

Project Pluto Flood Impact and Risk Assessment



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Executive Summary

This Flood Impact and Risk Assessment has been prepared by BMT to accompany a State Significant Development Application (SSDA) for the construction and ongoing operation of a data centre facility at 132 McCredie Road, Guildford West NSW 2161, in the Cumberland Council Local Government Area (LGA). The site is legally described as Lot 1 in DP596315.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the Project Pluto Data Centre (SSD-69223466) dated 4 April 2024

This report summarises a flood impact assessment that has been undertaken for the proposed development, including details of the model build and the potential flood impacts associated with the development. The proposed development incorporates several flood mitigation measures – including a swale along the eastern boundary and flood storage basin at the northern portion of the Site – aimed at minimising off-site impacts associated with the works. The report concludes that the proposed data centre will result in reduced flood levels to the west and along the northern boundary. Flood level changes are observed along the eastern and southern boundaries – with increases at the northern boundary and south of the Site and decreases along the southern boundary – along areas that are already subject to flooding. It is considered that these flood level changes do not result in a material increase to flood risk either on or off Site.

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1 Introduction

A State Significant Development Application (**SSDA**) has been prepared in support of a proposed data centre at 132 McCredie Road, Guildford West NSW 2161. The site is zoned E4 General Industrial and has a road frontage to McCredie Road. The developable site area is approximately 71,710 sqm.

The proposed development comprises:

- Site preparation works including bulk excavation and removal of existing hard standing and structures on the site, tree and vegetation clearing, and bulk earthworks;
- Construction, fit out and operation of a data centre with an approximate building height of 25.77m and total gross floor area of approximately 29,444 m² comprising:
 - At-grade parking for 53 car parking spaces and 2 accessible car parking spaces
 - Two (2) loading dock spaces.
 - Two (2) levels of technical data hall floor space with incorporating a total of nine (9) data halls
 - Ancillary office space
- Provision of required utilities, including:
 - Fuel storage
 - Two (2) Switch-rooms
 - Four (4) industrial water storage tanks
- Vehicle entry and egress driveways located along McCredie Road
- Internal access road
- Associated landscaping and site servicing
- Installation of services and drainage infrastructure.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) and accompanying cover letter issued for the Project Pluto Data Centre (SSD-69223466) dated 4 April 2024. Specifically, this report has been prepared to respond to the SEARs outlined in Section 1.2.



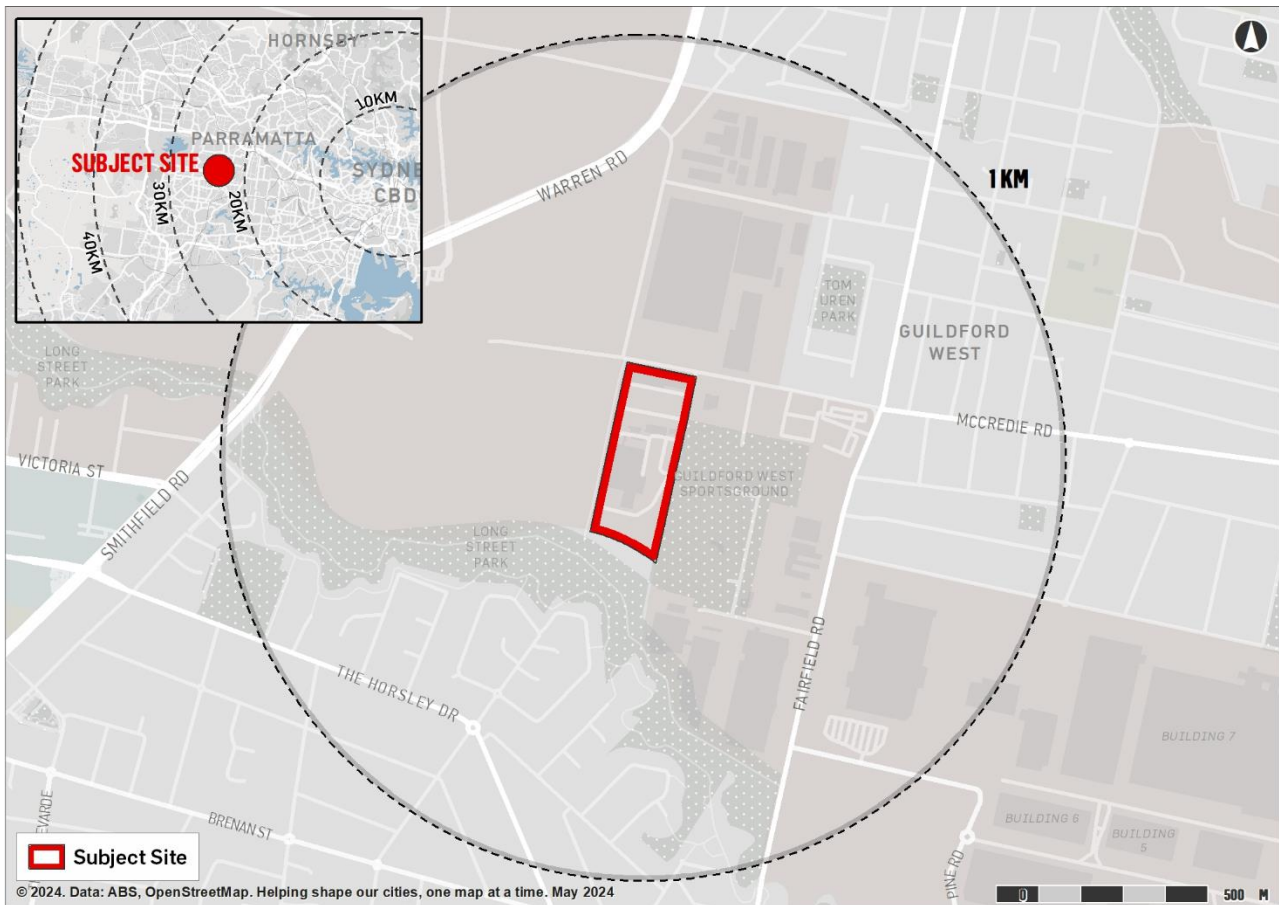


Figure 1.2 Local Context

1.2 The Site

The site is located on Gandangara Land and is in the Smithfield Industrial Area within the Cumberland Local Government Area (LGA). The existing site is shown in Figure 1.3. It is bounded by McCredie Road to the north.

The front part of the site adjoins the Guildford Transmission Substation, which is located immediately to the east and fronts onto McCredie Road. Other industrial uses are located further east, with residential properties beyond.

The Guildford West Sports Ground, which comprises several playing fields, is located to the south of the Guildford Transmission Substation. The playing fields bound the southern part of the site to the east. The playing fields / public recreation area also abut the southern boundary of the site.

Prospect Creek is located to the south of the public recreation area and is zoned C2 Environmental Protection. The area to the south of Prospect Creek is predominately characterised by low density single storey residential housing.

The site is located in the south eastern corner of the Smithfield Industrial Estate and is within close proximity of the Cumberland Highway (A28) and M4 and M7 motorways, which provide access to Sydney CBD, western Sydney and the south. A range of large format industrial uses are located to the west and north west of the site. The Smithfield Industrial Estate extends across the A28 to Gipps Road (approximately 3km west of the site). It forms part of the broader Smithfield Wetherill Park industrial

area, which is one of the largest of its kind in the Southern Hemisphere and makes a significant contribution to the New South Wales and Australian economies.

The site has a net developable area of 71,710 sqm and is currently vacant. It previously operated as a Castrol Lubricants facility. However, the majority of the site has now been cleared and subject to category 1 remediation works. A single storey office building is located on the northern portion of the site fronting McCredie Road. The building is vacant.

1.3 Staging

The proposal seeks consent for development to be constructed and operated in two phases to reflect the staged availability power supply. The proposed stages involve the following:

Stage 1: Construction of the main data centre building as well as the car park, perimeter access road, site access/exit driveways and landscaping. Stage one will involve the fit-out and operation of five of the 9 proposed data halls at levels 1 and 2 as well as the associated electrical rooms, generators, storage and office rooms.

Stage 2: Completion of the ultimate development scheme involving the extension of the building to the south with an additional four data halls, associated electrical rooms and generators, and associated landscaping and external works. The electrical substations will also be constructed in the north of the site during this phase.

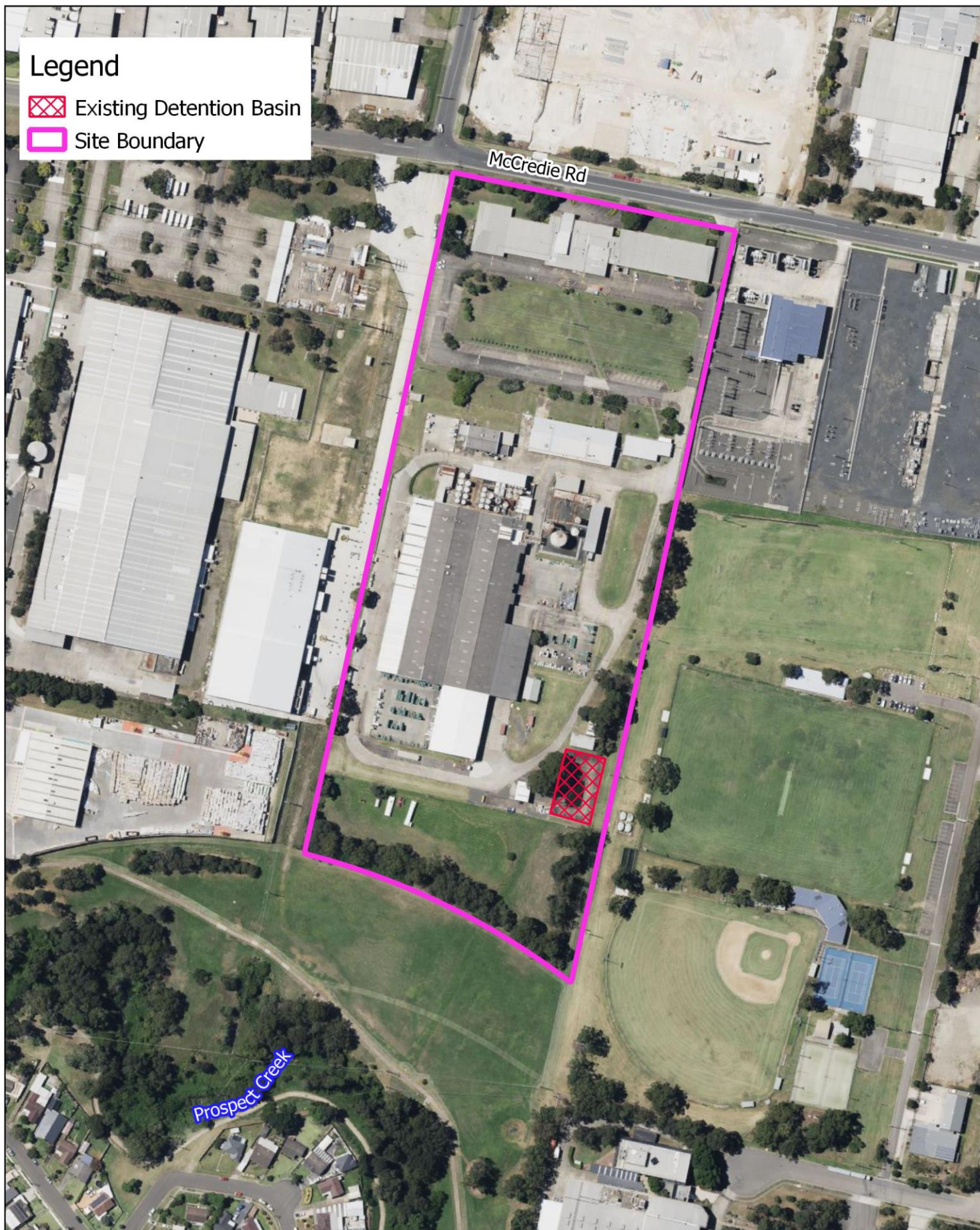
The works are to be completed in four (4) construction stages, as per below:

Stage 1:

- CC1 – Site Preparation works (including but not limited to vegetation removal, earthworks & piling, installation of footings, retaining walls)
- CC2 – Inground services installation, structural works
- CC3 – Façade construction, installation of services, fit out
- CC4 – Landscaping and external works

Stage 2:

- CC1 – Site Preparation works (earthworks & piling, installation of footings)
- CC2 – Inground services installation, structural works
- CC3 – Façade construction, installation of services, fit out
- CC4 – Landscaping and external works



Legend

-  Existing Detention Basin
-  Site Boundary

Title:

Existing Site Locality

Figure:

1.3

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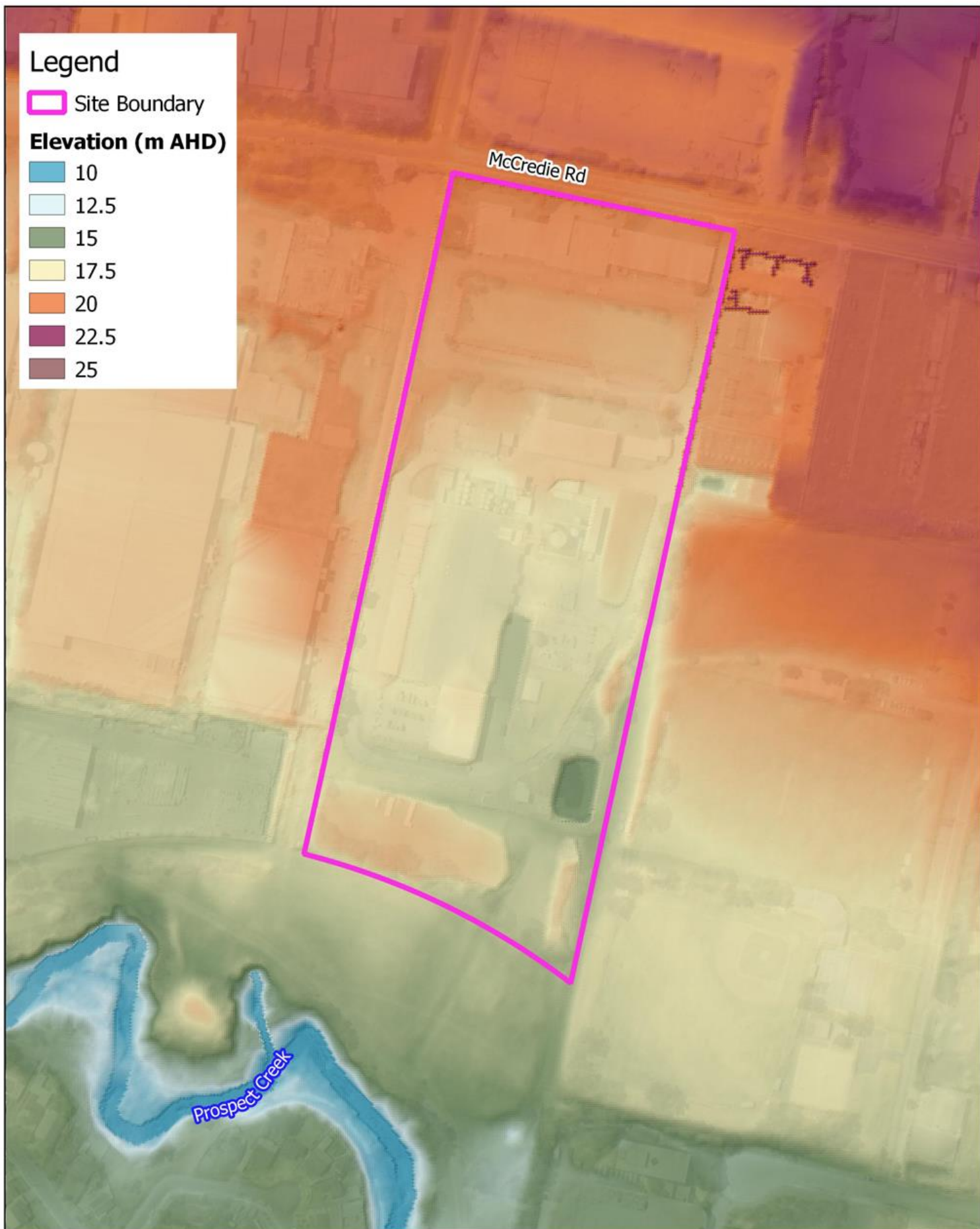



Legend

 Site Boundary

Elevation (m AHD)

 10
 12.5
 15
 17.5
 20
 22.5
 25



Title:

Existing Site Topography

Figure:

1.4

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1.1 Site Flood Context

BMT was engaged by Goodman to conduct a Flood Impact and Risk Assessment (FIRA) for the Environment Impact Statement (EIS) phase of the McCredie Road Data Centre.

