



M E M O R A N D U M

TO	Kirstin Hume-Grimm	CC
FROM	John Gan	DATE 5th August 2014
SUBJECT	Proposed development at Hunter Sports High School – Prelim Stormwater & Flood study report	

Kristin,

Please find enclosed our Preliminary report on “*site flooding and stormwater*” at the above school site.

This report has been established from our desktop investigations and reviews of available published reports including our telephone discussions with Peter D’Alessandro of Lake Macquarie City Council (Council). Plate 1 shows a locality plan of the site.

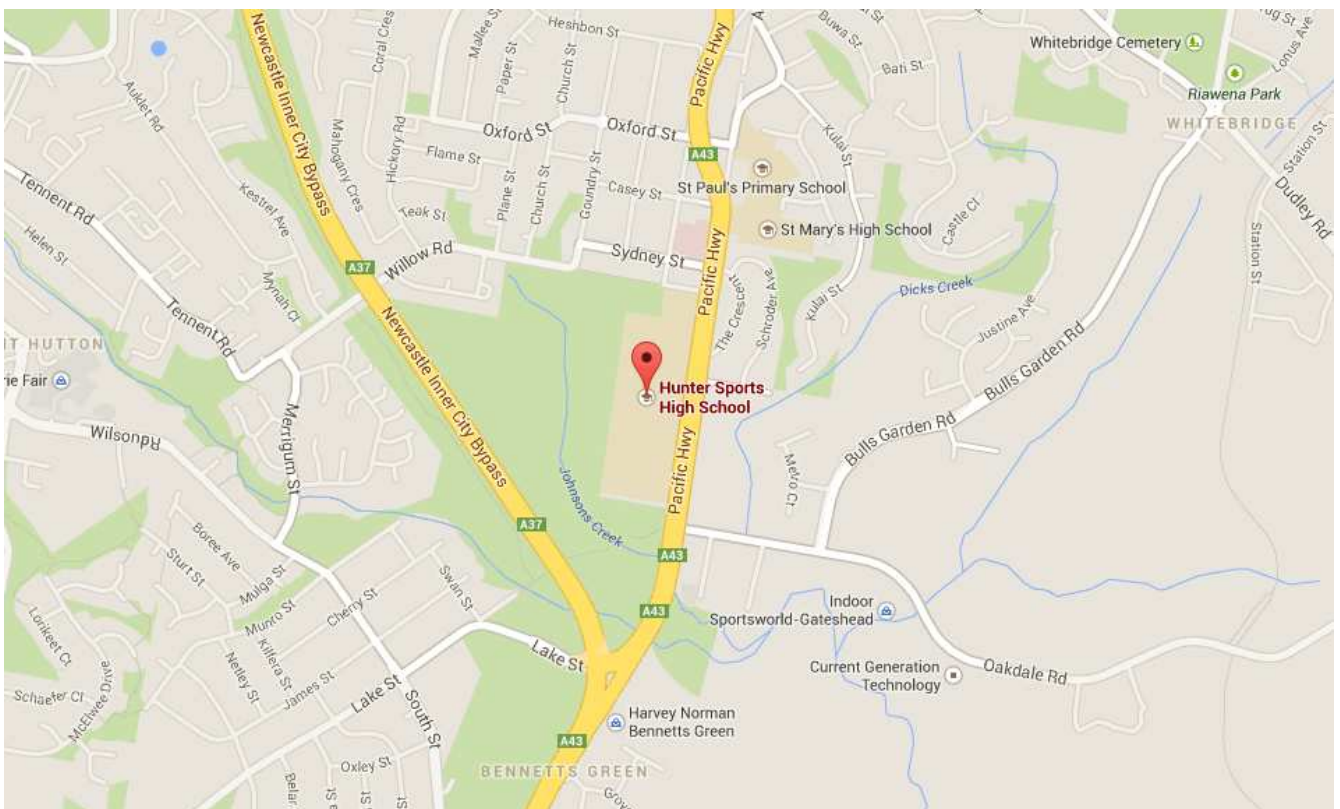


Plate 1 Locality Plan

The school site is accessed from the Pacific Highway at Gateshead on the Central Coast of NSW. Johnsons Creek forms the western and southern boundary of the school site.

