CELEBRATING 40 YEARS 1982 - 2022

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& PROJECT MANAGERS

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SUSTAINABLE CERTIFICATION
ISO 9001
AS/NZS 4801
ISO 14001

Our Ref: 110934-02-Flood Evacuation Management Plan
SL:tm

29 May 2023

Sydney Helicopters

89-151 Old Castlereagh Road

Castlereagh NSW 2749

Attn: Mark Harrold

Subject: 89-151 Old Castlereagh Road, Castlereagh - Flood Evacuation Management Plan

Dear Mark,

J Wyndham Prince have prepared this flood evacuation management plan to support the Development Application (DA) approval for the proposed Sydney Helicopters site at 89-151 Old Castlereagh Road, Castlereagh. We note that a separate development application (DA) has been submitted for a café to be located on the same site. The proposed café is also covered by this Flood Evacuation Management Plan. This letter demonstrates the evacuation procedures and requirements of the site during a regional flood event.

The proposed development involves the repurposing of the existing Penrith Lakes Development Corporations offices into a Helipad Facility. This will involve the repurposing of the existing offices and sheds on the site and the introduction of additional hardstand areas at the maintenance hanger and the final approach and take off area (FATO). Refer to the proposed site plan in Plate 1 below.

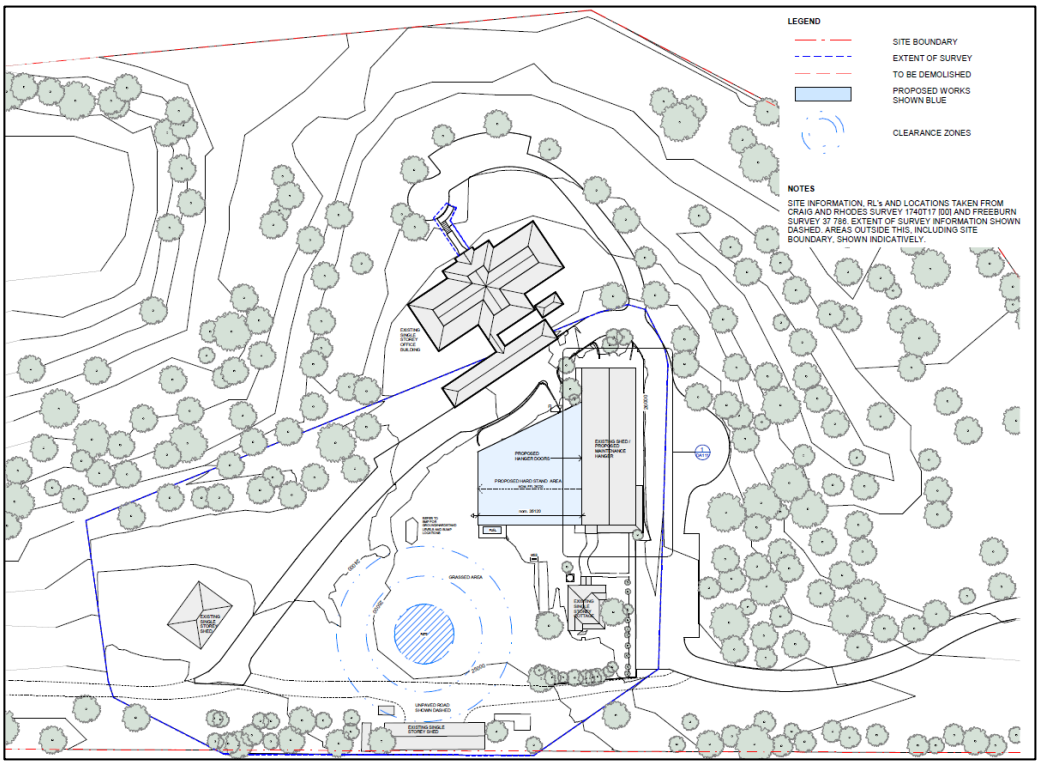


Plate 1 – Proposed Site Plan (Source: WMK Architecture)

1. FLOOD RISK AT THE SITE

The site is located at 89-151 Old Castlereagh Road, Castlereagh NSW 2749 and is within the Penrith City Council Local Government Area (LGA). The site elevation ranges from 24m AHD on the existing hardstand area and naturally grades to the basin that is located in the north-west portion of the site. The site is zoned as Tourism South Precinct in Penrith Lakes Development Control Plan (DCP) 2022.

The site is situated in the Hawkesbury Nepean catchment and was considered in the Nepean River Flood Study prepared by Advisian in 2017. The site is also considered in the Hawkesbury Nepean Valley Regional Flood Study prepared by WMA Water in 2019, however, flood mapping in the vicinity of Penrith Lakes is noted as being indicative only as the flood modelling does not incorporate the latest infrastructure of the Penrith Lakes Scheme.

The site is approximately 2.7 km east of the Nepean River and approximately 150m south of the Sydney International Regatta Centre.

Being part of the Hawkesbury Nepean Valley, formal evacuation of the residents within the valley is considered in the SES's evacuation strategy. The site is located within sub-sector 8.5 (Castlereagh) of the Penrith North Sector in the Hawkesbury Nepean Flood Plan (SES, 2015), which is a sub-plan of the State Emergency Management Plan (EMPLAN). Furthermore, as required by Penith Lakes DCP 2022, flood evacuatution strategy has been considered.

2. FLOOD EVACUATION ROUTES

The Hawkesbury Nepean Flood Plan (SES, 2015) identifies local and regional flood evacuation routes for the Penrith North Sector. The Penrith North Sector will need to be completely evacuated if the predicted flood level will exceed 8.2m (22.3m AHD) at the Penrith gauge which is near Victoria Bridge. The regional flood evacuation route is detailed as follows:

- Southbound along the Northern Road Evacuation Route
- Eastbound on the Great Western Highway or Eastbound on the M4 Motorway (dependant on what other sectors are also being evacuated at the same time).

The primary local flood evacuation route for the site is:

- Eastbound along Old Castlereagh Road
- Continue East along Andrews Road; and
- Southbound along the Northern Road Evacuation Route

The primary local flood evacuation route for the Sydney Helicopters site is east along Old Castlereagh Road. At the intersection of Old Castlereagh Road and Castlereagh Road, vehicles are expected to continue straight onto Andrews Road until reaching the Northern Road regional evacuation route. However, there is potential for vehicles to turn right onto Castlereagh Road and head south until reaching the Great Western Highway regional evacuation route.

The Evacuation Route for the Penrith North Sector can be seen illustrated in Map 1 and Map 9 in Vol 3, Ch4 of the Flood Plan (SES, 2015). Refer to Appendix A for extracts of these maps. Figure 2-1 in Appendix B illustrates the primary and alternate flood evacuation routes for the Sydney Helicopters site.

3. FLOOD EVACUATION ASSESSMENT

3.1. Available Evacuation Time

Based on advice received from the SES (received on a similar development in the Hawkesbury Nepean Valley), we understand that:

- Eight (8) hours of reliable warning of flood events is available;
- It takes approximately one (1) hour for the SES to mobilise its operations for this area on receipt of a flood warning; and

- It takes the community one (1) hour to accept that evacuation is necessary and to prepare for evacuation. Note that this typically applies to residential areas. Given that Sydney Helicopters will be a managed site, it is expected that less than one (1) hour would be needed to mobilise the staff and patrons on site.

Therefore, it is conservatively assumed that six (6) hours are available for the site to evacuate.

3.2. Sydney Helicopters Site Assessment

Based on information provided in your email dated 21 February 2023, we understand that the total anticipated number of patrons and staff occupying the Sydney Helicopters site at any given time would be 60. This includes Sydney Helicopters staff, café staff and all visitors to the site. We also understand that there are 40 available parking spaces on the site.

The following assumptions have been made in the flood evacuation assessment:

- The maximum number of private vehicles on the site would be 40 based on the number of car parking spaces provided;
- On average, each car would convey 3 passengers;
- The anticipated travel mode split is 90% by car and 10% by public transport/shuttle buses together with helicopter;
- As Old Castlereagh Road and Andrews Road are single-lane roads, a maximum lane capacity of 600 vehicles/ lane/ hour is available for evacuation;
- The capacity of a 12.5 m passenger bus is 65 persons; and
- An average walking pace for a pedestrian is 5.0 km/hr and a conservatively slow walking pace is 4.5 km/hr for older individuals.

We have considered three (3) alternate travel mode scenarios in our evacuation assessment:

1. All patrons and staff arrive (and evacuate) by private car – this results in the highest number of vehicle trips to evacuate the site;
2. There is limited capacity to evacuate by vehicle and all patrons and staff need to evacuate on foot to a location above the regional PMF flood level or via helicopter.

Scenario 1 – Private Vehicle Evacuation

Adopting an average of 3 persons per car and the 40 car parking spaces provided, there is the capacity to evacuate 120 persons by private car. Therefore, all of the anticipated 60 patrons and staff could be evacuated in this manner. At an evacuation rate of 600 vehicles/lane/hour on Old Castlereagh Road and Andrews Road, all patrons and staff of the Sydney Helicopters site could be evacuated within 4 minutes from the time that an evacuation notice is given.

Conservatively assuming only half of the available car spaces are taken by private vehicles (20), this would still provide enough capacity to allow for the 60 patrons and staff that are likely to be on site. This would halve the required evacuation time to 2 minutes.

Scenario 2 - Pedestrian Evacuation

In the unlikely event that vehicle access is restricted to/from the site, there is potential for all staff and patrons to walk east along Old Castlereagh Road and further east along Andrews Road to a location above the regional PMF flood level. Figure 37 of the Hawkesbury-Nepean Valley Regional Flood Study (WMA, 2019) and Map 015_B of the Nepean River Flood Study (Advisian, 2017) illustrates that Andrews Road would be flood free in a regional PMF flood event approximately 2 kms east of the site. It is a further 1 km along Andrews Road before reaching the regional Northern Road evacuation route.

