Pittwater Data Services Pty Ltd
ABN 36098815537
15 Lloyd George Grove, Tanilba Bay, 2319
Mobile: 0422088032
Email: pittwaterdataservices@live.com.au
Our Reference:
PDS24042023:825PITTWATERRD:BAYVIEW

Mr Craig Pocklington
C/-Bayview Golf Club
1825 Pittwater Road,
Bayview, 2105
28th April 2023

Flood Report for Bayview Golf Course Greens Upgrades

Dear Craig,

1.0 INTRODUCTION

I refer to your Development Application (DA) for Bayview Golf Course greens upgrades (Lot 191 DP 1039481) as discussed with yourself. Northern Beaches Council (NBC) has identified the golf course is subject to flood inundation. Therefore a flood review of the design, potential flood impact as detailed in NBC Development Control Plan Section B3.11 is required and presented in this report.

A Pre-Lodgement Meeting (PLM2022/0075) was held on the 10th May 2022. Minutes from that meeting in relation to flooding requires an assessment of the course green developments to be assessed in terms of potential flood impact; specifically loss of flood storage below the 1%AEP peak predicted flood level.

The following flood report was undertaken and submitted for both your and NBC consideration as part of the DA process. Note that Bayview Golf Course will be referred to as the ***site.***

2.0 SITE REVIEW

The ***site*** was reviewed by Mr Stephen Wyllie and on ***site*** discussions held with you on 22nd February 2023. The ***site*** is located as shown in Figure 1. There are several features of the topography of the ***site*** and its location in the catchment that is important to the potential inundation of the ***site***. These are:

1. The ***site*** eastern portion is a major flood storage area for the Cahill Creek catchment.
2. The ***site*** has had a history of filling however the main outlet channels have been essentially maintained.
3. The outlet to the ***site*** is controlled by a series under-shot gates which are opened during flooding periods and remained closed at other times. (Ref 2).

4. The ***site*** topography varies from level from 1.5 metres AHD to 27.5 metres AHD from the eastern to western boundaries of the ***site*** as shown in Figure 2.

3.0 REVIEW OF EXISTING DATA

The topography for this investigation used the NSW Government Land and Property Lidar 2014 Data Sydney 201105 and 201106. Contours were generated by Pittwater Data Services Pty Ltd at 0.5 metre intervals (Figure 1).

The design and existing contour plans for each greens was generated and published by Chrisp Consulting C110 to C1122 Rev A Job No23003 dated 27th February 2023. The required profiling volumes (Cut and Fill) were detailed on each sheet.

The Cahill Creek Catchment flooding has been extensively modelled by Royal Haskoning DHV (Ref 1) commissioned by Northern Beaches Council.

4.0 RESULTS OF INVESTIGATION

The flood study which is relevant to this review is (Ref 1). The important processes are:

1. The ***site*** is exposed to Creek and overland flows generated in a catchment. These flood flows accumulate on the lower portion of the ***site***, which act as a retarding basin ie inflows are temporally stored on the ***site*** reducing the velocities of floodwaters from various sources. The storage volume for a 1%AEP flood as shown in Figure 2 is approximately 250,000 cubic metres.
2. The natural creek system has been altered during the development of the ***site***, ensuring that a channel and ponding system maintains an efficient conveyance. The core of the flood flow (floodway) is shown in red in Figure 3.
3. An earth channel was constructed along the northern portion of the ***site*** between greens 5th and 6th,. This channel diverts overland flows from the western portion of the ***site.***
4. The lower portion of the ***site*** is inundated during floods of frequency of 20%AEP (1:5 years) and higher. The inundation of the 1%AEP frequency flood (1.92m AHD) is shown in Figure 2.
5. The 1%AEP predicted peak flood velocity at location 10 as shown in Figure 3 is 0.14m/s. This location is adjacent to the channel, The velocities in other areas are predicted to be lower
6. The 1%AEP as shown in Figure 2 inundates the lower portion of the ***site*** including greens 1,2,3,8,10,12 and 13th . Greens 1,2,3 and 8 (blue areas) are above the 1%AEP as shown in Figure 2.
7. The greens inundated by the 1%AEP are located away from the channel/ponding system where the core flows occur. The exception is the 1st green, which is 55metres north of the channel.
8. The 1st green location relative to the channel is shown in Figure 4. The flow and velocity distribution at this location is controlled by the under-shot gates where the width of high velocities is approximately the width of the outlet structure. The 1stgreen is outside the high velocity zone as shown conceptually in Figure 4.