The Site grades north to south from a high point of 20.0 m AHD on the north-east corner of the Site, towards a low point of 16.1 m AHD at the south-east corner of the Site. Site location and existing elevations are shown in Figure 1.4. An existing stormwater basin is located in the south-east portion of the Site and partially collects overland flows draining from the north. The proposed development will involve the construction of a Data Centre and associated amenities. The proposed works and staging summary are shown in Figure 1.5 and Figure 1.6.

The Site is located within the Prospect Creek catchment. The findings of the Holroyd City LGA Overland Flood Study indicate that the Site is subject to overland flow draining from McCredie Road to Prospect Creek, located approximately 100m south of the Site. This report provides detailed information about the methodology and outcomes of the FIRA to inform the design development and fulfil the requirements of EIS.



Figure 1.5 Site Plan – Stage 1 (Source: van der Meer Consulting, "SY242-012_SSDA-C101_C SITE PLAN – STAGE 1")

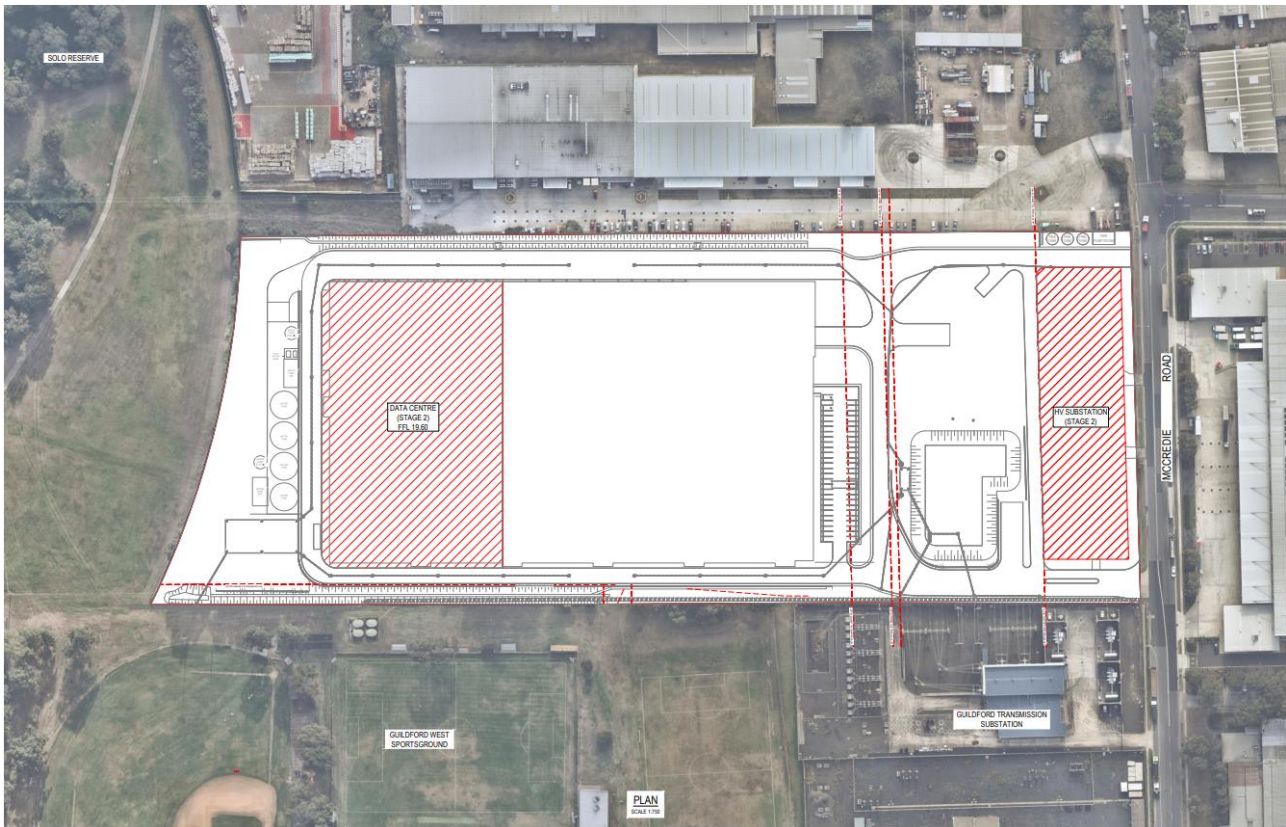


Figure 1.6 Site Plan – Stage 2 (Source: van der Meer Consulting, “SY242-012_SSDA-C102_C SITE PLAN – STAGE 2”)

1.2 SEARS and Agency Comments

This FIRA report addresses item 15 of the flood-related SEARs issued by NSW Department of Planning, Housing and Infrastructure on 4 April 2024 and Items 5 and 6 of the *Request for Response to SSD-69223466* provided by Cumberland City Council on 5 June 2025. Table 1.1 summarises the SEARS requirements and where each requirement has been addressed in this report. Table 1.2 responds to Cumberland City Council’s comments.

Table 1.1 SEARs Requirements

SEARs Requirement	BMT Comment
Identify any flood risk on-site having regard to adopted flood studies, the potential effects of climate change, and any relevant provisions of the NSW Flood Risk Management Manual.	This assessment has been undertaken using Cumberland City Council's adopted Holroyd City LGA Overland Flood Study TUFLOW model (see Sections 2.2 for summary of model and changes). Section 3 of this report includes a summary of existing flood behaviour for the 5% AEP, 1% AEP, 1% AEP under future climate change predictions, and the PMF event.
Where the development could alter flood behaviour, affect flood risk to the existing community or expose its users to flood risk, provide a flood impact and risk assessment (FIRA) prepared in accordance with the Flood Impact and Risk Assessment – Flood Risk Management Guide LU01.	This requirement is addressed as part of this report.
Detail design solutions and operational procedures to mitigate flood risk where required.	Peak flood impact associated with the proposed works have been partially attenuated by the inclusion of a flood storage basin at the front of the Site and a drainage swale at the east of the Site. See Section 4.3 for further summary of mitigation assessment.

Table 1.2 Cumberland City Council Response to SSD-69223466

Council Response	
The flood impact assessment (FIA) report version 05 dated 23 April 2025 prepared by BMT shall form part of the condition of consent.	Noted
The proposed drainage swale work along the eastern boundary as stated in the FIA report as flood mitigation measure to encourage flow away from neighbouring properties to the east is recommended to convert to approx. 0.5m x 1m culvert. However, the dimension of the culvert must be determined by the applicant's consultant in consultation with the Council's Engineer. The culvert must be maintained by the property owner. In this regard a positive covenant and restriction on the use must be created for the maintenance.	A 0.5m x 1m culvert would have significantly less capacity to convey flow when compared to the proposed swale, and would be limited to a single inlet and outlet location prone to concentrated velocities and even potential scouring in very rare events. A culvert would also be prone to blockage due to the transfer of debris material during flood events, even assuming full and regular maintenance in the lead-up. The proposed swale will allow for at least partial transfer of flows for all events up to and including the PMF, and aligns with the existing overland flowpath within this region.
The proposed flood mitigation basin to be provided on the northern portion and at the south-eastern corner of the site (as outlined in section 4 of the report), to provide additional volume storage must also be maintained by the owner of the proposed development.	Maintenance of the northern basin shall form part of the Stormwater Management Plan for the Site. A basin is not proposed at the south-eastern corner of the Site. The south-eastern basin was removed during design development in response to tree retention requirements issued by Council. Reference to a basin at the south-eastern corner of the Site in the April 2025 (Iteration 05) issue of this

Council Response	
	report is erroneous and was based on a superseded design.
Natural ground level external of the building must be maintained and it is recommended that any major cutting to change the ground levels of the site be avoided where possible.	See comments from VDM Engineers
All southern and northern fencing along the overland flow path up to 1 % AEP flood level must be constructed of permeable pool type metal fence or with opening to provide passage for the free flow of flood water.	See comments from Greenbox Architecture
Future occupants of the development must seek refuge in the area that is flood free or higher than PMF level inside the building unless otherwise directed by the SES or other emergency management personnel.	Shelter-in-place approach to form part of Site emergency management strategy. Can be actioned as part of future development of OFERP.
A flood level monitoring gauge or device is recommended for the site and appropriate signage should be installed to make the future occupants aware of the flooding situation. An emergency flood evacuation plan must be prepared and made available for the future occupants.	Flood level monitoring gauge/device to form part of emergency management strategy. Can be actioned as part of future development of OFERP.
The habitable floor level, i.e. the finished floor level of the buildings shall be at least 500mm above the associated 1% AEP flood level at the respective locations of the proposed buildings. The non-habitable area such as the garage, alfresco shall be at least 150mm above the associated 1% AEP flood level as per recommendation of the flood impact assessment report.	The proposed building FFL of 19.5 will be elevated at least 500 mm above the maximum flowpath levels along both the eastern and western boundaries. Local nuisance ponding at the boundary of the proposed building will be collected by local stormwater system see Stormwater Report for locations.

2 Site Flood Behaviour

2.1 Site Characteristics

The Site is located within the Prospect Creek catchment, a sub-catchment of the Georges River which drains into Botany Bay approximately 35 km downstream of the Site. The Prospect Creek catchment extends from Horsely Park to the west, Greystanes to the north, Warwick Farm to the south and Yagoona to the east and covers an area of approximately 98 km².

Flooding within the Prospect Creek catchment is defined by the Holroyd City LGA Overland Flood Study (2017), which indicates the Site is impacted by overland flows draining from elevated areas to the north which discharge south towards Prospect Creek.

2.2 Previous Flood Studies

Details of previous reports undertaken and their relevance in the context of the current assessment are presented in the following sections.

2.2.1 Holroyd City LGA Overland Flood Study (Lyll and Associates, 2017)

The Holroyd City LGA Overland Flood Study (Lyll and Associates, 2017) (hereafter referred to as the "Council Flood Study") included the development of a DRAINS hydrology model and TUFLOW hydraulic model across the Prospect Creek catchment to a discharge point near the Cumberland Rail Line. The Council Flood Study was modified in the vicinity of the Site and used to represent flood conditions, as described in Section 2.3.

2.3 Model Updates

In order to assess the existing flood conditions at a more localised and detailed scale, modifications were made to the Council Flood Study model to better reflect local, contemporary conditions. This included the following updates for the Site and immediate surrounds:

- Ground surface elevations within and surrounding the Site were updated based on 2019 LiDAR obtained from Geoscience Australia;
- Ground surface elevations within the Site were updated based on 2024 survey;
- Local obstructions at the site and the neighbouring site were included based on information supplied by SKY Engineering. These included:
 - The solid 400 mm high concrete bottom of the fence at the Site frontage along McCredie Road;
 - The 250 mm high brick wall along part of the boundary with the lot to the west;
 - The 2100 mm high retaining wall along part of the boundary with the sub-station to the east;
 - The solid walls along the northern portion of the sub-station site housing the transformers.

It is noted that the non-solid obstructions, such as fence lines, were not included in the Council Flood Study TUFLOW model. Within the Council Flood Study TUFLOW model, footprints of a large number of individual buildings were assigned a high hydraulic roughness value relative to the more hydraulically efficient roads and flow paths through allotments. Additionally, to account for the reduction in conveyance capacity due to fences and other obstructions within allotments, individual allotments where development was present were digitised and assigned a high roughness value (although not as high as individual buildings). This approach was retained in the model updates for the present assessment.

- The sub-catchments immediately east (Pro_558) and west (Pro_035) of the Site were further refined. Within the Council Flood Study, both catchments are larger than 10 ha which makes them amongst the 15 largest catchments in the study and notably larger than those draining to the Site from McCredie Road to the north. For this assessment:
 - The Pro_558 subcatchment has been further refined into 5 subcatchments.
 - The Pro_035 subcatchment has been further refined into 4 subcatchments.

It is considered that refinement of the subcatchments provides a more realistic hydraulic representation of local overland flows affecting the Site.

This updated version of the model is referred to as the “Existing Scenario TUFLOW model”. Results of the Existing Scenario TUFLOW model were verified through comparison with predicted 1% AEP flood levels produced by the Council Flood Study TUFLOW model, as described in the following Section.

2.4 Comparison with Existing Council Model

A comparison of the Existing Scenario TUFLOW model and the Council Flood Study TUFLOW model is shown in Figure 2.1 and indicated the magnitude and location of changes associated with the model updates listed in Section 2.3. The peak flood level difference mapping was prepared by subtracting peak existing flood levels predicted by the Council Flood Study TUFLOW model from peak flood level predicted by the Existing Scenario TUFLOW model.