Refer to Plate 2 for an extract of Map 015_B which illustrates the site in proximity to the PMF extent on Andrews Road.

Plate 2 – Proposed Flood Evacuation Route

It is noted that during the time of flood emergency, there is also an pportunity for some patrons to evacuate via helicopter exists given the site is owned by Sydney Helicopters, however, this has been conservatively left out of evacuation calculations.

3.3. Early Evacuation and Impact on Regional Flood Evacuation

As commercial properties within the Hawkesbury Nepean Valley are managed sites, these sites have the potential to be evacuated early on the direction of the site manager. That is, the SES's assumed one (1) hour time for residential residents to accept that they need to evacuate is not likely to be required for the commercial sites.

Therefore, the evacuation of commercial sites would occur ahead of the residential population. Given the proximity (approximately 3 km) of the site evacuees to the regional Northern Road evacuation route, the commercial evacuees would be on the Northern Road within 10 minutes, well before the residential properties in the Penrith North Sector start to mobilise.

The likelihood of all commercial properties in the area (including Sydney Helicopters) being at full capacity also needs to be considered. A severe weather event sufficient to trigger a regional evacuation would likely be apparent to a significant portion of the population in the preceding days via the issue of a 'Flood Watch' for the Hawkesbury Nepean River from the Bureau of Meteorology (BoM). It is therefore likely that many patrons of commercial premises, and particularly the Sydney Helicopters site, would choose to make alternate arrangements and would not be within the floodplain.

The early evacuation of commercial properties is considered beneficial in the context of the evacuation of the broader regional Hawkesbury Nepean Valley and is likely to improve the regional evacuation timeframe.

4. FLOOD EVACUATION STRATEGY

We recommend that Sydney Helicopters management undertake formal training for their staff in the evacuation strategy and the likely timeframe available for evacuation so that they can assist patrons evacuating the site without unnecessary panic.

We also recommend that Sydney Helicopters have current flood evacuation route maps prepared and printed for distribution to patrons when an evacuation is announced, particularly as traffic leaves the site. Flood evacuation plans should also be clear and visible at all entry/exit points of the site. For the successful implementation of evacuation plan, the site manager must:

- Know what to do in a flood;
- Provide the example of FloodSafe Plan to staff and construction workers;
- Maintain a register of special needs people;
- Possess emergency management skills;
- Arrange and carry out annual evacuation drills;
- Maintain the Flood Warning System;
- Engage an external auditor for annual audits; and
- Arrange for the updating and revision of the plan every 10 years.

If vehicular evacuation is restricted, preference should be given to evacuating the elderly, disabled and children from the site. Able-bodied persons have more than sufficient time within the available six (6) hour evacuation time to walk 2 km east along Old Castlereagh Road and Andrews Road to a location above the regional PMF flood extent.

Any instruction provided at the time of an evacuation by the SES or other emergency services personnel takes precedence over this strategy. This strategy should be updated when the Hawkesbury Nepean Flood Plan (SES, 2015) is updated.

4.1. Regional Nepean River Flooding

The flood depth maps provided in the Regional Flood Study (WMA, 2019) indicate that the site is flood affected in a 20% AEP (1 in 5 AEP), 1% AEP (1 in 100 AEP) and a 0.2% AEP (1 in 500 AEP) regional flood event. In the 20% AEP and 1% AEP the flooding is localised to the existing farm dam and local overland flow path in the northern portion of the site. In the 0.2% AEP, the flooding begins to breach the banks of the flow path and inundates portion of the disturbed site.

For a 0.05% AEP (1 in 2000 AEP) and a PMF flood event the flood maps indicate that the site is completely submerged by floodwaters. This flood affectation will need to be considered during a regional flood evacuation, as evacuees will need to drive up Andrews Road and out of the PMF flood zone. As such, the site will be encircled by floodwaters, as illustrated in Figure 2-3. It is noted that the regional flood mapping presented in the study at Penrith Lakes is indicative only.

Refer to the figures from the Regional Flood Study (WMA, 2019) which are included in Appendix C.

4.2. Local Nepean River Flooding

Site Flooding

The flood depth maps provided in the Nepean River Flood Study (Advisian, 2017) indicate that the site is not flood-affected in a 20 year ARI (5% AEP). In the 50 year ARI (2% AEP), 100 year ARI (1% AEP) and 200 year ARI (0.5% AEP) the site is flood affected, however, the flooding is localised to the existing farm dam and local overland flow path in the northern portion of the site. In the 500 year ARI (0.2% AEP), the flooding begins to breach the banks of the flow path and inundates portion of the disturbed site.

For a 1000 year ARI (0.1% AEP), 2000 year ARI (0.05% AEP) and a PMF flood event the flood maps indicate that the site is completely submerged by floodwaters.

Refer to the figures from the Nepean River Flood Study (Advisian, 2017) which are included in Appendix D.

Andrews Road Flooding

In events up to and including the 50 year ARI (2% AEP), the local evacuation route (Old Castlereagh Road and Andrews Road) remain flood free. In the 100 year ARI (1% AEP) and greater events, Andrews Road becomes inundated between Castlereagh Road and Laycock Street. This flood affectation will need to be considered during a regional flood evacuation, as evacuees will need to drive up Andrews Road and out of the PMF flood zone.

This flood affectation will need to be considered during a regional flood evacuation, as evacuees will need to drive up Andrews Road and out of the PMF flood zone.

Section 9.1.4 of the Nepean River Flood Study (Advisian, 2017) provides further details into the flood behaviours in the "Andrews Road Corridor" which is flooded by backwaters that emanate from Boundary Creek in the south and drain north across Andrews Road and through the Lakeside development.

Refer to Plate 3 below which depicts this flow path.

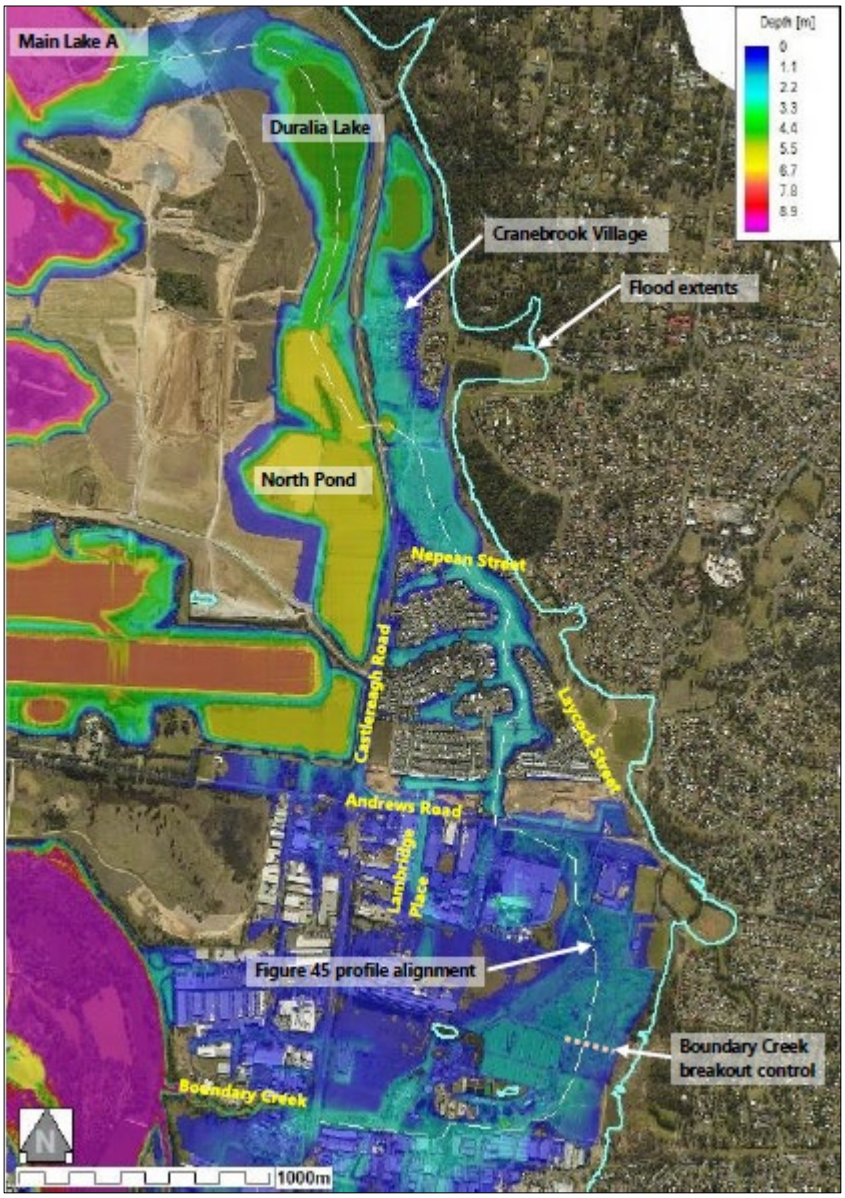


Plate 3 - Andrews Road flow corridor showing peak 200yr ARI depth and PMF extents (Source: Nepean River Flood Study, Figure 47)

During the PMF event, which is noted in the flood study as having the fastest rate of rise, the Boundary Creek breakout control (refer to Plate 3) is breached at a level of RL 24.7m. From this moment, it takes 2.8 hours for flood waters to increase to a level of RL 25.01m at the breakout control, at which point flows have expanded across the flow path and overtopped Andrews Road. Refer to section 9.1.4 of the Nepean River Flood Study (Advisian, 2018) for more information.

The Boundary Creek breakout occurs at a Penrith gauge level of RL 25.5m (near Victoria Bridge). As mentioned in Section 2 of this letter, the Penrith North sector (which includes the Sydney Helicopters site) will need to be completely evacuated if the predicted flood level at the Penrith gauge will exceed RL 22.3m. This means that the site will be evacuated well before a Boundary Creek breakout (and subsequent Andrews Road flooding) would occur.

