Our Ref: ID2655
Your Ref: SSD-62855708

24 September 2024

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Industry Assessments
Department of Planning and Environment
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email: Sally.Munk@planning.nsw.gov.au
CC: shelly.stingmore@one.ses.nsw.gov.au

Dear Sally,

Flood Emergency Management Plan for Waste Management Facility, Botany

Thank you for the opportunity to provide comment on the Flood Impact Assessment and Flood Emergency Management Plan (FEMP) for the proposed development at 2-4 Hale Street, Botany.

The NSW State Emergency Service (NSW SES) is the agency responsible for dealing with floods, storms and tsunami in NSW. This role includes, planning for, responding to and coordinating the initial recovery from floods. As such, the NSW SES has an interest in the public safety aspects of the development of flood prone land, particularly the potential for changes to land use to either exacerbate existing flood risk or create new flood risk for communities in NSW.

It is the preference of NSW SES that all development follows the application of sound land use planning and flood risk management in accordance with the Flood Prone Land Policy, the Flood Risk Management Manual 2023 (the Manual) and supporting guidelines.

The NSW SES has reviewed the proposed FEMP and the flood risk information (e.g. Bayside Flood Emergency Sub Plan 2023, Botany Bay and Foreshore Beach Floodplain Risk Management Study and Plan 2020 etc.) available to the NSW SES, noting the proposed development is at risk of flooding in a 20% Annual Exceedance Probability (AEP) event with adjacent roads becoming inundated by floodwaters[1]. The NSW SES also does not have statutory authority to endorse or approve flood emergency response plans, however, provides the following advice based on the principles outlined in the Guidelines as detailed in Attachment A.

We refer to our previous advice dated 18 April 2024 and meeting on 28 March 2024 and provide the following additional advice.

[1] CJ Arms, 2024, Flood Impact Assessment and FEMP, Section 2.2 Flood Prone Land, Page 8

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In summary, we:

- **Understand** that the proposal significantly reduces the number of people onsite from the existing development, and provides an additional upper floor office space[2].
- **Reiterate** that shelter in place is not an endorsed strategy by the NSW SES for future development.
- **Reiterate** that the NSW SES is opposed to the imposition of development consent conditions requiring private flood evacuation plans rather than the application of sound land use planning and flood risk management.
- **Reiterate** NSW SES is opposed to any strategy which transfers residual risk, in terms of emergency response activities, to NSW SES.
- **Recommend** references to "*the 1% AEP Event*[3]" and other modelled storm events are removed from the emergency management plan and replaced with clear and actionable triggers which align with warnings issued by the Bureau of Meteorology and NSW SES, rather than AEP events. Warnings will not list the expected AEP extent as this is not known until after the peak of the flood event. Further, as the site is affected by flash flooding it is not subject to flood warnings, which complicates any emergency management strategy for the site. As such, Severe Weather Warnings and Thunderstorm Warnings will be the most likely form of advice about the potential for flood producing storms and rainfall.
- **Recommend** removing reliance on modelled rates of rise[4] to determine when to initiate emergency response, as each flood event may behave differently in response to antecedent conditions.
- **Recommend** that the flood emergency plan is regularly exercised, similar to building fire evacuation drills. The NSW SES also recommends updating the FEMP at regular intervals and whenever additional flood information is available or highlighted during the drills or flood events.
- **Recommend** pursuing, if relevant, site design and stormwater management that reduces the impact of flooding and minimises any risk to the community. Any improvements that can be made to reduce flood risk will benefit the community.
- **Recommend** considering the impact of climate change on the flood risk.

Further useful information can be found here:

- NSW SES website
- Emergency Business Continuity Plan

[2] CJ Arms, 2024, Flood Impact Assessment and FEMP, Section 10.2 Safety, p99
[3] CJ Arms, 2024, Flood Impact Assessment and FEMP, Appendix G Flood Emergency Management Plan, Section 2.1 1% AEP Event, Page 205
[4] CJ Arms, 2024, Flood Impact Assessment and FEMP, Appendix G Flood Emergency Management Plan, Table 1: 1% AEP Event Flood Timing, Page 208

- The Department of Climate Change, Energy, the Environment and Water website

Please feel free to contact Kate Dawes via email at rra@ses.nsw.gov.au should you wish to discuss any of the matters raised in this correspondence. The NSW SES would also be interested in receiving future correspondence regarding the outcome of this referral via this email address.

