APPENDIX G – FLOOD EMERGENCY RESPONSE

van der meer

FLOOD EMERGENCY RESPONSE PLAN

CONSTRUCTION AND OPERATIONAL PHASES

SYD-05

769 MAMRE ROAD, KEMPS CREEK

6th June 2023

Document Control Record

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1. Introduction

van der Meer Consulting has been engaged to prepare a Flood Emergency Response Plan (FERP) for Microsoft's upcoming data centre project. The project is subject to potential flooding risks that can impact the project's progress, assets, and personnel safety.

The FERP outlines a strategy that demonstrates the contractor's approach to manage flooding emergency response during the construction phase, and the occupants' approach to manage flooding emergency response during the operation phase of the data centre facility. This plan addresses the relevant requirements of the project approvals, including the Environmental Impact Assessment (EIA), Submissions Report, and all applicable guidelines and standards specific to the management of flooding emergency response.

The purpose of this FERP is to minimize the risk of flood-related impacts on the project and to ensure the safety of all personnel involved in the construction and operation of the data centre facility.

1.1 Condition Compliance Table

This below table outlining the development conditions imposed on the project, and the relevant section of the report addressing the condition is outlined below:

Condition	Addressed in this document
Flood Management	
B39. Prior to the commencement of construction of the development, the Applicant must prepare a Flood Emergency Response Plan to the satisfaction of the Planning Secretary. The Plan must form part of the CEMP and OEMP required by conditions C2 and C5 and must:	
(a) be prepared by a suitably qualified and experienced person(s);	See Appendix D.
(b) address the provisions of the Floodplain Risk Management Guideline (OEH, 2007);	Sections 3,4,5,6
(c) include details of:	
(i) the flood emergency responses for both construction and operation phases of the development;	Section 5
(ii) predicted flood levels;	Section 3.5-3.6
(iii) flood warning time and flood notification;	Section 5.3
(iv) assembly points and evacuation routes;	CEMP
(v) evacuation and refuge protocols; and	Section 5.5
(vi) awareness training for employees and contractors.	Section 5.2
Environmental management	

Fig 1.1 – Condition Compliance Table

1.2 Background and Scope

The data centre is part of a larger overall development of the region. A locality plan for the site is provided in Figure 1.2 below:.

Fig 1.2 – Site Locality

The data centre is located approximately 48 kilometres (km) west of the Sydney Central Business District (CBD).

This Flood Emergency Response Plan (FERP) has been developed to supplement the Construction Emergency Response Plan (CERP) for construction, which is developed by the Contractor.

The data centre will consist of 2 multi-story buildings consisting of building modules of tenant spaces, facility support areas and open areas for external containerised plant. Water storage systems, diesel fuel storage areas and HV electrical switching station will also be required for the development.

Roads and carparks will be constructed around the building footprints and will have three separate entrances. Carparking will be on grade, with marked pedestrian access to the foyers of the building. A security fence will surround the development.

The property is located approximately midway along the South Creek immediately downstream of the confluence of South Creek with Cosgrove Creek. The contributing upstream catchment associated with South Creek is approximately 22,000 Ha (220km 2) with a mainstream length of 25 Km. The catchment generally comprises rural land which is interspersed with residential and industrial areas.

The smaller catchment associated with Cosgrove Creek is approximately 10% of the size of the larger South Creek catchment. The Cosgrove Creek catchment has an area of 2,150 Ha and a mainstream length of 9 Km. This catchment is also primarily rural residential land comprising large tracts of pervious areas.

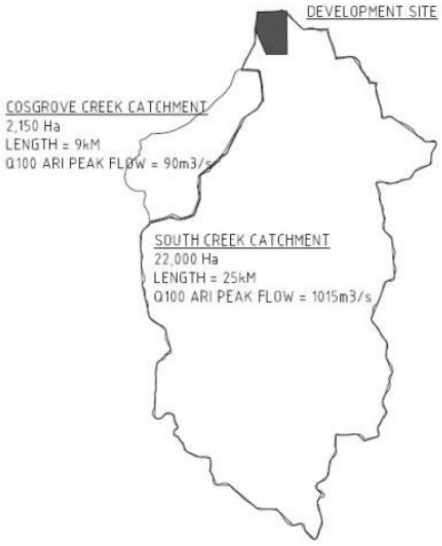


Figure 1.3. Contributing Catchments (Source: South Creek Study)

The Staging plan for the proposed development is shown below and referred in Appendix B:

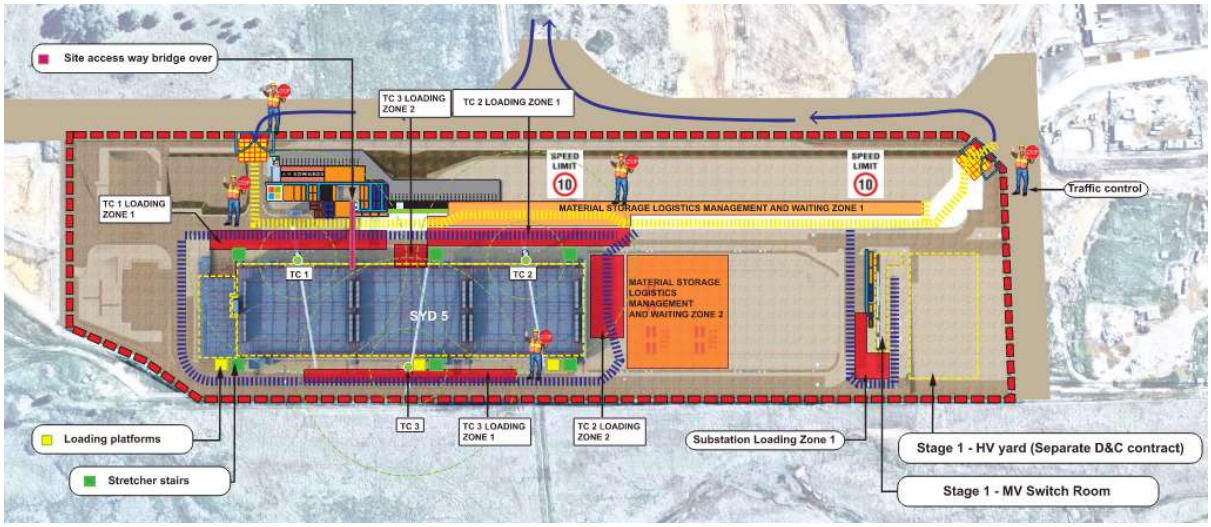


Figure 1.4. Staging Plan

1.3 Purpose and Application

This management plan sets out procedures to manage the impact due to flooding both pre- and post-construction of the SYD-05data centre proposed development. Specifically, the purpose of this FERP is to provide key information and instructions to respond to flood hazards during the construction and operation phase of the data centre.

Frasers Property Australia engaged Costin Roe Consulting to prepare the Mamre road and Southern Link Road Overland Flow Report (Rev G 16 May 2019). This Stormwater Management Report outlines the existing drainage conditions, as well as provides an overall philosophy for the collection, treatment, and disposal of stormwater from the development site. The report was prepared to consider the NSW Government's Floodplain Development Manual and in turn the Floodplain Risk Management Guidelines (EESG).

Under the State Emergency and Rescue Management Act 1989 and the State Emergency Service Act 1989, the SES has issued the SES Penrith city Local Flood Plan. This plan covers the preparedness measures, the conduct of response operations and the co-ordination of immediate recovery measures for all levels of flooding on the Nepean River within the boundaries of the Penrith City.

Additionally, Cardo Lawson Trebar has prepared the Penrith Overland Flow Flood Overview study, available on councils' website, Report J2453/R2251, Dated August 2006, Rev 4. With the purpose of the report being to define flood risk and prioritise flood risk management across the LGA.

van der Meer have developed this report based on the Overland Flow Report, The Penrith Overland Flow Flood Overview study, and the SES Penrith City Local Flood Plan, to address the final compilation of mitigation measures within the EIS and revised statement of commitments. This plan aims to demonstrate how flood emergency response will be managed during construction and operation of the Project.

The FERP has been developed to supplement the Construction Emergency Response Plan (CERP) for CC1 which will be developed by the Contractor. The final approved CERP will prescribe all emergency response procedures, based on hazards and risk identified within the Risk Assessment (Contractor), and where any conflict or confusion arises with this FERP, the CERP shall apply.

Implementing the FERP effectively will ensure that the Project team meets regulatory policy, legislative requirements and MSA's Safety Health and Environment policy in a systematic manner and continually improves its performance. The following objections and targets are set for the Project for the management of emergency flood response.

Objections	**Performance Indicators**
Minimize impacts or environmental consequences	No death or injury personnel during flood event
Mitigate site surface flow contributing to localised flooding via installation of appropriate stormwater management devices	No avoidable release of a prescribed containment to the environment during flooding event

1.4 Interface with other plans and requirements

This FERP is to be read in conjunction with the Construction Environmental Management Plan (CEMP) and will be attached as an appendix in the final CEMP.

1.5 Access

Light and Heavy vehicle access to site is through Mamre Road east of the site, onto Bakers Lane and the new Estate Road north of the site. Internal haul roads will provide access to and from the main construction compound and laydown area at the entry off Mamre road. Detailed site access is to be described in the Construction Environmental Control Plan and Traffic Management Plan.

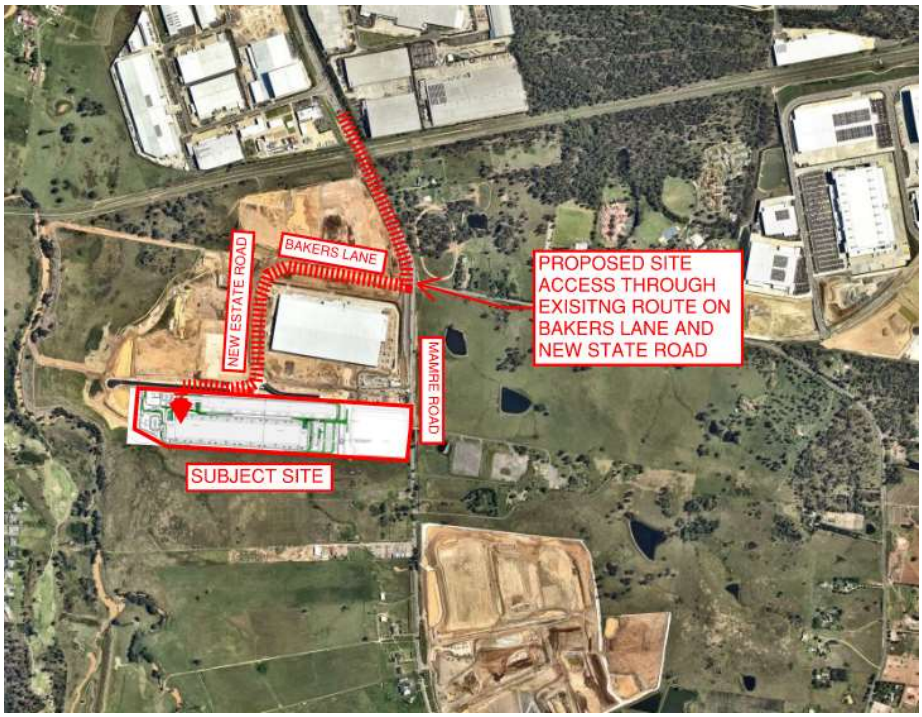


Fig 1.4.1 Access routes to site

2. Environmental Obligations

2.1 Compliance Requirements

The Development Consent condition B39 required the Flood Emergency Response Management Plan to be prepared as follows: Prior to the commencement of construction of the development, the Applicant must prepare a Flood Emergency Response Plan to the satisfaction of the Planning Secretary. The Plan must form part of the CEMP and OEMP required by conditions C2 and C5 and must:

(a) Be prepared by a suitably qualified and experienced person(s);
(b) Address the provisions of the Floodplain Risk Management Guideline (OEH, 2007);
(c) include details of:

(i) The flood emergency responses for both construction and operation phases of the development;
(ii) Predicted flood levels;
(iii) Flood warning time and flood notification;
(iv) Assembly points and evacuation routes;
(v) Evacuation and refuge protocols; and
(vi) Awareness training for employees and contractors.

Additionally Condition C1. Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:

(e) A contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible.

2.2 Relevant Legislation

The following table details the legislation, planning instruments and guidelines considered during development of this sub-plan.

Legislation	Description	Relevance to this plan
Environmental Planning and Assessment Act 1979	This Act establishes a system of environmental planning and assessment of development proposals for the State.	The conditions and obligations are incorporated into this FERP.
Fisheries Management Act 1994	This Act is applicable to all waters within the state including private and public waters and all permanent and intermittent waters. The Act is most relevant in respect to maintaining water quality and ensuring no polluted water from site works enters streams, creeks and waterways.	Water discharging from the Project site must not pollute the adjacent streams or watercourses.
Environment Protect/on and Biodiversity Conservation Act 1999	The main purpose of this Act is to provide for the protection of the environment especially those aspects that are of national environmental importance and to promote ecological sustainable development. The Act binds the	The project as a whole is a controlled action under the EPBC Act with controlling provisions related mainly to the Rail connection.

	Crown. Do not take, use, keep or interfere with “nationally significant" cultural and natural resources. protected wildlife and protected plants without Approval.	

Table 2.2.1 Relevant Legislation

2.3 Guidelines

Guidelines that have specific requirements relating to Flood Emergency Response include

- NSW Government’s Floodplain Development Manual, DIPNR 2005.
- Overland Flow Report, SSD 9522, Mamre Road and Southern Link Road, Orchard Hills, Reg G, Dated 16th May 2019
- Penrith City Local flood emergency sub plan, dated 8th February 2022
- New South Wales State Disaster Plan (DISPLAN 2010), State Emergency Management Committee, 2010.
- Flood Emergency Response Planning Classification of Communities, Floodplain Risk Management Guideline, DECC 2007.
- Australian Emergency Manuals Series, Manual 20: Flood Preparedness, Commonwealth of Australia 2009.
- Australian Emergency Manuals Series, Manual 21: Flood Warning, Commonwealth of Australia 2009.
- Australian Emergency Manuals Series, Manual 22: Flood Response, Commonwealth of Australia 2009.
- NSW State Flood Plan (March 2015 V1.0)

2.4 Relevant Project Documentation Referenced

The below reports and documentation completed by other consultants is also referenced in this report:

- SSD25725029 – Environmental Impact Statement, Appendix 11 – Civil Engineering Report
- ARUP – Kemps Creek Data Centre Stormwater and Flooding Report – Doc Number SYD05-06-07_C-R-0001 Rev 2 Dated 16th April 2021

2.5 Permits and Licenses

No additional permits and licenses are expected to be required for the management of flood emergency.