4.3. Flood Awareness

Staffs, construction workers and visitors to the site need to be made aware of the flood hazard and evacuation procedures through a combination of measures and must be aware of FloodSafe Plan.

Signage should be installed at key locations within the site with clearly labelled directions of travel in the event of a flooding emergency. The signage draws awareness to flooding on site and flood evacuation procedures. The signs to guide people along the regional flood evacuation routes towards safer areas have to be installed. The template from SES is provided in Appendix E.

Individual staff including construction workers must be aware of FloodSafe Plan. The FloodSafe tips and “Get Prepared for Flood” fact sheet need to be provided on the notice board of office buildings and café. A Hawkesbury-Nepean factsheet “Get Prepared for Flood” and FloodSafe tips from the SES can be found in Appendix F.

4.4. Flood Warning

Observation of local rainfall or floodwater

An important indication of likely imminent flood activity would be intense local rainfall. Furthermore, monitor WaterNSW site (Warragamba Dam - WaterNSW) for updates on spills from Warragamba Dam, affecting Nepean River water levels.

The Bureau of Meteorology

The Bureau of Meteorology does not prepare flood predictions for the Parramatta River but does issue Severe Thunderstorm Warnings and Severe Weather Warnings for Sydney.

Severe Thunderstorm Warnings are issued together with maps indicating the current location and predicted path of thunderstorms. Severe Weather Warnings are for severe weather not related to thunderstorms, cyclones or fire, but for other causes of intense rainfall or storm surge, such as “east coast lows”. These warnings are available at http://www.bom.gov.au/nsw/warnings/.

BoM also provides real-time rain radar coverage for Sydney at http://www.bom.gov.au/products/IDR713.loop.shtml.

The NSW SES (Emergency Phone Number 132 500)

The local SES unit is Penrith located at 27 Fowler Street, Claremont Meadows NSW. The applicable region is the Sydney Western Region, which operates a Facebook page for informing members of the public (https://facebook.com/penrithses/).

The SES issues Local Flood Advices. These are issued on the basis of localised valley watch information for locations for which the BoM does not issue Flood Warnings. They normally predict which class of flooding (minor, moderate or major) will occur, and must not contradict any Flood Warnings provided by the BoM for other gauges on the same river. Local Flood Advices are to be identified as being issued by the SES (Home | NSW State Emergency Service).

Local television and radio stations

Local television and radio stations would disseminate warnings from the Bureau of Meteorology, SES and other relevant sources. The local radio station for emergency information is 702 ABC.

5. POST-FLOOD RECOVERY PLAN

During a regional Nepean River flood event such as the PMF storm event, it is anticipated that the regional utility services such as electricity, sewer, water and communications would be out of commission for a period of time. Without the availability of these key utilities, it is unlikely that the Sydney Helicopters development would be able to conduct normal operations immediately following an extreme flood.

Once the SES has given the 'all clear' for residents and business owners to return to their premises after a flood, we anticipate that the post-flood recovery operations would include the following actions by the site manager:

- Arrange for a suitably qualified professional to undertake an inspection of the site for any structural damage to determine whether the building is safe to occupy;
- Liaise with utility providers to confirm the anticipated timeframes in which they can be restored;
- Clean up any debris and repair any damage to the building to ensure it is safe to occupy

Once all essential services are re-established and the site is cleaned/repaired after a flood event, normal operations could resume.

6. CONSULTATION

Urbis Pty Ltd has prepared the Response to Submissions (RTS) report for Sydney Helicopters in February 2022 in response to the community and agency submissions received during the public exhibition of the Environmental Impact Statement (EIS) for a proposed Helipad facility. The following government agencies had made submissions relevant response to each submission has been provided on the 2022 RTS report.

- Blue Mountains City Council;
- Civil Aviation Safety Authority;
- Department of Infrastructure, Transport, Regional Development & Communications;
- Julia Finn MP – Member for Granville;
- NSW DPE - Environment, Energy and Science Group;
- NSW Rural Fire Service;
- Penrith City Council; and
- Transport for NSW.

Refer to the 2022 RTS report for detailed information.

It is noted that the Department of Planning and Environment (DPE) required evidence of consultation with the Hawkesbury-Nepean Valley Flood Risk Management Directorate within Infrastructure NSW, NSW State Emergency Service (SES) and Transport for NSW as a part of this plan and is discussed below:

- Transport for NSW (TfNSW)

  Transport for NSW (TfNSW), stated in 2022 RTS report that *The proposed flood evacuation procedures appear to incorrectly identify primary evacuation routes via the Great Western Highway which, in particular, includes egress from the site via a low-lying railway underpass at Penrith. The proposal should revisit flood evacuation procedures and include consultation with NSW State Emergency Services on the preferred regional evacuation path.*

  It is noted that this report has addressed the TfNSW requirement in Sections 2 and 3 of this report.

- Hawkesbury-Nepean Valley Flood Risk Management Directorate within Infrastructure NSW

  J. Wyndham Prince understands that the Nepean Valley Flood Directorate were contacted via email by Sydney Helicopters, and the response is yet to be received. However, this study has considered the Hawkesbury Nepean Flood Plan (SES, 2015) which identified local and regional flood evacuation routes for the Penrith North Sector and is detailed in Section 2 of this report.

- NSW State Emergency Service (SES)

  J. Wyndham Prince understands that the Sydney Helicopters or DPE will liaise with SES to receive their expert review on this plan.

We trust that this assessment enables the SES to have confidence that the patrons and staff of the Sydney Helicopters will have a manageable and safe flood evacuation strategy.

Should you have any queries regarding this matter please do not hesitate to contact me.

Yours faithfully

SABINA LOHANI

Manager – Stormwater & Flooding

7. REFERENCES

- State Emergency Service (SES), Hawkesbury Nepean Flood Plan, NSW Government, September 2015.
- WMA Water (WMA), Hawkesbury Nepean Valley Regional Flood Study Final Report, Infrastructure NSW, July 2019.
- Advisian, Nepean River Flood Study, Penrith City Council, August 2017.
- NSW Department of Planning and Environment (DPE), Penrith Lakes Development Control Plan, June 2022

8. APPENDICES

Appendix A – Maps extracted from the Hawkesbury Nepean Flood Plan (SES, 2015)

Appendix B – Sydney Helicopters Flood Evacuation Plan

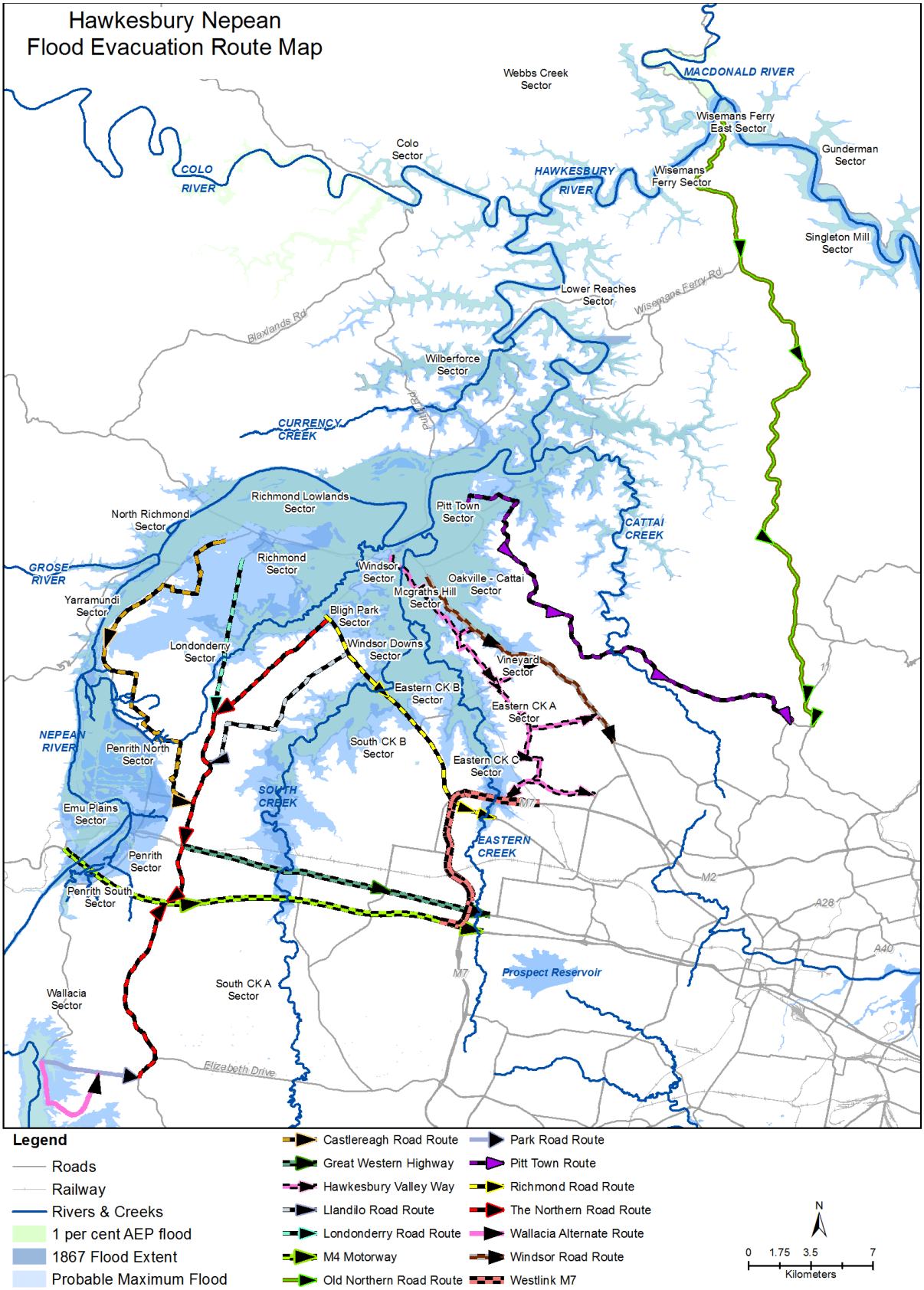
Appendix C – Maps extracted from the Hawkesbury Nepean Valley Regional Flood Study (WMA, 2019)