Yours sincerely,

Peter Cinque
Senior Manager, Emergency Risk Management
NSW State Emergency Service

ATTACHMENT A: Principles Outlined in the Support for Emergency Management Planning Guideline[5]

Principle 1 Any proposed Emergency Management strategy should be compatible with any existing community Emergency Management strategy.

Any proposed Emergency Management strategy for an area should be compatible with the evacuation strategies identified in the relevant local or state flood plan or by the NSW SES. As per the NSW State Flood Plan[6], and the Bayside Flood Emergency Sub Plan, evacuation is the primary emergency management strategy for people impacted by flooding[7].

The Flood Risk Management Manual 2023 notes flood risk management plans are 'living documents' which need to be regularly reviewed to ensure they remain appropriate to address the flood risk to the community, can be practically implemented and consider changing information and lessons learnt from any floods since the last review.

Although NSW SES encourages homes and businesses to be prepared and has developed a home FloodSafe toolkit and a Business FloodSafe toolkit, even well written plans are dependent on human application and often rely on technical support systems. Most plans will rely on the actions of one or more third parties and all plans require regular maintenance and review, and most importantly an ongoing commitment from all participants. These conditions are difficult to implement and are unlikely to be achieved in a private ownership context where there is no external audit or monitoring.

Any plan that a facility manager may wish to prepare for a site should address the following issues. The list is also an indication of the issues that should be addressed in any detailed major development proposal, especially if some of the key issues such as the reliability of evacuation routes, can be dealt with through better design and construction.

1. Is the site a frequently flooded site where site users may become complacent about the smaller more frequent floods and will be surprised and caught-out by bigger events?

At first glance it may seem that if people live or work in an area where frequent low-level floods occur, they would be more flood aware. Unfortunately, although they may be aware of flooding, they generally come to the view that they are not at risk because they think all floods are like the small ones they often see. This is not true and big floods will almost always catch people by surprise and exceed their capacity to deal with the situation unless they have considered this scenario in their planning and preparedness.

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[5] NSW Government. 2023. Principles Outlined in the Support for Emergency Management Planning Guideline

[6] NSW Government. 2021. NSW State Flood Plan. Section 1.6 Key Principles, Page 5

[7] NSW SES, Bayside Flood Emergency Sub Plan, Endorsed May 2023, Section 5.8

NSW SES does not support any strategy which requires people or vehicles to enter flood water, even at seemingly low levels of hazard. Driving through floodwater is the number one cause of flood related fatalities[8], with more than 100 fatalities across Australia since 2002[9]. Near misses are not recorded in these statistics, however as an example, NSW SES attended 3823 flood rescues in 2022, and a significant proportion of these were people trapped in cars after driving into floodwater.

2. Is it a location for which flood height prediction is either not available at all or within a reasonable time frame or where prediction is inherently uncertain?

These issues will make flood planning, warning and response timing very difficult. There are many locations where the time from rainfall to flooding is less than six hours and these are termed flash flood environments. Examples are Coffs Harbour, Wollongong, and many suburban Sydney areas. In these and similar locations, Severe Weather Warnings will be the most likely form of advice about the potential for flood producing storms and rainfall. Business owners/operators must be weather aware and act early on publicly broadcast severe weather and flood warnings.

3. Is the location remote from the main community and therefore not linked to existing community networks for warning and assistance purposes?

The more specific the warning requirement for individuals and sites becomes, the more difficult it is for the NSW SES to deliver warnings in the short time frames that often apply.

a) Will site users require special flood warning arrangements because of isolation, short warning times, age or ill health?

Neither the NSW SES nor the Bureau of Meteorology can undertake to provide special individual flood warning services for each business site. The more specific the warning requirement for individuals and sites becomes, the more difficult it is for the NSW SES to deliver warnings in the short time frames that often apply. Business owners/operators must be weather aware and act early on publicly broadcast severe weather and flood warnings.

b) Will evacuation rely on a third party for warning, transport or temporary accommodation?

Areas that do not have independent means of evacuation complicate the SES flood response. Evacuation plans must be self-sufficient and need to consider that other sections in the community may be placing demands of public and private transport resources.