From Figure 2.1, the following differences can be seen between the 1% AEP flood levels predicted by the two models:

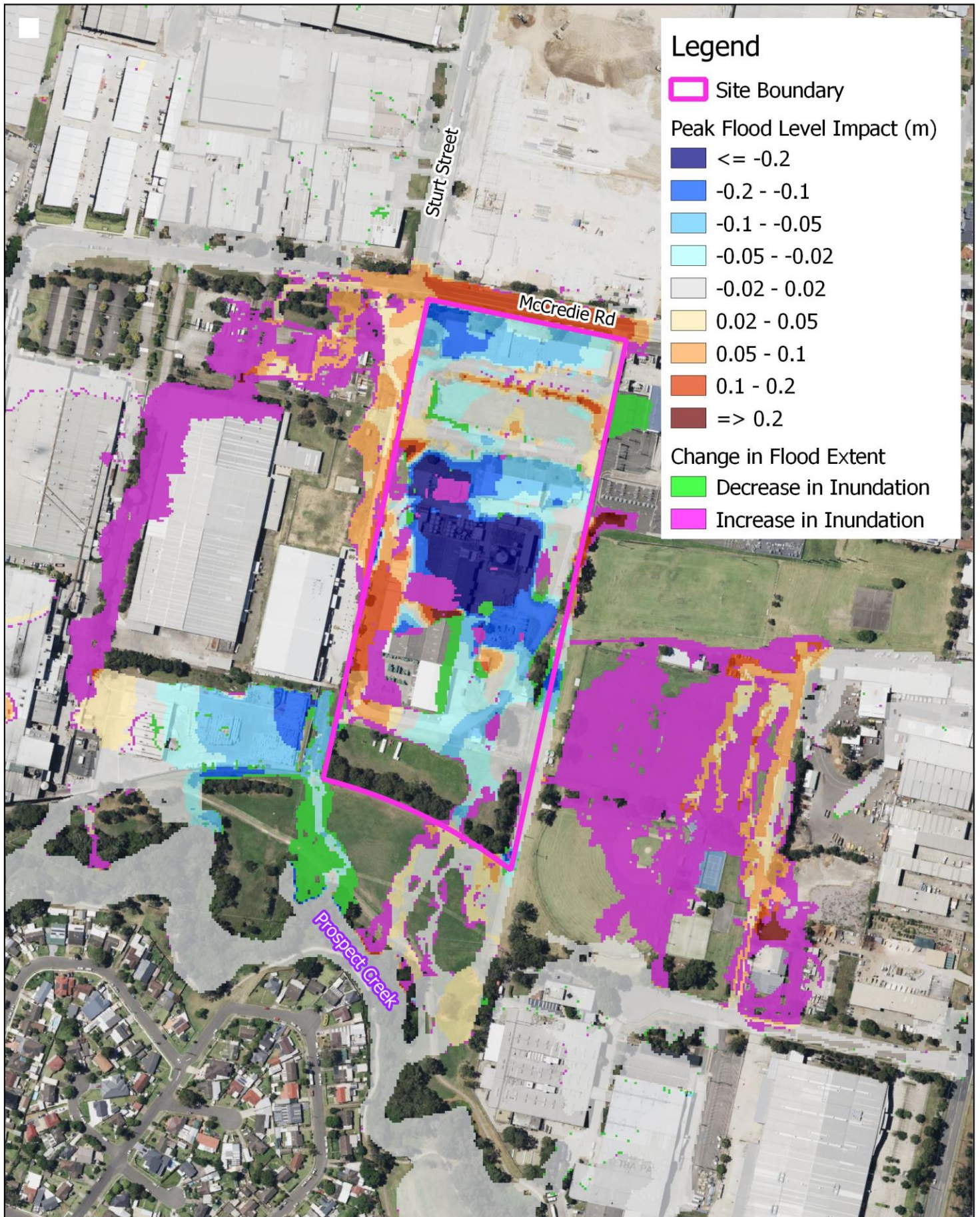
- Within the Site, the 1% AEP flood levels in the Existing Scenario TUFLOW model are predominantly lower than those predicted by the Council Flood Study TUFLOW model.
- Along McCredie Road, the 1% AEP flood levels in the Existing Scenario TUFLOW model are higher than those predicted by the Council Flood Study TUFLOW model.
- At the lots to the west and to the east of the Site, there are significant increases in the inundation extent in the Existing Scenario TUFLOW model.

Changes to flood levels on McCredie Road and the lot to the west in the “Existing Scenario TUFLOW model” reflect the obstruction of flow caused by the wall structures located to the north, east and west of the Site included in the model. These structures partially prevent the flow of water into the Site from McCredie Road (reducing flood levels on-site) and divert flow into the neighbouring lot to the west (increasing flood levels off-site at that location). Increases to inundation extents reflect the revised inflows utilised in the Existing Scenario TUFLOW model and based on the refined subcatchment in the hydrological model. The decrease observed at the centre of the Site reflects the lower ground elevations from the 2024 survey.

Overall, peak flood level changes upstream and downstream of the Site and increases in flood extent are predicted due to the model updates undertaken for this assessment. The model updates allow the model to better reflect existing flow behaviour at the local scale, and the differences between the two models occur only at the local level. The model updates do not reflect any proposed development but are reflective of the use of more recent topographic data, inclusion of local obstructions likely to materially impact on local flood conditions and refinement of neighbouring subcatchments to provide a more realistic representation of local overland flows. Therefore, the Existing Scenario TUFLOW model is considered fit for purpose for this assessment for use in defining the potential flood impacts of the proposed development on local flood behaviour.

2.4.1 Council Flood Model Update

It is noted that Cumberland City Council are currently tendering for the *Cumberland LGA (Western Catchment) Overland Flood Studies (review & update)*, which includes the areas draining to Prospect Creek. At the time of this assessment (19 March 2025), the tender is still open. Cumberland City Council have indicated that results for the updated study will not be available for several more years.



Title:
**Existing Scenario TUFLOW Model vs Council Flood Study
 TUFLOW Model - 1% AEP Event**

Figure:

2.1

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3 Existing Flood Conditions

The Existing Scenario TUFLOW model was used to simulate the 5% AEP, 1% AEP, 1% AEP with Climate Change, and Probable Maximum Flood (PMF) events, and define the on-site flood conditions discussed in this section. The 1% AEP with climate change was modelled based on a predicted 30% increase in rainfall. This defined the pre-development (baseline) flood conditions against which flood impacts of the proposed development were assessed.

Existing peak 1% AEP and PMF depths and levels at the Site are shown in Figure 3.2 and Figure 3.3. Existing peak 1% AEP and PMF velocities at the Site are shown in Figure 3.4 and Figure 3.5. Table 3.1 lists the predicted maximum peak flood levels at three key locations within the Site. These key locations, shown in Figure 3.1, were selected based on the proposed development described in Section 4.1. Existing flood conditions at the Site for all events, including peak flood velocities and hazard classification are included in Annex A.

Table 3.1 Existing Peak Flood Levels

Design Event	Peak Flood Level (m AHD)		
	Location A	Location B	Location C
5% AEP	20.3	18.7	18.7
1% AEP	20.3	18.7	18.7
1% AEP with Climate Change	20.4	18.8	18.8
PMF	20.7	19.1	19.1

As shown in Figure 1.4 the Site grades significantly from McCredie Road south towards Prospect Creek. This topography is captured in the variation in peak flood level across the Site. Under existing conditions, minor increases to peak flood levels are expected with increasing event rarity and consideration of climate change for all events up to the PMF (in which a more substantial peak flood level increase occurs). The Existing Scenario TUFLOW model indicates that maximum peak flood depths on Site occur at:

- The Site frontage (Location A) with peak flood depths of up to 0.61 m in the 1% AEP event; and
- The detention basin along the south-east boundary (indicated in Figure 1.4) of the Site (with flood depths in excess of 1.6 m in the 1% AEP event).

Outside of the heavier ponding in these areas, peak flood depths are predominantly between 0.15 m and 0.3 m, with isolated areas above this threshold in the 1% AEP event.

The highest flood velocities occur along the eastern driveway into the Site and continue down along the eastern boundary. The maximum peak flood velocity of 1.0 m/s is adjacent to the northern boundary with McCredie Road. Outside of these concentrated areas of flow, velocities across the Site are very low; predominantly below 0.2 m/s, with some minor flowpaths below 0.4 m/s in the 1% AEP event.

Peak flood conditions scale significantly in the PMF event, with maximum peak flood depths at the north of the Site in excess of 1 m and widespread depths in excess of 0.5 m across the Site. Peak flood depths in the basin exceed 2.3 m. Higher velocities are also concentrated along both the east and west boundaries of the Site, with a maximum peak in excess of 2 m/s.

Legend

-  Site Boundary
-  Reporting Locations



Title:

Reporting Locations

Figure:

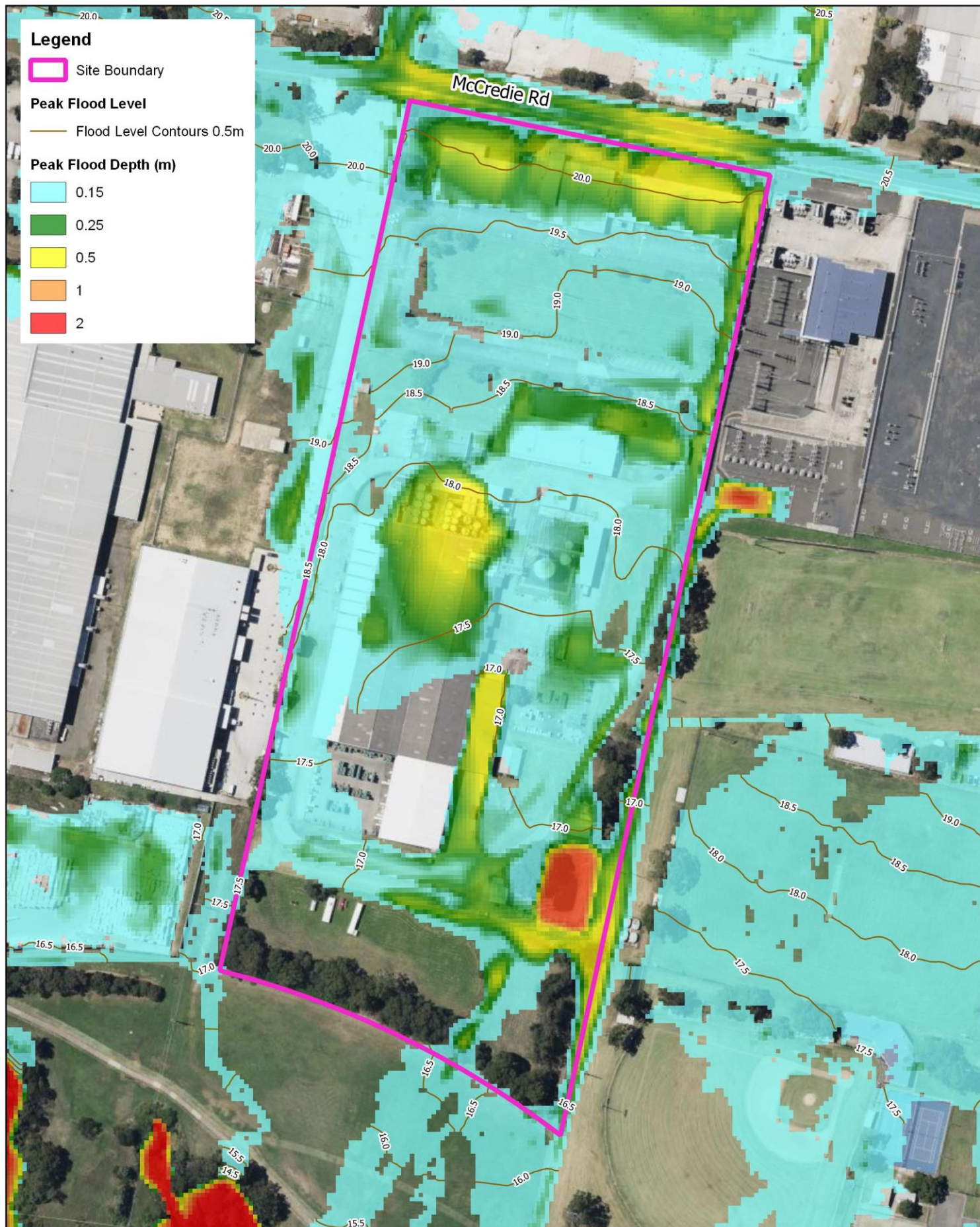
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Title:

Peak Flood Depths and Levels - Existing Conditions - 1% AEP Event

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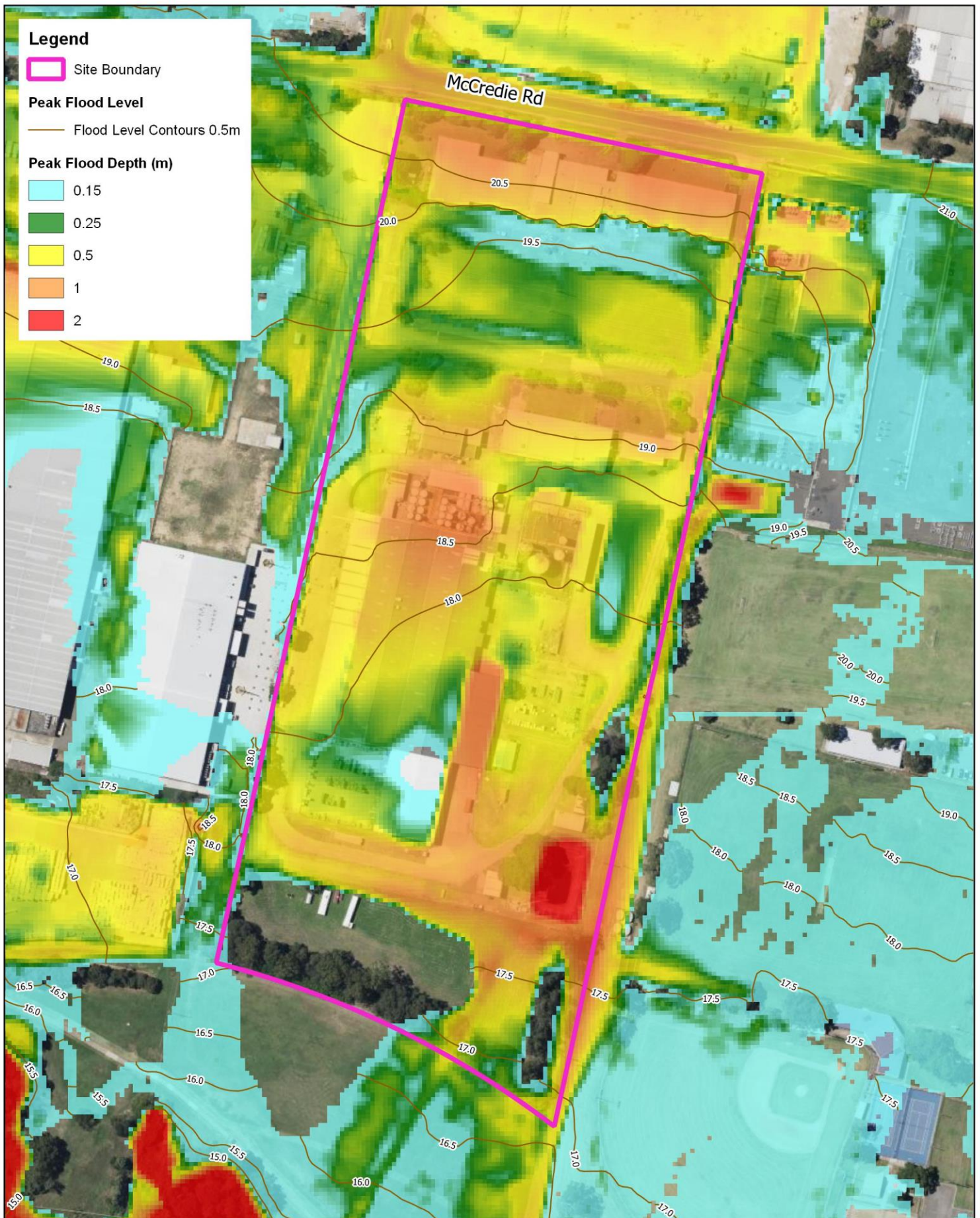
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Title:

Peak Flood Depths and Levels - Existing Conditions - PMF Event

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Figure:

3.3

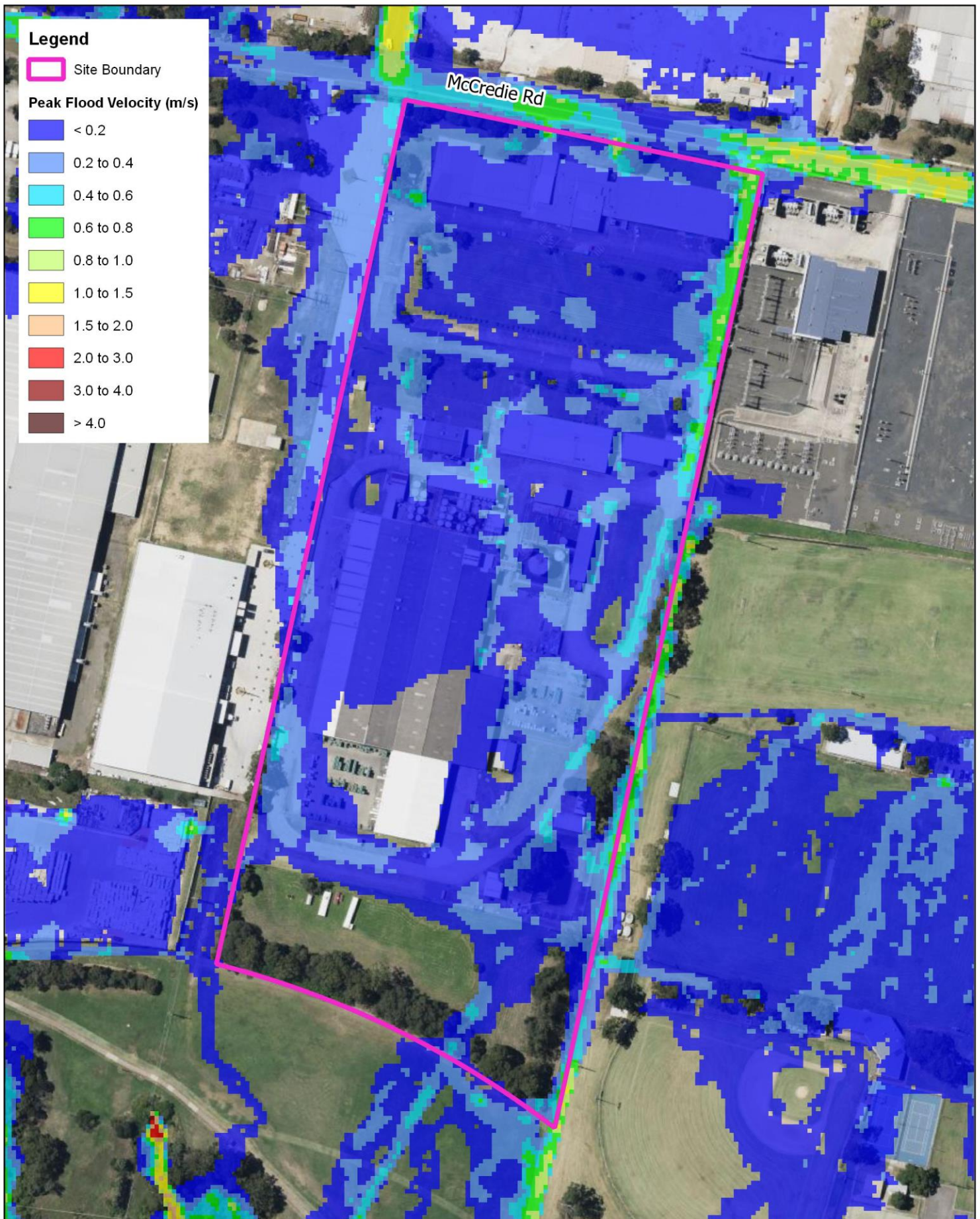
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Title:

Peak Flood Velocities - Existing Conditions - 1% AEP Event

Figure:

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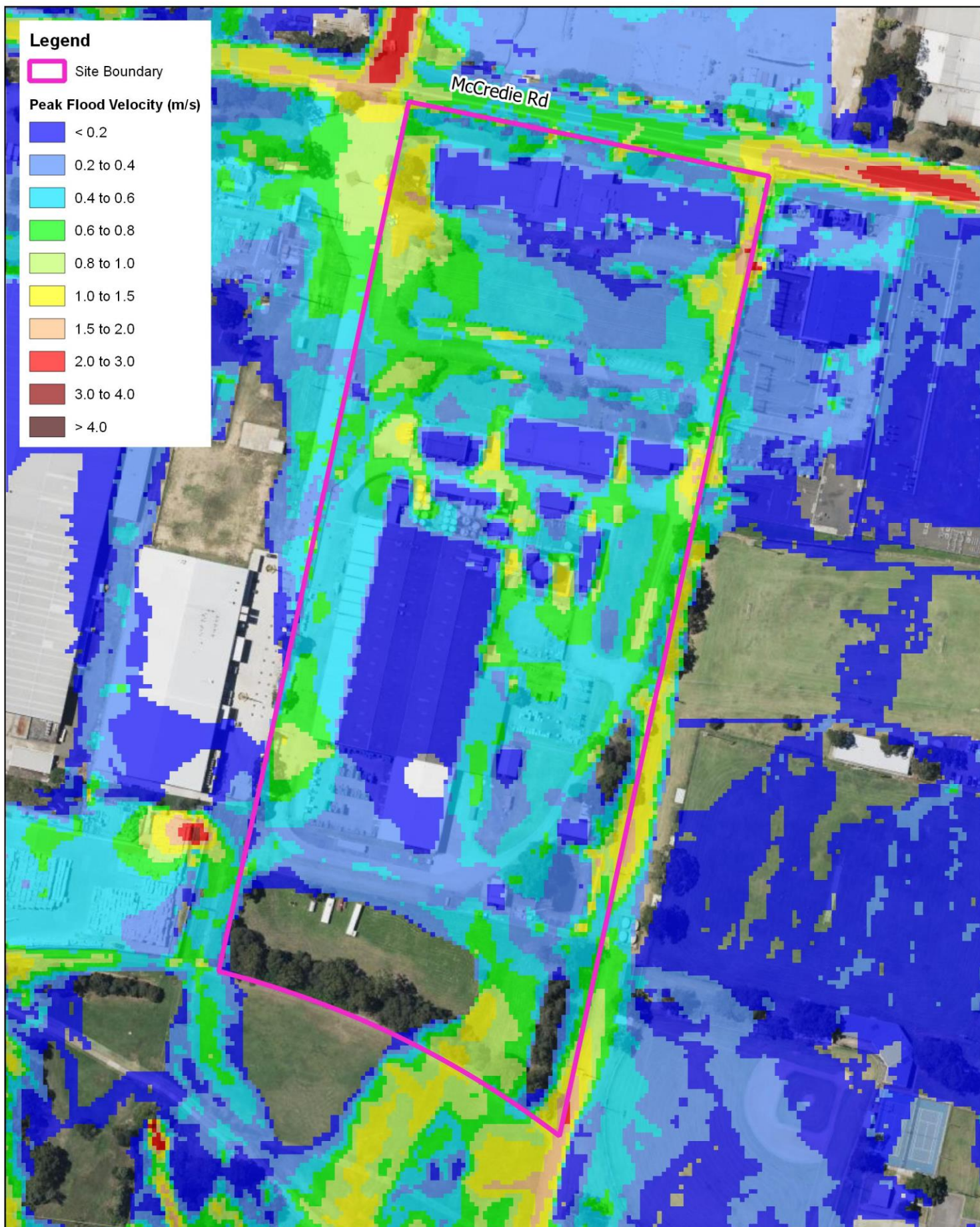
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Title:

Peak Flood Velocities- Existing Conditions - PMF Event

Figure:

3.5

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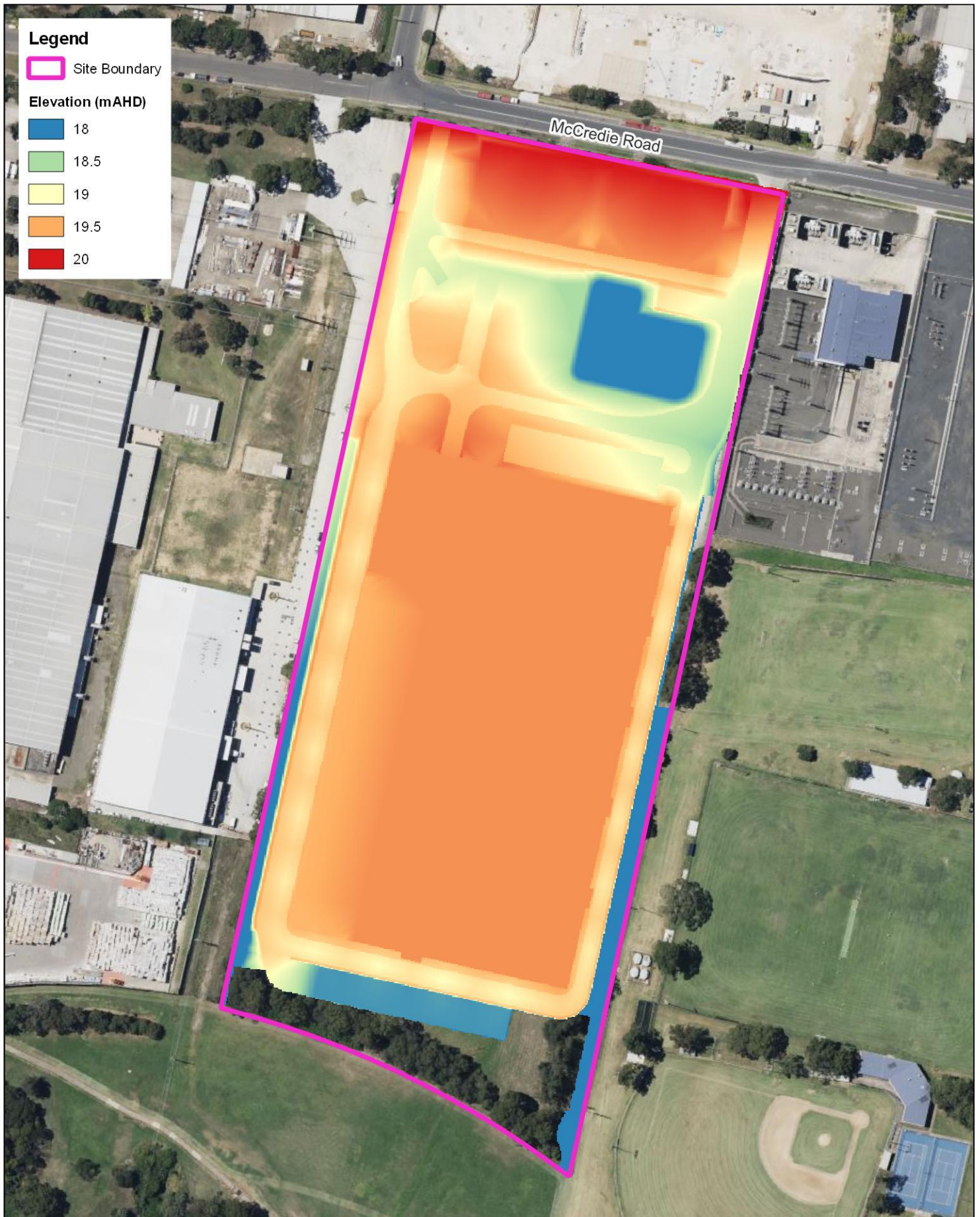
4 Post-Development Flood Behaviour

4.1 Model Updates

The proposed development comprises the following works at the Site:

- Clearing of the existing industrial site;
- Infilling of the existing stormwater basin;
- Construction of the data centre development;
- Driveways and carparking;
- Associated earthworks and infrastructure; and
- Flood Mitigation Works including
 - A flood mitigation basin at the northern portion of the Site
 - A drainage swale along the eastern boundary of the Site

These proposed works were provided in a Digital Elevation Model (DEM) format, shown in Figure 4.1. The proposed works DEM was incorporated into the Existing Scenario TUFLOW model, and this modified version of the model is referred to as the Post Development Scenario TUFLOW model. The Post-Development Scenario encompasses all work undertaken as part of Stage 1 and Stage 2 (see Section 1.3).



Title:

Proposed Works Digital Elevation Model

Figure:

4.1

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4.2 Potential Flood Impacts

The Post-Development Scenario TUFLOW model was used to simulate the 5% AEP, 1% AEP, 1% AEP with Climate Change and PMF events. Post-development scenario conditions for all events are shown in Annex B.

Modelling results were used to assess and map the relative flood impacts of the proposed development (i.e. peak flood levels from the post-development scenario minus peak flood levels from the existing scenarios). Peak 1% AEP event impact mapping is shown in Figure 4.2, while impact mapping for the remaining events is included as Annex C.

4.2.1 Peak Flood Level Impacts

Peak 1% AEP flood level impacts shown in Figure 4.2 indicate the proposed development will result in a decrease in peak flood level to the west of the site, along the northern boundary of the Site, and along the eastern boundary near the south-east corner, while causing increases in flood level up to 200mm to the north of the swale along the eastern boundary adjacent to the substation, and an increase in flood level downstream of the Site, at the south-east and south-west corners, discharging towards Prospect Creek. It is noted that flood level changes along the eastern boundary occur predominantly in non-trafficable areas, within the existing drainage swale or open space.

As can be seen from the figure, the proposed building will be flood free in a 1% AEP event. The proposed development will reduce flood affectation within the Site and increase the total flow path extent to the south of the Site.

4.2.2 Peak Flow Velocity Impacts

Peak 1% AEP flows flood velocity impacts shown in Figure 4.3 indicate the proposed development works will increase peak flood velocities off-site along the eastern boundary and downstream of the Site, with peak localised increases of up to 1 m/s.

4.2.3 Summary of Flood Behaviour

Off-site flood level and velocity impacts occur primarily due to the redistribution of flows as a result of the filling works associated with the proposed development. Under existing conditions, the Existing Scenario TUFLOW model indicates that the Site is affected by:

- Flows from McCredie Road to the north, which flows in through the openings of the front wall and down both driveway accesses and flood across the low-lying areas on the Site;
- Flows from the east, which under existing conditions flow along the easement to the east of the Site before exceeding the capacity of the easement and traversing through the Site; and
- Flows from the west, which under existing conditions flow along the easement to the west of the Site before exceeding the capacity of the easement and traversing through the Site.

As a result, all three areas, particularly McCredie Road and the easement to the east of the Site, have high concentrations of flood depths under existing conditions.

The expansion of the driveways and filing of the Site concentrates flows along the proposed driveways on the eastern and western boundaries, and prevents flows from traversing the Site along low-lying areas as per existing conditions. This results in an increased amount of flow concentrated into the northern part of the Site. This in turn, increases flows along the eastern easement (both within the swale and the drainage network), increasing flow discharging from the Site at the south-west corner and reducing flows discharging through the centre of the Site due to the proposed building – eventually discharging into Prospect Creek.