9. The green re-profiling within the flood storage zone has a net loss in fill volume for greens detailed in 6 except 1and 2. The cut fill volumes based on Ref 2 for these greens is shown in Table 4.1

Table 4.1 Greens Inundated by 1%AEP required Volume Changes

Green No	10st	12th	13th	Total	Comment
Cut cubic metres	0	0	0	0	Net gain in flood storage
Fill cubic metres	233	290	188	711	Net loss in flood storage
Difference cubic metres	233	290	188	711	Net loss of flood storage

The flood storage loss for the 1%AEP inundated greens is approximates 711cubic metres. Considering the total storage of the lower portion of the ***site*** is approximately 250,000 cubic metres this represents a small percentage from the storage system. The impact on the 1%AEP flooding processes would be imperceptible.

The peak 1%AEP velocities are low (<0.14m/s) and all contoured new green profiles are conducive to efficient streamlining of flood flows. No impact on velocity distribution is predicted.

In conclusion the ***site*** green profiling will have imperceptible impact (not measureable) on the flooding characteristics of the 1%AEP flooding processes in terms of loss of flood storage, velocity distribution and peak flood levels. Flooding related controls have been essentiall met (small storage loss) as required in NBC Development Control Plan B3.11 High Flood risk Precinct Flood Effects Caused by Development (Recreational and Environmental Use and PLM2022/0075 Flooding.