1. Data sources

This report is based on the reports reviewed by the author, and summarized in Table 1, which have been obtained from various sources, eg internet and Council:

Available maps, plans and reports of relevance have been obtained and used in this study. These are summarized at Table 1.

Table 1

No	Report/Maps	Source	Authority
1	Original survey including contours of the school site	GAO	Department of Public Works (1979)
2	Draft - Jewells Wetland Flood Study, 2013	Internet	Prepared by Lake Macquarie City Council
3	Draft Report – Jewells Wetland Flood Study, May 2013 including maps and plans.	Council	Prepared by BMT WBM

2. Findings

2.1 Existing site contours

The parcel of land forming the school site has an elevation that ranges from RL 17.0 and 31.73 m AHD. Refer to Attachment 3 which shows the existing low and high spots including the site contours. In general, the school site slopes approximately from the north-east corner to south-west corner of the site. The high point is located on the north-east corner of the school site and slopes gently towards the low point, which is located in the south-west corner of the site.

2.2 Stormwater drainage inventory:

A check with Lake Macquarie City Council shows that the site is serviced by a pit/pipe, including kerb and gutter stormwater drainage system running along Pacific Highway, which eventually drains into Johnsons Creek.

2.3 Flood levels

The flood levels have been obtained from the *Jewells Wetland Flood Study*, May 2013, and are summarized at Table 2.

Table 2

	100 yr ARI	Probable Maximum Flood (PMF)
Flood level (mAHD)	16.5 (Refer to Attachment 1 for details)	18.4 (Refer to Attachment 2 for details)

2.3 Effects of Climate change

Tables 3 and 4 summarises our sea level analyses due to the effects of climate change.

Table 3

Mean High Water Spring (MHWS)	1.557 (m)		
Climate Change - Sea Level Rise Benchmark (m)	2011	2050	2100
	0	0.4	0.9
Mean High Water Spring (MHWS) (m)		1.957	2.457
Mean High Water Spring (MHWS) at Australian Height Datum (AHD)	0.937	1.020	1.520

Table 4

Highest Recorded Tide Recorded in 1974 (m)	2.4		
Climate Change - Sea Level Rise Benchmark (m)	2011	2050	2100
	0	0.4	0.9
Highest High Water Spring (HHWS) (m)		2.800	3.300
Highest High Water Spring (HHWS) at Australian Height Datum (AHD)	0.937	1.863	2.363

3. Comments

My comments and Council's requirements for the site are as follows:

- From the existing school site survey data, the school site slopes approximately from the north-east corner to the south-west corner, with levels ranging from RL 31.73m to RL 17.0 mAHD.
- Johnsons Creek forms the western and southern boundary of the school site.
- From the above *Jewells Wetland Flood Study*, May 2013 report, our findings show that the school site is not affected by the 100 year ARI storm event but is affected by the Probable Maximum Flood storm. This only applies to the south-west corner of the school site. Refer to details summarized at Table 2 and depicted on Attachment 2.
- Tables 3 and 4 summarises the sea level rises due to Climate Change.
 - Normally designs have been based on MHWS and HHWS. If these assumptions are accepted by DEC, then the site will be OK, esp when a freeboard of 0.5m is added to obtain the Habitable Floor Level.
 - Therefore the site is not directly affected by sea level rises due to Climate Change.
- Council advises that a Stormwater Management Plan will need to be formulated to address the proposed school development. The objectives for plan on the site would include:
 - Incorporate Water Sustainable Urban Design (WSUD) measures including;
 - Rainwater / stormwater reuse to minimise potable water use;
 - Treat stormwater for best practice pollutant reduction to mitigate impacts on receiving environments;

