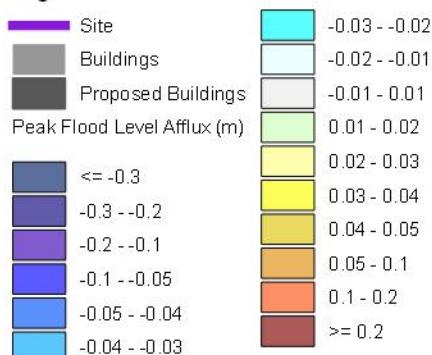


Annexure C – Afflux Flood Maps


Legend


©Copyright Information

0 25 50 m


Figure Number

C1

Figure Title

Peak Flood Level Afflux
Post-Development Conditions
10% AEP Design Flood Event

Client

Landcom

Project Title

Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref

P23-002

Issue Date

24-May-24

Version

Final

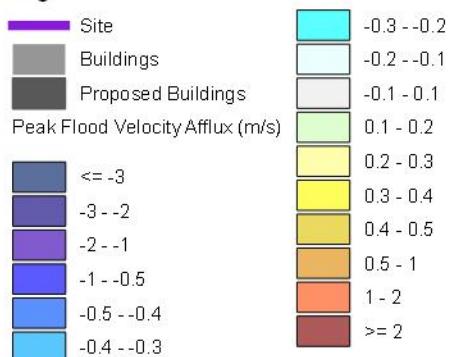
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0 25 50 m



Figure Number

C2

Figure Title

Peak Flood Velocity Afflux
Post-Development Conditions
10% AEP Design Flood Event

Client

Landcom

Project Title

Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref

P23-002

Issue Date

24-May-24

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Legend

Site

Buildings

Proposed Buildings

Peak Velocity-Depth Afflux (m²/s)

<= -0.25

-0.25 - -0.2

-0.2 - -0.15

-0.15 - -0.1

-0.1 - -0.08

-0.08 - -0.06

-0.06 - -0.04

-0.04 - -0.02

-0.02 - 0.02

0.02 - 0.04

0.04 - 0.06

0.06 - 0.08

0.08 - 0.1

0.1 - 0.15

0.15 - 0.2

>= 0.2

0 25 50 m



Figure Number

C3

Figure Title

Peak V-D Product Afflux
Post-Development Conditions
10% AEP Design Flood Event

Client

Landcom

Project Title

Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref

Issue Date

Version

P23-002

24-May-24

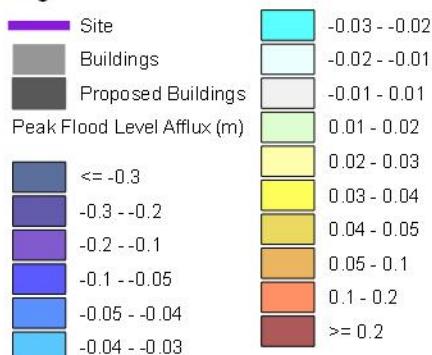
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0 25 50 m


Figure Number

C4

Figure Title

Peak Flood Level Afflux
Post-Development Conditions
5% AEP Design Flood Event

Client

Landcom

Project Title

Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref

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Issue Date

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Legend

| | |
|----------------------------------|--------------|
| Site | -0.3 -- -0.2 |
| Buildings | -0.2 -- -0.1 |
| Proposed Buildings | -0.1 - 0.1 |
| Peak Flood Velocity Afflux (m/s) | 0.1 - 0.2 |
| <= -3 | 0.2 - 0.3 |
| -3 -- -2 | 0.3 - 0.4 |
| -2 -- -1 | 0.4 - 0.5 |
| -1 -- -0.5 | 0.5 - 1 |
| -0.5 -- -0.4 | 1 - 2 |
| -0.4 -- -0.3 | >= 2 |

©Copyright Information

0 25 50 m



Figure Number

C5

Figure Title

Peak Flood Velocity Afflux
Post-Development Conditions
5% AEP Design Flood Event

Client

Landcom

Project Title

Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref

P23-002

Issue Date

24-May-24

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Legend

| | |
|--|---------------|
| Site | -0.06 - -0.04 |
| Buildings | -0.04 - -0.02 |
| Proposed Buildings | -0.02 - 0.02 |
| Peak Velocity-Depth Afflux (m ² /s) | 0.02 - 0.04 |
| <= -0.25 | 0.04 - 0.06 |
| -0.25 - -0.2 | 0.06 - 0.08 |
| -0.2 - -0.15 | 0.08 - 0.1 |
| -0.15 - -0.1 | 0.1 - 0.15 |
| -0.1 - -0.08 | 0.15 - 0.2 |
| -0.08 - -0.06 | >= 0.2 |

Copyright Information

0 25 50 m



Figure Number

C6

Figure Title

Peak V-D Product Afflux
Post-Development Conditions
5% AEP Design Flood Event

Client

Landcom

Project Title

Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref

P23-002

Issue Date

24-May-24

Version

Final

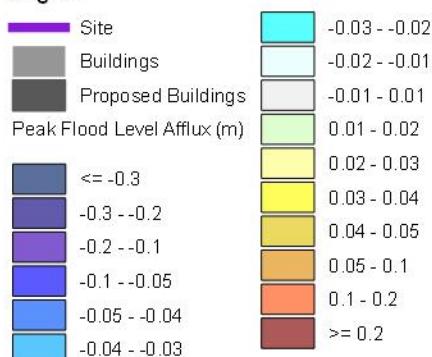


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Legend



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Figure Number

C7

Figure Title

Peak Flood Level Afflux
Post-Development Conditions
1% AEP Design Flood Event

Client

Landcom

Project Title

Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref

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Issue Date

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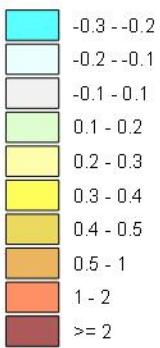


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Legend

- Site
- Buildings
- Proposed Buildings
- Peak Flood Velocity Afflux (m/s)



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0 25 50 m



Figure Number

C8

Figure Title

Peak Flood Velocity Afflux
Post-Development Conditions
1% AEP Design Flood Event

Client

Landcom

Project Title

Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref

P23-002

Issue Date

24-May-24

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Legend

| | |
|--|---------------|
| Site | -0.06 - -0.04 |
| Buildings | -0.04 - -0.02 |
| Proposed Buildings | -0.02 - 0.02 |
| Peak Velocity-Depth Afflux (m ² /s) | 0.02 - 0.04 |
| <= -0.25 | 0.04 - 0.06 |
| -0.25 - -0.2 | 0.06 - 0.08 |
| -0.2 - -0.15 | 0.08 - 0.1 |
| -0.15 - -0.1 | 0.1 - 0.15 |
| -0.1 - -0.08 | 0.15 - 0.2 |
| -0.08 - -0.06 | >= 0.2 |

Copyright Information

0 25 50 m



Figure Number

C9

Figure Title

Peak V-D Product Afflux
Post-Development Conditions
1% AEP Design Flood Event

Client

Landcom

Project Title

Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref

P23-002

Issue Date

24-May-24

Version

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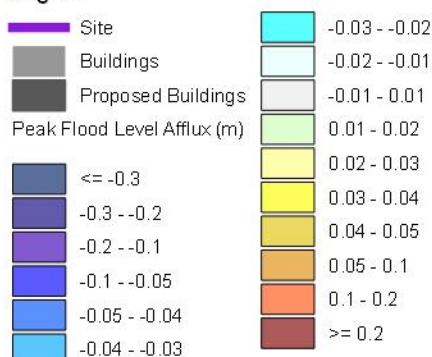