4.2.4 Cumulative Development Assessment

The Site is located at the lower portion of an overland flowpath which traverses from the Liverpool-Parramatta Transitway to the north, through properties on Warren Road, onto the Site and then discharges into Prospect Creek to the south of the Site. The area surrounding the Site (inclusive of the local suburbs draining south to the Prospect Creek watercourse) includes several properties which have current or approved SSD applications, including:

- 6 Herbet Place, Smithfield (immediately upstream of the Site on the same overland flowpath); and
- 28-54 Percival Road Smithfield, 15-21 Britton Street Smithfield and 7 Long Street, Smithfield which are located on a separate overland flowpath west of the Site. It is noted that development in these areas would not have the potential to impact on Site flood conditions, but would similarly ultimately discharge to Prospect Creek.

The full scale of developments at those properties, and the potential individual impacts on catchment flood behaviour, have not been assessed as part of this assessment. It is also noted that a catchment wide flood study would be required to quantitatively determine the potential effects of cumulative development of those properties on local and Prospect Creek flood conditions.

However, the following conclusion can be drawn from a high-level/qualitative assessment of cumulative flood conditions: providing development of properties along flowpaths discharging to Prospect Creek include flood mitigation works like the ones proposed at the Site – namely the inclusion of flood storage basin and drainage swale:

- Only localised changes to peak flood behaviour at those individual properties would be expected (i.e. a redistribution of flows) and;
- No significant cumulative flood impacts would be expected across the catchment.

4.3 Flood Assessment for Previous Designs

A Development Application (DA) was submitted for a separate Warehouse Development at the Site in July 2023. Cumberland City Council approved the DA subject to deferred commencement conditions including an amended Flood Impact Assessment Report. In response to the deferred commencement, a design modification was developed which included several flood mitigations works within the overall Site design to reduce impacts to neighbouring properties. These included:

- Inclusion of a swale along the eastern boundary to encourage flow away from neighbouring properties to the east
- Inclusion of a basin at the south-east corner of the Site to provide additional volume storage

The eastern boundary swale has been included within the current design, in addition to a large stormwater basin in the northern portion of the Site between the substation and data centre. Both measures in combination help to reduce flood level increases off-site, particularly along the eastern boundary where flow concentrations are highest. The basin at the south-east corner of the Site is not included in the current design in response to a Council request for tree retention purposes

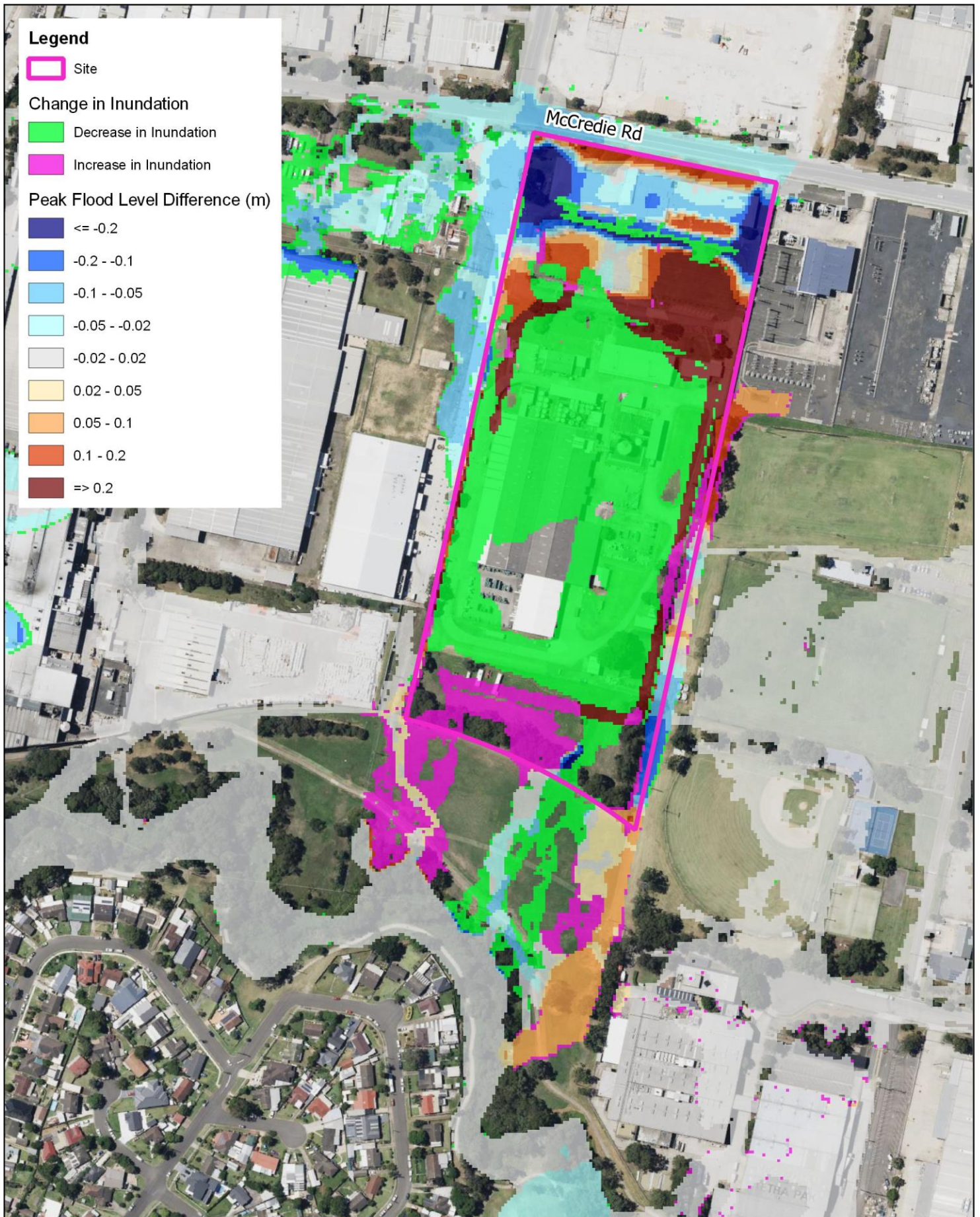
In September 2024, Cumberland City Council approved the modified DA subject to conditions including additional flooding requirements. These requirements are listed below:

69B. DACCZ19 – Flooding Requirements

- a. The flood impact assessment (FIA) report prepared by BMT dated 6 February 2024 should form part of the condition of consent.*
- b. The proposed swale in the FIA as flood mitigation measure along the eastern boundary to encourage flow away from neighbouring properties to the east is recommended to convert as 450 x 900 mm culvert. The dimension of the culvert must be determined by the applicant's consultant with the consultation of Council's Engineer. The culvert must be maintained by the property owner and a positive covenant must be signed in this regard.*
- c. The proposed basin located on the south of the Site (page 17 of FIA), downstream of the eastern swale/culvert to provide additional volume storage must be maintained by the owner of the proposed development.*
- d. Natural ground level external of the building must be maintained and it is recommended that any major cutting to change the ground levels of the site be avoided where possible.*
- e. All southern and northern fencing along the overland flow path up to 1% AEP flood level must be constructed of permeable pool type metal or with opening to provide passage for the free flow of flood water.*
- f. Future occupants of the development must seek refuge in the area that is flood free or higher than PMF level inside the building unless otherwise directed by the SES or other emergency management personnel.*
- g. A flood level monitoring gauge or device is recommended for the site and appropriate signage should be installed to aware the future occupants. An emergency flood evacuation plan must be prepared and made available for the future occupants.*

Peak flood impact maps associated with the approved DA Warehouse Design from the FIA report prepared by BMT dated 6 February 2024 are included in Annex D for reference purposes only. It is noted from the figures that the DA Warehouse Design will result in a decrease in peak flood level along the eastern boundary of the Site, increases in flood level downstream of the Site and re-distribution of flows along the north-western and north-eastern boundaries.

Similar to the results of the Warehouse DA and MOD assessment, this Data Centre application results in flood level changes along areas that are already subject to flooding. Flood level changes are also commensurate to impacts previously approved by Cumberland Council for the warehouse DA. It is considered that these flood level changes do not result in a material increase to flood risk either on or off Site.



Title:
Peak Flood Level Impact - 1% AEP Event

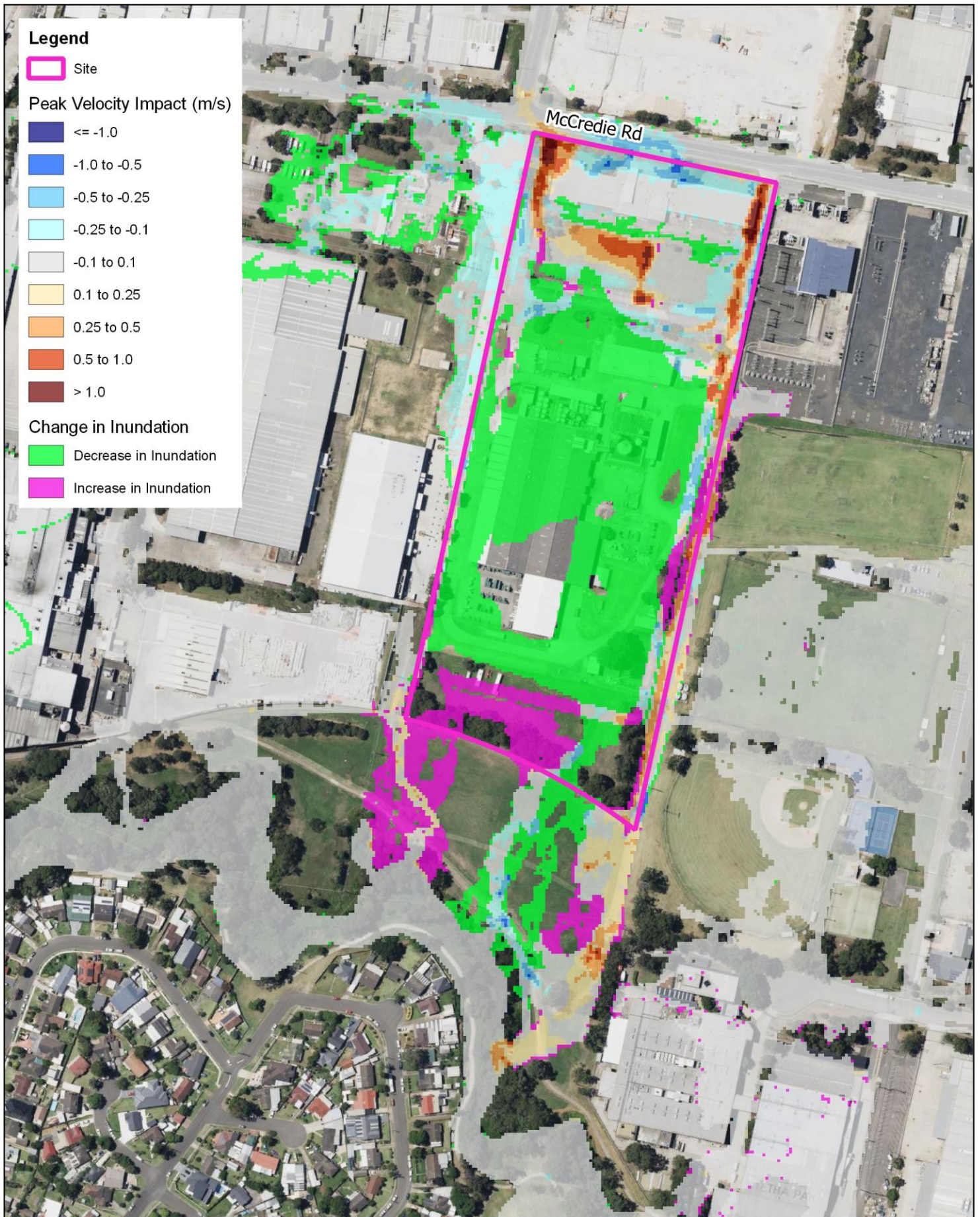
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0 80 160 m





Peak Flood Velocity Impact - 1% AEP Event

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4.4 Flood Hazard

The best practice flood risk management approach to flood hazard mapping (AIDR, 2017) classifies the floodplain into the six distinct hazard classifications (H1 to H6) shown in Figure 4.4. These hazard classifications are based on adopted thresholds of flood depth, velocity and depth-velocity product that identify when flood conditions are likely to present a risk to people, vehicles and buildings. A description of each hazard threshold is provided in Table 4.1.

