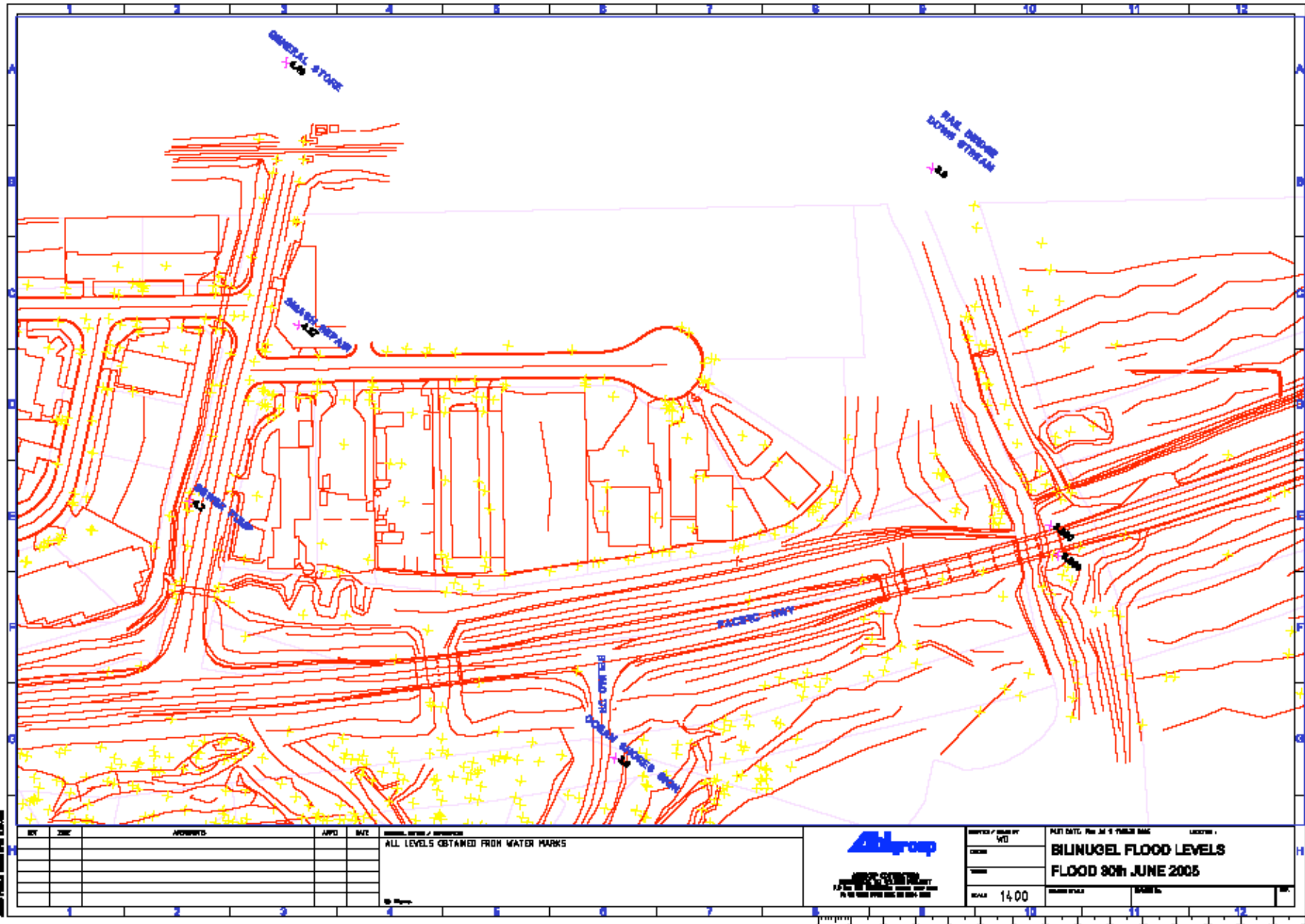


# Extended to Probable Maximum Flood



# June 2005 Flood Calibration





REV	DATE	APPROVED	APPD	DATE

ALL LEVELS OBTAINED FROM WATER MARKS



DRAWN BY: VJ  
 CHECKED:  
 SCALE: 14.00

PROJECT: BILNUGEL FLOOD LEVELS  
 FLOOD 30th JUNE 2005



# 2005 Flood Calibration Billinudgel Area

Location	Observed	Modelled
Balemo Dr, Ocean Shores Sign	3.60	3.60
Marshalls Ck, Pacific Hwy, upstream	3.85	3.78
Wilfred St, Sewer Pump	4.2	4.14
Smash Repairs	4.27	4.21
General Store	4.49	4.48

The model fit is on average within 40 mm at the 5 locations, with a maximum error of 10 mm. This is considered a good fit.

# Event Modelling, Pre/Post Upgrade

Event	Highway downstream	Highway upstream	Wilfred St at Highway Channel	General Store
1987	3.12/3.12	3.30/3.31	3.59/3.60	4.08/4.09
2005	3.59/3.59	3.78/3.81	4.00/4.02	4.48/4.49
Probable Maximum Flood	4.78/4.78	5.00/5.05	4.98/5.04	5.11/5.15

# Maximum Impacts

- ◆ 1987 Flood (“100 yr flood”) – 0.01 m
- ◆ 2005 Flood (500 yr flood) – 0.03 m
- ◆ Probable Maximum Flood – 0.06 m

# Conclusions

- ◆ As requested, we have examined locally derived 1 in 100 year flood data
- ◆ The flood model shows that the design at Marshalls Creek will meet the EIS requirement  
ie no significant increase in flood levels upstream and downstream