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Figure Number

C10

Figure Title

Peak Flood Level Afflux
Post-Development Conditions
1% AEP Design Flood Event (Climate
Change)

Client

Landcom

Project Title

Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref
P23-002

Issue Date
24-May-24

Version
Final

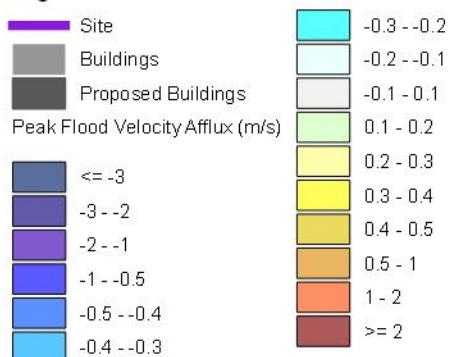
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Figure Number

C11

Figure Title

Peak Flood Velocity Afflux
Post-Development Conditions
1% AEP Design Flood Event (Climate
Change)

Client
Landcom
Project Title
Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref P23-002 **Issue Date** 24-May-24 **Version** Final



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Legend

| | |
|--|---------------|
| Site | -0.06 - -0.04 |
| Buildings | -0.04 - -0.02 |
| Proposed Buildings | -0.02 - 0.02 |
| Peak Velocity-Depth Afflux (m ² /s) | 0.02 - 0.04 |
| <= -0.25 | 0.04 - 0.06 |
| -0.25 - -0.2 | 0.06 - 0.08 |
| -0.2 - -0.15 | 0.08 - 0.1 |
| -0.15 - -0.1 | 0.1 - 0.15 |
| -0.1 - -0.08 | 0.15 - 0.2 |
| -0.08 - -0.06 | >= 0.2 |

Copyright Information

0 25 50 m



Figure Number

C12

Figure Title

Peak V-D Product Afflux
Post-Development Conditions
1% AEP Design Flood Event (Climate
Change)

LWE Ref
P23-002

Issue Date
24-May-24

Version
Final

Client
Landcom
Project Title
Flood Impact Assessment
6 Halifax Street, Macquarie Park

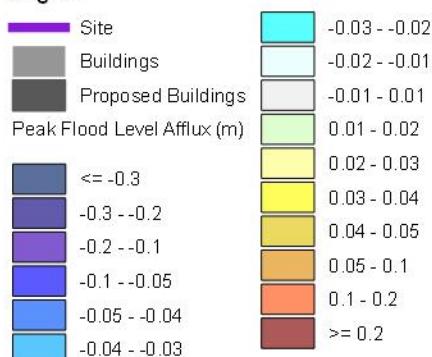
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Figure Number

C13

Figure Title

Peak Flood Level Afflux
Post-Development Conditions
PMF Design Flood Event

Client

Landcom

Project Title

Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref
P23-002

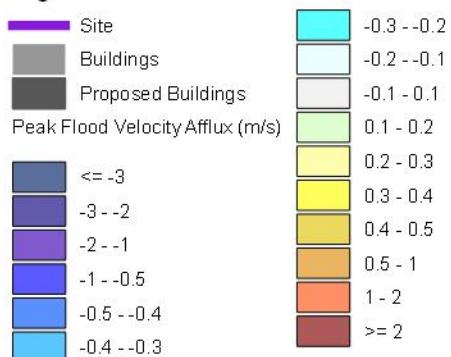
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Figure Number

C14

Figure Title

Peak Flood Velocity Afflux
Post-Development Conditions
PMF Design Flood Event

Client

Landcom

Project Title

Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref

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Legend

| | |
|--|---------------|
| Site | -0.06 - -0.04 |
| Buildings | -0.04 - -0.02 |
| Proposed Buildings | -0.02 - 0.02 |
| Peak Velocity-Depth Afflux (m ² /s) | 0.02 - 0.04 |
| <= -0.25 | 0.04 - 0.06 |
| -0.25 - -0.2 | 0.06 - 0.08 |
| -0.2 - -0.15 | 0.08 - 0.1 |
| -0.15 - -0.1 | 0.1 - 0.15 |
| -0.1 - -0.08 | 0.15 - 0.2 |
| -0.08 - -0.06 | >= 0.2 |

Copyright Information

0 25 50 m



Figure Number

C15

Figure Title

Peak V-D Product Afflux
Post-Development Conditions
PMF Design Flood Event

Client

Landcom

Project Title

Flood Impact Assessment
6 Halifax Street, Macquarie Park

LWE Ref

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Annexure D – Proposed Development Plans



| Parking Schedule | | |
|------------------|--------------------------------|-------|
| Level | Type | Count |
| BASEMENT 2 | STANDARD 5400x2400 | 24 |
| BASEMENT 2 | VISITOR MOTORBIKE 1200X2500 | 6 |
| | | 30 |
| BASEMENT 1 | ADAPTABLE 5400x2400 | 4 |
| BASEMENT 1 | CAR SHARE | 3 |
| BASEMENT 1 | STANDARD 5400x2400 | 11 |
| BASEMENT 1 | VISITOR 5400x2400 | 1 |
| BASEMENT 1 | VISITOR MOTORBIKE 1200X2500 | 4 |