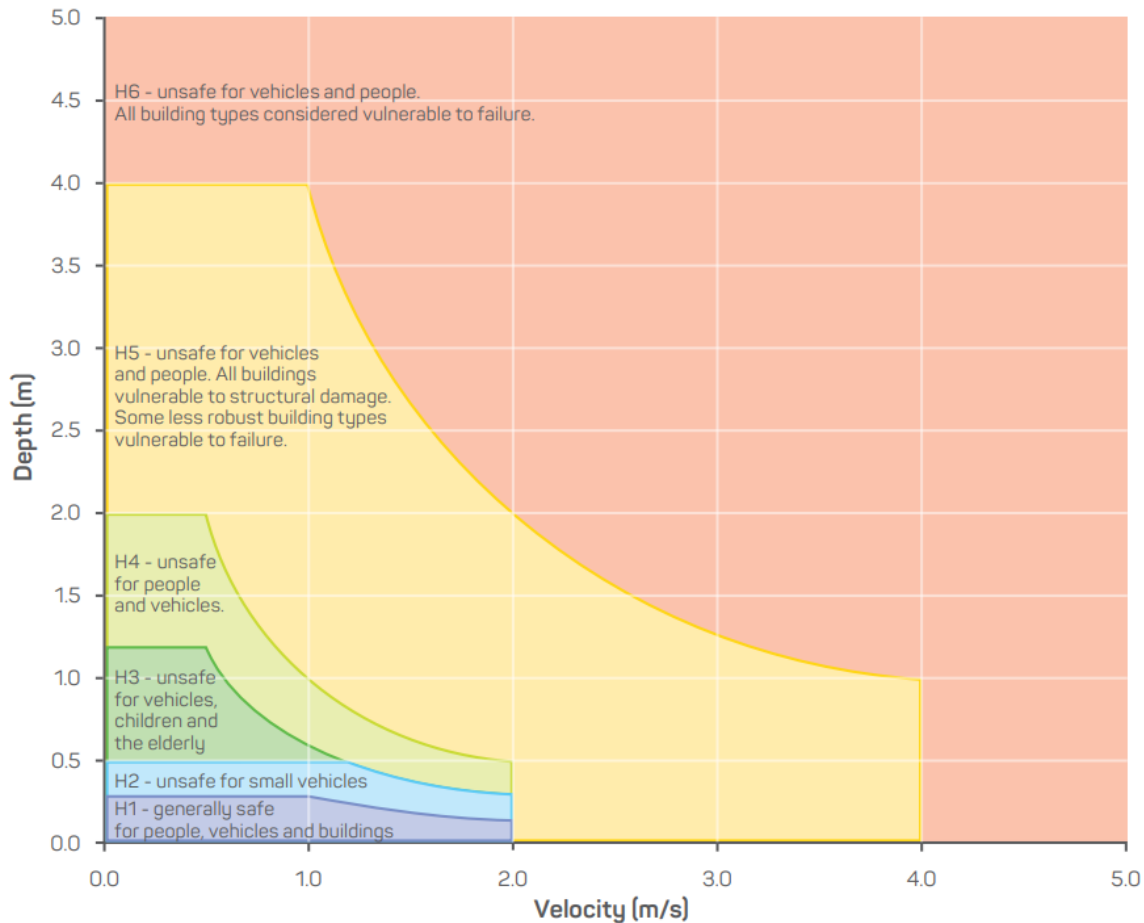


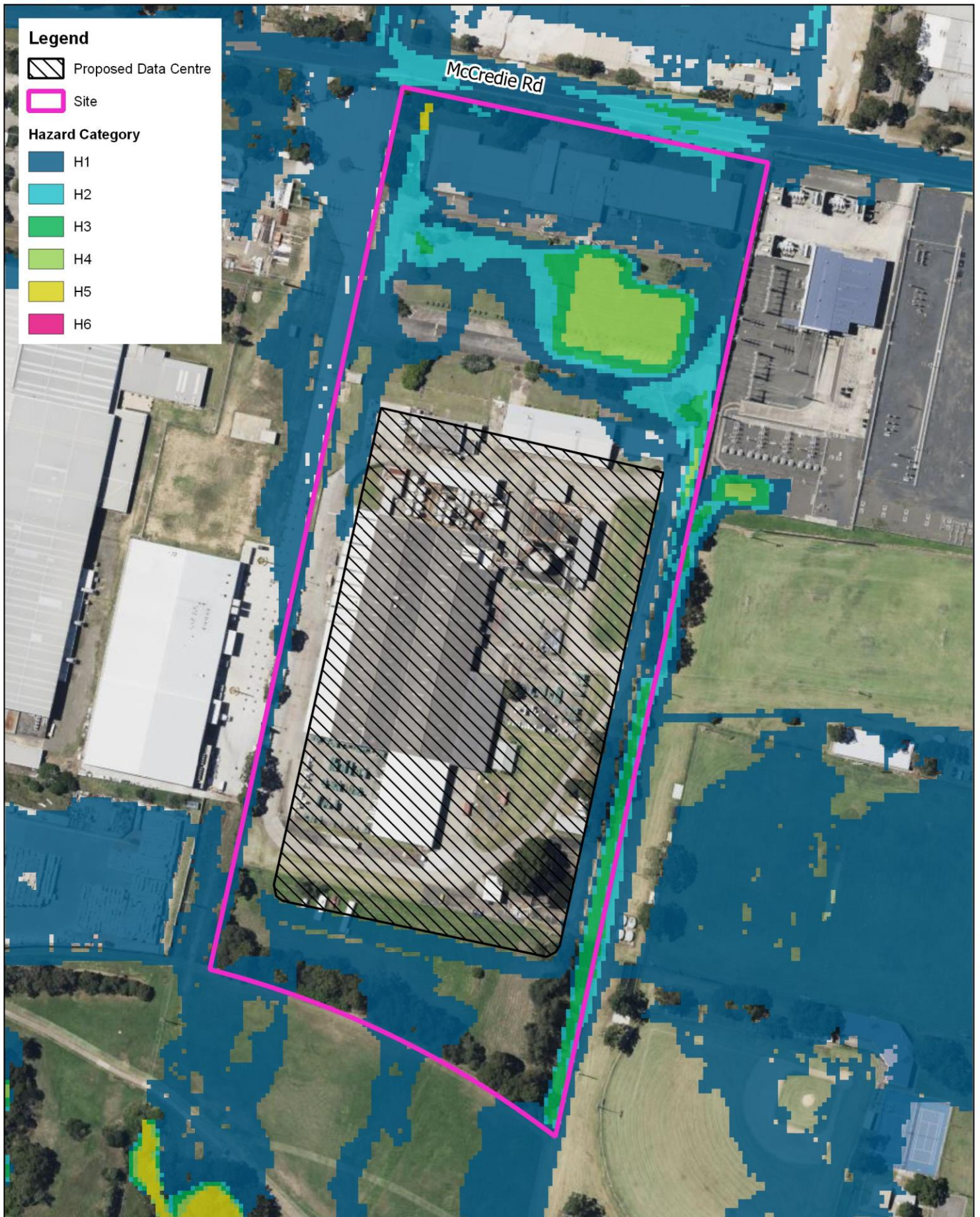
Figure 4.4 Flood Hazard Curves (2017)

Table 4.1 Flood Hazard Classification Thresholds (AIDR, 2017)

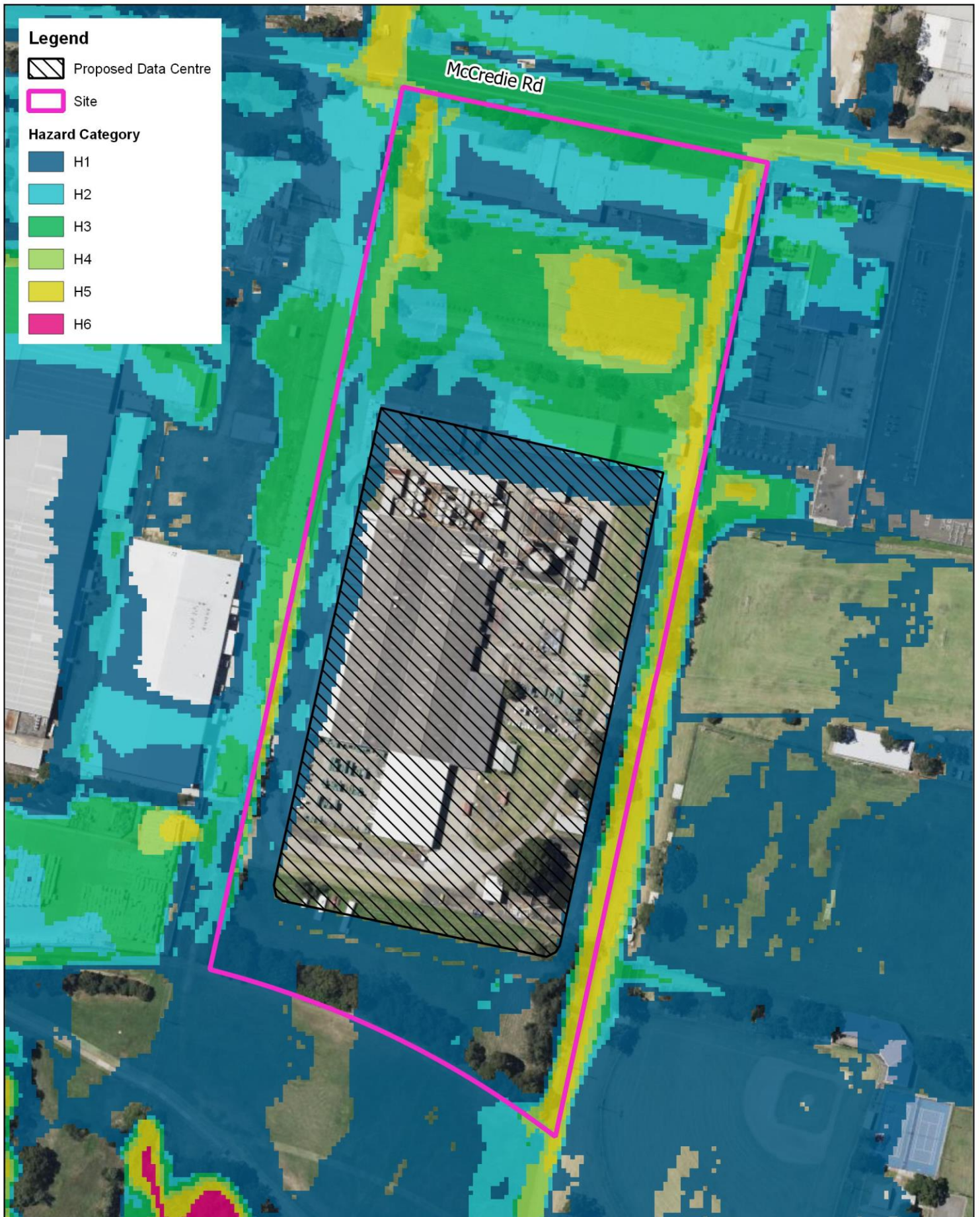
Hazard Classification	Description
H1	Generally safe for vehicles, people and buildings
H2	Unsafe for small vehicles.
H3	Unsafe for all vehicles, children and the elderly.
H4	Unsafe for all people and vehicles.
H5	Unsafe for vehicles and people. All building types vulnerable to structural damage. Some less robust building types vulnerable to failure.
H6	Unsafe for vehicles and people. All building types considered vulnerable to failure.

Flood hazard classification mapping for post-development conditions during all events is included in Annex B. In the 5% AEP Event, modelling results indicate flood hazard classification of H1 to H3 (with H4 present within the northern basin) on-site. The most hazardous areas of H3 are along the entrance to the driveway and east boundary of the Site. A slight increase in flood hazard is indicated during the 1% AEP Event, as shown in Figure 4.5, with H4 along the eastern boundary. The 1% AEP with Climate Change scenario indicates a larger extent of H2 across the northern portion of the site, as well as H4 adjacent to the northern basin, near the western access into the driveway, and along the eastern boundary. Up to and including the 1% AEP with Climate Change, the proposed building is flood free. As shown in Figure 4.6, the modelling results indicate a PMF flood hazard classification of H1 to H5 on-site under post-development conditions, with the highest hazard classification H5 along the western driveway access, the northern portion of the site adjacent to the northern basin, and along the eastern boundary. In the PMF event, the proposed data centre building is subject to hazard classification H1 along its north side but is largely flood-free otherwise.

As shown in Figure 4.6, the modelling results indicate a PMF flood hazard classification of H1 to H5 on-site under post-development conditions, with the highest hazard concentrations along the eastern boundary.



Title:	Figure:	Rev:
Peak Flood Hazard - Post-Development Conditions - 1% AEP Event	4.5	A
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Title:	Figure:	Rev:
Peak Flood Hazard - Post-Development Conditions - PMF Event	4.6	A
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5 Development Controls

5.1 General Flood Planning Requirements

Flood planning requirements for development with the Cumberland City Council LGA are set out in the following documents:

- Cumberland Development Control Plan (DCP) (2021), Part G – Miscellaneous Development Controls, Part G4 – Stormwater and Drainage
 - Section 2.6 Flood Risk Management
- Cumberland Local Environmental Plan (LEP) (2021), Section 5.21 Flood Planning

Flood related development consent conditions relevant to the Site have been extracted from these policies for this assessment and are shown in Table 5.1 and Table 5.2.

Table 5.1 Cumberland Development Control Plan (2021), Flood risk management

Cumberland City Council Requirement		BMT comment
General		
C1.	<i>The proposed development does not result in any increased risk to human life and does not increase the potential flood affectation on other development or properties</i>	The proposed development building will be located in low hazard areas for all events up to and including the PMF. As outlined in Section 4.2 the development will reduce flood levels to the west and along the northern boundary. Flood level changes are observed along the eastern and southern boundaries – with increases at the northern boundary and south of the Site and decreases along the southern boundary – along areas that are already subject to flooding. It is noted that flood level changes along the eastern boundary occur predominantly in non-trafficable areas, within the existing drainage swale or open space.

Table 5.2 Cumberland Local Environmental Plan 2021 – Flood Planning

Cumberland City Council Requirement	BMT comment
(2) <i>Development consent must not be granted to development on land the consent authority considers to be within the flood planning area unless the consent authority is satisfied the development –</i> (a) <i>is compatible with the flood function and behaviour on the land, and</i> (b) <i>will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of the other development or properties, and</i> (c) <i>will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.</i>	a) The proposed building works are located in areas affected by low velocity floodwaters for all events up to and including the PMF, which can be considered a flood storage/fringe area as per Cumberland Council's Map 2 Flood Hydraulics Category. The buildings are therefore compatible with flood function and behaviour. b) As outlined in Section 4.2 the development will reduce flood levels to the west and along the northern boundary. Flood level changes are observed along the eastern and southern boundaries – with increases at the northern boundary and south of the Site and decreases along the southern boundary – along areas that are already subject to flooding. c) Peak flood impacts are not expected to extend into the Prospect Creek watercourse and therefore it is not expected that changes to flood behaviour as a result of the development will result in adverse environmental impacts. Commentary on changes to stormwater discharge is included as part of the Integrated Water Management Plan prepared by Van Der Meer.

6 Conclusions and Recommendations

BMT have undertaken a site-specific flood impact assessment for the proposed development at 132 McCredie Road, Smithfield. This included modelling of existing and post-development overland flow flood conditions, within and in the vicinity of the Site based on modified versions of the Council Flood Study TUFLOW model that was previously adopted by Cumberland City Council to define flood conditions within the Prospect Creek catchment. The modelling results indicate the existing Site is impacted by peak floodwater depth of up to 0.6m and hazard classification of up to H3 (localised and within the basin up to H5) in 1% AEP events.

The proposed development incorporates several flood mitigation measures – including a swale along the eastern boundary and a flood storage basin at the northern portion of the Site – aimed at minimising off-site impacts associated with the works. The flood modelling conducted for this assessment indicates that the proposed development of the Site will result in reduced flood levels to the west and along the northern boundary. Flood level changes are observed along the eastern and southern boundaries – with increases at the northern boundary and south of the Site and decreases along the southern boundary – along areas that are already subject to flooding. It is considered that these flood level changes do not result in a material increase to flood risk either on or off Site.

Given the flash-flooding nature of Site affectation, and the presence of high hazard floodwaters in rare and extreme events it is recommended that a flood emergency response plan be developed for the Site prior to operations commencing, with preliminary consideration of available warning time for the closure of the Site prior to operation, opportunities for evacuation and the potential for temporary shelter-in-place in response to extreme events.

References

Australian Institute for Disaster Resilience (AIDR) (2017), Australian Disaster Resilience Handbook Collection Guideline 7-3 Flood Hazard.