[8] Haynes, et al. 2016. An analysis of human fatalities from floods in Australia 1900-2015, s.l.: Report for the Bushfire and Natural Hazard Cooperative Research Centre

[9] Peden. 2016. Royal Life Saving Drowning Data: Presentation 15 February 2016, Sydney: Royal Life Saving Australia.

The Flood Emergency Management Plan states "*As the duration of flooding may be extended from hours to several days (refer Jacobs 2020) the option for rescue and to allow medical evacuation if required via roof access will also reduce risks to life*[10]". The use of flood boats and helicopters may not always be feasible due to weather, resource availability or risks, which can result in large number of people trapped on the floodplain.

There are significant risks associated with mass rescue, including:

- Insufficient number of flood rescue boats for the number of people remaining on low flood islands.
- Insufficient air lift capacity.
- Severe weather which makes rescue by boat or air more difficult e.g. wind fetch caused waves.
- Potential exposure to sewage, contaminants, disease, poisons, hidden snags, dead animals and debris etc.
- Drowning or injuries related to floodwater hazards.

NSW SES is opposed to any strategy which transfers residual risk, in terms of emergency response activities, to NSW SES.

c) Is the area isolated by floodwater before inundation of the land the dwelling is built upon? i.e. is the only the safe road out closed by river floodwater or local stormwater before flooding is obvious to residents, making it difficult to motivate people to action?

Vehicular escape routes that rise steadily and lead away from the flood are the best. In the worst case, a community would be cut-off by floodwater and left stranded on an island on high ground that could subsequently be submerged. The problem of localised closure of roads due to inadequate stormwater capacity can be critical where the available warning and evacuation time is short. If an area is cut off from road access but still has some overland escape route, this may at least provide an alternate means for people to escape floodwaters.

d) Is the development relying on an elevated structure to achieve compliance with habitable floor level requirements?

This approach, although effective for property protection, brings with it the problem that residents will be convinced that it is safe to "sit-out the flood". Unless the floor level is above the limit of all flooding i.e. above the PMF this is not true because the water could keep rising over the floor level after residents have lost their escape route.

People tend to resist calls to evacuate before the land around them is obviously flooded. Unfortunately, our experience is that people change their mind about this option **after** they

[10] CJ Arms, 2024, Flood Impact Assessment and FEMP, Appendix G Flood Emergency Management Plan, Section 3 Flood Evacuation Requirements and Preparation, Page 227

have been surrounded by flood water or when essential services such as water, power and sewer cease to function. Rescue, resupply and medical responses are difficult and can be dangerous under these conditions.

In flash flood environments (floods with less than 6 hours warning) provision of a safe refuge above the limit of flooding (PMF) may be an advantage if the duration of flooding will be very short and the flood depth or velocity is high on or adjacent to the site. The success of this strategy will depend very much on the likely behaviour of people and building designs which put cars or other property under the refuge area may encourage people to take risks to save these items.

e) Will an SES response such as difficult/dangerous rescue or demand on limited SES resources be required if the private arrangements fail and people do not leave early enough (see above)?

During periods of widespread flooding the NSW SES will have to deal with many communities facing the impact of flooding. There is no thing as a safe period of isolation although obviously the shorter the better and the longer the period of isolation, the more chance there is for mishap requiring external intervention. Even relatively brief periods of isolation, in the order of a few hours, can lead to personal medical emergencies that have to be responded to.

f) Is communication to the area reliant on services such as telephone and power which are known to be subject to failure during floods/storms?

Inability to communicate in an emergency will complicate the implementation of any plan and could be fatal. Lack of communication to and from the site also requires someone from outside to confirm the safety of people on the site.

Principle 2 Decisions should be informed by understanding the full range of risks to the community.

Decisions relating to future development should be risk-based and ensure Emergency Management risks to the community of the full range of floods, are effectively understood and managed.

Further, risk assessment should consider the full range of flooding, including events up to the Probable Maximum Flood (PMF) and not focus only on the 1% AEP flood. This is reflected in the NSW Flood Risk Management Manual 2023. Climate change considerations should also be included, in line with NSW Government Guidelines.