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Client
 **LANDCOM**

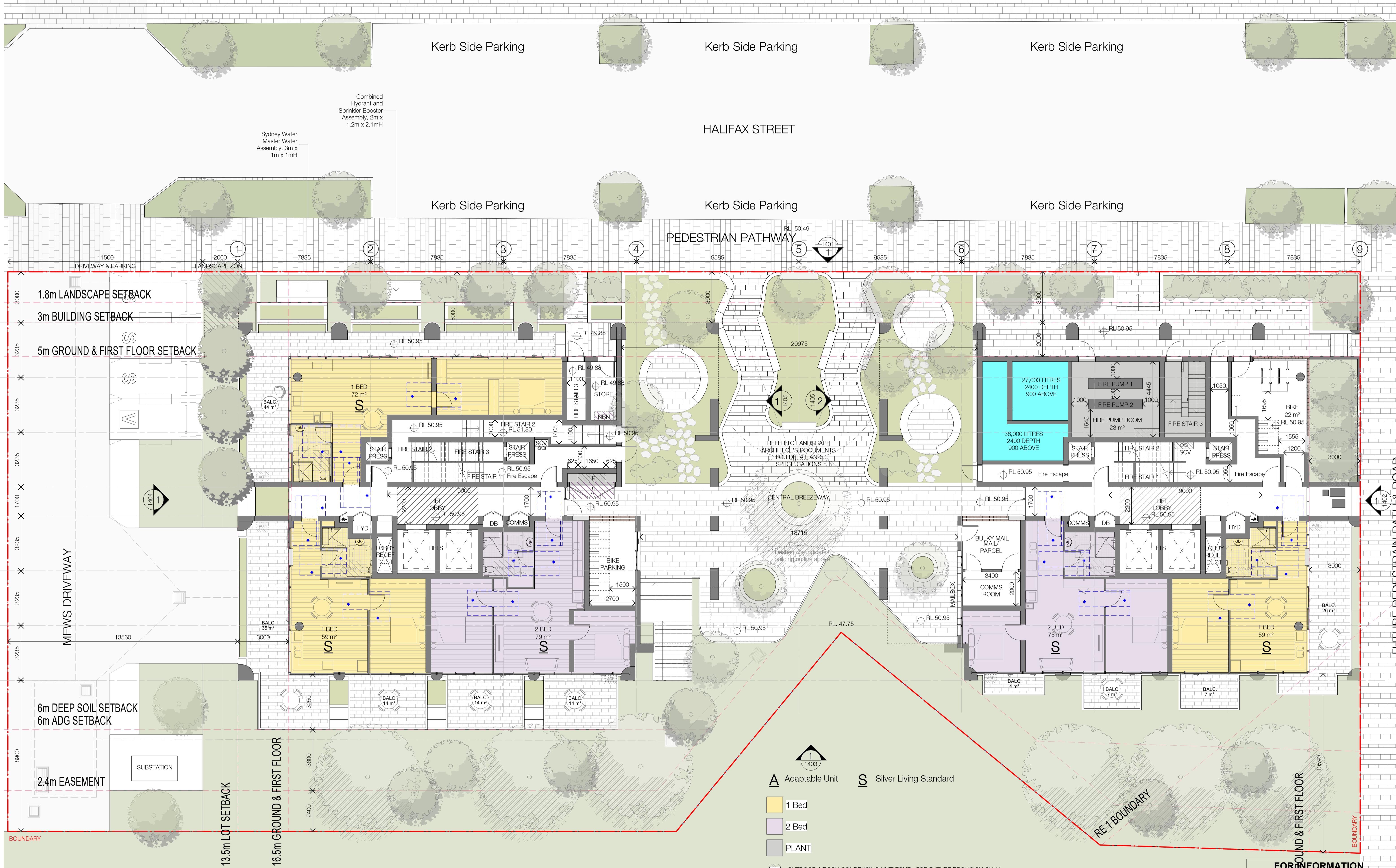
Project

**LACHLAN LINE AFFORDABLE HOUSING
LOT 117 LACHLAN'S LINE**

Drawing Name

FLOOR PLAN B1

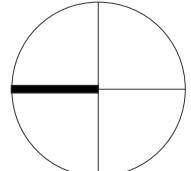
| Date | Scale | Sheet Size |
|-------------|---------|------------|
| 2023/07/05 | 1 : 100 | @ A1 |
| Drawn | Chk. | Job No. |
| LL | SC | 6540 |
| Drawing No. | | Revision |
| DA-1002 | / 1 | |



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Nominated Architects: Adam Haddow-7188 | John Pradel-7004

| Rev | Date | Revision | By | Chk. |
|-----|------------|-----------------|----|------|
| 1 | 2023/07/05 | FOR INFORMATION | LL | SC |



Client

Project
LACHLAN LINE AFFORDABLE HOUSING
LOT 117 LACHLAN'S LINE

Drawing Name
FLOOR PLAN GROUND

Date
2023/07/05

Scale
1 : 100

Sheet Size
@ A1

Drawn
Chk.

Job No.

LL SC

6540

Revision

DA-1003

SJB Architects
L2, 490 Crown St
Surry Hills NSW
2010 Australia
T 61 2 9380 9911
www.sjb.com.au



Annexure E – Council’s Advice and Flood Information



PROPERTY: Lot 117 Lachlan's Line (6 Halifax Street, Macquarie Park)

MEETING DATE: 30/03/2023 **TIME:** 3:30pm to 5:00pm

PRELODGMENT No: PRL NO: PRL2023/0006

DEVELOPMENT: Proposed Affordable housing development. 9,887sqm of GFA including 13 storeys 38 car parking spaces and total 135 units

Note: The site benefits from a Concept Approval under SSD-5093.

ATTENDANCE:

UDRP Panel:

Gabrielle Morrish Architect/Urban Designer
Matthew Pullinger Architect/Urban
Designer

Council:

Sohail Faridy Senior Coordinator Development Assessment
Nic Najar Development Adviser – Town Planner

Proponents:

Paul Hunt
Lishi Li
Sevda Cetin
Pip Hyde
Anton Reisch
Roh Iyer
Nigel Macdonald
Kemal Hughes
Tasha Burrell
Fay Edwards -
Sonny Naamo

- Additional information is required to closely examine the cumulative overshadowing impact on Linear Park 4, particularly around 11:30 am to 1:30 pm on the winter solstice. It is important to ensure that the proposal is able to maintain a minimum of direct solar access to at least 50% of the open space in Linear Park 4.

Drainage and flooding:

- A detailed Flood Impact Assessment is required to be submitted with the Application
- Flood modelling files are required to be submitted with a DA
- A flood emergency response plan is required consistent with the LLUDG

Based on the information provided, the below major issues are to be addressed on a future DA submission:

- The site is affected by an overland flow path (Figure 8). Flood Impact Assessment Report must be prepared for pre and post developed scenario using 2D flood modelling software. The applicant shall prove that the proposed development is not adversely affecting the flood conditions to the neighbouring properties or downstream catchment. This includes 1% AEP and PMF Velocity Depth product (VxD), Flood Hazard Vulnerability, Flood Velocity and Flood Level values.