Yours Faithfully

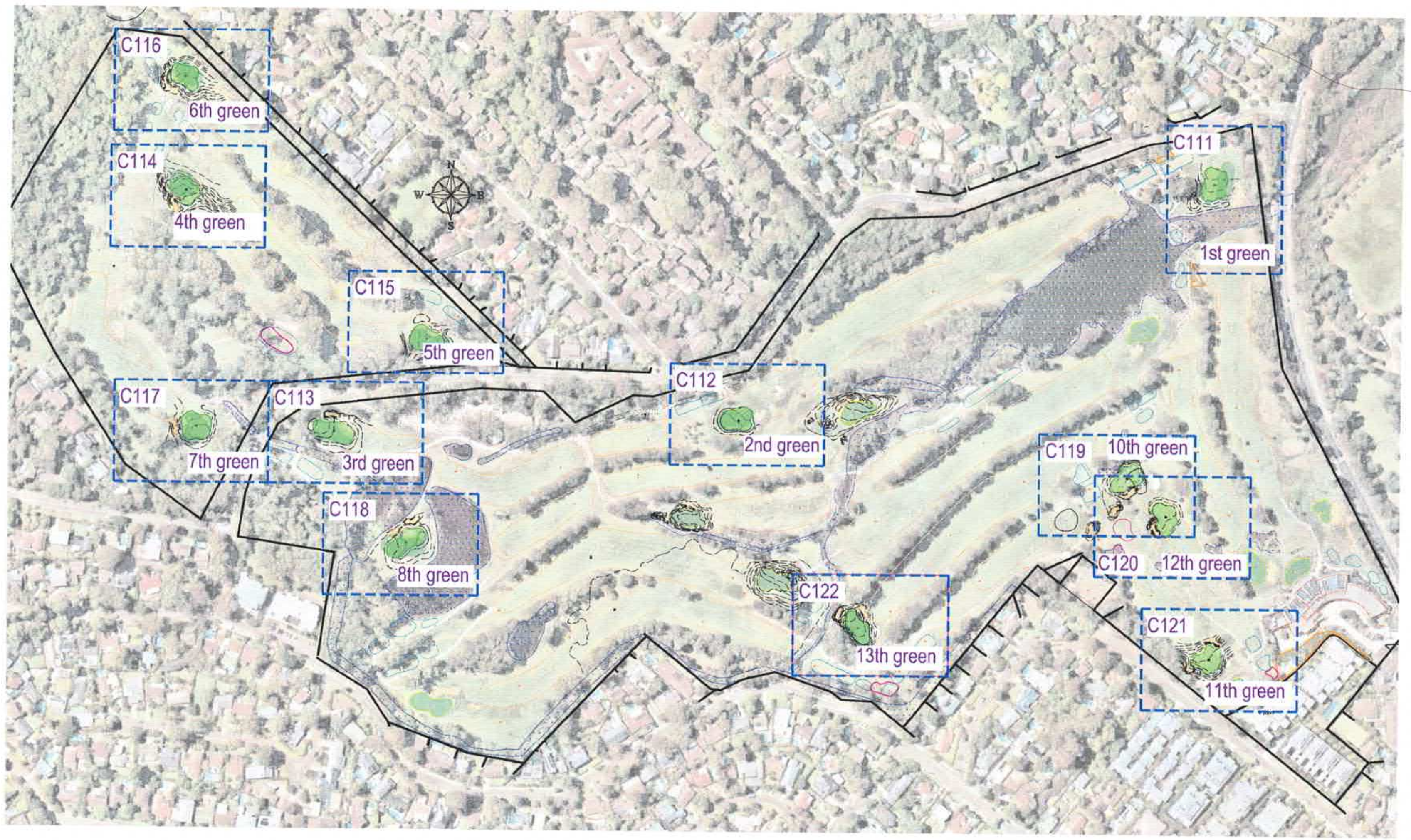
Stephen Wyllie Bsc(Eng) FMA Member

Director 28/4/2023

5.0 REFERENCES

1. McCarrs Creek, Mona Vale and Bayview Flood Study and Review, Royal Haskoning DHV, July 2017.
2. .Estuarine Risk Management and Water Management Report for Drainage works at Bayview Golf Club.Horton Coastal Engineering Pty Ltd, August 2021.
3. ChrisP Consulting Job No 23003.

