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BULLER RIVER UPDATED HAZARD MAPPING

As requested, we have produced new flood hazard maps as well as flood depth maps for the Buller River model based on the results from the most recent model update carried out last year (Gardner, 2017). Please note that while producing these maps we found a minor error in the application of the tidal boundary condition in the Orowaiti Lagoon for the sea level rise scenarios and have therefore rerun the model for all of these scenarios. The maps that we have produced therefore supersede all previous results. We have also supplied digital result files for peak depth, peak water Level, peak speed and hazard categorisation for each of the scenarios which can be used within any standard GIS package.

FLOOD HAZARD MAPS

There are a large number of potential hazard categorisations to use. For this report, hazard categories have been presented based on the general guidelines from the Australian Rainfall and Runoff Guidelines (Cox, 2016) and are based on a combination of speed and velocity. The hazard categories are summarised in Table 1 and presented graphically in Figure 1.

Table 1 – Description of Hazard Categories

Hazard Vulnerability Classification	***Description***
H1	Generally safe for vehicles, people and buildings.
H2	Unsafe for small vehicles.
H3	Unsafe for vehicles, children and the elderly.
H4	Unsafe for vehicles and people.
H5	Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust buildings subject to failure.
H6	Unsafe for vehicles and people. All building types considered vulnerable to failure.