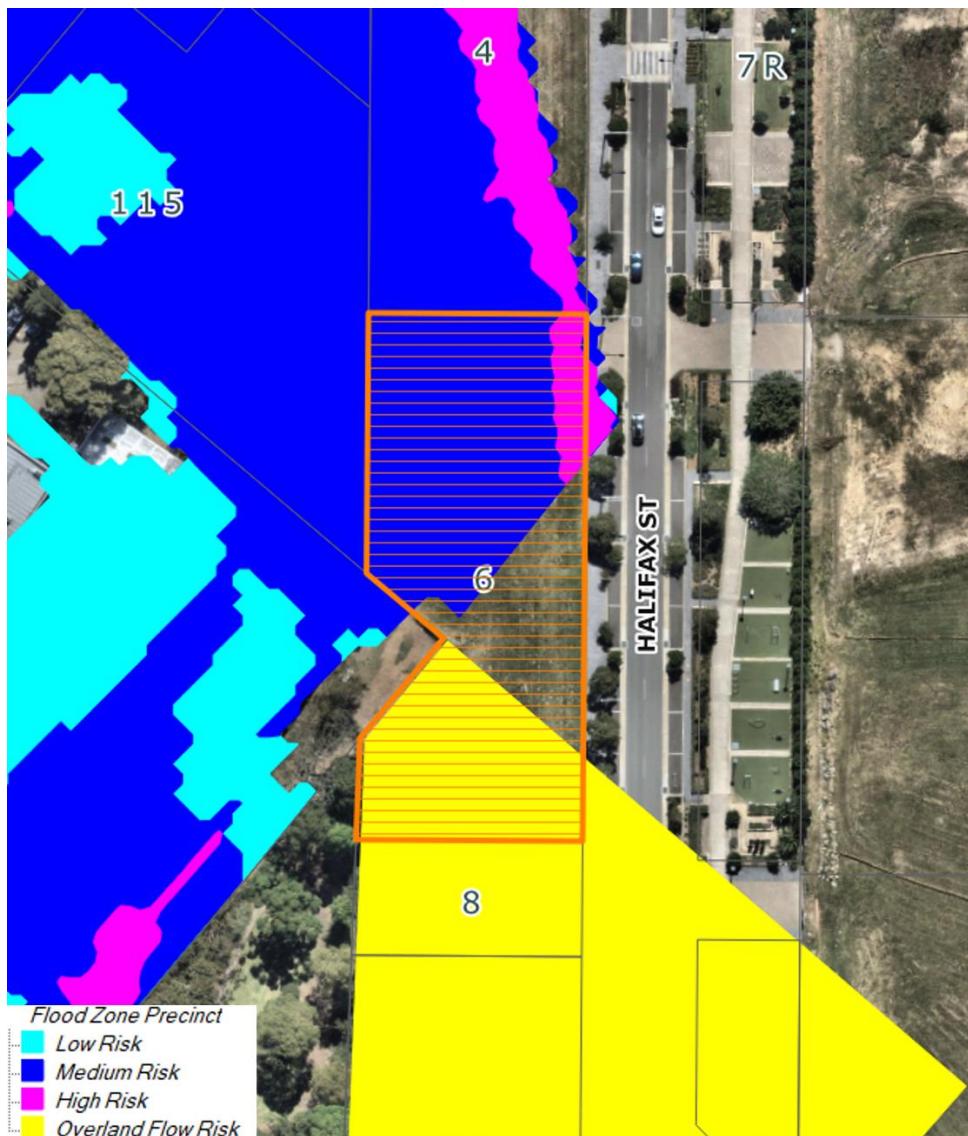


Figure 8: Flood Risk Precinct Extract (Source: Ryde Maps)

- Flood emergency response plan detailing the flood evacuation strategy during 1% AEP and PMF flood event must be submitted to Council.
- Full electronic copies of executable TUFLOW/HECRAS modelling file clearly identifying each scenario shall be submitted to Council. Electronic copy of modelling results for pre and post development scenario for velocity, depth, flood level, VxD VxD afflux and flood level afflux for 1% AEP and PMF flood event shall be submitted to Council.
- Existing scenario flood levels shall be calibrated with the flood levels provided by Council in the flood certificate. Please provide flood level calibration in the table or in the map for the locations shown in Council flood certificate.
- Any proposed basement and openings to basement such as stairwell entries, ventilation openings etc. shall be protected up to PMF level. Driveway crest level, openings to basement and PMF level must be shown in the report.
- The freeboard requirements of Ryde DCP to be implemented in the design of the habitable/non-habitable building areas. Please Figure 9 from Council's DCP for freeboard requirements.

| Drainage System/ Overland Flow | Residential | | | Industrial/ Commercial | |
|---|---------------------------|--|------------------------------------|---------------------------|-------------|
| | Land Level ^(b) | Habitable Floor Level | Non-Habitable Level ^(c) | Land Level ^(b) | Floor Level |
| Surface Drainage/ adjoining ground level ^(a) | - | .15m | - | - | .15m |
| Public drainage infrastructure, creeks and open channels | 0.5m | 0.5m | 0.1m | 0.3m | 0.3m |
| Flooding and Overland Flow (Overland Flow Precincts and Low Risk) | N/A | 0.3m | 0.15m | N/A | 0.3m |
| Flooding and Overland Flow (Medium Risk and greater) | N/A | 0.5m | 0.3m | N/A | - |
| Onsite Detention ^(d) | N/A | 0.2m | 0.1m | N/A | 0.2m |
| Road Drainage Minor Systems (Gutter and pipe flow) | | 0.15m below top of grate | | | |
| Road Drainage | | Refer to Figure 2-1. | | | |
| Detention Basins ^(e) | | The top water level shall be designed to be 0.5m below top of embankment (100yr ARI) | | | |

Table 2.1 Freeboard requirements.

Figure 9: Council Free Board Requirements (Source: RDCP 2014)



Senan Naamo
14/60 Station St E
PARRAMATTA NSW 2150

24 May 2023

Our ref: D23/70779

Dear Mr. Naamo,

RE: Request for Flood Information – No. 6 Halifax Street, Macquarie Park

Reference is made to your application received on 19 May 2023 seeking flood level information pertaining to the above-mentioned address.

Please find attached flood level data sheet providing flood levels for the 100 year ARI (Average Recurrence Interval) flood event and the PMF (Probable Maximum Flood) event.

This information is derived from models established as part of the Macquarie Park Flood Study Report and Floodplain Risk Management Study and Plan.

Council's database indicates the presence of a Ø375mm drainage pipe within the site.

Please be advised that flood models are approximate. Care and expertise is required in the interpretation of these flood levels. In addition, this flood information does not take into account any local overland flow issues.

Any person or organisation who acts on the information provided does so at his / her / its own risk. To the extent permitted by law, the City of Ryde accepts no responsibility and excludes all liability whatsoever in respect of any use of or reliance upon this information.

Should you require any further information, please feel free to contact me on (02) 9952 8105.

Yours sincerely,



Anil Shrestha
Senior Stormwater Engineer

FLOOD INFORMATION REQUEST

Property Address: No. 6 Halifax Street, Macquarie Park

Issue Date: 24 May 2023

Flood Study Reference: Macquarie Park Flood Study Report (April 2010)

Flood Model Reference: TUFLOW Model (July 2010)

Flood Level Location Map

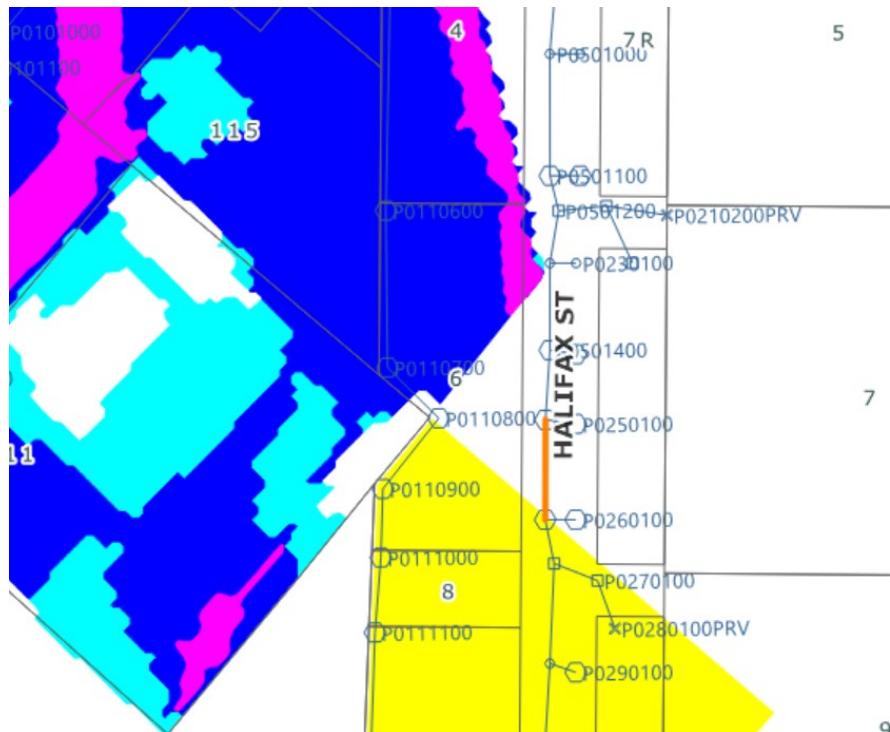


Flood Level Data Table

| Location | 100 Year ARI Flood Event (m AHD) | Probable Maximum Flood (m AHD) |
|----------|-------------------------------------|-----------------------------------|
| A | 46.91 | 46.97 |
| B | 43.90 | 43.93 |
| C | 48.56 | 48.63 |
| D | 45.17 | 45.20 |
| E | 51.51 | 51.57 |
| F | 47.65 | 47.67 |
| G | 52.88 | 52.90 |
| H | Nil | Nil |
| I | 54.20 | 54.21 |
| J | Nil | 49.32 |