FIGURES



ISSUE FOR DEVELOPMENT APPLICATION

REV	DATE	REVISION DESCRIPTION
A	27.02.2023	ISSUE FOR REVIEW AND COMMENT

TITLE	NAME
DRAWN	DI
DESIGNED	CP
DRG CHECK	CP
DESIGN CHECK	AL
APPROVED	CP

BAYVIEW GOLF CLUB

CHRISP CONSULTING

SEDIMENT AND EROSION CONTROL MANAGEMENT

CLIENT

BAYVIEW GOLF CLUB

ZONE MAP AREAS & GENERAL WORKS

JOB NUMBER: 23003

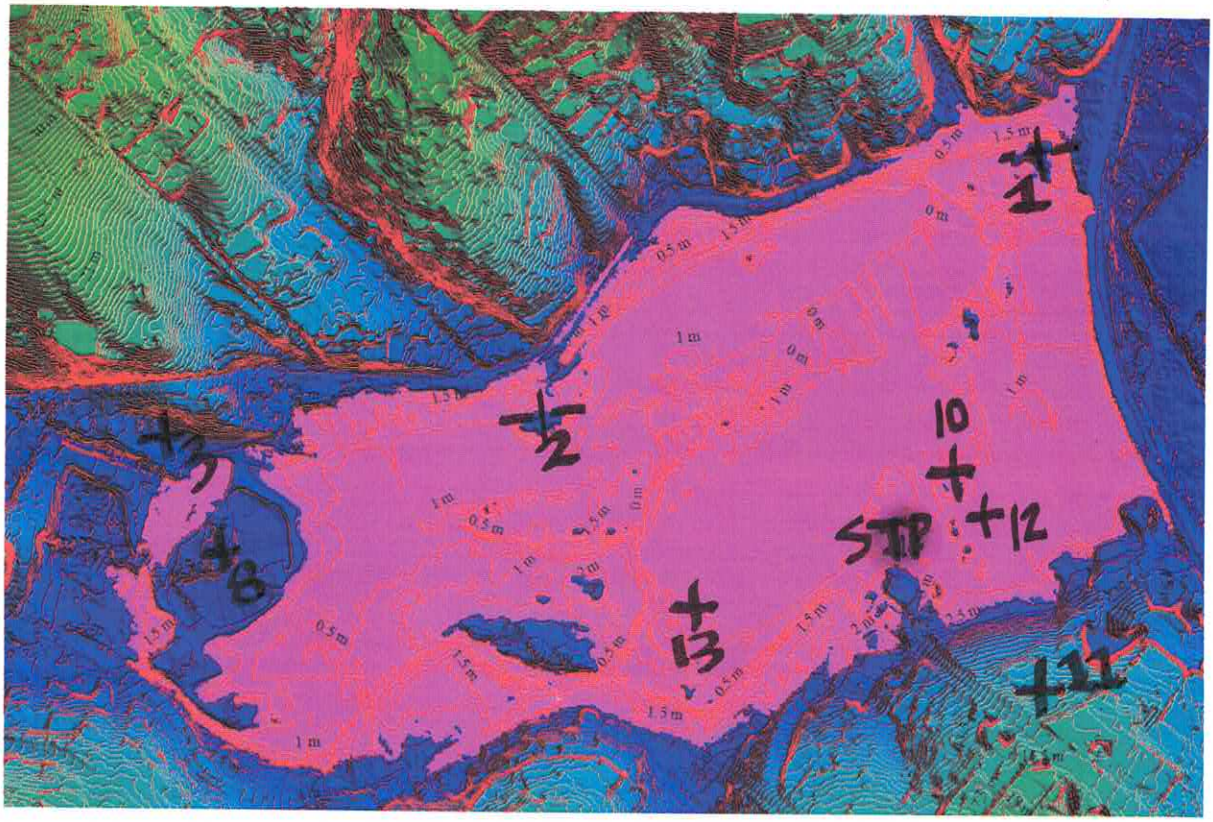
SCALE @ A1: NTS

SHEET No: C110

REV: A

THIS TEXT TO BE PRINTED IN COLOUR

FIGURE 1



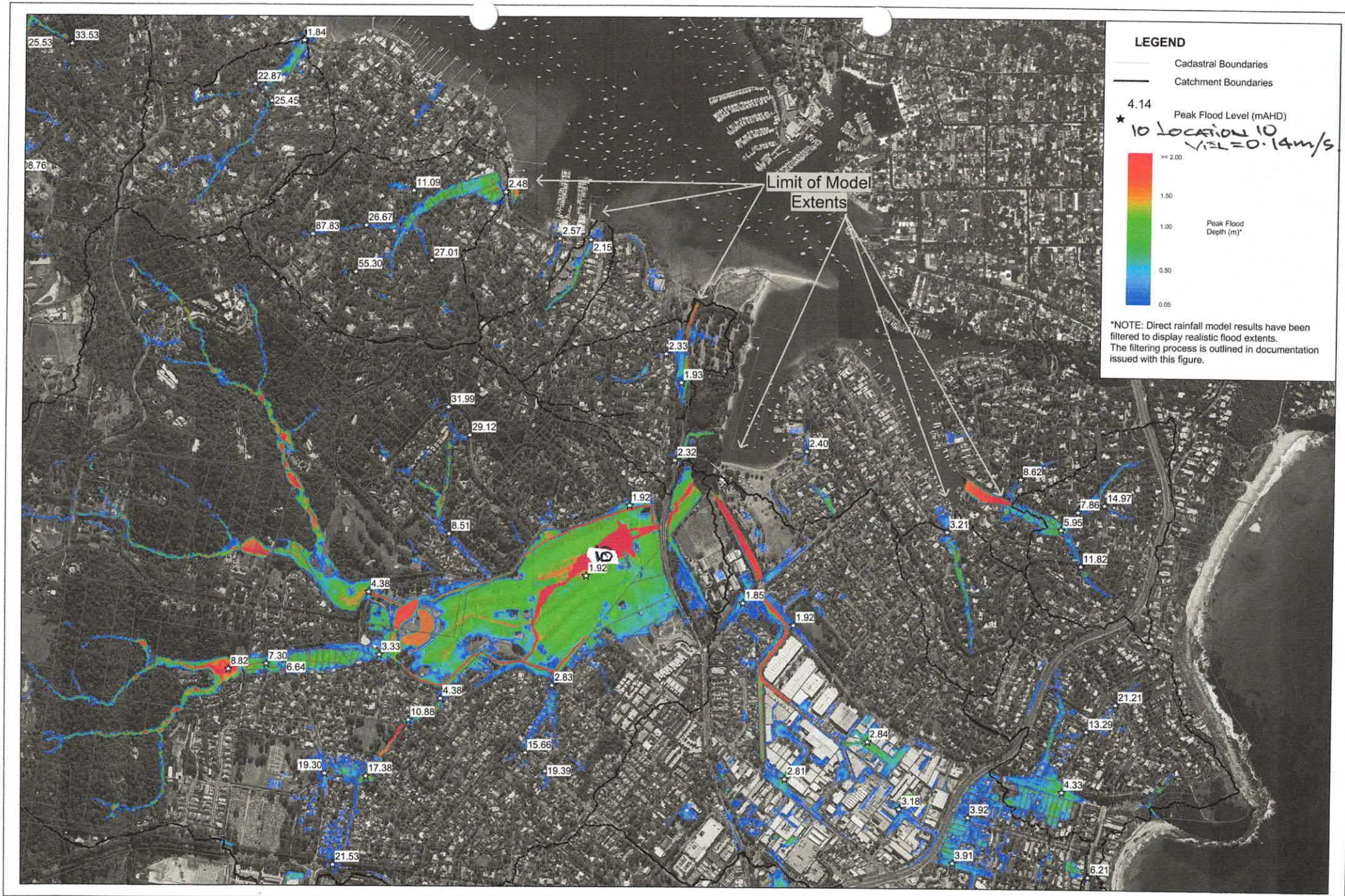
LEGEND

1% AEP INNUNDATION

1 GREEN NO.1 ABOVE 1% AEP

STP: SEWAGE TRANSFER STATION