3. Existing Flood Behaviour and During Construction

The Overland Flow Report, SSD 9522, Mamre Road and Southern Link Road, Orchard Hills, Reg G, Dated 16th May 2019, has modelled the pre and post development flood levels and extents based on the previous scheme. The SES also has publicly available data on the flood extents of storms for various storm severities which is detailed in the relevant section below.

3.1 Pre-development Costin Roe Flood Levels

The Costing Roe Consulting report states: ”The predicted peak flood levels, depth and velocities were extracted from the hydrodynamic modelling and were used to generate water surface profiles, depth profiles and velocity profiles for each of the design events. The water surface extents for the 1% AEP event has been presented below in Figure 3.1.1. . Predicted 1% AEP flood levels and depths at key locations (defined in Figure 3.1.1) are also presented in Table 3.1.2.”

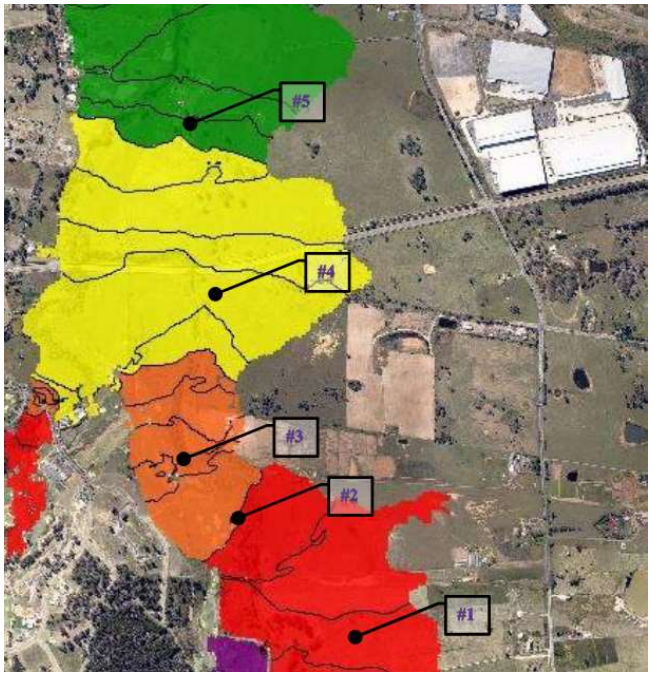


Fig 3.1.1 Modelling results of the Overland Flow Costin Roe Report

With Location marker 3 being the most relevant to the site of the proposed data centre. The result of the modelling is shown below:

No	TUFLOW			South Creek Study		
	Ground Level (m)	Flood Depth (m)	Flood Level (m)	Ground Level (m)	Flood Depth (m)	Flood Level (m)
3	33.11	1.49	34.6	33.11	1.52	34.63

Table 3.1.2 Modelling Results of the Costin Roe Reporting

3.2 SES 5% AEP

The SES provides Publicly available data for flooding extents, see below for the relevant 5% AEP Flooding Extents below:

Fig 3.2.1 – 1% AEP SES Flood Extents

3.3 SES 1% AEP Extents

The SES provides Publicly available data for flooding extents, see below for the relevant 1% AEP Flooding Extents below:

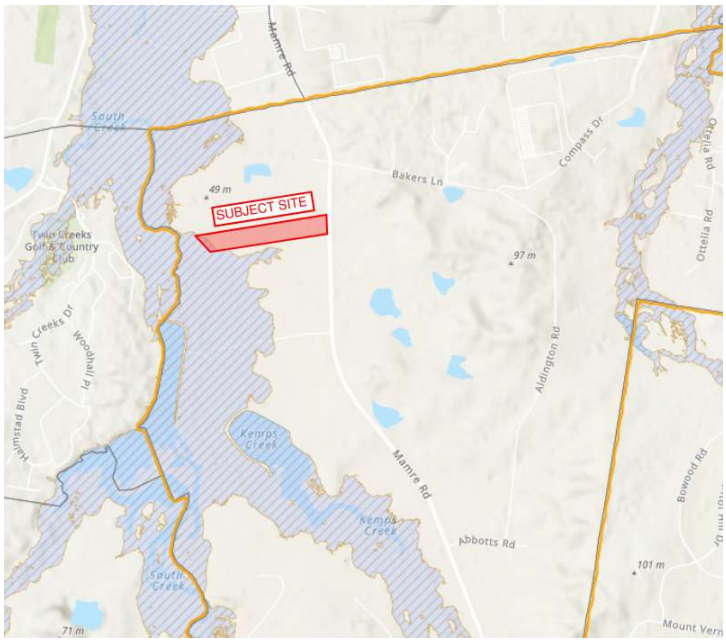


Fig 3.3.1 – 1% AEP SES Flood Extents

3.4 SES PMF Extents

The SES provides Publicly available data for flooding extents, see below for the relevant PMF Flooding Extents below:

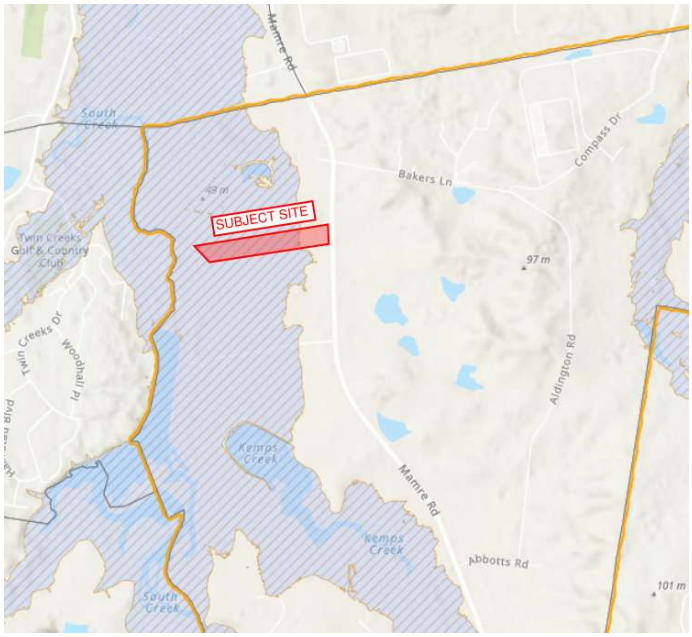


Fig 3.4.1– PMF SES Flood Extents

The SES provides Publicly available data for flooding extents, see below for the relevant PMF Flooding Extents for the greater area below:

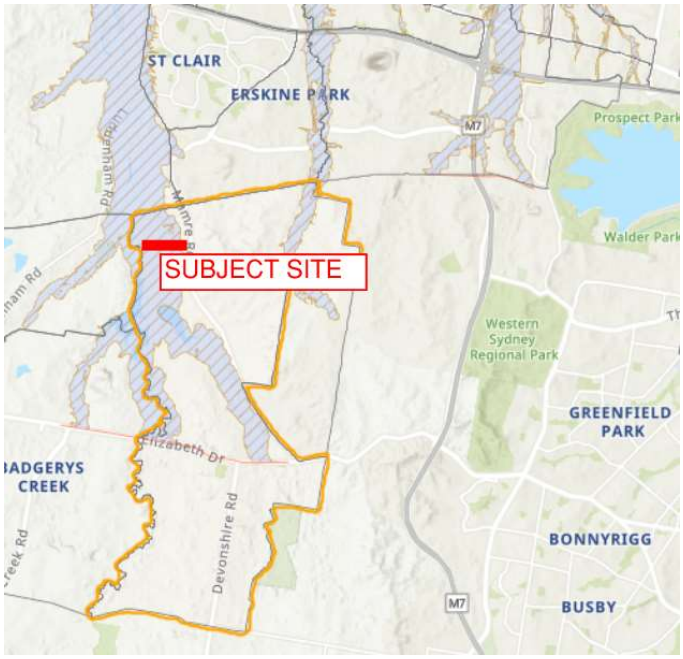


Fig 3.4.2– PMF SES Flood Extents for the Greater Area

3.5 Post-development Costin Roe 1% AEP Flood Levels

Costin Roe has prepared the Mamre toad and Southern Link Road Overland Flow Report, Rev G dated 16th May 2019. See the below figure 3.7.1 the available data for relevant 1% AEP flooding extents:

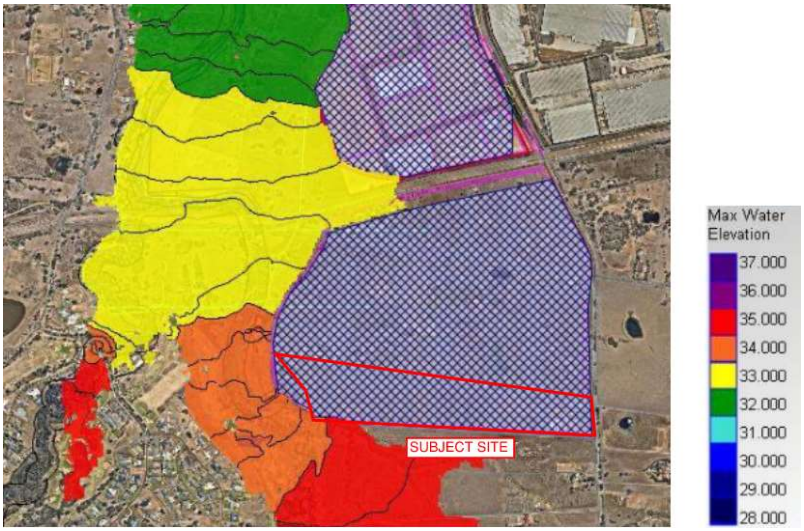


Fig 3.5.1– Costin Roe 1% AEP Flood Levels

The diagram indicates that the 1% AEP flood levels of the site is approx. RL 35, with the proposed FFL of SYD-05 level of 39.4 m, and the current site level being approx. RL 38.6, being 4.4 m and 3.6 m higher respectively. Therefore, it is highly unlikely that the 1% AEP poses any risk to the site aside from local area flooding onsite and regional flooding of roads and escape routes.

3.6 Post-development Costin Roe PMF Flood Levels

Costin Roe has prepared the Mamre toad and Southern Link Road Overland Flow Report, Rev G dated 16th May 2019. See the below figure 3.7.1 the available data for relevant 1% AEP flooding extents:

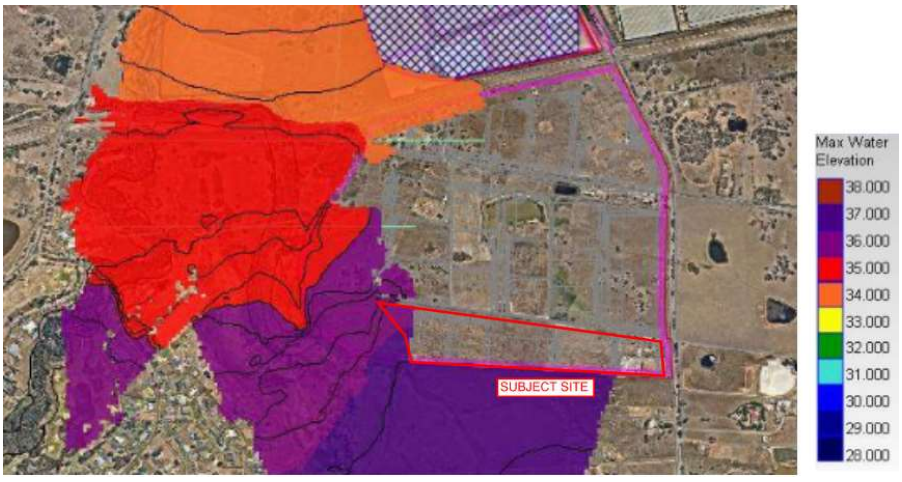


Fig 3.6.1– Costin Roe PMF Flood Levels

The diagram indicates that the PMF flood levels of the site is approx. RL 37.3, with the proposed FFL of SYD-05 level of 39.4 m, and the current site level being approx. RL 38.6, being 2.1 m and 1.3 m

higher respectively. Therefore, it is highly unlikely that the 1% AEP poses any risk to the site aside from local area flooding onsite and regional flooding of roads and escape routes.

3.7 Penrith Overland Flow Study 5%, 1%, PMF Extents

Cardo Lawson Trebar has prepared the Penrith Overland Flow Flood Overview study, available on councils' website, Report J2453/R2251, Dated August 2006, Rev 4. See the below figure 3.7.1 the available data for flooding extents, see below for the relevant PMF Flooding Extents below:

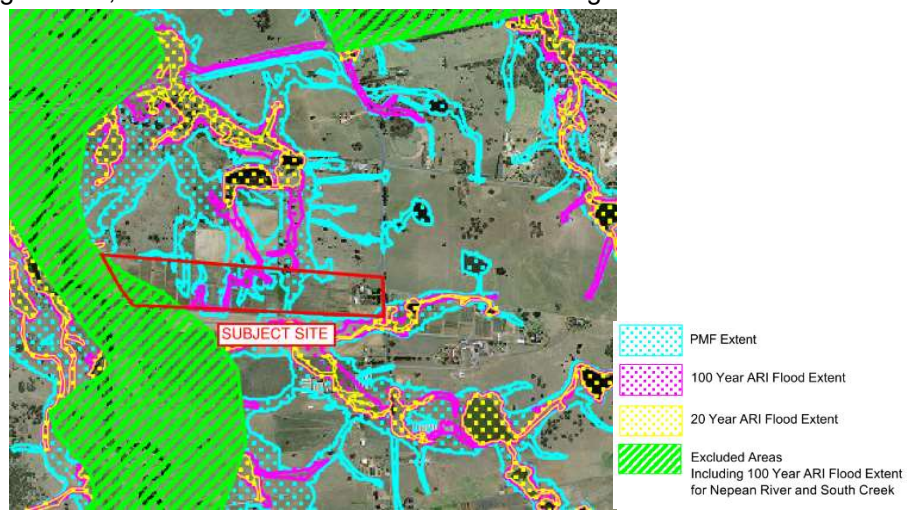
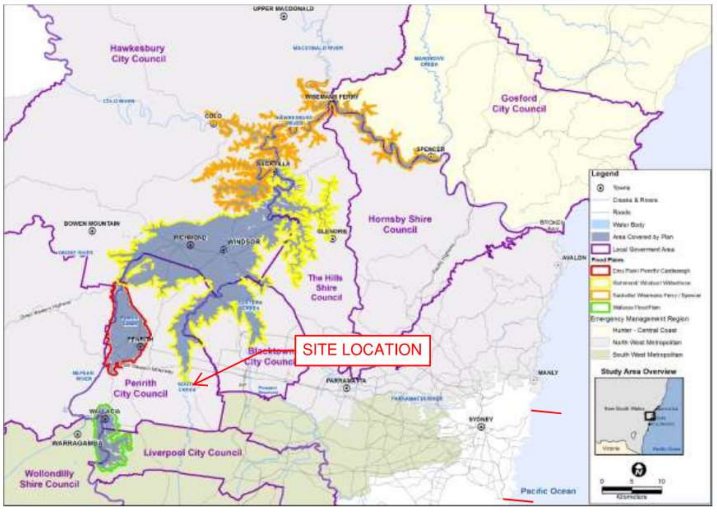


Fig 3.7.1–Flood Extents

3.8 Hawkesbury Nepean Valley Flood Emergency Plan PMF Extents

This plan is a Sub Plan to the State Flood Plan 2018. It was approved by the Commissioner of the NSW State Emergency Service (NSW SES), which is the designated Combat Agency for floods, on 4 June 2020 and was endorsed by the NSW State Emergency Management Committee (SEMC) on 4 June 2020. See the below figure 3.8.1 for the PMF Flood extents for the Hawkesbury Nepean valley greater area.