Notes:

- All levels are based on Australian Height Datum (AHD).
- Flood levels are indicative only.
- The flood levels were derived using Aerial Laser Survey (ALS) data which is considered as approximate.
- This flood level information is for existing site conditions only.
- Concept plans are required for all new development proposals.
- The floor levels of the proposed habitable floor area should be set with a freeboard of 300 mm (Overland Flow and Low Risk) and 500 mm (Medium Risk and High Risk) to the 100 year ARI flood level. A freeboard of 150 mm (Overland Flow and Low Risk) and 300 mm (Medium Risk and High Risk) is applicable for non-habitable floor areas. Refer City of Ryde Development Control Plan 2014.
- A site specific flood study / risk assessment may be required for any future development. Engage a suitably qualified engineer to assist you in this matter. Any study or assessment shall be in accordance with the NSW Government's Floodplain Development Manual 2005 and the City of Ryde Development Control Plan 2014.
- Site specific ground and building survey levels should be used to relate flood levels and to assess the impact of flooding.

Flood Risk Map

Flood Risk Precincts

| |
|---------------|
| Low Risk |
| Overland Flow |
| Medium Risk |
| High Risk |



Lifestyle and opportunity @ your doorstep

Flood Extent (100 Year ARI Event)



Flood Extent (Probable Maximum Flood)



Annexure F – BoM and ARR Datahub Information

LOCATION 33.800 S 151.125 E * NEAR.. Lachlan Line

LIST OF COEFFICIENTS TO EQUATIONS OF THE FORM

$$\ln(I) = A + B \times (\ln(T)) + C \times (\ln(T))^2 + D \times (\ln(T))^3 + E \times (\ln(T))^4 + F \times (\ln(T))^5 + G \times (\ln(T))^6$$

T = TIME IN HOURS AND I = INTENSITY IN MILLIMETRES PER HOUR

| RETURN PERIOD | A | B | C | D | E | F | G |
|---------------|----------|-------------|-------------|------------|------------|-------------|-------------|
| 1 | 3.366183 | -0.58590E+0 | -0.35202E-1 | 0.78626E-2 | 0.93803E-3 | -0.22910E-3 | -0.23718E-4 |
| 2 | 3.617748 | -0.57971E+0 | -0.33718E-1 | 0.72888E-2 | 0.87575E-3 | -0.16950E-3 | -0.32431E-4 |
| 5 | 3.866802 | -0.56569E+0 | -0.29568E-1 | 0.74971E-2 | 0.40707E-3 | -0.21631E-3 | -0.11509E-4 |
| 10 | 3.986462 | -0.55799E+0 | -0.27428E-1 | 0.73704E-2 | 0.20124E-3 | -0.21605E-3 | -0.51993E-5 |
| 20 | 4.125691 | -0.55206E+0 | -0.25679E-1 | 0.74547E-2 | 0.16218E-4 | -0.23099E-3 | 0.19022E-5 |
| 50 | 4.282383 | -0.54531E+0 | -0.23758E-1 | 0.76404E-2 | 0.21351E-3 | -0.26593E-3 | 0.14466E-4 |
| 100 | 4.386818 | -0.54085E+0 | -0.22442E-1 | 0.76345E-2 | 0.34239E-3 | -0.26773E-3 | 0.17987E-4 |

RAINFALL INTENSITY IN mm/h FOR VARIOUS DURATIONS AND RETURN PERIODS

RETURN PERIOD (YEARS)

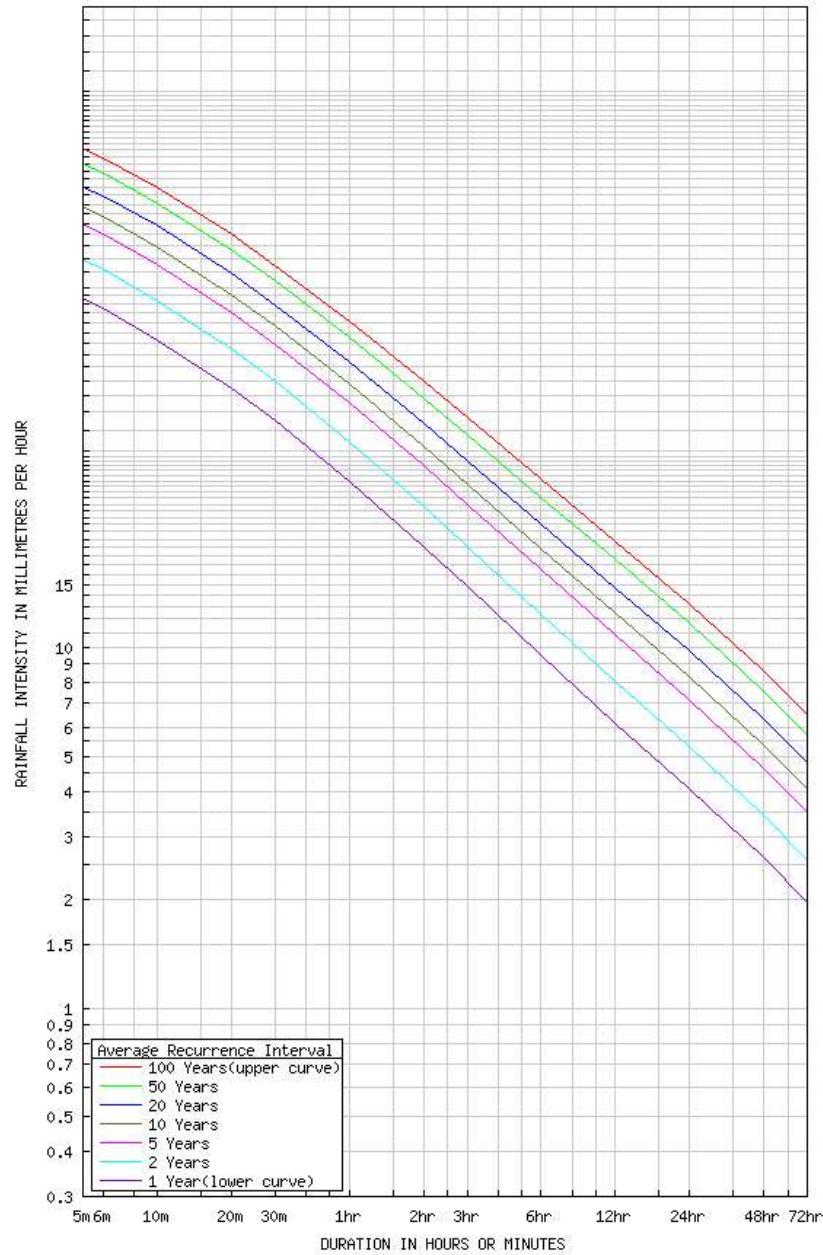
| DURATION | 1 | 2 | 5 | 10 | 20 | 50 | 100 |
|----------|------|------|------|------|------|------|------|
| 5 mins | 93.3 | 119. | 150. | 167. | 190. | 220. | 243. |
| 6 mins | 87.4 | 112. | 140. | 157. | 179. | 207. | 228. |
| 10 mins | 71.6 | 91.6 | 116. | 129. | 148. | 171. | 189. |
| 20 mins | 52.4 | 67.1 | 85.1 | 95.3 | 109. | 127. | 140. |
| 30 mins | 42.6 | 54.7 | 69.6 | 78.1 | 89.4 | 104. | 115. |
| 1 hour | 29.0 | 37.3 | 47.8 | 53.9 | 61.9 | 72.4 | 80.4 |
| 2 hours | 19.0 | 24.6 | 31.9 | 36.2 | 41.8 | 49.2 | 54.8 |
| 3 hours | 14.8 | 19.1 | 25.0 | 28.5 | 33.0 | 39.0 | 43.6 |
| 6 hours | 9.52 | 12.4 | 16.5 | 18.9 | 22.0 | 26.2 | 29.4 |
| 12 hours | 6.18 | 8.09 | 10.9 | 12.5 | 14.7 | 17.6 | 19.8 |
| 24 hours | 4.05 | 5.31 | 7.17 | 8.31 | 9.78 | 11.7 | 13.2 |
| 48 hours | 2.61 | 3.43 | 4.63 | 5.38 | 6.33 | 7.60 | 8.59 |
| 72 hours | 1.96 | 2.57 | 3.49 | 4.06 | 4.78 | 5.75 | 6.51 |