FIGURE 2



NORTH

PAGE SIZE A3 | SCALE 1:10,000

PROJECT NO: 8A0433

PROJECT TITLE: McCarrs Creek, Mona Vale and Bayview Flood Study

FIGURE A.5B PEAK FLOOD DEPTH (1% AEP EVENT)

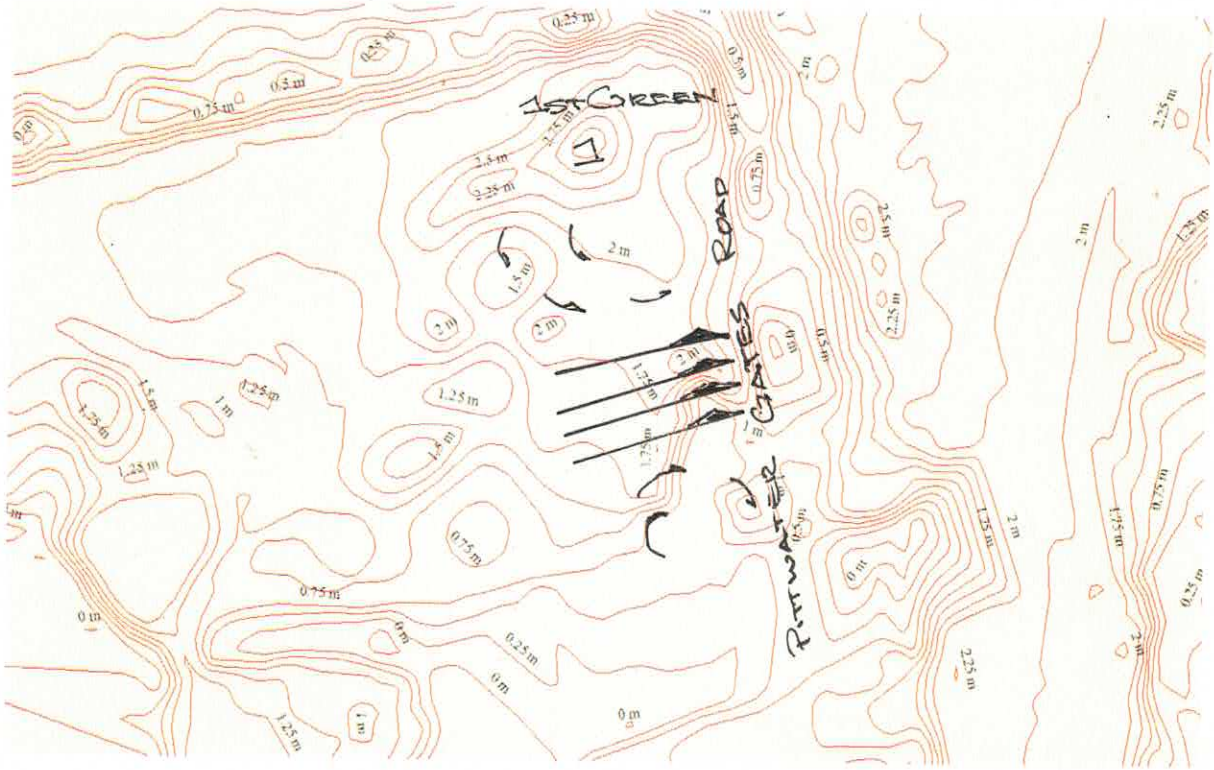
CO-ORDINATE SYSTEM: Datum: GDA94 Projection: MGA Zone 56 REVISION C

CREATED BY: P.Carolan DATE 6/07/2017

FILEPATH I:\Projects\8A0433 - McCarrs Creek and Mona Vale Flood Study\04_Technical_Data\01_GIS\07_Figures\Final_Report\Appendix_A

Royal HaskoningDHV

FIGURE 3



CONCEPTUAL 10% AEP VELOCITY DISTRIBUTION

LEGEND

→ : VELOCITY VECTORS

1 : GREEN NO

FIGURE 4