Map 1: Area Covered by the Hawkesbury-Nepean Flood Emergency Sub Plan (Wallacia to Spencer)

Fig 3.8.1– Hawkesbury Nepean Flood Emergency Plan PMF Extents Greater Regional Area

3.9 Flood Hazard

The South Creek Study includes hydrology and modelling of the 5% AEP event to the 0.5% AEP event, as well as the PMF event. The study shows the subject site approximately midway along the South Creek tributary and is affected by flooding during the 1% AEP event and also the 5% AEP event. The overbank flooding from South Creek extends partially within the property, comprising low hazard zones and a small area of high hazard.

The Costin Roe Consulting Overland Flow report SSD9522 notes reference to the South Creek Study. The study includes South Creek and associated tributaries, defining flood planning levels and hydraulic hazard zones along the creek and creek floodplain areas. And notes that for the proposed development, The South Creek Study includes hydrology and modelling of the 5% AEP event to the 0.5% AEP event, as well as the PMF event. The study shows the subject site approximately midway along the South Creek tributary and is affected by flooding during the 1% AEP event and also the 5% AEP event. The overbank flooding from South Creek extends partially within the property, comprising low hazard zones and a small area of high hazard.

Additionally, the Penrith Overland Flow Overview study includes hydrology and modelling of the 5% AEP event to the 0.5% AEP event, as well as the PMF event. However, the report shows the SYD-05 site only being affected by the PMF Hazard Extent at the South-eastern corner of the site, and affecting the access on Mamre road at the south of the site. See figure 3.9.1 Below:

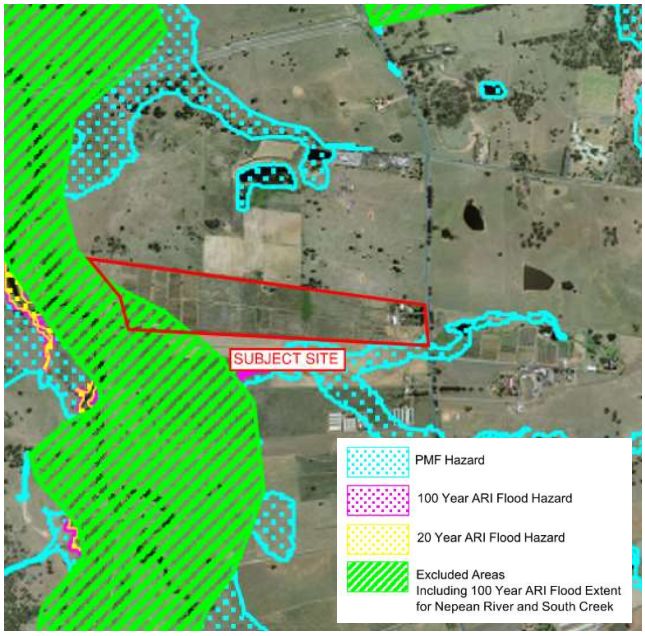


Fig 3.9.1– Penrith Overland Flow Overview Study Flood Hazard Extents

4. Aspects and Impacts

Refer to Table 4.1: Aspects and Impacts Related to Flooding for the aspects and impacts for the construction of the Project below:

Aspects	Impacts and Opportunities
Altered surface water flow conditions due to earthworks	Localised flooding of site including excavations
	Diversion of water flows into sediment controls
	Restricted access to work areas
	Safety issues related to standing water
Extreme rainfall	Overland flows from the topping of South Creek causing flooding of worksite
Direct heavy rainfall on worksites	Soil erosion and sedimentation of waterways including South Creek

Table 4.1– Aspects and Impacts Related to Flooding

5. Emergency Response

The overall approach to flood emergency response is the consideration of evacuation and refuge. As identified by the various sources Probable Maximum Flood (PMF) mapping, the Project site is not impacted by regional flooding, therefore this FERP is based upon the assessed local area PMF flow regimes.

Section 1.1 of this report states that the smaller catchment associated in with his development is also primarily rural residential land comprising large tracts of pervious areas.

With little response time for very short duration storms that would potentially produce significant flood flows in this area, the only realistic safe option in extreme flood events is for persons to remain on site. With respect to evacuation, since hazardous flows would subside with the storm duration, the form of the development would not impede evacuation.

The below sections 5.1 to 5.12 outline flood emergency response including measures to be taken if adequate response time could be obtained.

5.1 Site Preparation

Construction compounds and stockpile areas are to be located elevated regions above RL 34.63 in accordance with Section 3 of this report, in order to mitigate the impact of potential flooding during construction. Given that significant filling has occurred on site, resulting in much of the site being now located above RL 37.00, the location of these construction compounds is flexible, on the condition that they are above the flood level stated above. The Flood Extents of the predeveloped site are shown in Section 3 and the Appendices of this report.

The following measures will be implemented to reduce the likelihood of damage to site equipment and the environment and to protect the safety of personnel:

- Daily monitoring of weather forecasts using the Bureau of Meteorology (BoM)
- Monitoring of the BoM warning website daily

5.2 Personnel Preparation and Training

Site occupants should undergo flood awareness training as part of the site induction process. At a minimum training should include:

- Occupants to be made aware of this Flood Emergency Response Plan (FERP) and where to find it.
- That the facility is not flood prone
- The proximity of potential flood waters to the site
- The advised plan of action in most cases is to go to the muster location and wait out the storm.
- The muster location in the event of flooding (as noted in the Construction Emergency Response Plan (CEMP).
- The recommended safe egress route and the dangers of crossing flood waters, in case of emergency.
- The need to take direction from the flood warning.

5.3 Flood Triggers

It is noted that significant lead warning time would not be required to enable effective flood response plans to be initiated for this site. The freeboard set at 0.5m above the 1% AEP means that the site is at a level higher than the 0.5% AEP flood level. The site is significantly above the PMF level and is not flood affected, meaning that safe refuge in major flood events is available. Further, given the travel distances from the western fringe of the site to the eastern flood free portions are less than 1000m, vehicular and pedestrian evacuation to flood free land above the PMF level may be completed quickly. It is noted that sufficient warning times are recommended in the Flood Response section of the report, however even if these were to be shortened to less than an hour this would still result in ample time for safe evacuation to be made.

The following response triggers provide information on flood rate of rise, timing and potential flood triggers that could be utilised by future facility owners which are below the PMF flood level to be able to prepare their own flood response plans. The rate of rise can be reviewed directly via the BOM river gauges in South Creek, and a site-specific gauge is recommended for the site. One such system is the Dipstick automatic flood warning system by Tuftec.

Response Triggers:

1. **Trigger 1 -** A flood alert/watch/advice is issued by the BOM. The BOM alert will be issued if flood producing rain is predicted. This provides an early warning that flooding may occur, however is not confirmation that flooding will occur. If this alert is issued then the Project Manager/Owners Representative should be on alert for further BOM, SES or site-specific Triggers.
2. **Trigger 2 –** General flood alert issued by the BOM. A generalized flood warning would be issued when flooding is expected to occur in a given area. These would generally be provided by the BOM with three hours warning time is expected from issue of warning to peak flood level as per the “Service Level Specification for Flood Forecasting and Warning Services for New South Wales – Version 2.0” (Bureau of Meteorology, 2013). It is noted that Trigger 3 may occur prior to Trigger 2 and the Project Manager/Owners Representative is required to consider this eventuality.
3. **Trigger 3 -** Site flood level gauge achieves flood level in South Creek of RL 32m. This would allow for 2hr to evacuation level (i.e. Q100+0.5m) in a PMF event, or 5-6 hours in a 0.5% AEP (1 in 200yr ARI). Project Manager/Owners Representative at this point should put site personnel/building occupants on alert to evacuate or move to on-site refuge with follow up in 1hr or Trigger 4 being met. Project Manager/Owners Representative to contact SES for additional updates and confirmation of road closures.
4. **Trigger 4 –** Site flood level gauge achieves flood level in South Creek of RL 33.8m. This trigger would allow for a 1hr period prior to the evacuation level being reached (i.e. the 1% AEP+0.5m) in a PMF event, or 2 hours in a 0.5% AEP (1 in 200yr ARI). Project Manager/Owners Representative should advise evacuation within 30min is required, otherwise immediate evacuation could occur or remain on site for future movement to on-site refuge. Any evacuation route or timing should be completed in consultation with SES to confirm road closures.
5. **Trigger 5 –** Site flood level gauge achieves flood level in South Creek of RL 34.2m (i.e. Q100+0.5m), or rate of rise between Trigger 2 to 4 is less than 2 hours. Project

Manager/Owners Representative should advise occupants or remaining occupants to move to on-site flood refuge zones. No further vehicular evacuation would be recommended.

5.4 Flood Response

Flood response operations will begin on receipt of Bureau of Meteorology advice, or when warning signs and triggers are noted in section 5.3 of this report above leads to an expectation of flooding, as detailed below.

Response Item	Action	Procedures	Responsibility
Monitor	Daily weather (intense heavy rainfall) / precipitation forecast monitoring	Monitor Bureau of Meteorology (BOM) on daily basis.	Project Manager
Flood Alert	Increase level of alert	Notify all on-site supervisors of flood alert, watch or advice. Monitor Bureau of Meteorology (BOM) website.	Project Manager
Flood Watch	Increase level of alert. prepare for activation of FERP	Notify all on-site supervisors of flood alert, watch or advice	Project Manager
Severe Weather Warning for flash flooding	Increase level of alert. prepare for activation of FERP	Notify all on-site supervisors of flood alert, watch or advice	Project Manager
Severe Thunderstorm Warning for flash flooding	Increase level of alert. prepare for activation of FERP	Notify all on-site supervisors of flood alert, watch or advice. Monitor Bureau of Meteorology (BOM) website.	Project Manager

ACTIVATION Occurrence of localised intense rainfall with associated observation of rising water levels on-site or adjacent waterways.	Mobilise site personnel to designated emergency assemble area or evacuation assemble area. Close site to external visitors	Immediately notify all personnel of the activation of flood emergency response plan.	Project Manager

Table 5.4.1– Aspects and Impacts Related to Flooding

Within 24 hours prior to a predicted flood impacting the Project site, the requirements set out in the CERP will be implemented including the following general requirements:

- All staff to be alerted of the impending flood conditions.
- Mobile construction equipment, excess material, skips and hazardous substances will be removed from the flood prone area to areas of higher ground, generally to the east of the site.
- Flood risk and areas of the site would be revised and inspected on a case-by-case basis. In the event there poses a large flood risk, or the particular area of a work site is assessed risk of large flooding impact, power would be turned off in areas as deemed required by the WHSE manager.
- Power will be turned off in the event of Trigger 5, as noted in Section 5.3 of this report, until it is deemed safe to turn it back on - Site toilets to be pumped out into tankers.
- Loose materials to be moved out of flood prone area or secured.
- Emergency erosion and sediment controls will be implemented. This may include temporary bunds to divert water around key areas such as stockpiles and reduce risk to surrounding properties which might otherwise be affected.
- Evacuation of staff to a refuge location safe from flood prone areas.

Monitoring of BoM will continue throughout this process to ensure up to date information is available.

5.5 Evacuation

As the site characteristics preclude adequate warning lead-time, the initial response of all site personnel will be to ensure safe mobilisation to high ground, to the east of the site, beyond the reach of hazardous flows, to the nominated flood emergency assembly area. This assembly area location is provisional only, with the actual location determined on-site as per Contractor Emergency Response Plan. Evacuation from site will be determined from this point based on available information from emergency services. This procedure will be detailed within the Contractor's Construction Emergency response plan (CERP).

As per the NSW State Flood Plan (2015) guideline evacuation procedures:

Any evacuation operation will have the following stages:

- Decision to evacuate.
- Mobilization (mobilization may begin prior to the decision to evacuate)
- Evacuation Warning delivery
- Evacuation Order delivery
- Withdraw

The Evacuation Route, in accordance with the SES Flood Evacuation Route Guidelines for the Hawkesbury Nepean Valley is shown below:

Fig 5.5.1– Evacuation Route Towards M4 Motorway

With the general intent to head towards the Western Motorway (M4) as shown above. Further information on the Flood Evacuation Route Guidelines for the Hawkesbury Nepean Valley is available on the SES website.

5.6 Construction Phase

Construction compounds and stockpile areas are to be located elevated regions above RL 34.63 in accordance with Section 3 of this report, in order to mitigate the impact of potential flooding during construction. Given that significant filling has occurred on site, resulting in much of the site being now located above RL 37.00, the location of these construction compounds is flexible, on the condition that they are above the flood level stated above. The Flood Extents of the predeveloped site are shown in Section 3 and the Appendices of this report.