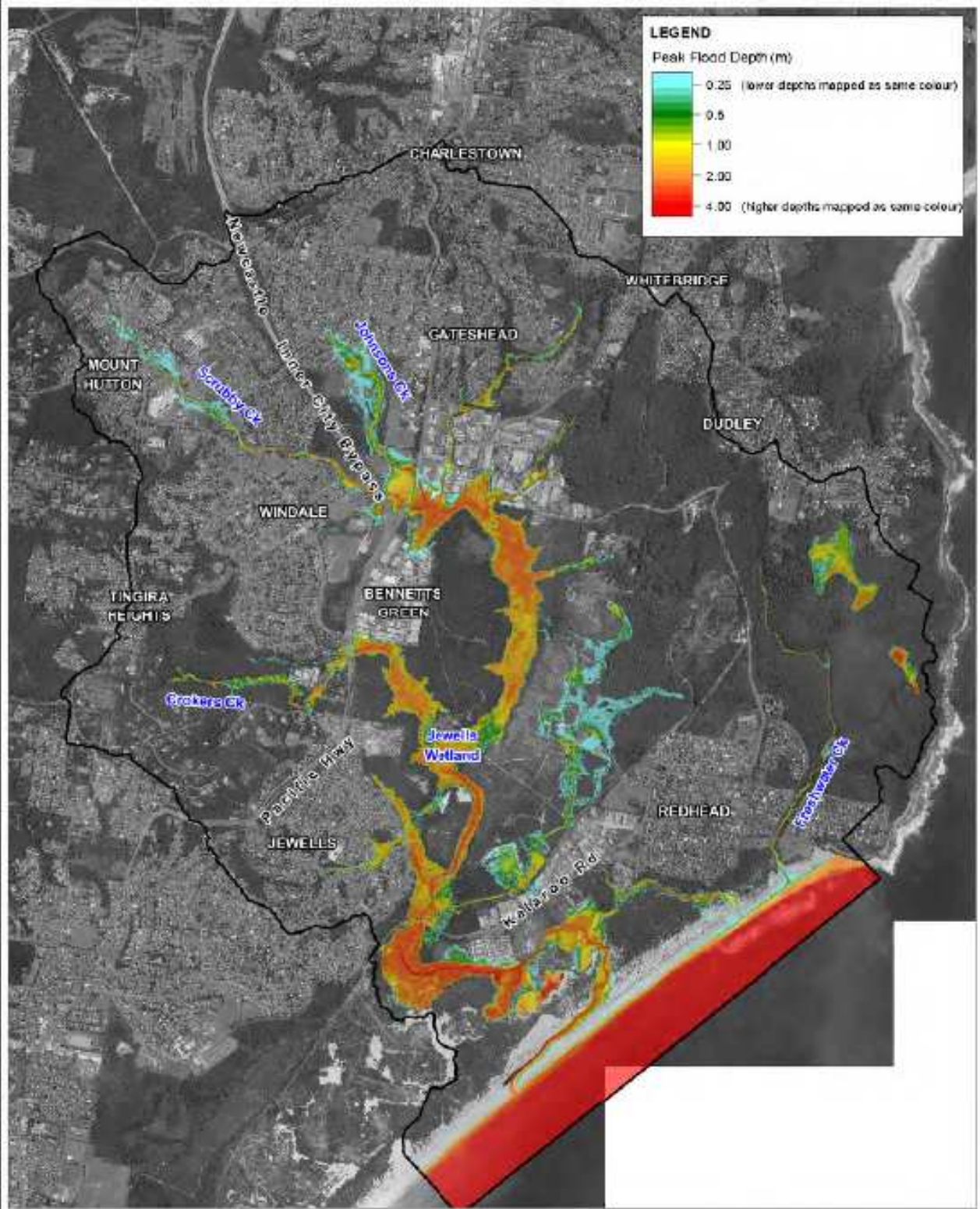
- Minimise discharge to sewer; and
- Integrate treatment systems with the landscape design for enhanced amenity
 - o Provide stormwater and drainage infrastructure including overland flow paths;
 - o Minimise water pollution;
 - o Mitigate potential flooding impacts (including consideration of climate change, sea level rise and increased rainfall intensity);
 - o Mitigate potential impacts on groundwater hydrology and quality; and
 - o Minimise water pollution associated with construction activities for the development.
- Current site flooding issues will determine the Habitable Floor Level (HFL) for the proposed new buildings on the school site. Therefore, with reference to Table 2, the Habitable Floor Level will need to be located at a minimum level of RL16.5m AHD (100 year ARI flood depth) plus a 0.5m (freeboard) which equals 17.0m AHD.