Appendix D – Maps extracted from the Nepean River Flood Study (Advisian, 2017)

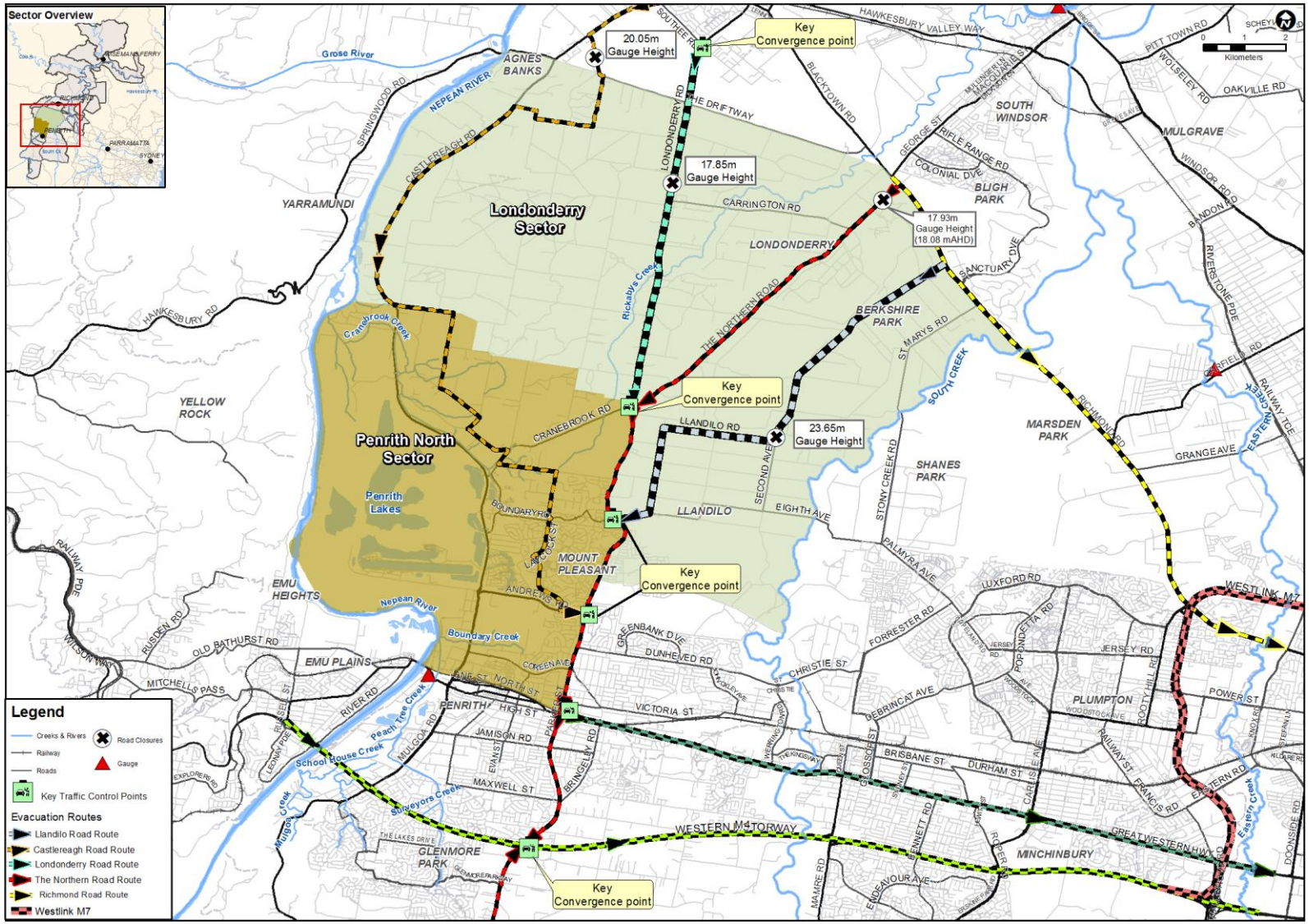
Appendix E – Signs to Guide Flood Evacuation Routes

Appendix F – Hawkes-Nepean Fact Sheet “Get Prepared for Flood”

APPENDIX A – MAPS EXTRACTED FROM THE HAWKESBURY NEPEAN FLOOD PLAN (SES, 2015)



Map 1: Regional Evacuation Routes within the Hawkesbury-Nepean Valley



Map 9: Londonderry and Penrith North - Evacuation Routes

APPENDIX B – SYDNEY HELICOPTERS FLOOD EVACUATION PLAN

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
CELEBRATING 40 YEARS 1982 - 2022

LEGEND

- Primary Flood Evacuation Route
- Alternate Flood Evacuation Route
- Existing Contours
- Site Area

N

0 200 400 m

Scale 1: 14299 @ A3

Projection: GDA2020 / MGA zone 56

Figure 2-1

89-151 Old Castlereagh Road, Castlereagh

Flood Evacuation Routes

Date: 15/02/2023 Revision:A

File Name: J:\110934 - 89-151 Old Castlereagh Road\02 - Package\SWE\QGIS\Project\Flood Evacuation Route.qgz

APPENDIX C – MAPS EXTRACTED FROM THE HAWKESBURY NEPEAN VALLEY REGIONAL FLOOD STUDY (WMA, 2019)

HAWKESBURY-NEPEAN VALLEY
REGIONAL FLOOD STUDY
FINAL REPORT
JULY 2019

FIGURE 21
FLOOD DEPTHS
1 IN 5 AEP EVENT
PENRITH

Notes: The mapped flood information represents Hawkesbury-Nepean mainstream regional flooding including backwater effects, but does not include local catchment flooding or local overland flooding.

Flood behaviour information is subject to change as a result of new data, methods and technology.

The mapped flood information excludes the impacts of climate change and implementation of potential flood mitigation measures.

Any flooding information within the banks of rivers or streams should not be used for any assessment (other than flood extents) without detailed investigation. Flood depths are indicative only. To determine the depth of flooding at a particular location, the flood level should be compared to a surveyed ground level.

Flood mapping over Penrith Lakes is indicative only as the flood modelling does not incorporate the latest infrastructure of the Penrith Lakes Scheme.

PENRITH LAKES
Andrews Rd
Castlereagh Rd
Victoria Bridge
Dunheved Rd
PENRITH
Great Western Hwy
EMU PLAINS
Mulgoa Rd
Great Western Hwy
Tench Ave
Jamison Rd
Jamison Park
GLENBROOK
Maxwell St
M4 MOTORWAY
Penrith Golf Course
The Northern Rd

N

Penrith Lakes Area (approximate only) - refer to note
Depth (m)
0 - 1
1 - 2.5
2.5 - 5
5 - 10
10 - 15
> 15

0 0.5 1 2 3 km

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FIGURE 25
FLOOD DEPTHS
1 IN 100 AEP EVENT
PENRITH

Notes: The mapped flood information represents Hawkesbury-Nepean mainstream regional flooding including backwater effects, but does not include local catchment flooding or local overland flooding.

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Flood mapping over Penrith Lakes is indicative only as the flood modelling does not incorporate the latest infrastructure of the Penrith Lakes Scheme.

The Nepean River Flood Study provides more detailed analysis of flood behaviour in the area shown for this flood event.

PENRITH LAKES
Andrews Rd
Castlereagh Rd
Victoria Bridge
Dunheved Rd
PENRITH
Great Western Hwy
EMU PLAINS
Mulgoa Rd
Great Western Hwy
Tench Ave
Jamison Rd
Jamison Park
GLENBROOK
Maxwell St
M4 MOTORWAY
Penrith Golf Course
The Northern Rd

N

Penrith Lakes Area (approximate only) - refer to note
Area of Penrith City Council Nepean River Flood Study - refer to note

Depth (m)
0 - 1
1 - 2.5
2.5 - 5
5 - 10
10 - 15
> 15

0 0.5 1 2 3 km

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HAWKESBURY-NEPEAN VALLEY
REGIONAL FLOOD STUDY
FINAL REPORT
JULY 2019

FIGURE 29
FLOOD DEPTHS
1 IN 500 AEP EVENT
PENRITH

Notes: The mapped flood information represents Hawkesbury-Nepean mainstream regional flooding including backwater effects, but does not include local catchment flooding or local overland flooding.

Flood behaviour information is subject to change as a result of new data, methods and technology.

The mapped flood information excludes the impacts of climate change and implementation of potential flood mitigation measures.

Any flooding information within the banks of rivers or streams should not be used for any assessment (other than flood extents) without detailed investigation. Flood depths are indicative only. To determine the depth of flooding at a particular location, the flood level should be compared to a surveyed ground level.

Flood mapping over Penrith Lakes is indicative only as the flood modelling does not incorporate the latest infrastructure of the Penrith Lakes Scheme.

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Jamison Rd
Jamison Park
GLENBROOK
Maxwell St
M4 MOTORWAY
Penrith Golf Course
The Northern Rd

N

Penrith Lakes Area (approximate only) - refer to note
Area of Penrith City Council Nepean River Flood Study - refer to note

Depth (m)
- 0 - 1
- 1 - 2.5
- 2.5 - 5
- 5 - 10
- 10 - 15
- > 15

0 0.5 1 2 3 km

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FIGURE 33
FLOOD DEPTHS
1 IN 2000 AEP EVENT
PENRITH

Notes: The mapped flood information represents Hawkesbury-Nepean mainstream regional flooding including backwater effects, but does not include local catchment flooding or local overland flooding.

Flood behaviour information is subject to change as a result of new data, methods and technology.

The mapped flood information excludes the impacts of climate change and implementation of potential flood mitigation measures.