(Raw data: 37.37, 8.08, 2.57, 72.46, 17.63, 5.75, skew= 0.000)

HYDROMETEOROLOGICAL ADVISORY SERVICE

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* ENSURE THE COORDINATES ARE THOSE REQUIRED SINCE DATA IS BASED ON THESE AND NOT LOCATION NAME.



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Australian Rainfall & Runoff Data Hub - Results

Input Data

Longitude 151.134

Latitude -33.791

Selected Regions (clear)

River Region show

ARF Parameters show

Storm Losses show

Temporal Patterns show

Areal Temporal Patterns show

BOM IFDs show

Median Preburst Depths and Ratios show

10% Preburst Depths show

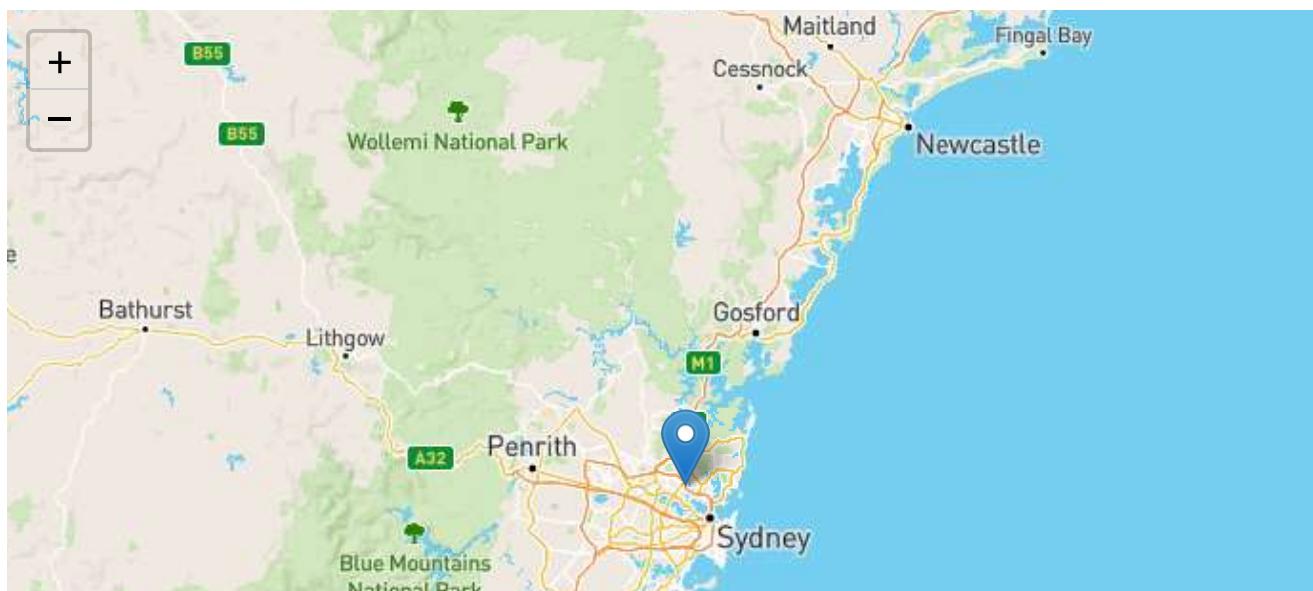
25% Preburst Depths show

75% Preburst Depths show

90% Preburst Depths show

Interim Climate Change Factors show

Probability Neutral Burst Initial Loss (./nsw_specific) show





Data

River Region

| | |
|---------------------|----------------------------|
| Division | South East Coast (NSW) |
| River Number | 13 |
| River Name | Sydney Coast-Georges River |

Layer Info

| | |
|----------------------|---------------------|
| Time Accessed | 04 May 2023 02:56PM |
| Version | 2016_v1 |

ARF Parameters

$$ARF = \text{Min} \left\{ 1, \left[1 - a \left(Area^b - c \log_{10} Duration \right) Duration^{-d} \right. \right. \\ \left. \left. + e Area^f Duration^g (0.3 + \log_{10} AEP) \right. \right. \\ \left. \left. + h 10^{i Area \frac{Duration}{1440}} (0.3 + \log_{10} AEP) \right] \right\}$$

| Zone | a | b | c | d | e | f | g | h | i |
|----------|------|-------|-----|-------|----------|-------|-----|-----|-----|
| SE Coast | 0.06 | 0.361 | 0.0 | 0.317 | 8.11e-05 | 0.651 | 0.0 | 0.0 | 0.0 |

Short Duration ARF

$$ARF = \text{Min} \left[1, 1 - 0.287 \left(Area^{0.265} - 0.439 \log_{10}(Duration) \right) . Duration^{-0.36} \right. \\ \left. + 2.26 \times 10^{-3} \times Area^{0.226} . Duration^{0.125} (0.3 + \log_{10}(AEP)) \right. \\ \left. + 0.0141 \times Area^{0.213} \times 10^{-0.021 \frac{(Duration-180)^2}{1440}} (0.3 + \log_{10}(AEP)) \right]$$

Layer Info

| | |
|----------------------|---------------------|
| Time Accessed | 04 May 2023 02:56PM |
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| | |
|----------------|---------|
| Version | 2016_v1 |
|----------------|---------|

Storm Losses

Note: Burst Loss = Storm Loss - Preburst

Note: These losses are only for rural use and are **NOT FOR DIRECT USE** in urban areas