5.7 Operation Phase

Given the facilities 24hr operational time and potential risk to staff and employees that would occupy the facilities, The Operation Site Manager is responsible for implementing this Flood Emergency Response Plan (FERP) for the evacuation of staff and employees from the site prior to a flood event. The evacuation of the site should be in accordance with Section 5.3 of this report. The Operation Phase FERP must also include the following details, to be included in the site induction, provided on any notice boards, and made available to all employees and contractors on the site:

- Name and position of a Flood Evacuation and Emergency Response Coordinator and a Deputy.
- Emergency phone numbers.
- Emergency Exits.
- Location of muster stations and Evacuation Assembly Areas.
- Flood Emergency evacuation routes.

A copy of the FERP shall be displayed in all buildings, on all levels at appropriate locations.

Site preparation should be undertaken if a flood warning is issued (Section 5.1) time permitting, and it is safe to do so. It should include:

- All electrical equipment/machinery which cannot withstand water inundation within the building or externally are to be raised above the 1% AEP flood level.
    - Note that as significant filling has occurred on site, resulting in much of the site being now located above RL 37.00, the vast majority of site is now located significantly above the 1% AEP flood level.
- The materials of any structures below the 1% AEP flood line are to be flood compatible (i.e., Masonry, steel etc.).
- Any risk and hazard areas or hazardous materials stored on site must be raised above the 1% AEP flood level plus 0.5m freeboard, bunding is not preferred.
- Ensure that any stockpiled materials during operation of the facility do not have an increased risk of being washed off-site if a flood event is expected.

5.8 Post-Storm Response During Construction Phase

Following flooding of the site, the initial response will be to determine whether it is safe to return to the site. A safety walk through is to be conducted by senior staff including the safety representative, the Project Director, Construction Manager, and a qualified electrician to identify danger areas. The team will assess the following:

- Likelihood of flood damage to access roads.
- Determine if flood waters have receded.
- The electrician is to check any inundated or water affected power boxes and electrical equipment.
- The power is to remain off until assessed by the electrician.

Once it is deemed safe to return to site, the following are to be undertaken:

- Any equipment, materials or debris moved by the flood water should be returned to rightful area or discarded if damaged beyond repair/use.
- Check stockpiles for erosion or losses. Restore erosion and sediment control devices as per the relevant Erosion and Sediment Control Plan.
- Temporary onsite structures or partly constructed structures should be checked for erosion or other water damage prior to entering them or continuing work.
- Check portable wastewater systems on site and schedule maintenance/servicing.

- Determine whether any water held in excavations can be pumped to sediment basins/holding tanks for treatment prior to discharge. Undertake water testing/sampling in line with the Soil and Water Management Plan.

5.9 Post-Storm Response in Operational Phase

Following flooding of the site, the initial response will be to determine whether it is safe to return to the site. A safety walk through is to be conducted by senior staff including the safety representative, the Occupants site manager, Environmental Manager, and health and safety manager, and a qualified electrician to identify danger areas. The team will assess the following:

- Likelihood of flood damage to roads.
- Likelihood of flood damage to structures.
- Determine if flood waters have receded.
- The electrician is to check any inundated or water affected power boxes and electrical equipment.
- The power is to remain off until assessed by the electrician.

Once it is deemed safe to return to site, the following are to be undertaken:

- Any equipment, materials or debris moved by the flood water should be returned to rightful area or discarded if damaged beyond repair/use.
- Check wastewater and water systems on site and schedule maintenance/servicing if required.

5.10 Notification during Construction Phase

The contractor will inform the client and relevant statutory and regulatory authorities (such as the EPA) in the event of an incident as necessary.

Environmental emergencies will be handled by the contractor in accordance with the Safety Health and Environmental Management System (SHEMS) and CERP as follows:

- Immediately report all incidents to the Project Manager / Construction Manager, who is to assess the situation and manage the following steps:
    - Immediately take all reasonable steps to contain further damage or danger to personnel and the environment.
- Inform relevant authorities in accordance with the regulatory requirements.
- Contact emergency service personnel as necessary (e.g., fire dept., spill clean-up services, etc.). Site emergency response team will also be contacted.
- Where there is potential for the community to be impacted by an incident, any response or notification required will be undertaken in coordination with the appropriate emergency services. Refer to Microsoft's Compliant and Enquiry Process for General Contractor form attached in Appendix C of this report.
- Inform the Client's Representative as necessary and in accordance with contractual requirements.

- Complete a detailed report of the emergency incident.
- Liaise with the Client's Representative regarding corrective and preventive actions required and the timeframes within which these actions must occur.
- The designated personnel will undertake corrective and preventive actions. Information on the handling of hazardous materials is contained in the SDS register.

5.11 Notification during Operational Phase

The site manager will inform the client and relevant statutory and regulatory authorities (such as the EPA) in the event of an incident as necessary.

Environmental emergencies will be handled by the site manager in accordance with the Safety Health and Environmental Management System (SHEMS) and CERP as follows:

- Immediately report all incidents to the Owner/Site Manager, who is to assess the situation and manage the following steps:
    - Immediately take all reasonable steps to contain further damage or danger to personnel and the environment.
- Inform relevant authorities in accordance with the regulatory requirements.
- Contact emergency service personnel as necessary (e.g., fire dept., spill clean-up services, etc.). Site emergency response team will also be contacted.
- Where there is potential for the community to be impacted by an incident, any response or notification required will be undertaken in coordination with the appropriate emergency services. Refer to Microsoft's Compliant and Enquiry Process for General Contractor form attached in Appendix C of this report.
- Complete a detailed report of the emergency incident.
- Liaise with the Owner/The Owners Representative regarding corrective and preventive actions required and the timeframes within which these actions must occur.
- The designated personnel will undertake corrective and preventive actions. Information on the handling of hazardous materials is contained in the SDS register.

Project Emergency contact numbers are included below.

Contact Name	Telephone number	Address
OEH Pollution Hotline	131 555	NA
Ministry of Health	(02) 9391 9000	NA
WorkCover	13 10 50	NA
Fire and Rescue NSW	000	NA
Penrith City Council	0247327777	601 High St, Penrith NSW 2750
NSW Police	000	NA
Emergency Services General	000	NA
Additional Contact Numbers to be added:		
Principal's Representative	TBC	TBC
Contractor's Construction Manager	TBC	TBC
Contractor's Environmental Manager	TBC	TBC
Contractor's Project Manager	TBC	TBC
Contractor's Health & Safety Manager	TBC	TBC
Contractor's Community Liaison Manager	TBC	TBC
Occupants Representative	TBC	TBC
Occupants Site Manager	TBC	TBC
Occupants Environmental Manager	TBC	TBC
Occupants Health & Safety Manager	TBC	TBC

Table 5.11.1– Project Emergency Contact Information

5.12 Contingency Plan

The following contingency plan is to be adopted in order to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible.

1. Risk Assessment and Monitoring:
    - The builder should conduct regular site walks and assessments fortnightly to identify areas on the site that pose a flood impact risk.
    - Identify specific areas where personnel may be trapped or where plant and equipment could be dangerously impacted.
    - Monitor weather conditions daily through reliable sources like the Bureau of Meteorology (BOM) and incorporate weather updates into daily prestart meetings or online portals like Hammertech.
    - Establish a system to receive alerts or notifications regarding severe weather events promptly.
2. Emergency Response Team:
    - Designate an emergency response team responsible for coordinating flood response activities.
    - Ensure team members are trained in emergency procedures and are familiar with evacuation routes and assembly points.
    - Identify a backup team in case primary team members are unavailable during an emergency.
3. Emergency Communication:
    - Implement a communication protocol to relay urgent information to all personnel on-site.
    - Establish an emergency contact list with up-to-date contact details of all workers, contractors, and relevant authorities.
    - Utilize multiple communication channels, such as text messages, online portals, and public address systems, to reach all stakeholders quickly.
4. Evacuation/Marshalling and Safety:
    - Develop a Marshall plan that includes clear Marshall locations, assembly points, and designated personnel responsible for guiding others to safety. In accordance with this plan and the CEMP,
    - Develop an evacuation plan that includes clear evacuation routes, assembly points, and designated personnel responsible for guiding others to safety. In accordance with this plan and the CEMP,
    - Conduct regular drills to ensure everyone understands the evacuation procedures.
    - Identify high ground or safe areas nearby where personnel can take shelter during flooding.
    - Ensure all workers have access to personal protective equipment (PPE) and emergency kits.
5. Equipment and Asset Protection:
    - Identify critical plant and equipment vulnerable to flood damage.
    - Implement measures to secure or relocate vulnerable equipment to higher ground or secure storage areas in advance.
    - Establish procedures for safely shutting down and securing equipment in case of immediate flooding threats.

6. Recovery and Restoration:
    - Develop a plan for post-flood recovery and restoration activities.
    - Coordinate with relevant authorities to assess the extent of damage and obtain necessary permits for reconstruction.
    - Engage appropriate contractors or service providers to assist with cleanup, repair, and restoration processes.
7. Review and Continual Improvement:
    - Conduct regular reviews every 10 years and assessments of the contingency plan.
    - Learn from past experiences and incorporate any lessons learned into future planning.
    - Stay updated with the latest technology, forecasting methods, and best practices for managing extreme weather events.

6. Compliance Management

6.1 Roles and Responsibilities

The table below outlines the roles and responsibilities of stakeholders related to the FERP:

Role	Responsibility
Contractor's Project Manager	Manage the delivery of the Project including overseeing implementation of the FERP Oversee the implementation of all flood management initiatives
Contractor's Construction Manager	Oversee the implementation of all flood management initiatives Monitor weather forecasts and conditions for potential flooding and notify relevant site personnel Monitor compliance and conformance with this Plan
Contractor's Environmental Manager	Manage review and continual improvement of this Plan Inspecting and reporting on compliance Monitor weather forecasts and conditions for potential flooding
Supervisors	Manage review and continual improvement of this Plan Inspecting and reporting on compliance Monitor weather forecasts and conditions for potential flooding
Contractor's Health and Safety Manager	Responsible for day-to-day implementation of health and safety procedures Monitor weather forecasts and conditions for potential flooding Assist the Contractor's Project Manager in the implementation of flood management initiatives
Contractor's Community Liaison Manager	Communicate and liaise with neighbours if any risk of impact from project flooding
Owners Operational Site Manager	Manage the Operation of the Site including overseeing implementation of the FERP Monitor weather forecasts and conditions for potential flooding and notify relevant site personnel Oversee the maintenance of all flood management initiatives
Owners Operational Environmental Manager	Manage review and continual improvement of this Plan Inspecting and reporting on compliance Monitor weather forecasts and conditions for potential flooding
Owners Operational Health and Safety Manager	Responsible for day-to-day implementation of all health and safety procedures Monitor weather forecasts and conditions for potential flooding

Table 6.1.1– Roles and Responsibilities

6.2 Monitoring during Construction Phase

Monitoring of controls will be undertaken as outlined within the Soil and Water Management Plan; daily by the site supervisor and weekly by the environmental manager, as well as prior to predicted heavy rainfall to determine adequacy of environmental controls.

6.3 Monitoring during Operational Phase

Monitoring of controls will be undertaken as outlined within the Site Operational Management Plan; daily by the Site Manager and weekly by the Operational environmental manager, as well as prior to predicted heavy rainfall to determine adequacy of environmental controls.

6.4 Non-compliances, Non-conformance, and Actions during Construction Phase

It is the responsibility of all site personnel to report non-compliances and non-conformances to the Site Supervisor and/or the Contractor's Environmental Manager.

Non-compliances, non-conformances and corrective and preventative actions will be managed in accordance with the CEMP.

6.5 Non-compliances, Non-conformance, and Actions during Operational Phase

It is the responsibility of all site personnel to report non-compliances and non-conformances to the Site Manager and/or the Operational Environmental Manager.

Non-compliances, non-conformances and corrective and preventative actions will be managed in accordance with the Operational Environmental Management Plan.

6.6 Review and Improvement

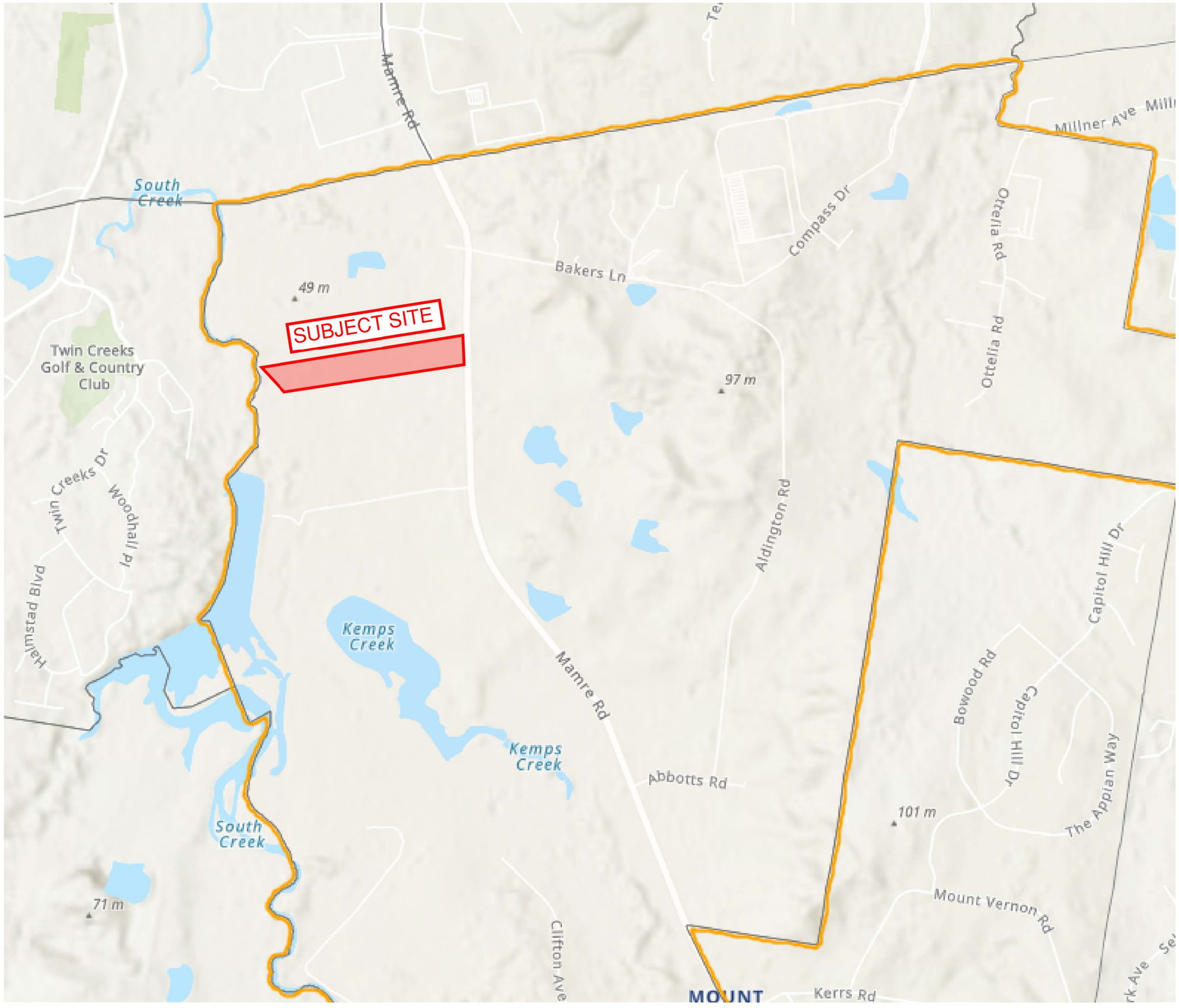
This plan will be reviewed every 10 years basis or after a flood emergency has occurred. Updates to this plan will be briefed to all site personnel through toolbox talk or prestart briefings. Regular assessment of current earthworks and relative ground levels and impacts to surface flows, etc., are to be undertaken. A revised risk assessment will then be completed, and the Emergency Response Plan updated accordingly to reflect any changed conditions. During the operational phase, allows implement the most recent version of the flood emergency response plans approved by the Planning Secretary, for the duration of the operation.