Any flooding information within the banks of rivers or streams should not be used for any assessment (other than flood extents) without detailed investigation. Flood depths are indicative only. To determine the depth of flooding at a particular location, the flood level should be compared to a surveyed ground level.

Flood mapping over Penrith Lakes is indicative only as the flood modelling does not incorporate the latest infrastructure of the Penrith Lakes Scheme.

The Nepean River Flood Study provides more detailed analysis of flood behaviour in the area shown for this flood event.

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Penrith Golf Course
The Northern Rd

N

Penrith Lakes Area (approximate only) - refer to note
Area of Penrith City Council Nepean River Flood Study - refer to note

Depth (m)
- 0 - 1
- 1 - 2.5
- 2.5 - 5
- 5 - 10
- 10 - 15
- > 15

0 0.5 1 2 3 km

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HAWKESBURY-NEPEAN VALLEY
REGIONAL FLOOD STUDY
FINAL REPORT
JULY 2019

FIGURE 37
FLOOD DEPTHS
PMF EVENT
PENRITH

Notes: The mapped flood information represents Hawkesbury-Nepean mainstream regional flooding including backwater effects, but does not include local catchment flooding or local overland flooding.

Flood behaviour information is subject to change as a result of new data, methods and technology.

The mapped flood information excludes the impacts of climate change and implementation of potential flood mitigation measures.

Any flooding information within the banks of rivers or streams should not be used for any assessment (other than flood extents) without detailed investigation. Flood depths are indicative only. To determine the depth of flooding at a particular location, the flood level should be compared to a surveyed ground level.

Flood mapping over Penrith Lakes is indicative only as the flood modelling does not incorporate the latest infrastructure of the Penrith Lakes Scheme.

PENRITH LAKES
Andrews Rd
Castlereagh Rd
Victoria Bridge
Great Western Hwy
EMU PLAINS
PENRITH
Mulgoa Rd
Tench Ave
Dunheved Rd
Great Western Hwy
Jamison Rd
Jamison Park
GLENBROOK
Maxwell St
M4 MOTORWAY
Penrith Golf Course
The Northern Rd

N

Penrith Lakes Area (approximate only) - refer to note
Depth (m)
0 - 1
1 - 2.5
2.5 - 5
5 - 10
10 - 15
> 15

0 0.5 1 2 3 km

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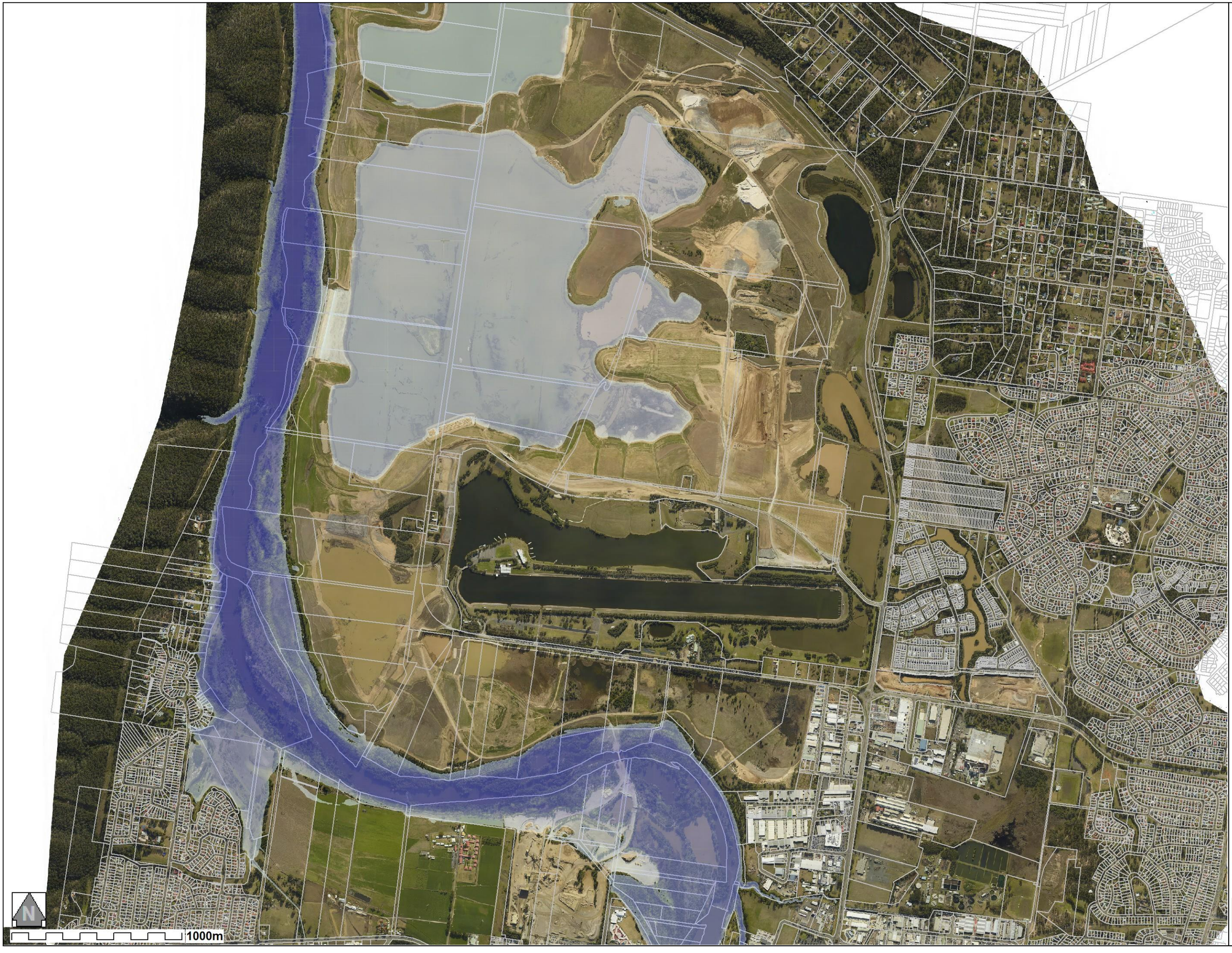
APPENDIX D – MAPS EXTRACTED FROM THE NEPEAN RIVER FLOOD STUDY (ADVISIAN, 2017)



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NEPEAN RIVER FLOOD STUDY

Flood Depth Surface 20 year ARI

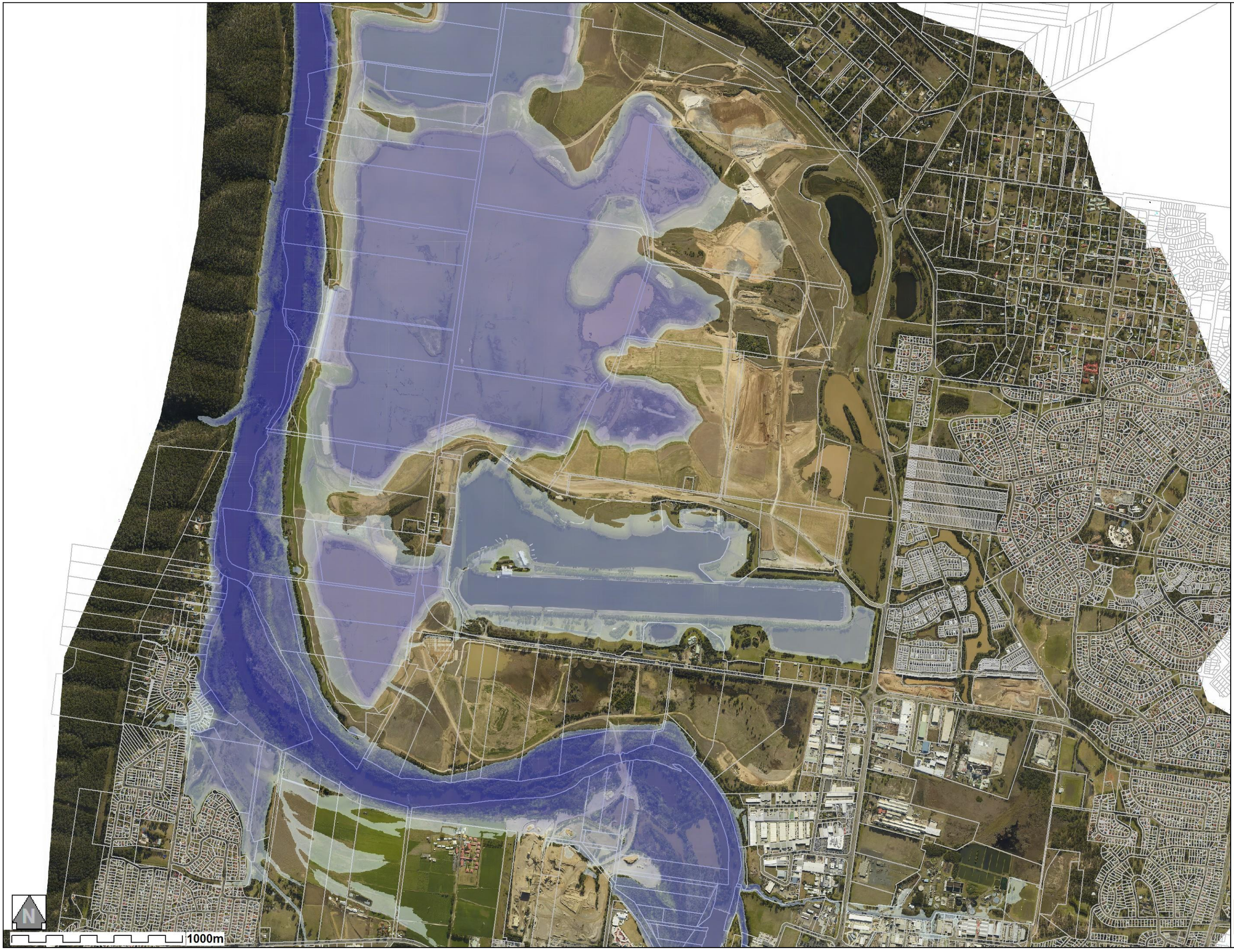
MAP 024_B

Scale 1:20,000 [A3]