Note: As this point is in NSW the advice provided on losses and pre-burst on the NSW Specific Tab of the ARR Data Hub (./nsw_specific) is to be considered. In NSW losses are derived considering a hierarchy of approaches depending on the available loss information. The continuing storm loss information from the ARR Datahub provided below should only be used where relevant under the loss hierarchy (level 5) and where used is to be multiplied by the factor of 0.4.

| | |
|---------------------------------------|--------|
| ID | 7239.0 |
| Storm Initial Losses (mm) | 33.0 |
| Storm Continuing Losses (mm/h) | 1.8 |

Layer Info

| | |
|----------------------|---------------------|
| Time Accessed | 04 May 2023 02:56PM |
|----------------------|---------------------|

| | |
|----------------|---------|
| Version | 2016_v1 |
|----------------|---------|

[Temporal Patterns](#) | Download (.zip) (static/temporal_patterns/TP/ECsouth.zip)

| | |
|-------------|---------|
| code | ECsouth |
|-------------|---------|

| | |
|--------------|------------------|
| Label | East Coast South |
|--------------|------------------|

Layer Info

| | |
|----------------------|---------------------|
| Time Accessed | 04 May 2023 02:56PM |
|----------------------|---------------------|

| | |
|----------------|---------|
| Version | 2016_v2 |
|----------------|---------|

[Areal Temporal Patterns](#) | Download (.zip)
(./static/temporal_patterns/Areal/Areal_ECsouth.zip)

| | |
|-------------|---------|
| code | ECsouth |
|-------------|---------|

| | |
|------------------|------------------|
| arealabel | East Coast South |
|------------------|------------------|

Layer Info

| | |
|----------------------|---------------------|
| Time Accessed | 04 May 2023 02:56PM |
|----------------------|---------------------|

| | |
|----------------|---------|
| Version | 2016_v2 |
|----------------|---------|

BOM IFDs

Click here (http://www.bom.gov.au/water/designRainfalls/revised-ifd/?year=2016&coordinate_type=dd&latitude=-33.791&longitude=151.134&sdmin=true&sdhr=true&sdday=true&user_label=) to obtain the IFD depths for catchment centroid from the BoM website

Layer Info

| Time Accessed | 04 May 2023 02:56PM |
|---------------|---------------------|
|---------------|---------------------|

Median Preburst Depths and Ratios

Values are of the format depth (ratio) with depth in mm

| min (h)\AEP(%) | 50 | 20 | 10 | 5 | 2 | 1 |
|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 60 (1.0) | 9.3 (0.303) | 6.4 (0.159) | 4.5 (0.096) | 2.7 (0.050) | 2.6 (0.041) | 2.5 (0.035) |
| 90 (1.5) | 14.5 (0.414) | 9.6 (0.208) | 6.3 (0.117) | 3.1 (0.051) | 2.3 (0.032) | 1.7 (0.021) |
| 120 (2.0) | 10.3 (0.267) | 7.4 (0.147) | 5.5 (0.093) | 3.7 (0.055) | 3.1 (0.038) | 2.6 (0.029) |
| 180 (3.0) | 9.2 (0.206) | 7.4 (0.126) | 6.2 (0.090) | 5.0 (0.064) | 4.1 (0.044) | 3.4 (0.032) |
| 360 (6.0) | 7.3 (0.124) | 11.1 (0.142) | 13.6 (0.148) | 16.0 (0.150) | 12.1 (0.095) | 9.1 (0.063) |
| 720 (12.0) | 5.2 (0.065) | 11.2 (0.103) | 15.2 (0.117) | 18.9 (0.126) | 23.5 (0.130) | 27.0 (0.132) |
| 1080 (18.0) | 4.5 (0.046) | 10.1 (0.076) | 13.9 (0.087) | 17.5 (0.094) | 23.5 (0.105) | 27.9 (0.110) |
| 1440 (24.0) | 1.1 (0.010) | 6.5 (0.042) | 10.0 (0.054) | 13.3 (0.062) | 21.1 (0.081) | 26.9 (0.091) |
| 2160 (36.0) | 0.0 (0.000) | 2.6 (0.014) | 4.4 (0.020) | 6.0 (0.023) | 8.9 (0.028) | 11.0 (0.031) |
| 2880 (48.0) | 0.0 (0.000) | 0.1 (0.000) | 0.1 (0.001) | 0.2 (0.001) | 2.2 (0.006) | 3.8 (0.009) |
| 4320 (72.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.9 (0.002) | 1.5 (0.003) |

Layer Info

| | |
|----------------------|--|
| Time Accessed | 04 May 2023 02:56PM |
| Version | 2018_v1 |
| Note | Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged. |

10% Preburst Depths

Values are of the format depth (ratio) with depth in mm

| min (h)\AEP(%) | 50 | 20 | 10 | 5 | 2 | 1 |
|-----------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 60 (1.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 90 (1.5) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 120 (2.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 180 (3.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 360 (6.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 720 (12.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 1080 (18.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 1440 (24.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 2160 (36.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 2880 (48.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 4320 (72.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |

Layer Info

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|----------------------|---------------------|
| Time Accessed | 04 May 2023 02:56PM |
| Version | 2018_v1 |

| | |
|-------------|--|
| Note | Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged. |
|-------------|--|

25% Preburst Depths

Values are of the format depth (ratio) with depth in mm

| min (h)\AEP(%) | 50 | 20 | 10 | 5 | 2 | 1 |
|-----------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 60 (1.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 90 (1.5) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 120 (2.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 180 (3.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 360 (6.0) | 0.0 (0.000) | 0.2 (0.002) | 0.3 (0.003) | 0.4 (0.003) | 0.2 (0.001) | 0.0 (0.000) |
| 720 (12.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 1080 (18.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 1.1 (0.005) | 1.9 (0.007) |
| 1440 (24.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.4 (0.002) | 0.7 (0.003) |
| 2160 (36.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 2880 (48.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |
| 4320 (72.0) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) | 0.0 (0.000) |

Layer Info

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| Time Accessed | 04 May 2023 02:56PM |
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|----------------|---------|
| Version | 2018_v1 |
|----------------|---------|

| | |
|-------------|--|
| Note | Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged. |
|-------------|--|