6.7 Community Consultation

An assigned community consultant (ERM) has been allocated to the project to monitor and address construction related complaints. The consultant will be engaged for the life of the construction to provide project updates and community liaison. Refer to Microsoft's Compliant and Enquiry Process for General Contractor form attached in Appendix C of this report. Further, both the applicant (MSFT) and GC (AWE) will include a community complaints link and email on their project webpage.

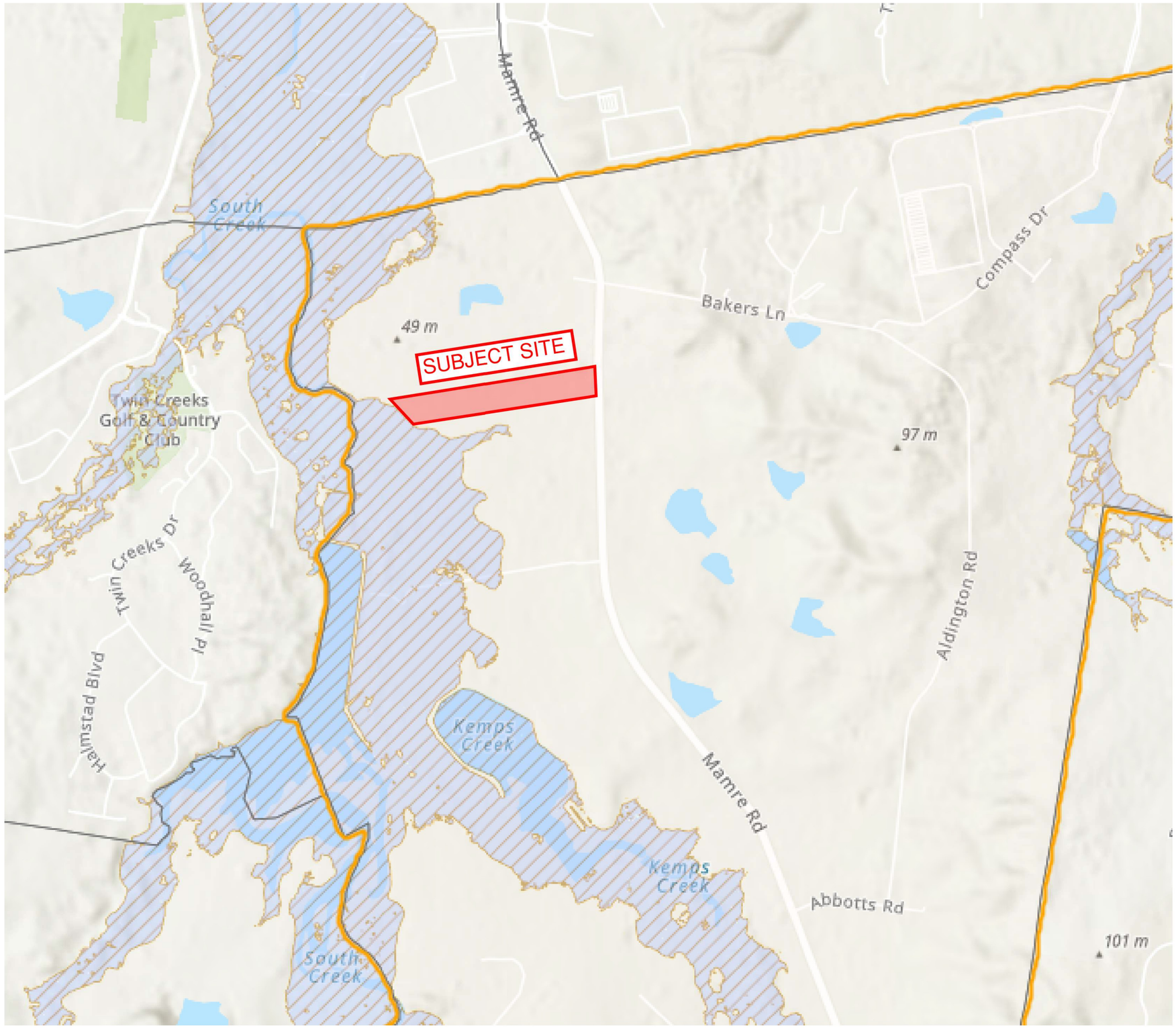
7. Appendix A – Flood Extents Plans

VDM
Appendix A
20230508



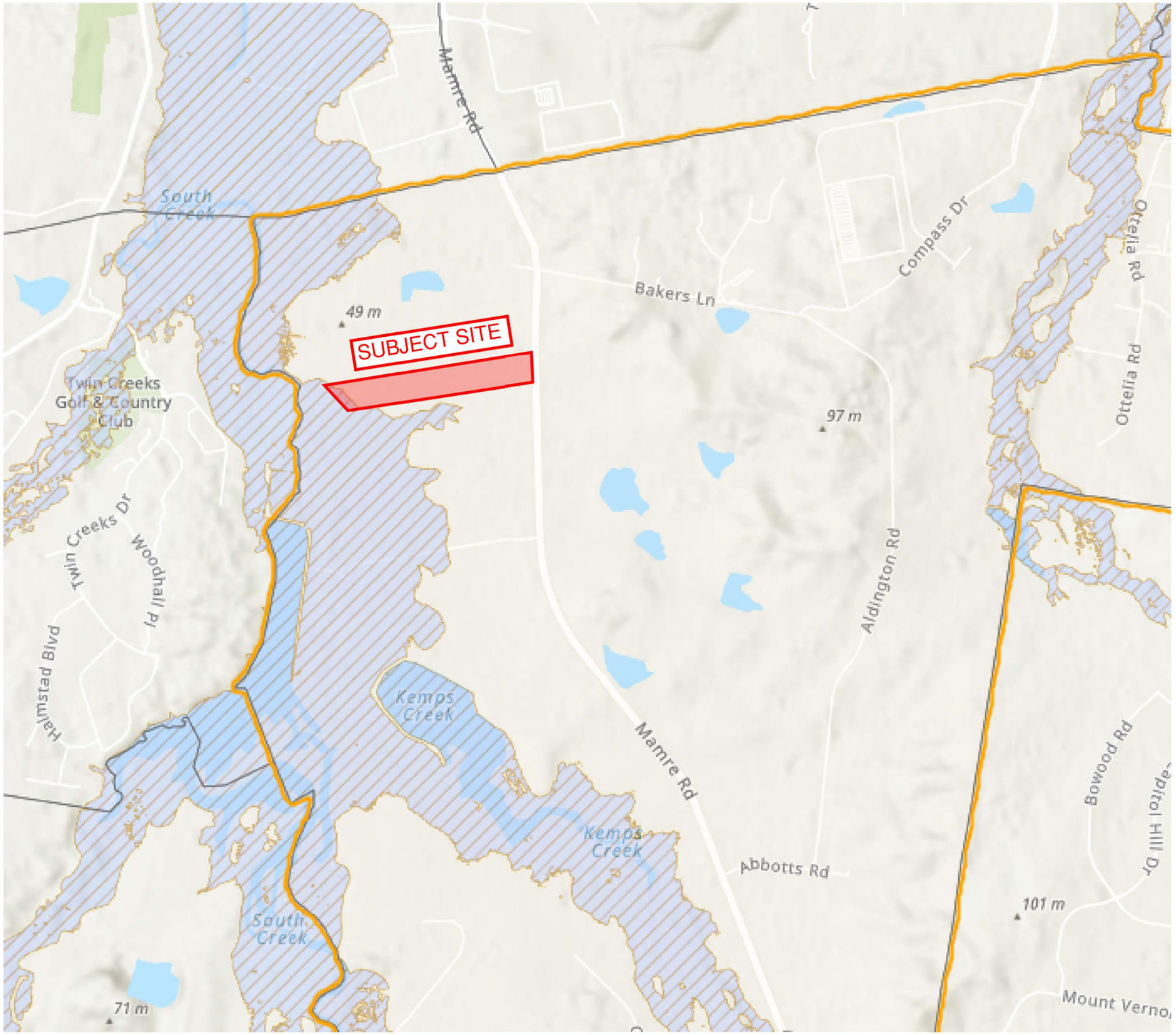