5/11/2018
rp301077-14401-dmc-FS-Maps-r1.docx

PENRITH CITY COUNCIL

Advisian
WorleyParsons Group



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NEPEAN RIVER FLOOD STUDY

Flood Depth Surface 50 year ARI

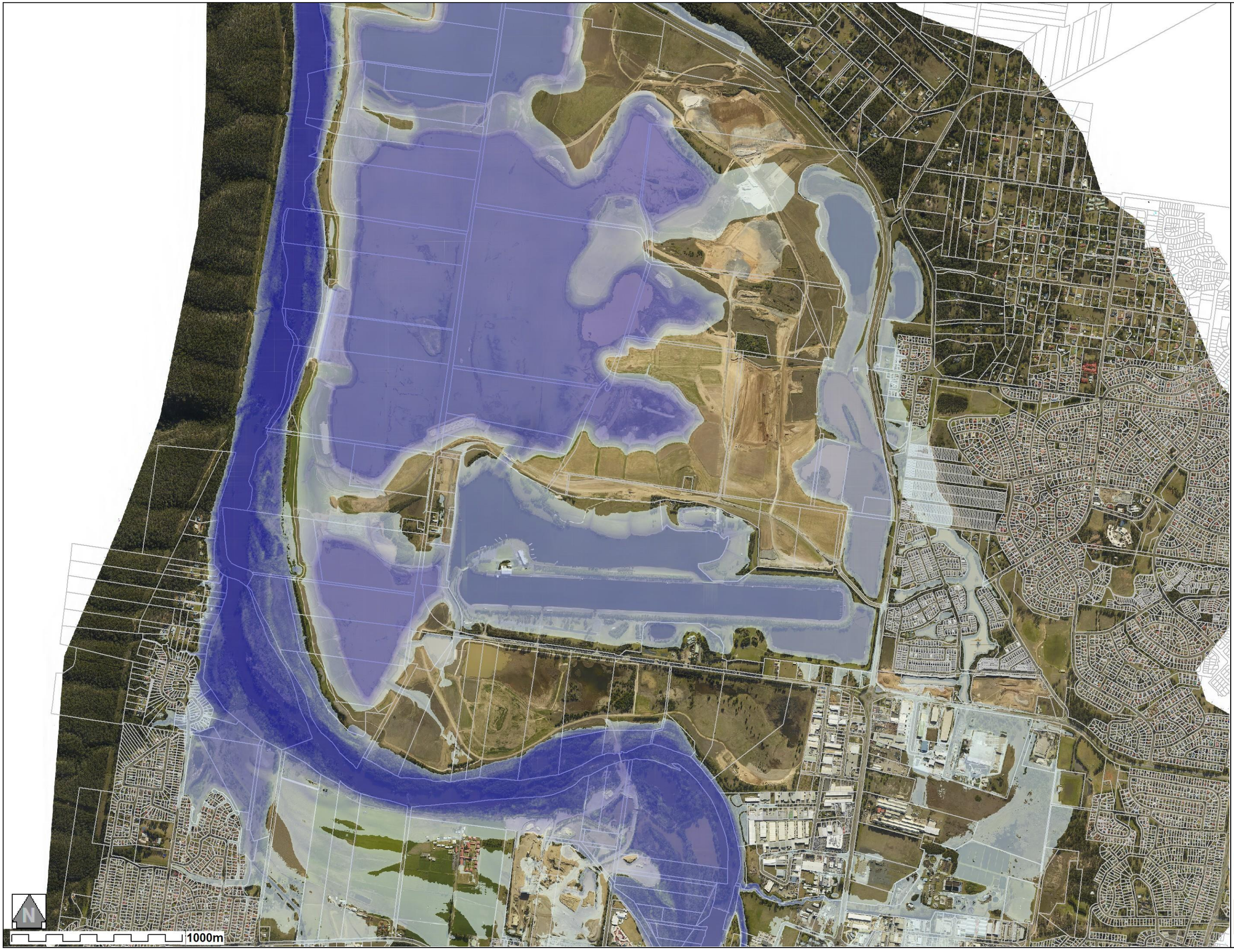
MAP 025_B

Scale 1:20,000 [A3]

5/11/2018
rp301077-14401-dmc-FS-Maps-r1.docx

PENRITH CITY COUNCIL

Advisian
WorleyParsons Group



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NEPEAN RIVER FLOOD STUDY

Flood Depth Surface 100 year ARI

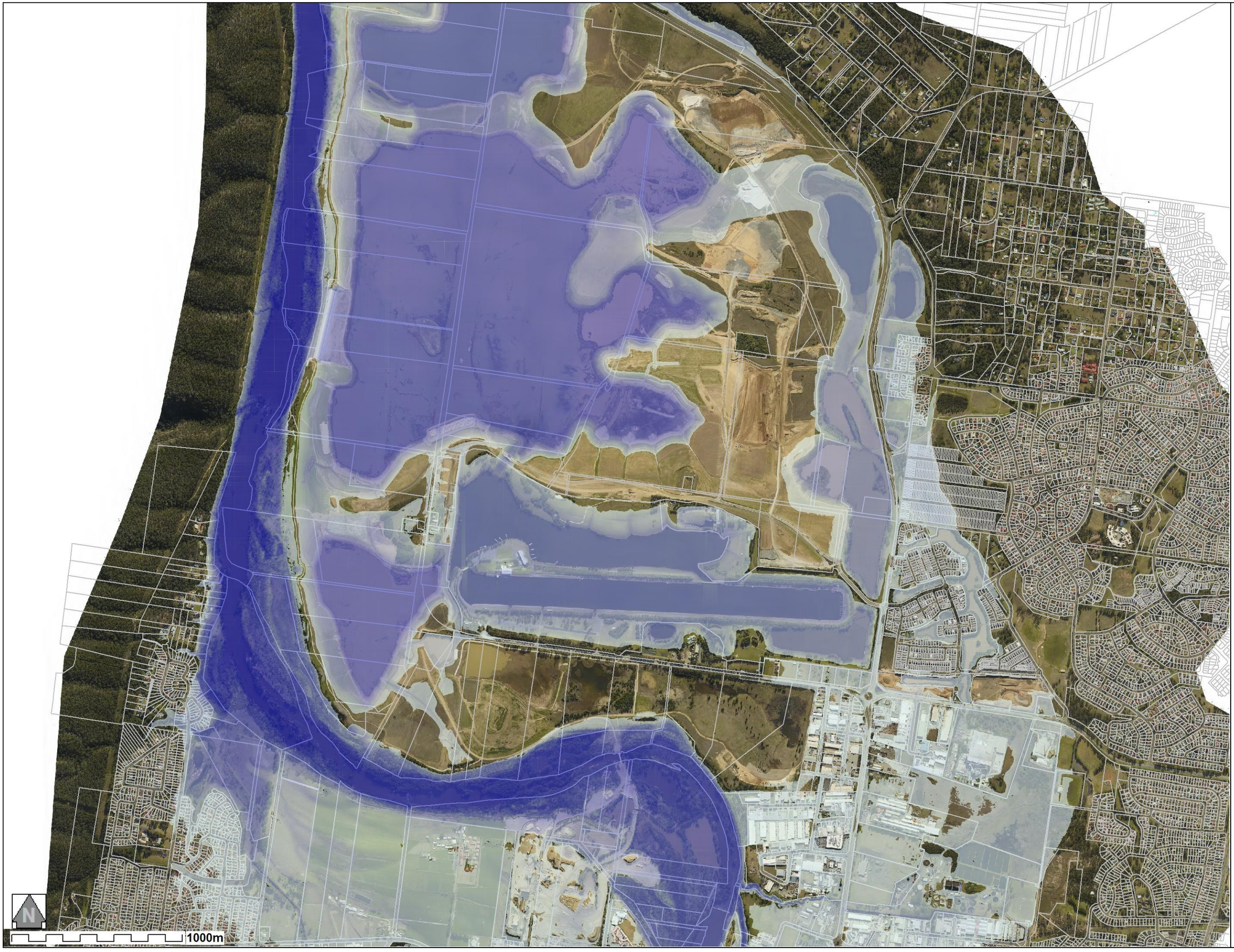
MAP 026_B

Scale 1:20,000 [A3]