If you have any queries, please do not hesitate to contact John Gan on (02) 93727803



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ATTACHMENTS



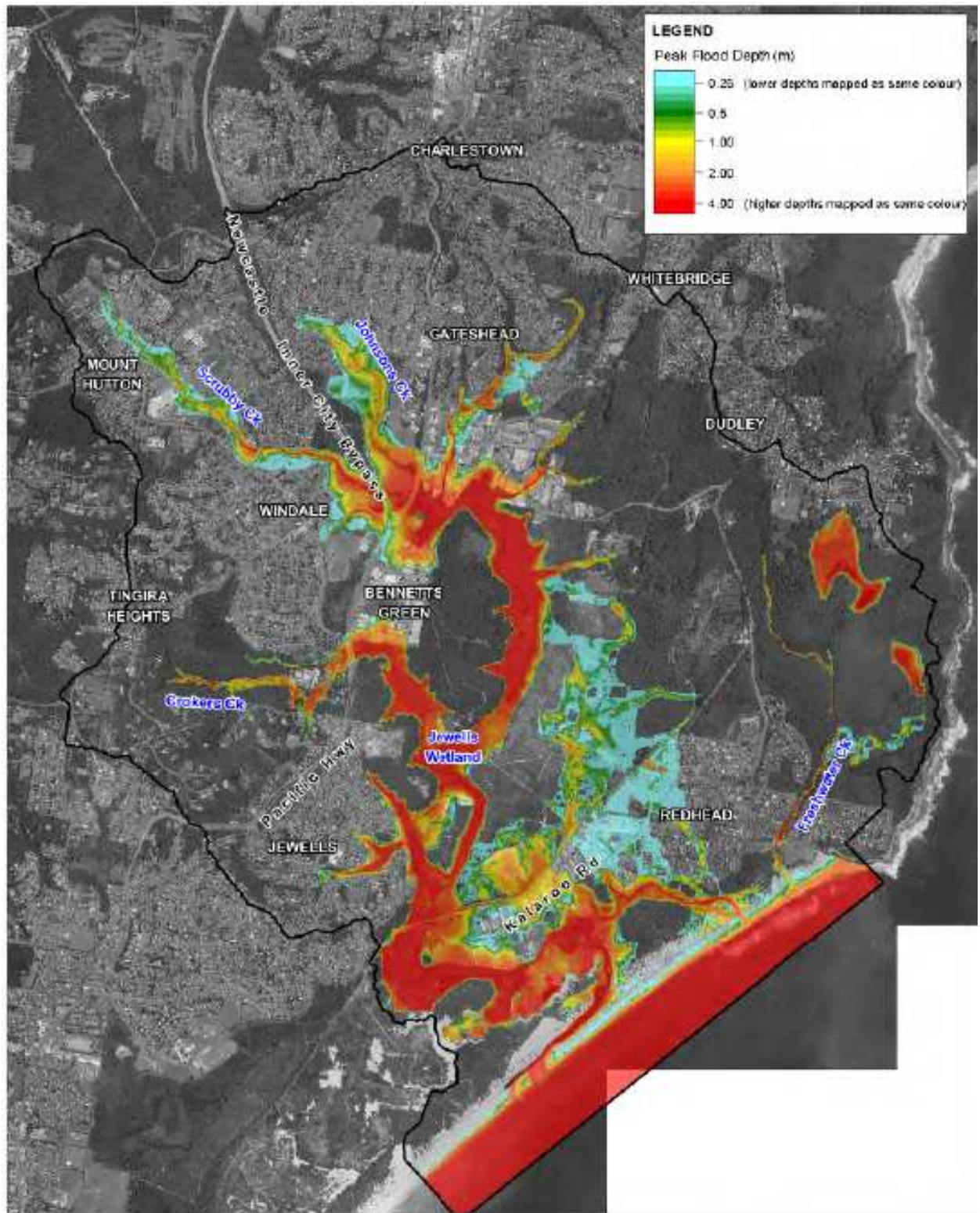
Title:
Peak Flood Depth - 1% AEP Event

Figure:	Rev:
1%_AEP_d	A

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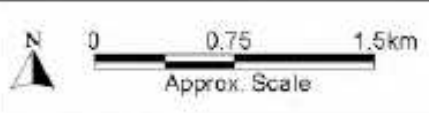
Attachment 1



Title:
Peak Flood Depth - PMF Event

Figure	Rev.
PMF_d	A

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Attachment 2