The site is identified in the Flood Impact Assessment as being "*a low-lying area of the catchment which is a designated flood prone area (Bayside Council) and subject to significant flooding in the events greater than the 1% AEP*[11]". The site is isolated by flooding as frequently

[11] CJ Arms, 2024, Flood Impact Assessment and FEMP, Section 2.2 Flood Prone Land, Page 8

as a 20% AEP event with the proposed driveway entrance on Hale Street reaching depths of 0.25 metres[12]. During a Probable Maximum Flood (PMF) event the site is inundated within a matter of minutes reaching depths in excess of 4 metres across the site approximately 90 minutes after rainfall begins[13]. The majority of the site is classified as Hazard Level 5 (H5) during a PMF event, this level of hazard is unsafe for all people and vehicles with buildings considered vulnerable to failure.

In addition to the flood risks that people may be exposed to onsite, we recommend ensuring that any potential for debris, from waste materials onsite, to enter floodwater is minimised.

Further the site may be affected by flooding as a result of coastal inundation with the Flood Impact Assessment stating "*some low-lying areas of the catchment (including at the corner of Hale St and Luland St) are susceptible to tidal inundation even during dry weather. These areas are at higher risk of flooding during spring tides, storm surges and from future sea level rise.*[14]"

Principle 3 Development of the floodplain does not impact on the ability of the existing community to safely and effectively respond to a flood.

Evacuation must not require people to drive or walk through flood water.

Development strategies relying on an assumption that mass rescue may be possible where evacuation either fails or is not implemented are not acceptable to the NSW SES.

Principle 4 Decisions on development within the floodplain does not increase risk to life from flooding.

Managing risks associated with Low Flood Islands requires careful consideration of development type, likely users, and their ability respond to minimise their risks. This includes consideration of:

- Isolation – There is no known safe period of isolation in a flood, the longer the period of isolation the greater the risk to occupants who are isolated.
- Secondary risks – This includes fire and medical emergencies that can impact on the safety of people isolated by floodwater. The potential risk to occupants needs to be considered and managed in decision-making.
- Consideration of human behaviour – The behaviour of individuals such as choosing not to remain isolated from their family or social network in a building on a floor above the PMF for an extended flood duration or attempting to return to a building during a flood, needs to be considered.

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[12] CJ Arms, 2024, Flood Impact Assessment and FEMP, Appendix G Flood Emergency Management Plan, Section 2.4.1 20% AEP Flood Depth, Page 220
[13] CJ Arms, 2024, Flood Impact Assessment and FEMP, Appendix G Flood Emergency Management Plan, Section 2.2 PMF Flood Depths, Page 210
[14] CJ Arms, 2024, Flood Impact Assessment and FEMP, Section 5.2.1 Botany Bay Foreshore Beach Catchment, Page 9

Principle 5 Risks faced by the itinerant population need to be managed.

Any Emergency Management strategy needs to consider people visiting the area or using a development.

Principle 6 Recognise the need for effective flood warning and associated limitations.

An effective flood warning strategy with clear and concise messaging understood by the community is key to providing the community an opportunity to respond to a flood threat in an appropriate and timely manner.

NSW SES utilises the Australian Warning System which is a nationally consistent, three-tiered approach to issue clear warnings and lead people to take action ahead of severe weather events. The three warning tiers consist of Advice, Watch and Act and Emergency Warning. These warnings can be viewed on the SES website and the HazardWatch website and app.

However, neither the NSW SES nor the Bureau of Meteorology can undertake to provide special individual flood warning services for each business site. Business owners/operators must be weather aware and act early on publicly broadcast severe weather warnings.

The only warnings available for this site will be Sever Storm Warnings and Thunderstorm Warnings from the Bureau of Meterology.

Principle 7 Ongoing community awareness of flooding is critical to assist effective emergency response.

The flood risk at the site and actions taken to reduce risk to life should be communicated to all site users (includes increasing risk awareness, community connections, preparedness actions, appropriate signage and emergency drills) during and after the construction phase. However, it is important to note that the NSW SES is opposed to the imposition of development consent conditions requiring private flood evacuation plans rather than the application of sound land use planning and flood risk management.

Development in a floodplain will increase the need for NSW SES to undertake continuous community awareness, preparedness, and response operations.

Residents and users of the proposed development should be made aware of their flood risk, the Hazards Near Me app (a tool to receive flood warnings as part of the Australian Warning System) and the NSW SES website which contains comprehensive information for the general community about what to do before, during and after floods as well as in-language resources and HazardWatch (NSW SES interactive information and warnings site).