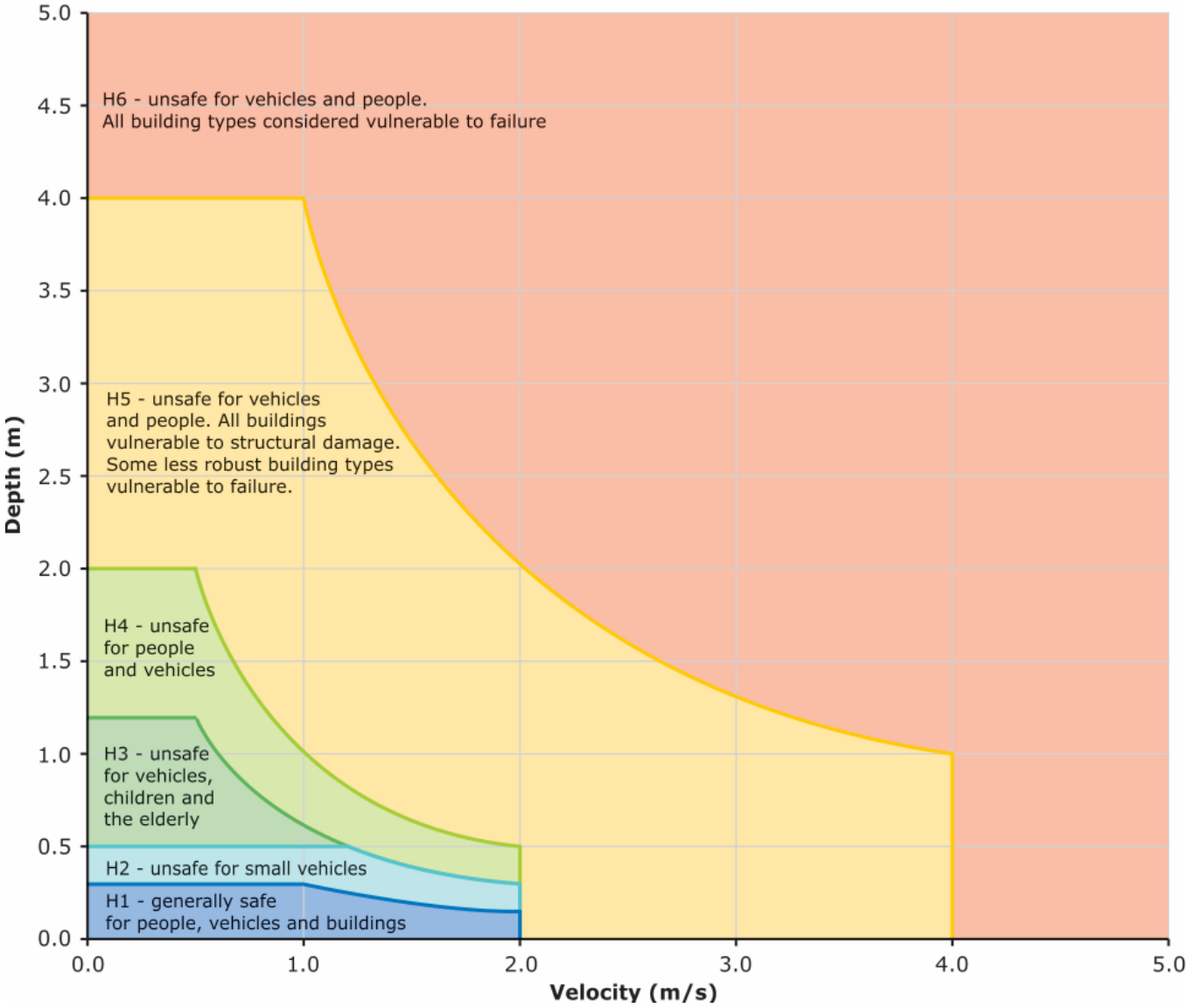

Figure 1 – Graphical representation of the Hazard Categories

More detailed information on the derivation of the Hazard Categories can be found in the Australian Rainfall and Runoff guidelines which can be accessed online at http://arr.ga.gov.au/arr-guideline (NB. hazard categories are discussed in Chapter 7 of Book 6 – Hydraulics).

There are a range of more specific hazard categorisations available which are more specific for evacuation planning etc, however the categories adopted for these maps are the most general and suitable for a wide range of purposes.

MODELLED SCENARIOS

The modelled scenarios are the same as were run in the 2017, however are summarised in Table 2 below.

Table 2 – Summary of modelled scenarios

Scenario	*Description*
1	50 year, no blockage, current climate
2	50 year, 10% Blockage SH Bridge, 5% Blockage Rail Bridge, current climate
3	50 year, 15% Blockage SH Bridge, 10% Blockage Rail Bridge, current climate
4	100 year, no blockage current climate
5	100 year, 10% Blockage SH Bridge, 5% Blockage Rail Bridge current climate
6	100 year, 15% Blockage SH Bridge, 10% Blockage Rail Bridge current climate
7	50 year, no blockage, 16% increase in rainfall, 0.7m sea level rise
8	50 year, 10% Blockage SH Bridge, 5% Blockage Rail Bridge, 16% increase in rainfall, 0.7m sea level rise
9	50 year, 15% Blockage SH Bridge, 10% Blockage Rail Bridge, 16% increase in rainfall, 0.7m sea level rise
10	100 year, no blockage, 16% increase in rainfall, 0.7m sea level rise
11	100 year, 10% Blockage SH Bridge, 5% Blockage Rail Bridge, 16% increase in rainfall, 0.7m sea level rise
12	100 year, 15% Blockage SH Bridge, 10% Blockage Rail Bridge, 16% increase in rainfall, 0.7m sea level rise
13	100 year, no blockage, 16% increase in rainfall, 1m sea level rise
14	100 year, 10% Blockage SH Bridge, 5% Blockage Rail Bridge, 16% increase in rainfall, 1m sea level rise
15	100 year, 15% Blockage SH Bridge, 10% Blockage Rail Bridge, 16% increase in rainfall, 1m sea level rise

PDF maps are attached separately to this document. I trust this meets you requirements. Don't hesitate to get in touch if you have any questions in regards to these maps / results.

Kind regards,

Matthew Gardner

CMEngNZ, CPEng

Director, Land River Sea Consulting Ltd

Works Cited

Cox, Smith. 2016. *Australian Rainfall Runoff Guidelines: Flood Hydraulics - Chapter 7. Safety Design Criteria.* s.l. : Commonwealth of Australia (Geoscience Australia), 2016.

Gardner, Matthew. 2017. *Buller River: Updated Hydraulic Modelling.* s.l. : Land River Sea Consulting Ltd, 2017.

Attachments

Peak Flood Depth Maps Scenarios 1 to 15

Flood Hazard Maps Scenarios 1 to 15