5/11/2018
rp301077-14401-dmc-FS-Maps-r1.docx

PENRITH CITY COUNCIL

Advisian
WorleyParsons Group



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NEPEAN RIVER FLOOD STUDY

Flood Depth Surface 200 year ARI

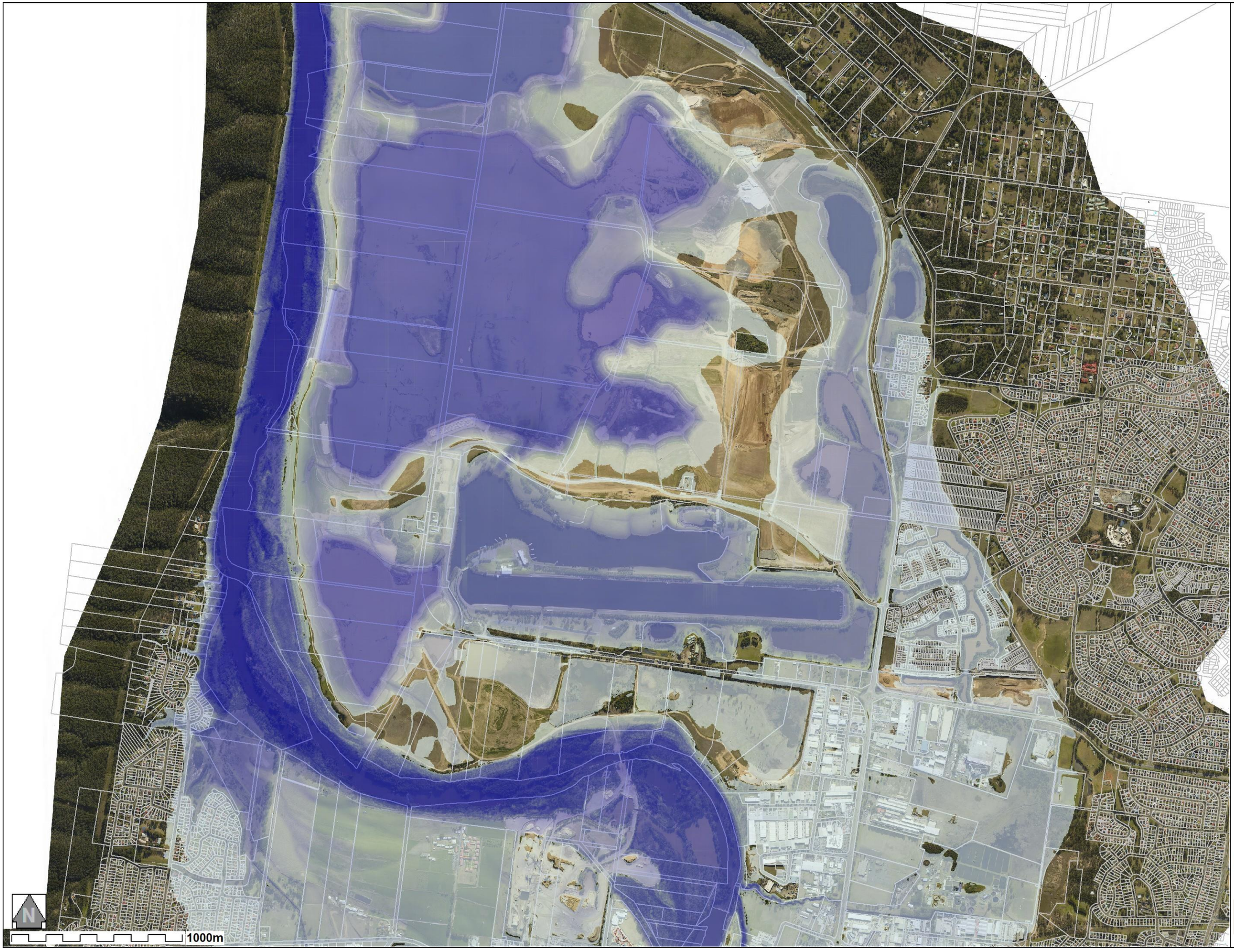
MAP 027_B

Scale 1:20,000 [A3]

5/11/2018
rp301077-14401-dmc-FS-Maps-r1.docx

PENRITH CITY COUNCIL

Advisian
WorleyParsons Group



NEPEAN RIVER FLOOD STUDY

Flood Depth Surface 500 year ARI

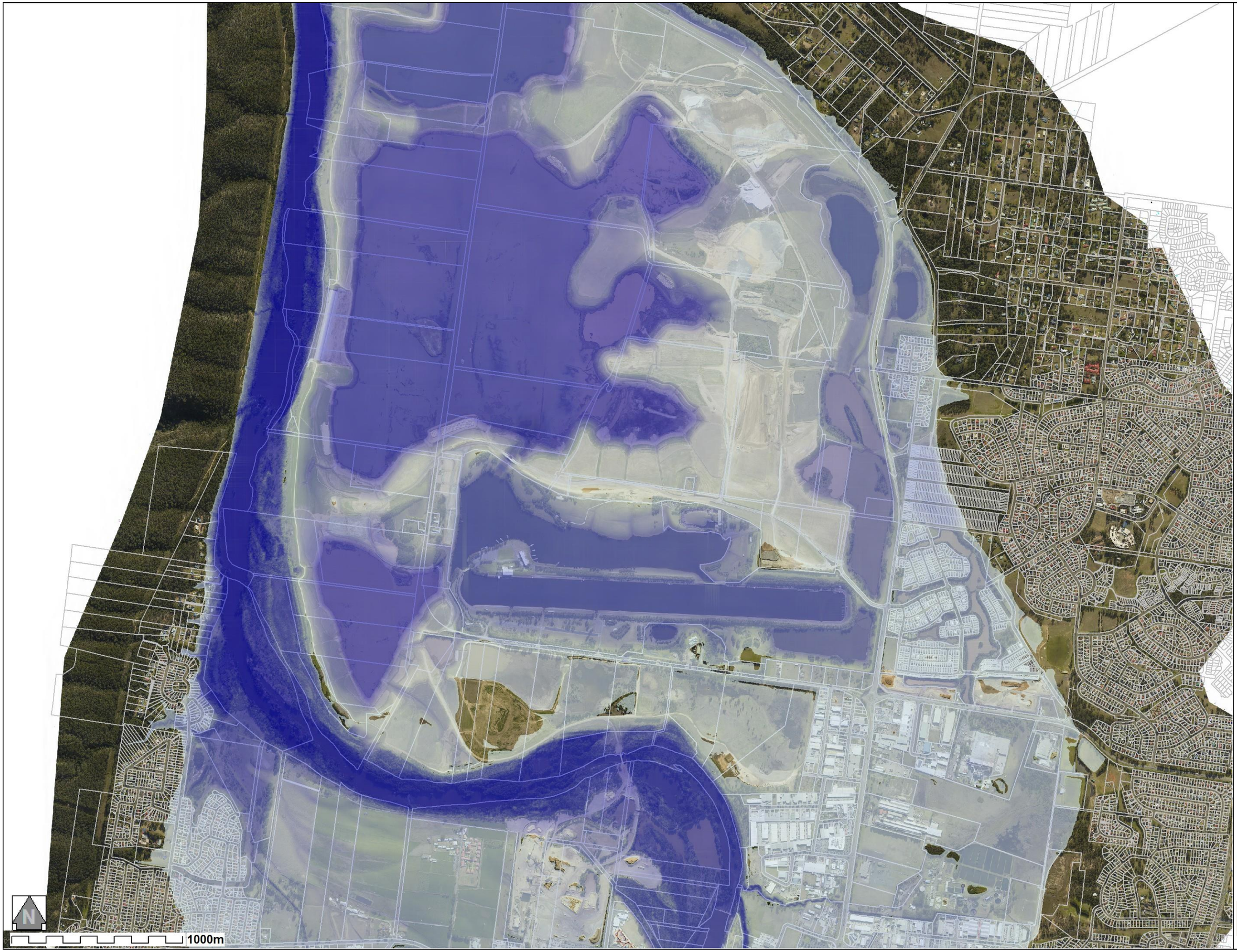
MAP 028_B

Scale 1:20,000 [A3]

5/11/2018
rp301077-14401-dmc-FS-Maps-r1.docx

PENRITH CITY COUNCIL

Advisian
WorleyParsons Group



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NEPEAN RIVER FLOOD STUDY

Flood Depth Surface 1000 year ARI

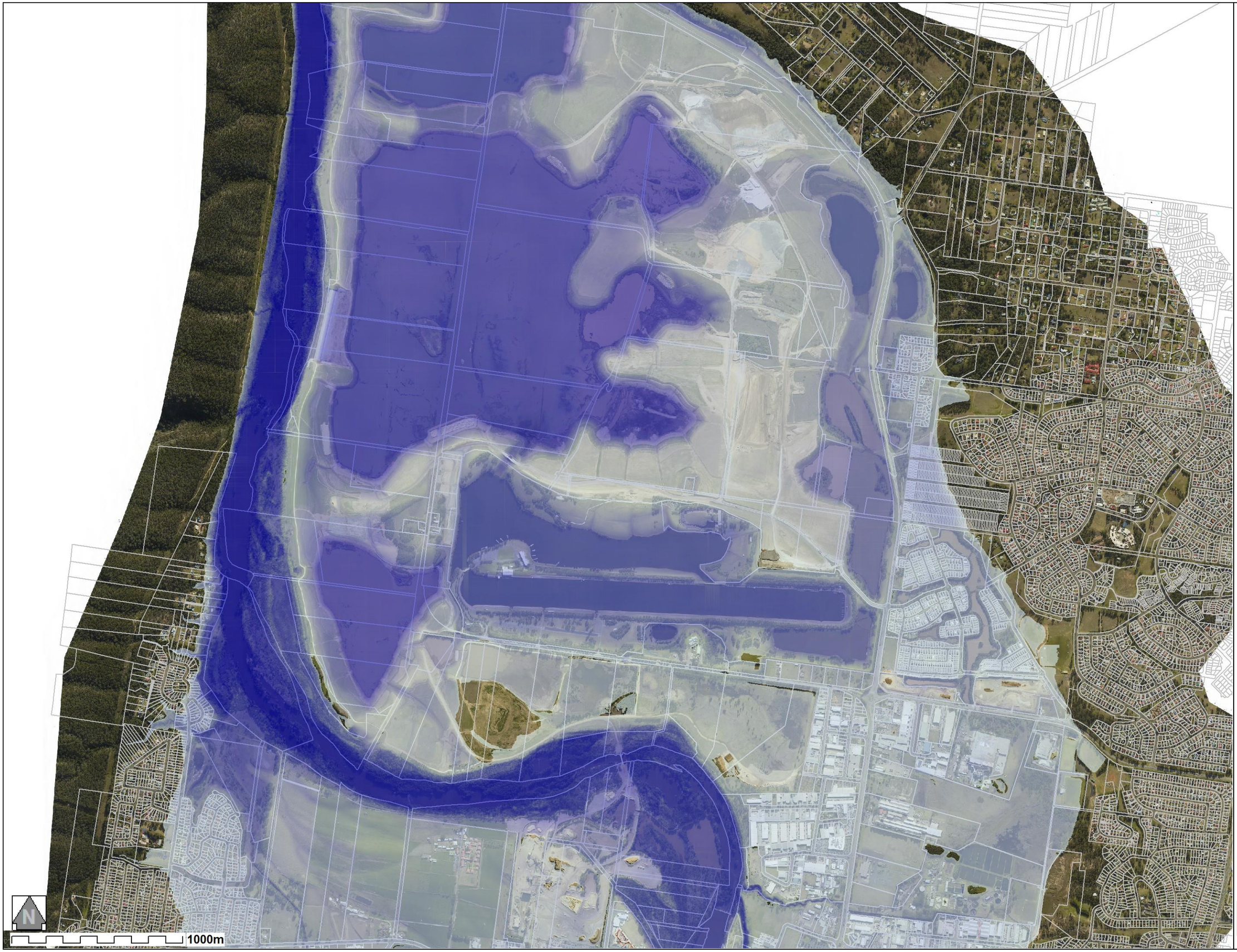
MAP 029_B

Scale 1:20,000 [A3]