SES FLOOD MAPPING - 5 YEAR STORM

VDM
Appendix A
20230508



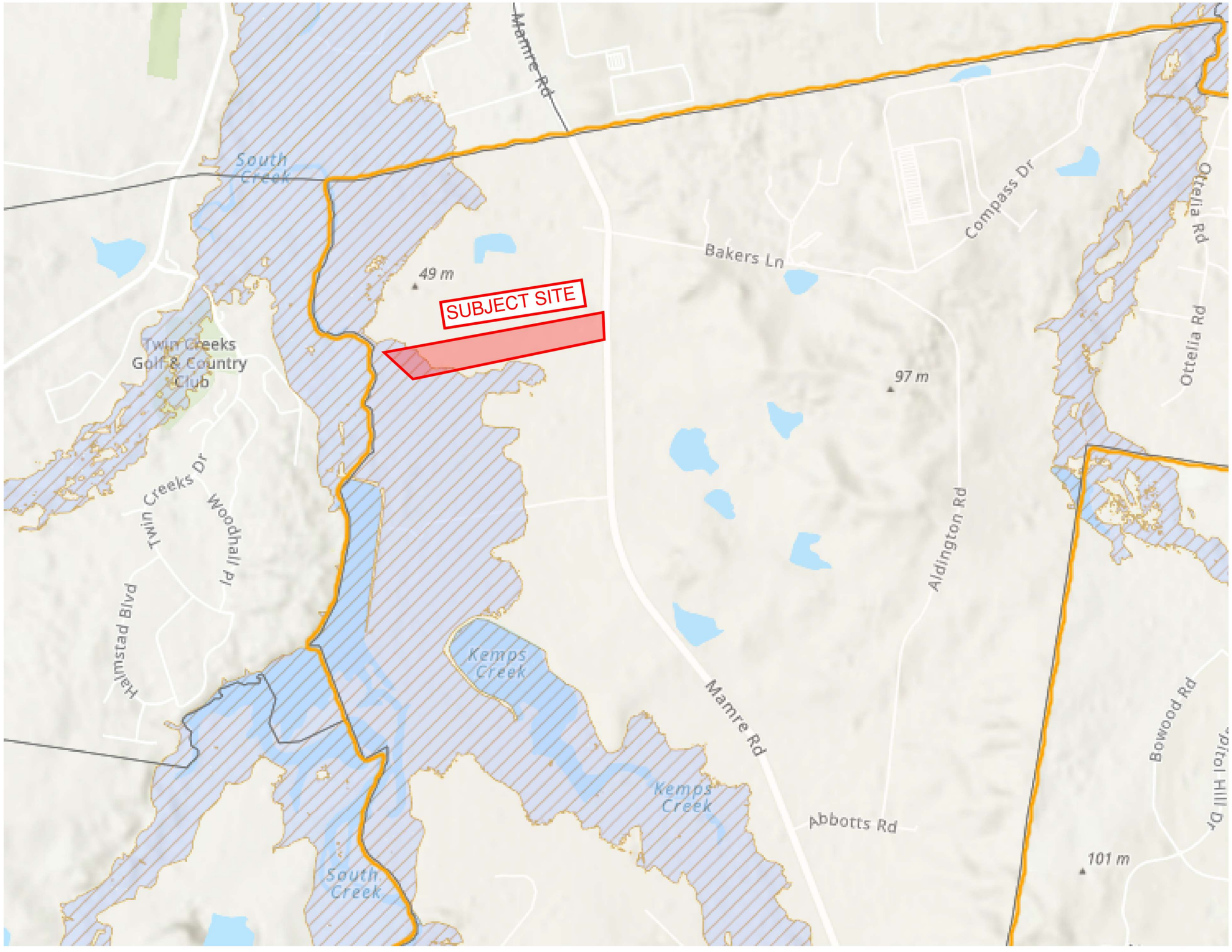
SES FLOOD MAPPING - 20 YEAR STORM

VDM
Appendix A
20230508



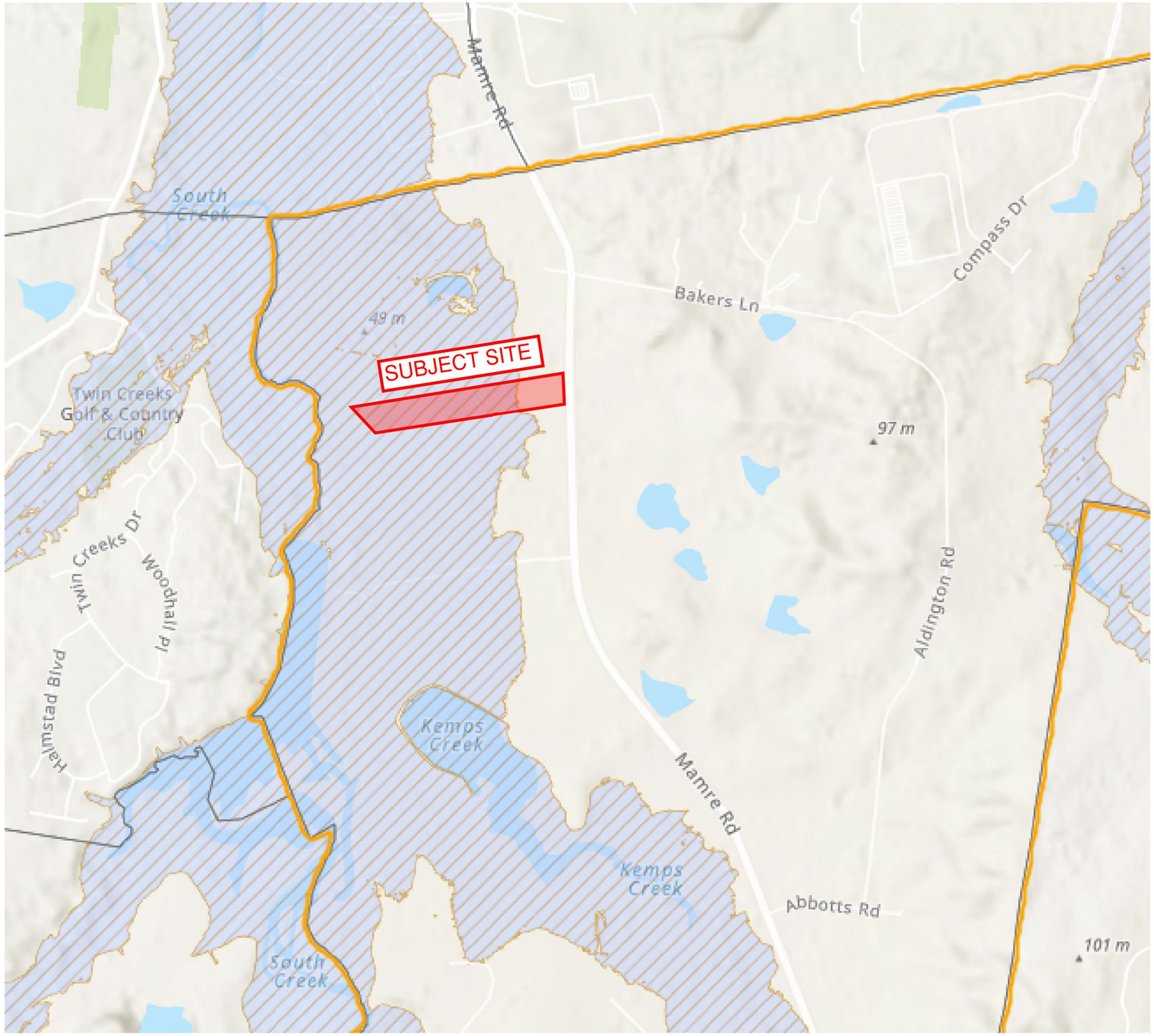
SES FLOOD MAPPING - 100 YEAR STORM

VDM
Appendix A
20230508



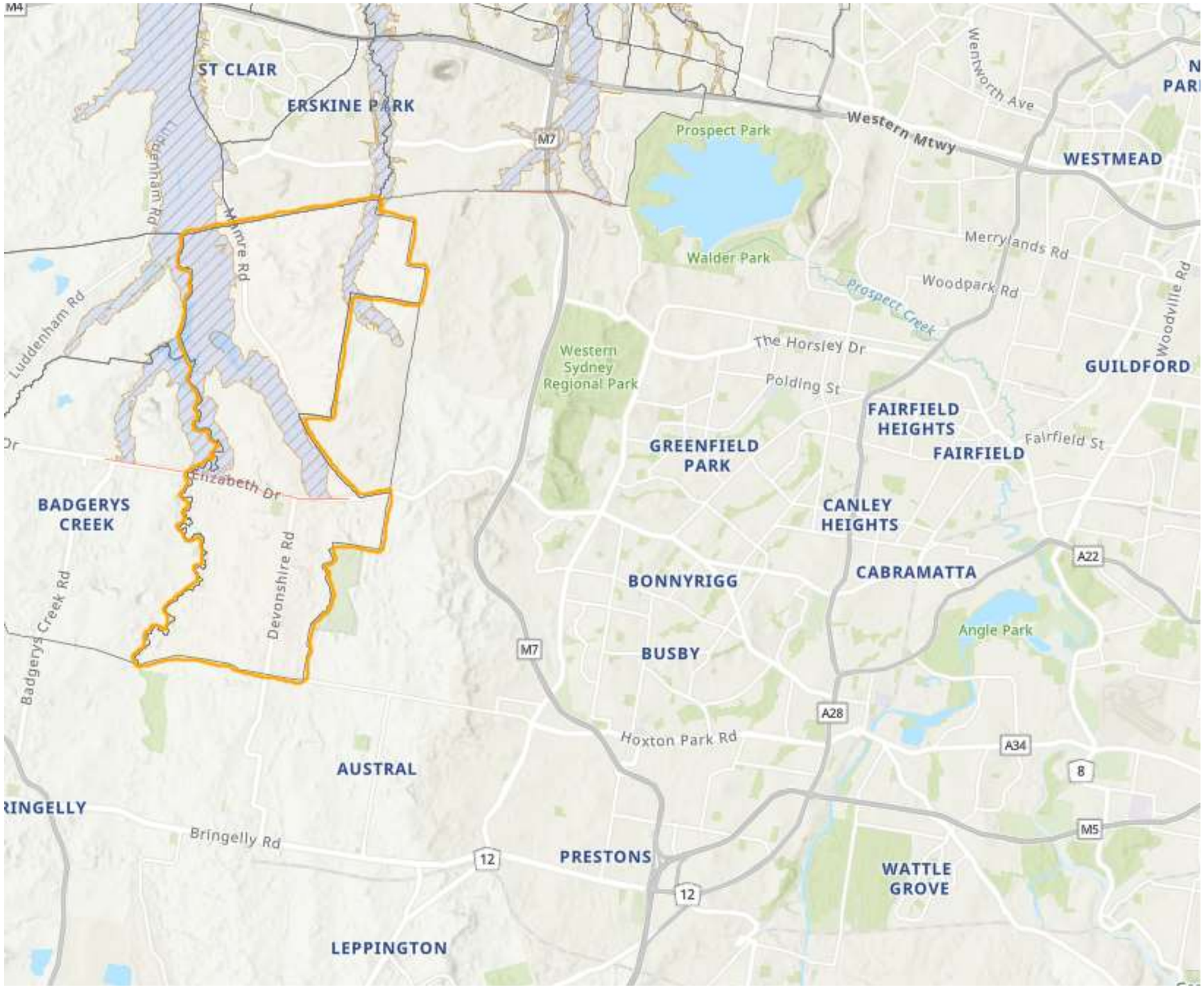
SES FLOOD MAPPING - 500 YEAR STORM

VDM
Appendix A
20230508



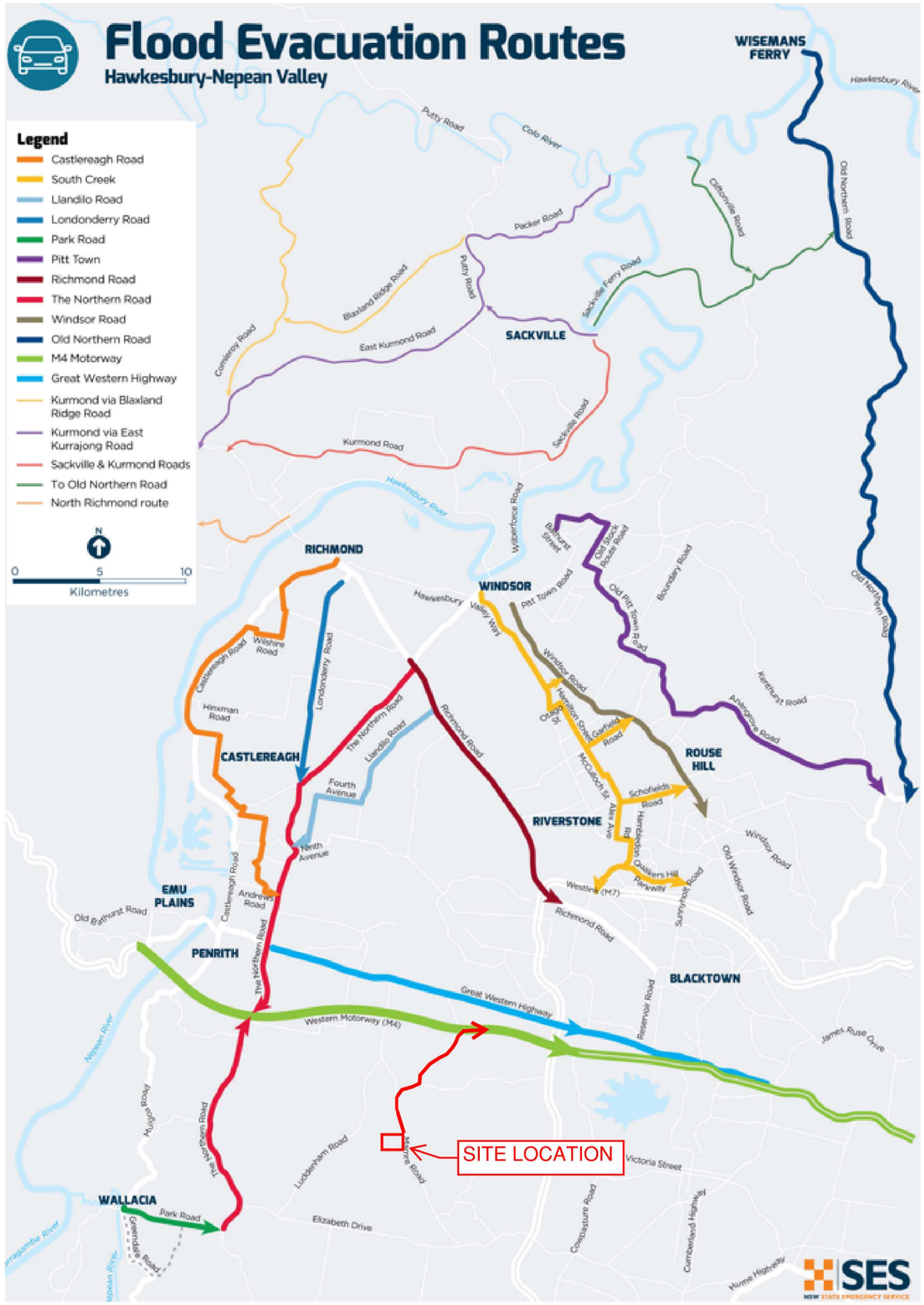
SES FLOOD MAPPING - PMF STORM

VDM
Appendix A
20230508



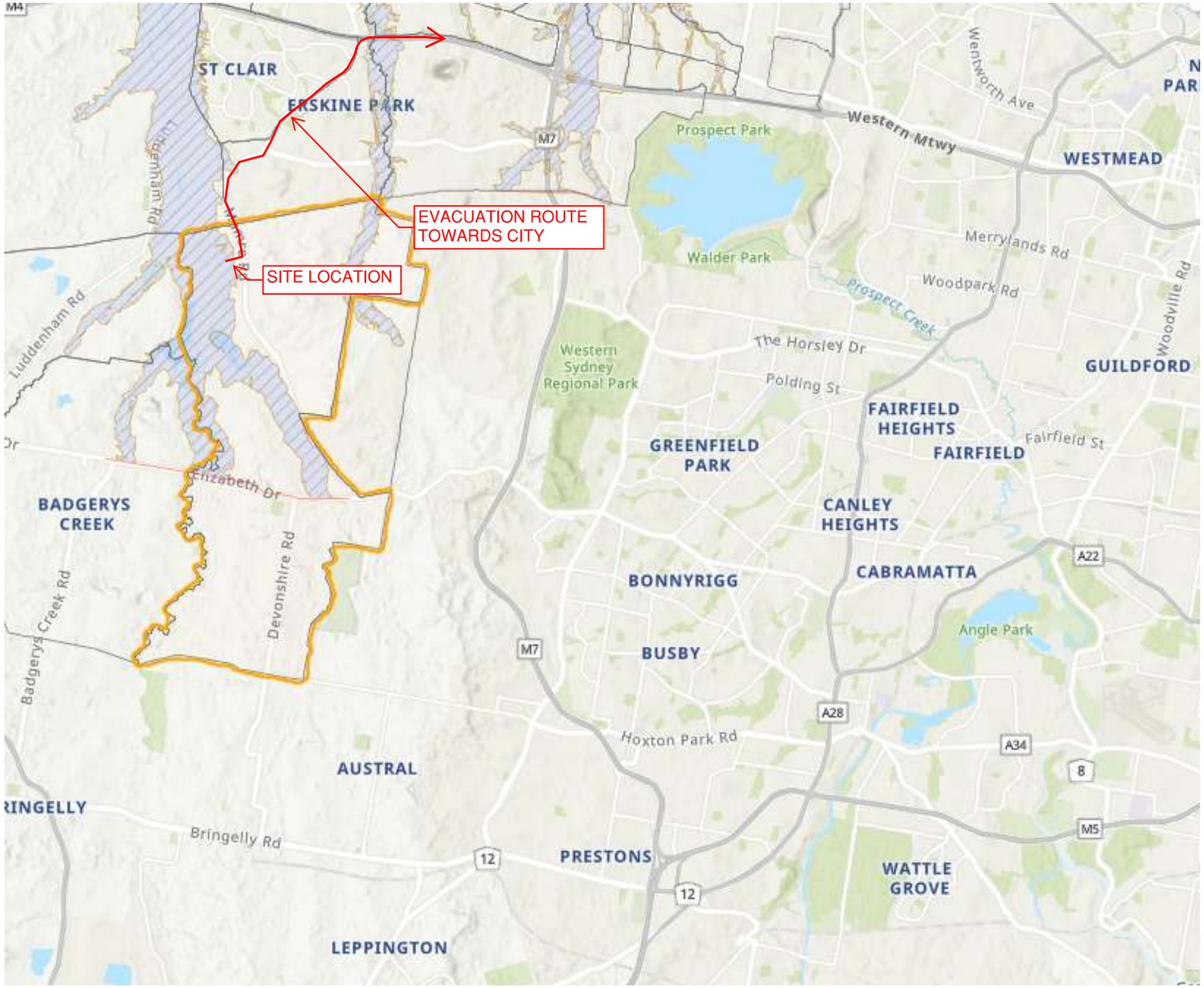
SES FLOOD MAPPING - PMF STORM IN THE GREATER AREA

VDM
Appendix A
20230508



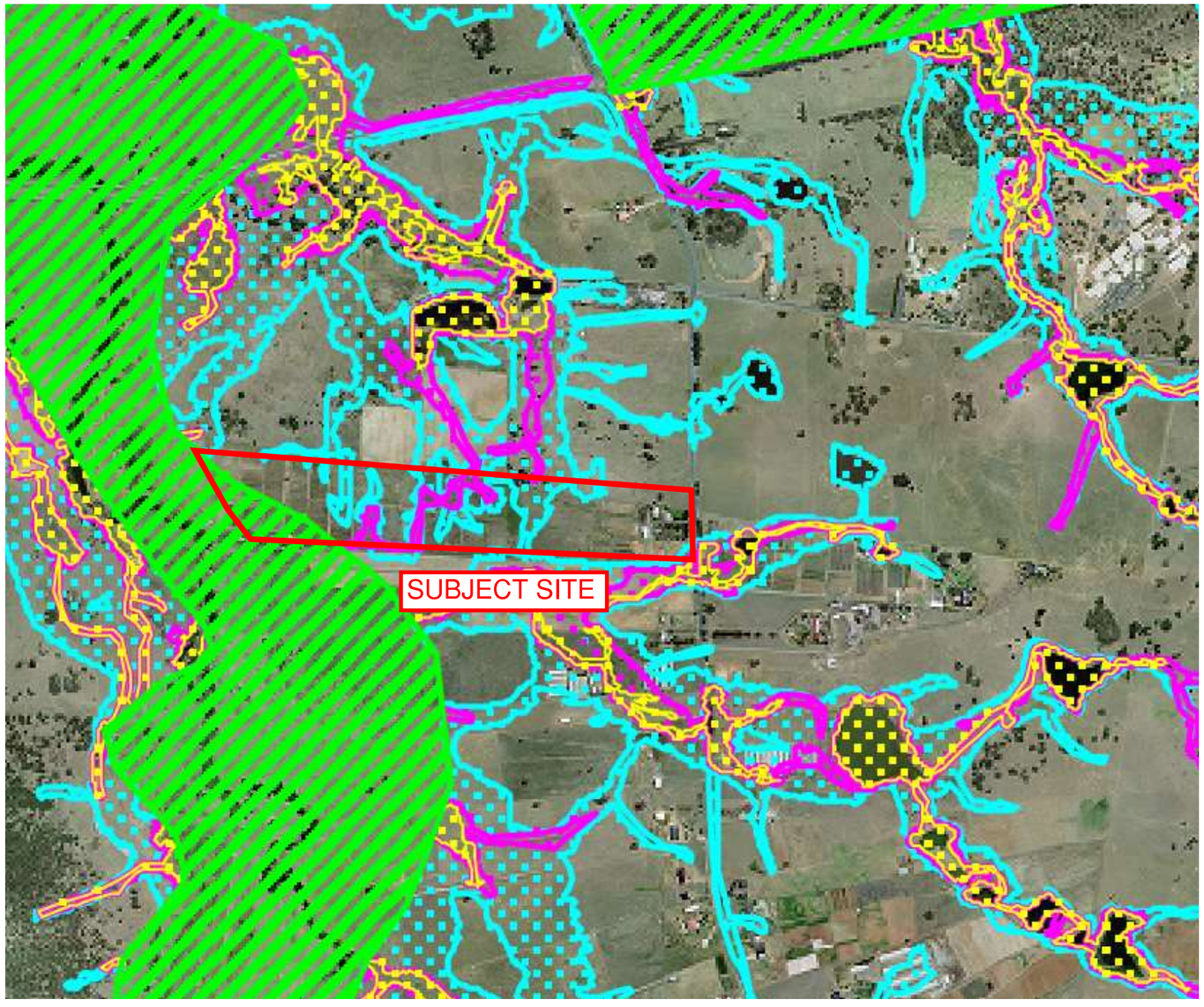