75% Preburst Depths

Values are of the format depth (ratio) with depth in mm

| min (h)\AEP(%) | 50 | 20 | 10 | 5 | 2 | 1 |
|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 60 (1.0) | 46.2 (1.508) | 34.2 (0.845) | 26.2 (0.555) | 18.6 (0.344) | 19.6 (0.308) | 20.3 (0.286) |
| 90 (1.5) | 43.4 (1.237) | 42.0 (0.911) | 41.0 (0.762) | 40.1 (0.651) | 32.9 (0.453) | 27.5 (0.338) |
| 120 (2.0) | 43.2 (1.115) | 40.1 (0.791) | 38.1 (0.643) | 36.2 (0.533) | 35.7 (0.445) | 35.3 (0.393) |
| 180 (3.0) | 46.4 (1.036) | 43.2 (0.737) | 41.1 (0.599) | 39.2 (0.496) | 43.5 (0.466) | 46.7 (0.445) |
| 360 (6.0) | 43.5 (0.738) | 54.3 (0.697) | 61.5 (0.669) | 68.4 (0.642) | 71.6 (0.564) | 73.9 (0.516) |
| 720 (12.0) | 29.1 (0.364) | 41.2 (0.380) | 49.2 (0.381) | 56.8 (0.377) | 67.1 (0.371) | 74.8 (0.365) |
| 1080 (18.0) | 30.7 (0.318) | 41.8 (0.315) | 49.1 (0.309) | 56.1 (0.301) | 70.5 (0.315) | 81.3 (0.320) |
| 1440 (24.0) | 13.6 (0.124) | 32.4 (0.213) | 44.8 (0.244) | 56.7 (0.262) | 64.6 (0.248) | 70.5 (0.239) |
| 2160 (36.0) | 8.5 (0.065) | 22.5 (0.123) | 31.8 (0.143) | 40.7 (0.155) | 52.0 (0.165) | 60.6 (0.170) |
| 2880 (48.0) | 4.9 (0.034) | 9.2 (0.044) | 12.0 (0.048) | 14.7 (0.050) | 25.8 (0.073) | 34.1 (0.085) |
| 4320 (72.0) | 0.0 (0.000) | 1.6 (0.007) | 2.7 (0.009) | 3.7 (0.011) | 24.1 (0.059) | 39.3 (0.086) |

Layer Info

| | |
|----------------------|--|
| Time Accessed | 04 May 2023 02:56PM |
| Version | 2018_v1 |
| Note | Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged. |

90% Preburst Depths

Values are of the format depth (ratio) with depth in mm

| min (h)\AEP(%) | 50 | 20 | 10 | 5 | 2 | 1 |
|----------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 60 (1.0) | 87.6 (2.861) | 73.1 (1.808) | 63.5 (1.342) | 54.2 (1.002) | 81.3 (1.279) | 101.6 (1.431) |
| 90 (1.5) | 110.6 (3.150) | 109.1 (2.369) | 108.2 (2.010) | 107.3 (1.740) | 99.3 (1.369) | 93.3 (1.149) |
| 120 (2.0) | 87.0 (2.248) | 108.9 (2.148) | 123.5 (2.083) | 137.4 (2.021) | 129.6 (1.617) | 123.7 (1.377) |
| 180 (3.0) | 77.8 (1.739) | 100.7 (1.717) | 115.8 (1.686) | 130.3 (1.651) | 121.4 (1.301) | 114.8 (1.093) |
| 360 (6.0) | 76.7 (1.303) | 94.9 (1.217) | 106.9 (1.162) | 118.4 (1.112) | 131.1 (1.034) | 140.6 (0.981) |
| 720 (12.0) | 60.3 (0.753) | 82.0 (0.758) | 96.5 (0.747) | 110.3 (0.731) | 123.5 (0.683) | 133.4 (0.651) |
| 1080 (18.0) | 68.5 (0.710) | 89.2 (0.674) | 102.9 (0.648) | 116.1 (0.622) | 136.6 (0.610) | 152.1 (0.598) |
| 1440 (24.0) | 48.2 (0.439) | 73.0 (0.479) | 89.5 (0.487) | 105.2 (0.487) | 116.7 (0.449) | 125.4 (0.425) |
| 2160 (36.0) | 30.9 (0.236) | 60.7 (0.331) | 80.5 (0.362) | 99.5 (0.379) | 107.5 (0.341) | 113.6 (0.318) |
| 2880 (48.0) | 20.0 (0.137) | 44.5 (0.215) | 60.8 (0.243) | 76.3 (0.258) | 93.3 (0.263) | 106.1 (0.264) |
| 4320 (72.0) | 6.7 (0.040) | 16.3 (0.069) | 22.7 (0.079) | 28.8 (0.085) | 60.7 (0.150) | 84.7 (0.186) |

Layer Info

| | |
|----------------------|--|
| Time Accessed | 04 May 2023 02:56PM |
| Version | 2018_v1 |
| Note | Preburst interpolation methods for catchment wide preburst has been slightly altered. Point values remain unchanged. |

Interim Climate Change Factors

| | RCP 4.5 | RCP6 | RCP 8.5 |
|------|---------------------|---------------|----------------------|
| 2030 | 0.869 (4.3%) | 0.783 (3.9%) | 0.983 (4.9%) |
| 2040 | 1.057 (5.3%) | 1.014 (5.1%) | 1.349 (6.8%) |
| 2050 | 1.272 (6.4%) | 1.236 (6.2%) | 1.773 (9.0%) |
| 2060 | 1.488 (7.5%) | 1.458 (7.4%) | 2.237 (11.5%) |
| 2070 | 1.676 (8.5%) | 1.691 (8.6%) | 2.722 (14.2%) |
| 2080 | 1.810 (9.2%) | 1.944 (9.9%) | 3.209 (16.9%) |
| 2090 | 1.862 (9.5%) | 2.227 (11.5%) | 3.679 (19.7%) |

Layer Info

| | |
|---------------|--|
| Time Accessed | 04 May 2023 02:56PM |
| Version | 2019_v1 |
| Note | ARR recommends the use of RCP4.5 and RCP 8.5 values. These have been updated to the values that can be found on the climate change in Australia website. |

Probability Neutral Burst Initial Loss

| min (h)\AEP(%) | 50.0 | 20.0 | 10.0 | 5.0 | 2.0 | 1.0 |
|--------------------|------|------|------|------|------|------|
| 60 (1.0) | 15.8 | 9.3 | 9.9 | 11.1 | 10.5 | 8.3 |
| 90 (1.5) | 14.2 | 8.8 | 9.5 | 9.7 | 9.5 | 7.7 |
| 120 (2.0) | 15.7 | 9.7 | 10.2 | 10.1 | 9.9 | 7.0 |
| 180 (3.0) | 16.1 | 10.4 | 11.2 | 11.0 | 11.0 | 7.3 |
| 360 (6.0) | 17.0 | 10.9 | 11.8 | 10.7 | 10.9 | 6.6 |
| 720 (12.0) | 20.5 | 14.4 | 13.7 | 12.3 | 12.2 | 4.1 |
| 1080 (18.0) | 20.6 | 15.9 | 15.6 | 13.5 | 14.6 | 3.9 |
| 1440 (24.0) | 25.4 | 18.5 | 18.0 | 15.0 | 16.8 | 6.4 |
| 2160 (36.0) | 28.9 | 22.4 | 21.4 | 18.1 | 18.6 | 8.8 |
| 2880 (48.0) | 31.3 | 25.8 | 24.4 | 27.8 | 21.8 | 9.7 |
| 4320 (72.0) | 35.6 | 31.3 | 30.4 | 32.6 | 24.4 | 10.8 |

Layer Info

Time 04 May 2023 02:56PM

Accessed

Version 2018_v1

Note As this point is in NSW the advice provided on losses and pre-burst on the NSW Specific Tab of the ARR Data Hub (./nsw_specific) is to be considered. In NSW losses are derived considering a hierarchy of approaches depending on the available loss information. Probability neutral burst initial loss values for NSW are to be used in place of the standard initial loss and pre-burst as per the losses hierarchy.

[Download TXT \(downloads/813ad21e-05d1-4fc0-9e24-7cc160a72676.txt\)](#)

[Download JSON \(downloads/44e82499-3f82-407e-ba41-5a30d49e9649.json\)](#)

[Generating PDF... \(downloads/7fbed7a3-c392-4735-9838-8b16ed9aefc5.pdf\)](#)