5/11/2018
rp301077-14401-dmc-FS-Maps-r1.docx

PENRITH CITY COUNCIL

Advisian
WorleyParsons Group



NEPEAN RIVER FLOOD STUDY

Flood Depth Surface 2000 year ARI

MAP 030_B

Scale 1:20,000 [A3]

5/11/2018
rp301077-14401-dmc-FS-Maps-r1.docx

PENRITH CITY COUNCIL

Advisian
WorleyParsons Group

LEGEND

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NEPEAN RIVER FLOOD STUDY

Flood Depth Surface PMF

MAP 031_B

Scale 1:20,000 [A3]

5/11/2018
rp301077-14401-dmc-FS-Maps-r1.docx

PENRITH CITY COUNCIL

Advisian
WorleyParsons Group

APPENDIX E – SIGNS TO GUIDE FLOOD EVACUATION ROUTES

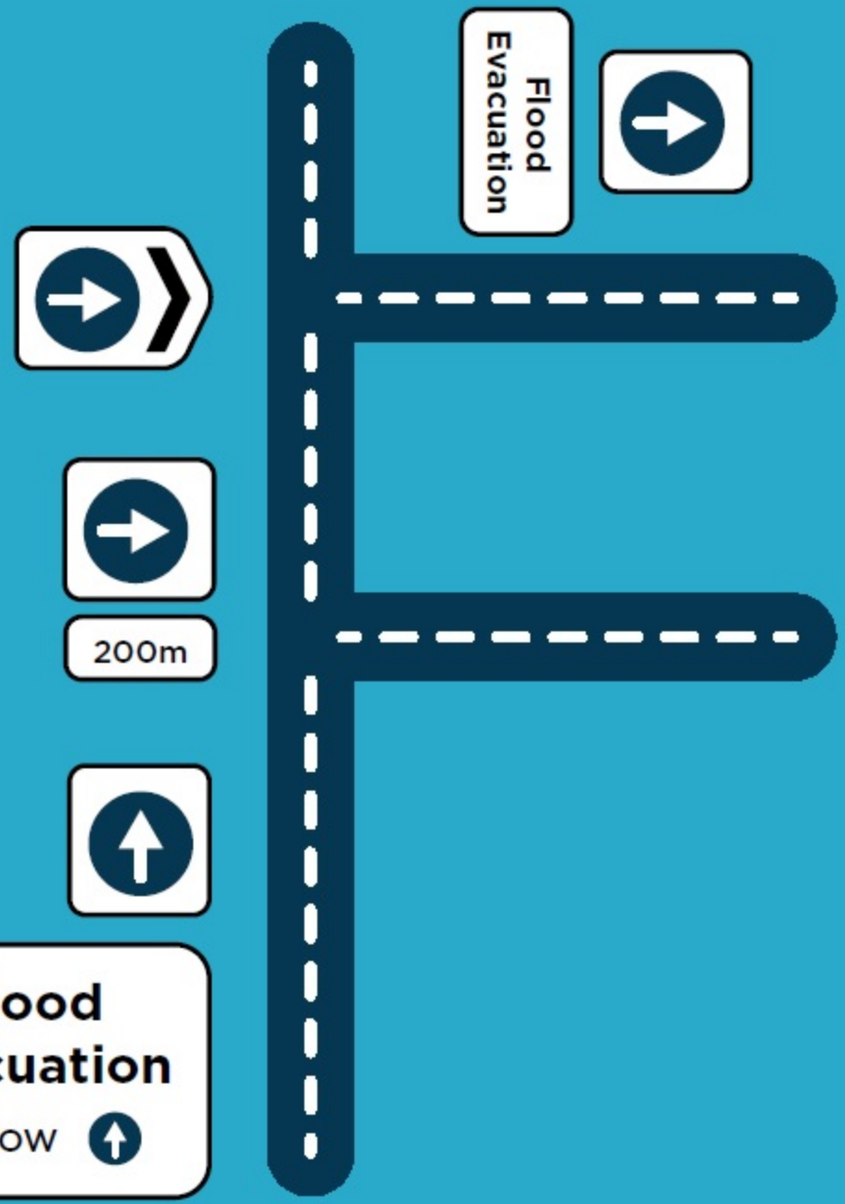
Signs to guide people along the regional flood evacuation routes towards safer areas.

4 Direction at the intersection

3 Advance notice of turns

2 Shows you're still on the route

1 At the start of the route



APPENDIX F – HAWKES-NEPEAN FACT SHEET "GET PREPARED FOR FLOOD"

HAWKESBURY-NEPEAN FACT SHEET

Get Prepared for Flood

SOME SIMPLE ACTIONS CAN SAVE LIVES

Your local flood risk

The Hawkesbury-Nepean Valley has a long history of flooding.

When there is heavy rainfall, water flows down five major rivers into the floodplain. It is slowed from reaching the ocean by around 80 kilometres of narrow gorges from Ebenezer to Spencer. This means that floodwater can back up and rise quickly, causing wide, deep and dangerous floods.

There are hidden dangers in floodwater like debris, electrical wires, pollutants and sewage. In a flood, bridges can be cut, roads closed, public transport routes interrupted, power lost and mobile phone and internet connections disrupted.

It is important for everyone who lives in the floodplain to be prepared. For more information see **www.myfloodrisk.nsw.gov.au**

How to prepare before a flood

✓ **Know where to get updates and warnings**

- Bureau of Meteorology for local weather updates
- NSW State Emergency Service (NSW SES) for information on floods and storms
- ABC Radio as the official emergency broadcaster

✓ **Prepare a 'Get Ready to Go' Kit**

What to pack:

1. Health care items like medications and prescriptions
2. Copies of your important documents (hard copies or stored digitally)
3. Important valuables and momentos
4. Important phone numbers
5. Radio, torch, phone chargers and batteries
6. Clothing and personal items

✓ **Make a plan for evacuation**

Know where you will go, how you will get there, what evacuation routes you can use, what you will do with your animals, and how you will manage your health

✓ **Share your plan**

Talk with your relatives, friends, and neighbours about what you will do if you need to evacuate

What to do during a flood

Follow NSW SES Flood Advice and Emergency Warnings

- Listen to your local ABC radio station for up to date flood information and advice
- Follow advice from NSW SES. If you are asked to evacuate, don't wait until it is too late

Take your 'Get Ready to Go' Kit

- This should include your medications, prescriptions and any assistance equipment

Take your animals

- Put them on leashes or in carriers
- Take food, medication and registration/vaccination documents

Know where to go

- Follow advice on evacuations and check live traffic information
- Make your way to relatives or friends outside the floodplain if you can
- Official evacuation centres will be announced at the time of the emergency

Look out for each other

Share information with family, friends, and neighbours. Help each other especially people who may need assistance

Where to find information

Useful websites to visit and phone apps to download

- Local weather updates: **www.bom.gov.au** and Bureau of Meteorology app
- Local ABC Radio frequency: **https://reception.abc.net.au** and ABC Listen app
- Flood and storm updates: **www.ses.nsw.gov.au** **www.facebook.com.au/NSW.SES**
- Plan for your animals: **www.getreadyanimals.nsw.gov.au**
- Live traffic information: **www.livetraffic.com** and Live Traffic app

Need help?

For emergency help in floods call NSW SES on 132 500

For all life threatening emergencies call 000

- Hearing/speech impaired SMS NRS: 0423 677 767
- Internet Relay: **https://internet-relay.nrscall.gov.au**
- If you are homeless call **Link2Home** on **1800 152 152**
- If an interpreter is required, emergency services can access translation services

My important contacts

Who will you need to contact in an emergency?

(e.g. emergency contact, relatives, friends, doctor, pharmacist, carer, support worker, Link2Home)

Name: ..... **Phone:** .....

Name: ..... **Phone:** .....

Name: ..... **Phone:** .....

Name: ..... **Phone:** .....

Name: ..... **Phone:** .....

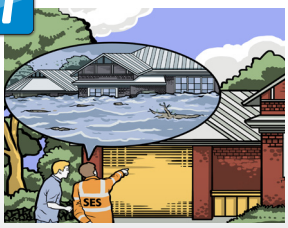
My checklist

I am prepared because:

	✓
I know where to find information like weather updates, warnings and advice	☐
I know where I will go in an evacuation and how I will get there	☐
I know what I will take with me	☐
I have talked with my household about what we will do if we need to evacuate	☐
I have a plan for keeping my animals safe	☐
I know how I will manage my health	☐
I have talked through my plan with relatives, friends and neighbours	☐
I have a list of my important numbers ready	☐

8 TIPS YOU CAN DO NOW TO PREPARE FOR FLOODS

1 KNOW YOUR RISK



2 KNOW WHERE TO GO

3 KNOW WHO TO CALL

4 KNOW YOUR PLAN

5 GET YOUR KIT TOGETHER

6 PREPARE NOW TO ACT EARLY

7 CHECK YOUR INSURANCE

8 LISTEN TO LOCAL RADIO

SES
NSW STATE EMERGENCY SERVICE

FloodSafe