SES FLOOD EVACUATION ROUTES SYDNEY + SITE ROUTE

VDM
Appendix A
20230508



SES FLOOD MAPPING - PMF STORM IN THE GREATER AREA
+ SITE EVACUATION ROUTE

VDM
Appendix A
20230508



PMF Extent

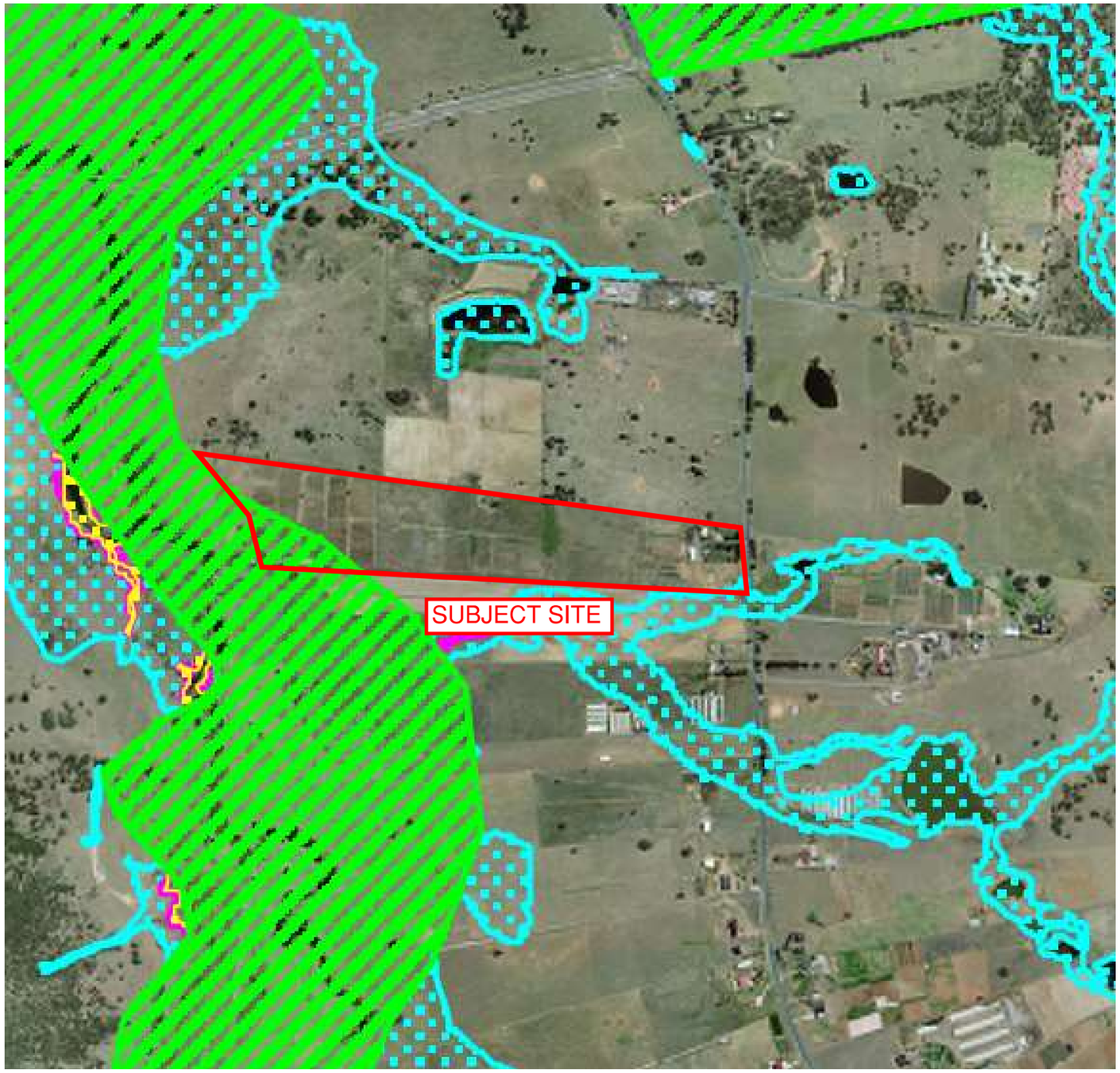
100 Year ARI Flood Extent

20 Year ARI Flood Extent

Excluded Areas
Including 100 Year ARI Flood Extent
for Nepean River and South Creek

PENRITH OVERLAND FLOW STUDY - FLOOD EXTENTS

VDM
Appendix A
20230508



PMF Hazard

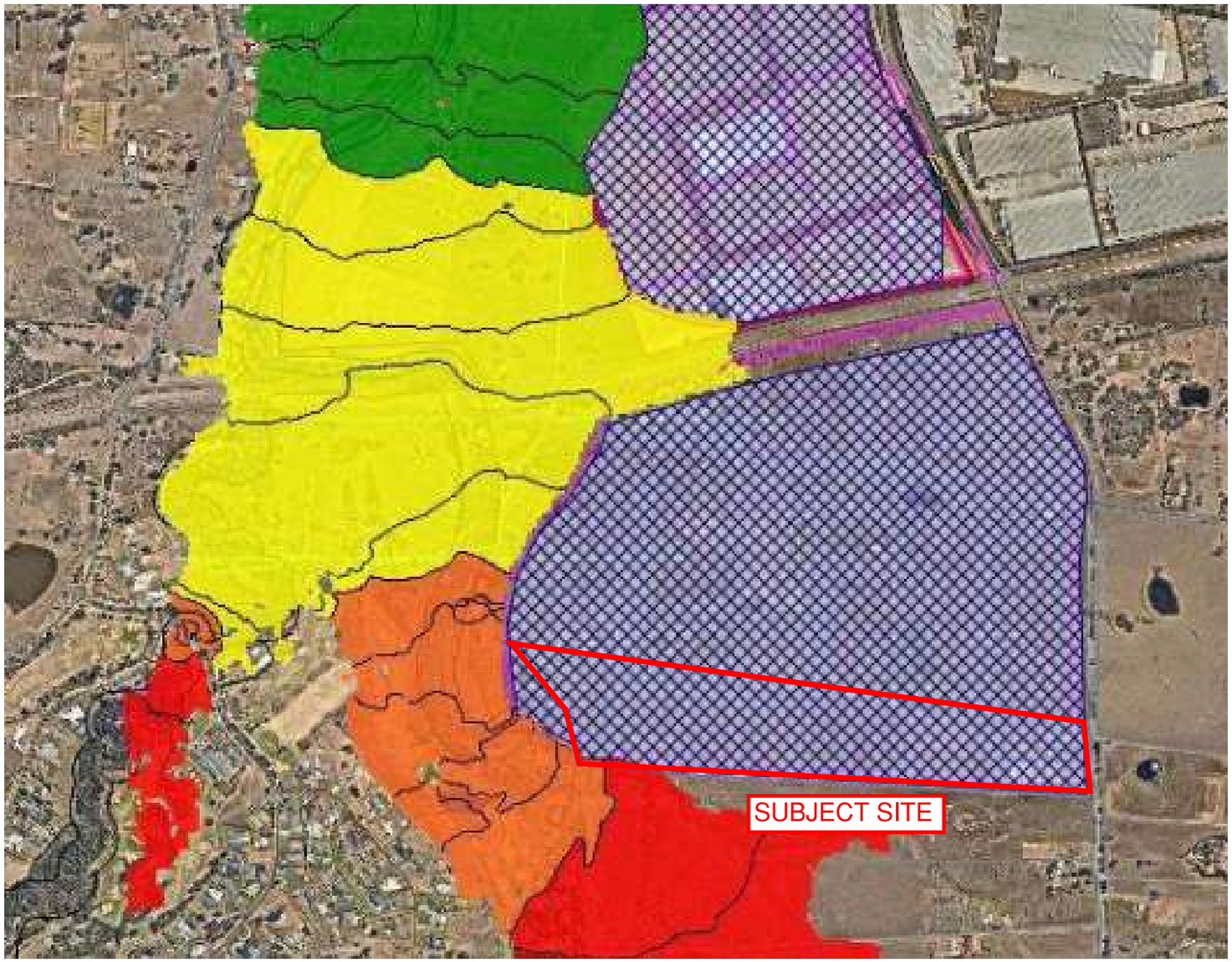
100 Year ARI Flood Hazard

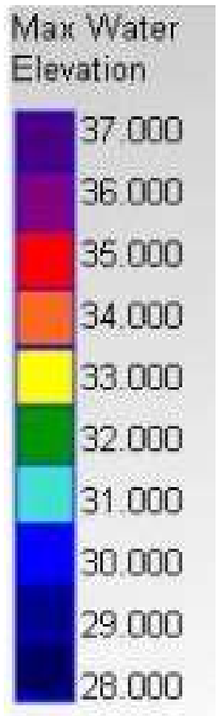
20 Year ARI Flood Hazard

Excluded Areas
Including 100 Year ARI Flood Extent
for Nepean River and South Creek

PENRITH OVERLAND FLOW STUDY - FLOOD HAZARD EXTENTS

VDM
Appendix A
20230605

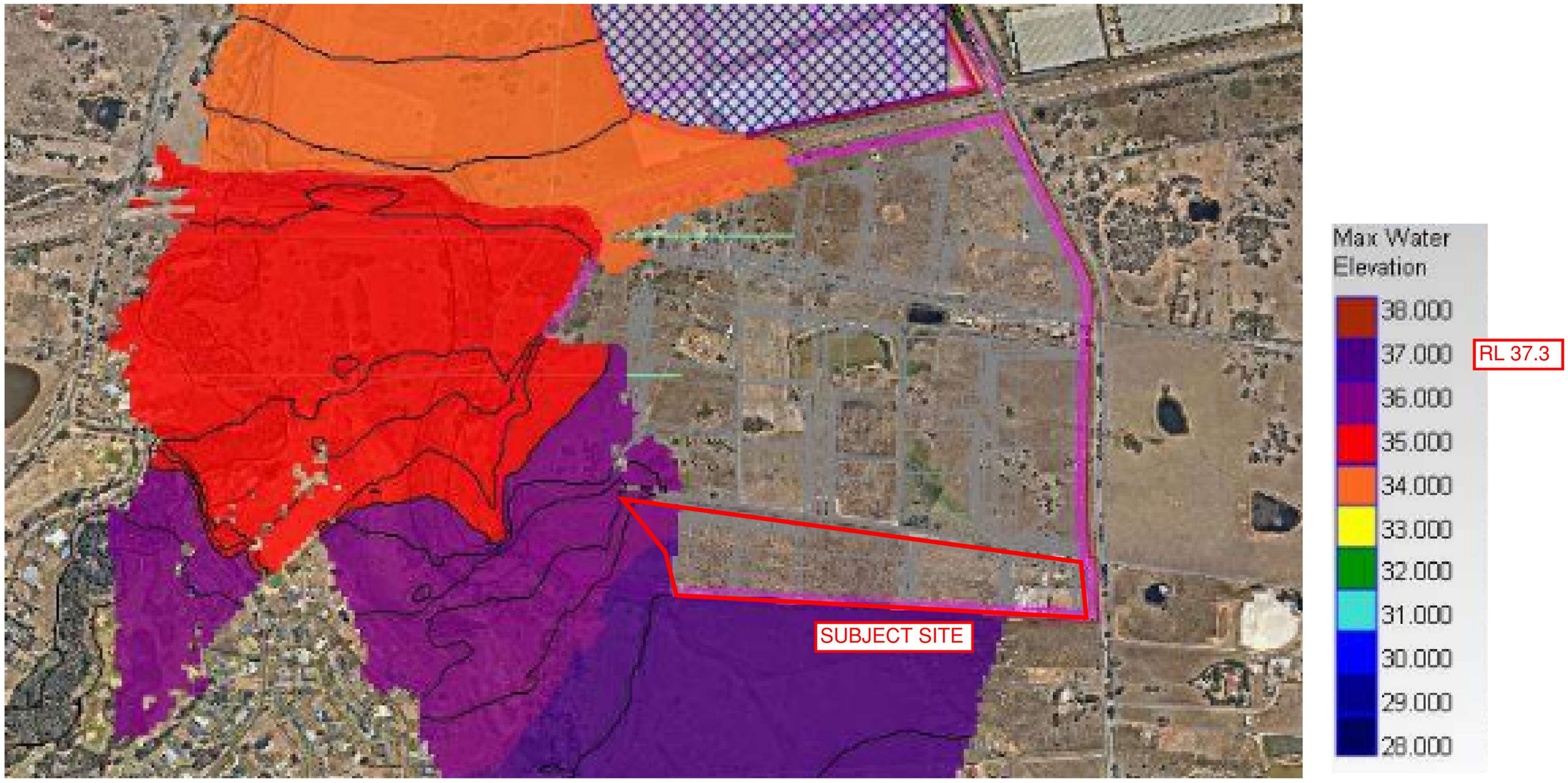




RL 35

COSTIN ROE 1% AEP FLOOD EXTENTS

VDM
Appendix A
20230605



COSTIN ROE PMF FLOOD EXTENTS

8. Appendix B – Staging Plan

Site Establishment (Main Construction)

Legend

- STAGE 1
- Chain wire fence
- Two coat spray sealed with compacted road base
- Tempoary road path to be coordinated and managed by civil contractor with services trenching sequences for structural trade logistics requirements / sequencing.

Site access way bridge over

TC 3 LOADING ZONE 2

TC 2 LOADING ZONE 1

TC 1 LOADING ZONE 1

SPEED LIMIT 10

SPEED LIMIT 10

Traffic control

MATERIAL STORAGE LOGISTICS MANAGEMENT AND WAITING ZONE 1

AW EDWARDS

TC 1

TC 2

SYD 5

MATERIAL STORAGE LOGISTICS MANAGEMENT AND WAITING ZONE 2

TC 3

TC 3 LOADING ZONE 1

TC 2 LOADING ZONE 2

Substation Loading Zone 1

Loading platforms

Stretcher stairs

Stage 1 - HV yard (Separate D&C contract)

Stage 1 - MV Switch Room

Microsoft

AW EDWARDS

2.0

9. Appendix C – Microsoft's Compliant and Enquiry Process for General Contractor form

Microsoft Complaint and Enquiry Process for General Contractor

General Contractor: AW Edwards SYD05

Effective enquiries and complaints management is critical to minimise complaints from the community.

For the **Microsoft SYD05 Datacentre Project Kemps Creek**, construction-related complaints are to be directed via phone to the General Contractor:

AW Edwards

Project Manager James Breakell

Mobile: 0466 891 876

Email: jbreakell@awedwards.com.au

Any other enquiries or questions to be sent to Microsoft's enquiry email at SydDCcommunities@erm.com

1.1 Recording and tracking

For every complaint and enquiry call received, General Contractor will record the following information in the Complaint and Enquiry Register:

- Name and contact details
- Time and date of contact
- Details of the enquiry or complaint
- Subject matter for the enquiry or complaint
- Status of the enquiry or complaint (reflecting Microsoft approval processes)
- Detailed summary of the response to the enquiry or complaint
- Time and date of response activity until the issue has been resolved
- Sentiment following issue closed.

Where a contact is complimentary, sentiment will be recorded as positive and this feedback will be provided to the Project, Site and Construction Managers.

The General Contractor will provide the completed complaints spreadsheet weekly to ERM to include in monthly reporting to Microsoft.

1.2 Response times

The table below shows General Contractor response times for inbound enquires and complaints.

Enquiry source	Target acknowledgement	Target resolution
Construction complaint via call to General Contractor (GC)	GC to respond to call on the same business day*	Within five business days

1.3 Escalation process

Where a complaint cannot be resolved directly on site, requires a more considered or written response, or is not done to the satisfaction of the complainant by the General Contractor, the complaint is to be escalated to ERM.

1.4 Responding to a call

Tips for General Contractor team members responding to complaints and enquiries:

1. Start the conversation off right: when picking up the call, introduce yourself and ask how you can help.
2. Listen to the caller's concern and frustration, without interruption. Show empathy and understanding throughout the conversation.
3. Maintain a calm and composed demeanour, regardless the situation. Respond professionally and respectfully, avoiding defensiveness or emotional reactions.
4. Ask specific questions to gather relevant information (see Complaints and Enquiries Register). Take detailed notes during the call to ensure accuracy and demonstrate effectiveness.
5. Acknowledging any inconvenience or negative experience. Validate the caller's feelings and assure that their concerns matter and assure them that you will investigate the issue.
6. Take necessary steps to investigate and resolve the issue as outlined in Sections 1.5 and 1.6 below.
7. Offer practical solutions or alternatives to address the issue. If immediate fix is not possible, assure the caller that you will take prompt action to investigate and return the call to provide information regarding the solution. If necessary, escalate the issue to manager or ERM for further assistance.

1.5 Investigate and prepare a response

Below are recommended steps to help resolve the issue:

1. Speak to parties involved and collect evidence on the topic, including safety and environmental reports.
2. Speak to the project manager or most appropriate contact on site to ensure you have bigger-picture perspective.
3. Recap your response with the project manager to assure your messaging is in alignment
    a. Understand commitments you are going to make, if any
    b. Confirm the timeline of commitments to help set expectations.

1.6 Delivering on commitment

Once the issue has been resolved,

1. Log your commitment in the safety management system (i.e., Hammertech) so it can be prioritised and actioned
    - If you do not have access to the safety management system, ask your Environment Quality and Safety manager to log.
2. Document your interaction and resolution in the project Complaints and Enquiry Register so you have record of the relationship over time.
3. If appropriate, follow up with stakeholder to ensure they are satisfied.

10. Appendix C – Andrew Wallis Experience and Qualifications

BEng(Civil) University of Wollongong, 2002

MIEAust – Institute of Engineers
CPEng – Chartered Engineer
NER – National Engineering Register

AREAS OF EXPERTISE

Contract Supervision
Land Development
Masterplan / Civil Strategies
Project Management
Public / Roadworks
Stormwater Design & Strategies
Subdivisions
Water Sensitive Urban Design

ANDREW WALLIS

CIVIL MANAGER - NSW

Andrew has over 21 years' industry experience, he has worked with local government, contractors and developers on urban and land development projects. Andrew has extensive experience in project management, contract supervision, civil design and Water Sensitive Urban Design, including due diligence and conceptual strategies for both the private and public sectors. By working through the full spectrum of the development project life cycle, Andrew has the ability to plan for potential issues at the inception of the project.

EMPLOYMENT HISTORY

2020 – Present	**van der Meer Consulting**	**Civil Manager - NSW**
2018 – 2020	BG & E	Principal Engineer
2015 – 2018	RPS Group	Sutherland Engineering Manager
2008 – 2015	RPS Group	Senior Civil Engineer
2007 – 2008	Complete Urban Solutions	Senior Civil Engineer
2004 – 2007	Sutherland Shire Council	Design Engineer
2003 – 2004	Cardno	Design Engineer
2001 – 2003	Calibre	Graduate Engineer

PROJECT EXPERIENCE

BUILDINGS

- **Olympic Park Site 2 Hotel, NSW**
  Civil and stormwater design
- **4, 6 & 8 Parramatta Square, Parramatta NSW**
  Public Domain, WSUD and Stormwater upgrades
- **Porsche Centre, Alexandria NSW**
  Stormwater and WSUD strategy and design
- **Heathcote Church, NSW**
  Design and inspection of road, carparks and drainage
- **Botany Road, Alexandria NSW**
  Civil and stormwater Development Application
- **Belmore Street, Penrith NSW**
  Commercial development. $90m
- **IQ, Clarence Street, Burwood**
  Civil and stormwater DA Design
- **Commercial Road, Manly NSW**
  Civil and stormwater design
- **Castle Towers, Castle Hill NSW**
  Civil and Stormwater strategy

FLOOD STUDIES

- **Spring Flat Drainage Corridor, Mudgee NSW**
  Design and modelling of OSD and drainage structures
- **Church Street Flood Study, Mudgee NSW**
  Flood modelling and drainage strategy
- **Anderson Park, Neutral Bay NSW**
  Flood study to support playing field development
- **Ewey Creek Concept Plan, Miranda NSW**
  Design of creek adjustments and advise on flooding
- **Christ the King School, Bass Hill**
  Flood modelling and flood level advice
- **Perfection Avenue, Stanhope Gardens NSW**
  Design and modelling of drainage corridor

van der meer

PROJECT EXPERIENCE

INDUSTRIAL

- **Moorebank Logistics Park, Moorebank NSW**
  WSUD and stormwater Expert Witness
- **Captain Cook Drive, Kurnell NSW**
  Industrial Subdivision, Civil and stormwater DA
- **Mile End Road, Rouse Hill NSW**
  Industrial Subdivision DA
- **Mile End Road Data Centre, Rouse Hill NSW**
  Civil and stormwater strategy for DA
- **Yallah Industrial Subdivision, Yallah NSW**
  Civil and stormwater strategy for DA
- **Kurnell Land Fill, Kurnell, NSW**
  Various civil plans and advice
- **Mudgee Airport, Mudgee NSW**
  Industrial subdivision
- **51 Huntingwood Drive, Huntingwood NSW**

LAND DEVELOPMENT

- **1351 Camden Valley Way, Leppington NSW**
  Civil and PM for 70 lot subdivision
- **9 Glengarrie Road, Marsden Park NSW**
  80 lot subdivision – Civil and stormwater for DA
- **130 Gurner Avenue, Austral NSW**
  35 lot subdivision – PM and civil design for DA
- **155 Gurner Avenue, Austral NSW**
  70 lot subdivision – PM and civil design for DA
- **178 Old Pitt Town Road, Box Hill NSW**
  30 lot subdivision – PM, design and Supervision
- **62-64 Terry Road, Box Hill NSW**
  60 lot subdivision – Civil design and Supervision
- **57 Terry Road, Box Hill NSW**
  50 lot subdivision – Civil design for DA and CC
- **Mackillop Estate, Baulkham Hills NSW**
  150 lot subdivision - Civil and stormwater for DA
- **178 & 227 Hezlett Road, Kellyville**
  80 Lot Subdivision, Design, PM and Supervision
- **200 Jersey Road, Plumpton NSW**
  120 lot subdivision, PM, Design and Supervision
- **Monash Road, Menai NSW**
  100 lot subdivision – PM and Supervision
- **McCulloch Street, Riverstone NSW**
  26 lot subdivision – Design, PM and Supervision

HEALTH & AGED CARE

- **HammondCare, Greenwich NSW**
  Civil design, drainage, and site works.

MASTERPLAN / CIVIL STRATEGIES

- **Urban Renewal Strategy, Seven Hills NSW**
  Civil and Servicing Strategy for precinct 800 dwellings
- **Urban Renewal Strategy, Telopea, NSW**
  Civil and Servicing Strategy for precinct 1200 dwellings
- **Wilton North Community, Wilton NSW**
  Road and Stormwater Masterplan for residential land precinct
- **Lawson Town Centre, Lawson NSW**
  Civil and stormwater strategy for new town centre
- **Lady Carrington Estate, Helensburgh NSW**
  Civil and Stormwater Masterplan for residential rezoning
- **Mile End Road, Rouse Hill NSW**
  Civil and Stormwater Masterplan for residential rezoning
- **School Sites, Richmond Road, Marsden Park**
  Civil and Services strategy

PROJECT MANAGEMENT

- **Green Hills Parklands, Kurnell NSW**
  PM and supervision of DA and construction of sports complex including 10 playing fields. $25m
- **Bingara Gorge, Wilton NSW**
  PM and Contract Supervision – Various stages
- **Various Land sub-divisions**
  PM and supervision of Subdivisions 10 – 200 lots

PUBLIC DOMAIN / STREETSCAPE

- **Menai Road, Menai NSW**
  Road and drainage design for road upgrades
- **Bay Street and Knox Lane, Woollahra NSW**
  Design of intersection and Knox lane streetscape
- **Tugan Oceanway, Tugan QLD**
  Design of carpark and cycleway
- **Gymea Village, Gymea NSW**
  Parking and streetscape design

RESIDENTIAL

- **The Esplanade, Cronulla NSW**
  Civil design and documentation including public domain plan and site associated works.
- **55-89 Chandos St & 58-64 Atchison St, St Leonards NSW**
  Stormwater management plan for DA
- **138-139 North Steyne, Manly NSW**
  Civil design and documentation for tender.
- **Graevelia Estate – Yalla Strata Units, NSW**
  Civil documentation for construction and site works.