NSW Department of Planning and Environment (2023), Flood Risk Management Manual

Cumberland City Council (2021), Cumberland Development Control Plan 2021

Cumberland City Council (2021), Cumberland Local Environmental Plan 2021

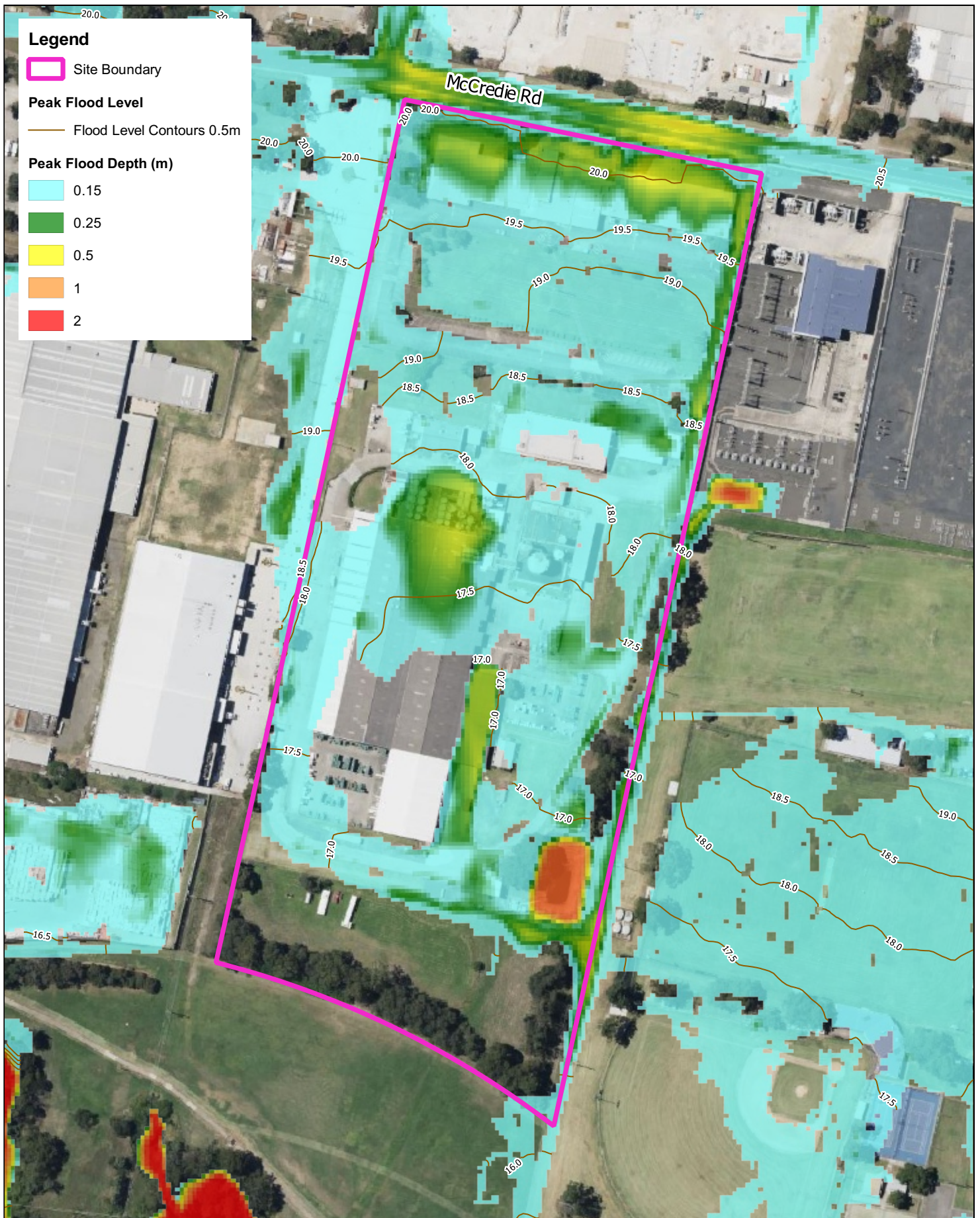
Cumberland City Council (2021), Map 2 Flood Hydraulic Categories

Lyll & Associates Consulting Water Engineers (2020), Holroyd City LGA Overland Flood Study

Van der Meer Consulting (2025), SY242-012_SSDA-C101_C SITE PLAN – STAGE 1

Van der Meer Consulting (2025), SY242-012_SSDA-C102_C SITE PLAN – STAGE 2

Annex A Existing Scenario Flood Mapping



Title:

Peak Flood Depths and Levels - Existing Conditions - 5% AEP Event

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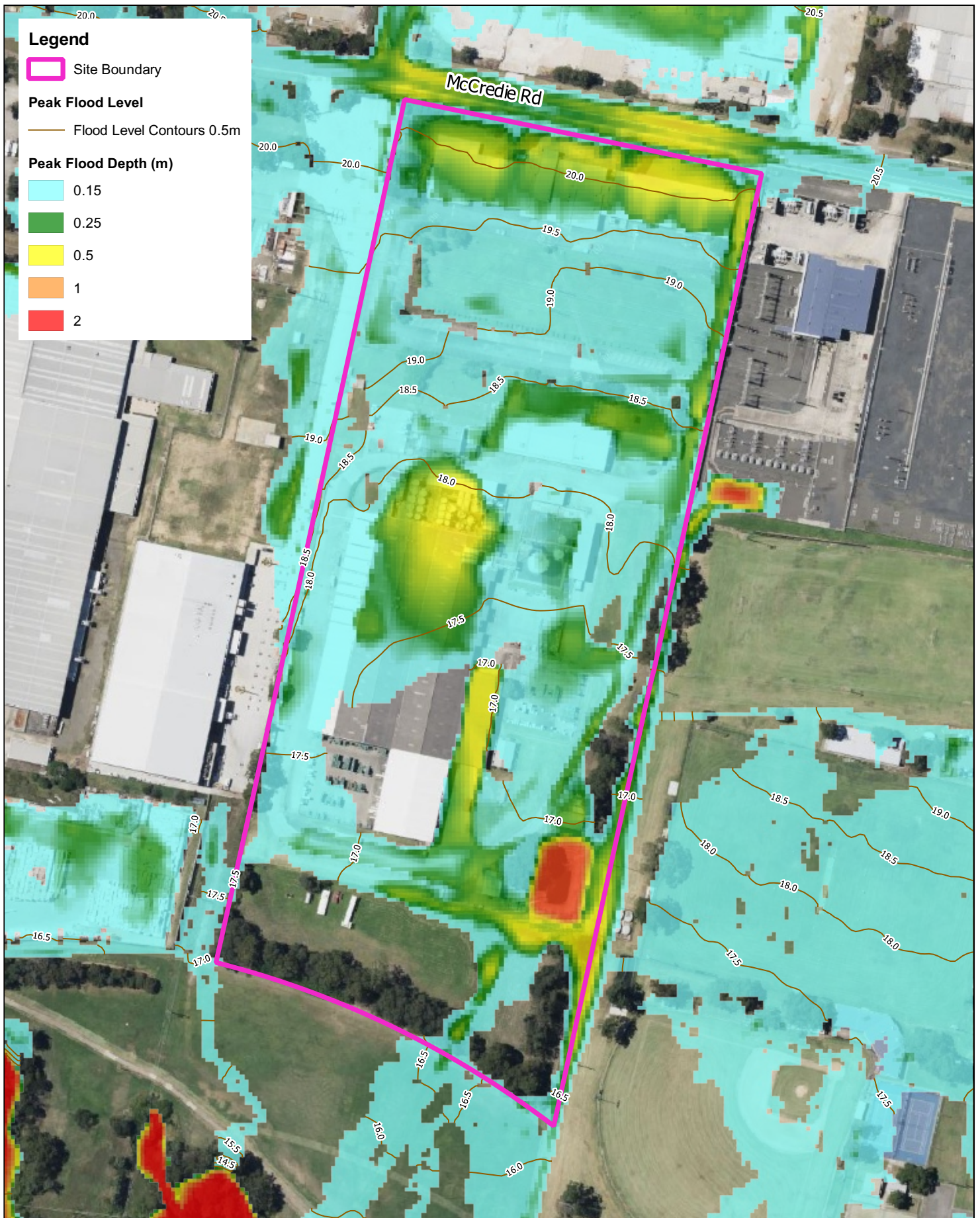
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Title:

Peak Flood Depths and Levels - Existing Conditions - 1% AEP Event

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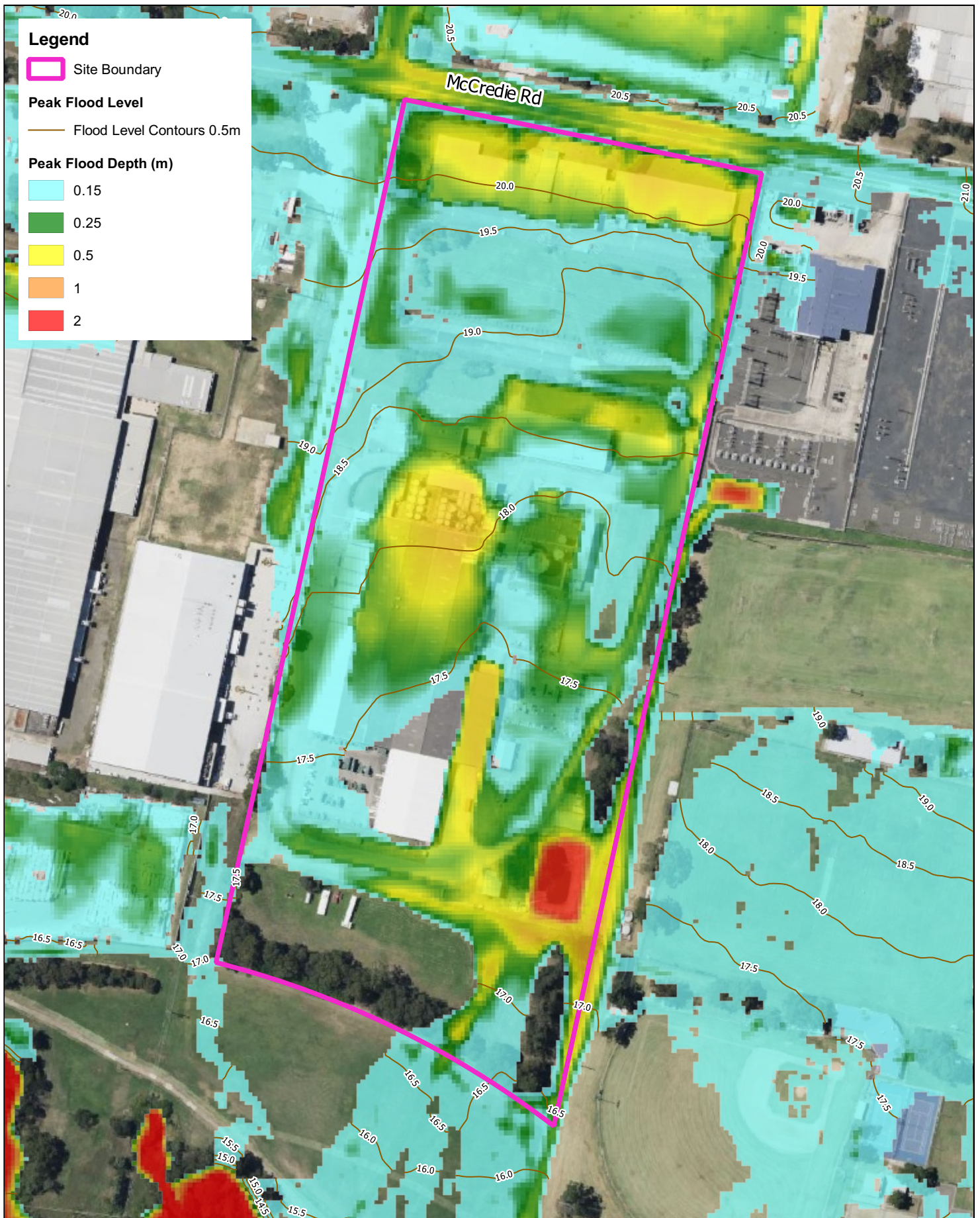
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Title:

Peak Flood Depths and Levels - Existing Conditions - 1% AEP Event with Climate Change (30% Increase in Rainfall)

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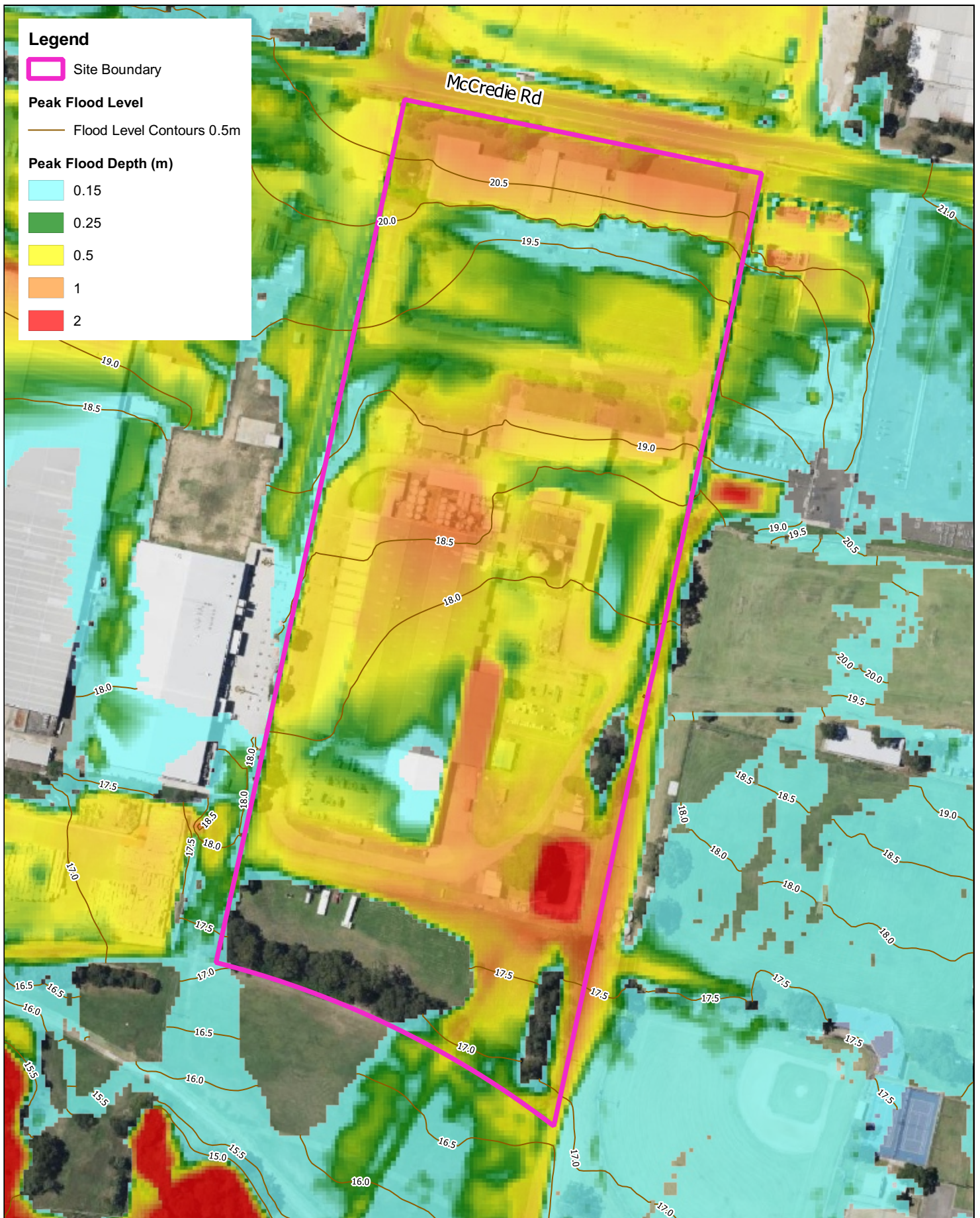
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Title:

Peak Flood Depths and Levels - Existing Conditions - PMF Event

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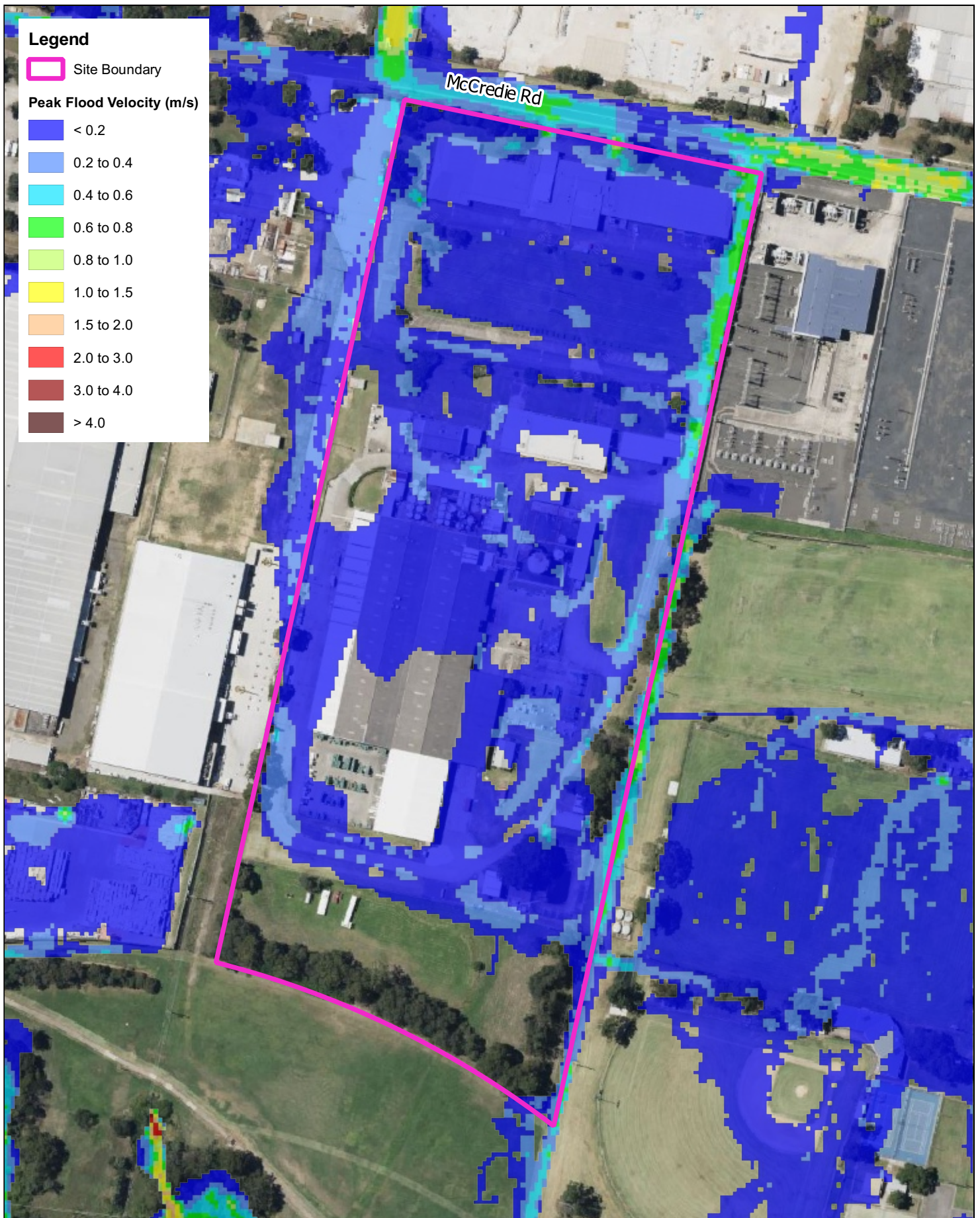
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Legend

 Site Boundary

Peak Flood Velocity (m/s)

- < 0.2
- 0.2 to 0.4
- 0.4 to 0.6
- 0.6 to 0.8
- 0.8 to 1.0
- 1.0 to 1.5
- 1.5 to 2.0
- 2.0 to 3.0
- 3.0 to 4.0
- > 4.0

Title:

Peak Flood Velocities - Existing Conditions - 5% AEP Event

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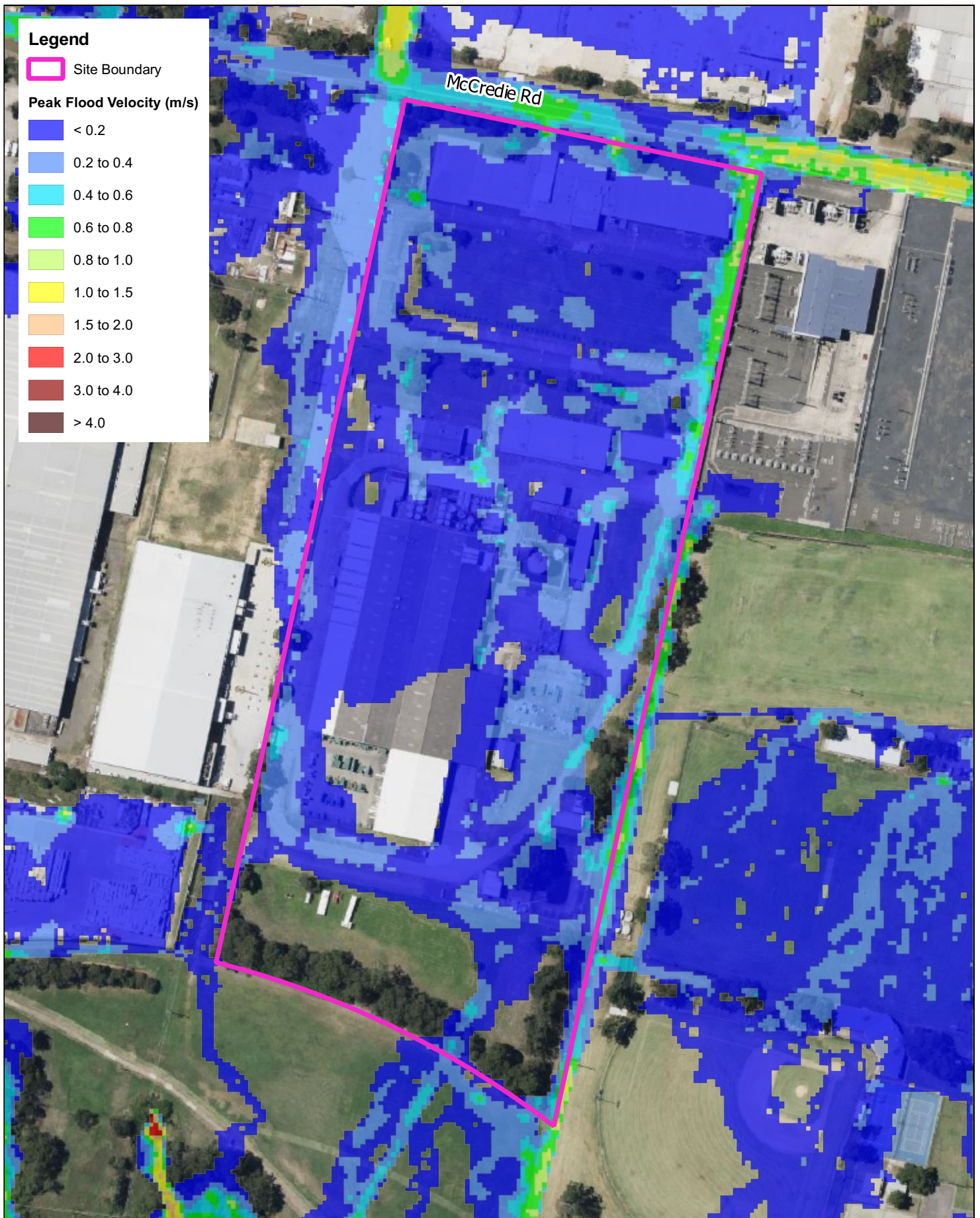
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Title:

Peak Flood Velocities - Existing Conditions - 1% AEP Event

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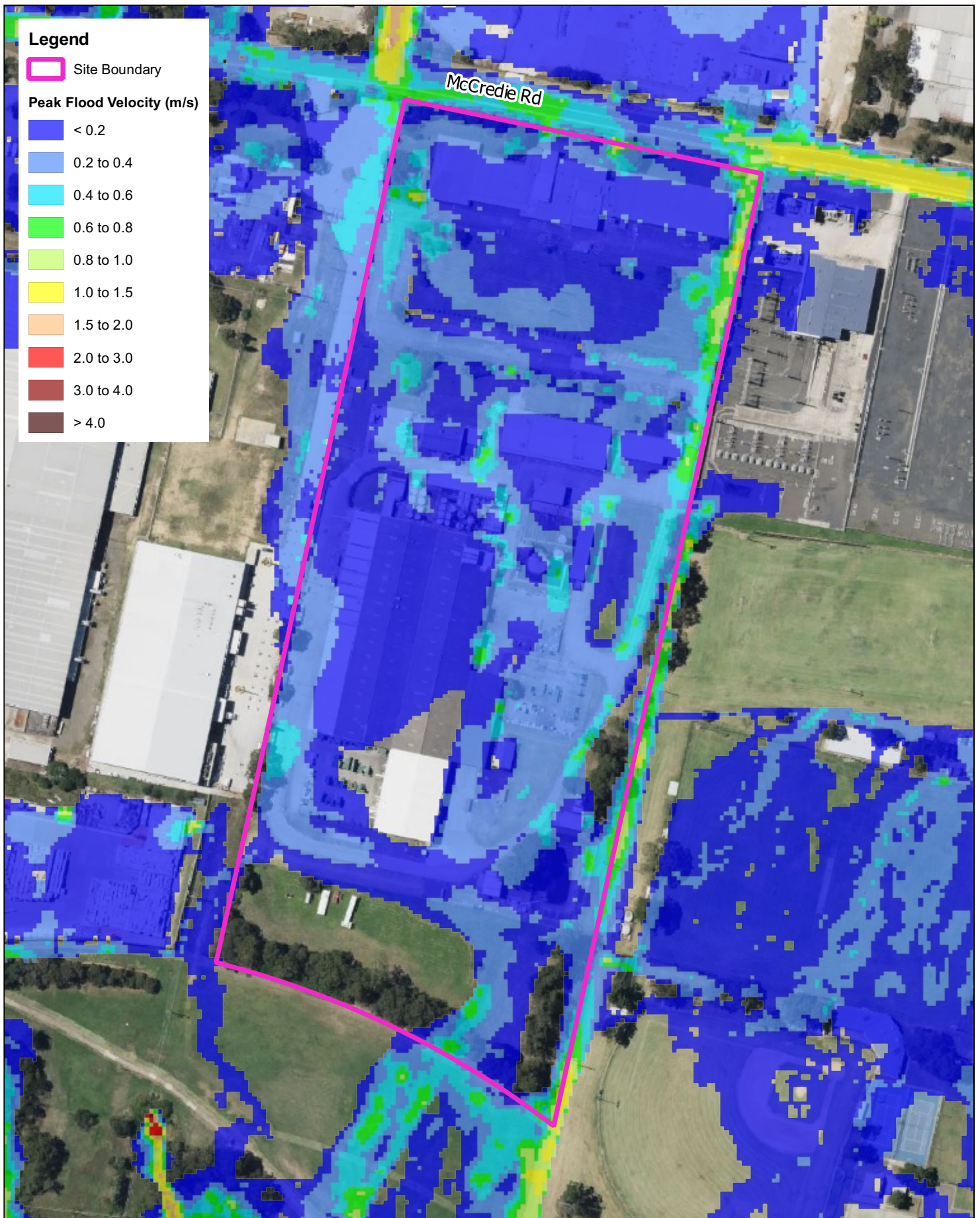
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Title:

Peak Flood Velocities - Existing Conditions - 1% AEP Event with Climate Change (30% Increase in Rainfall)

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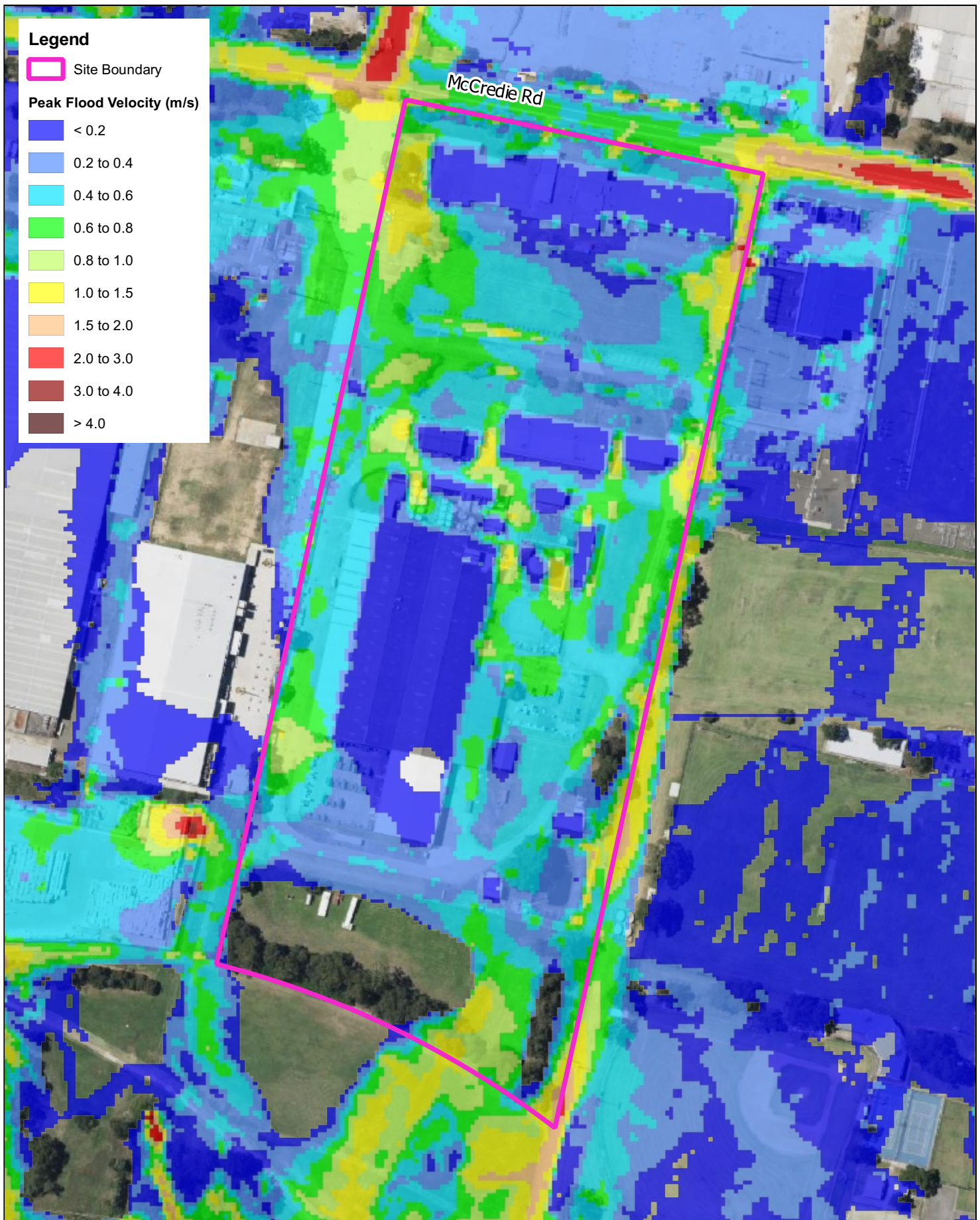
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Title:

Peak Flood Velocities- Existing Conditions - PMF Event

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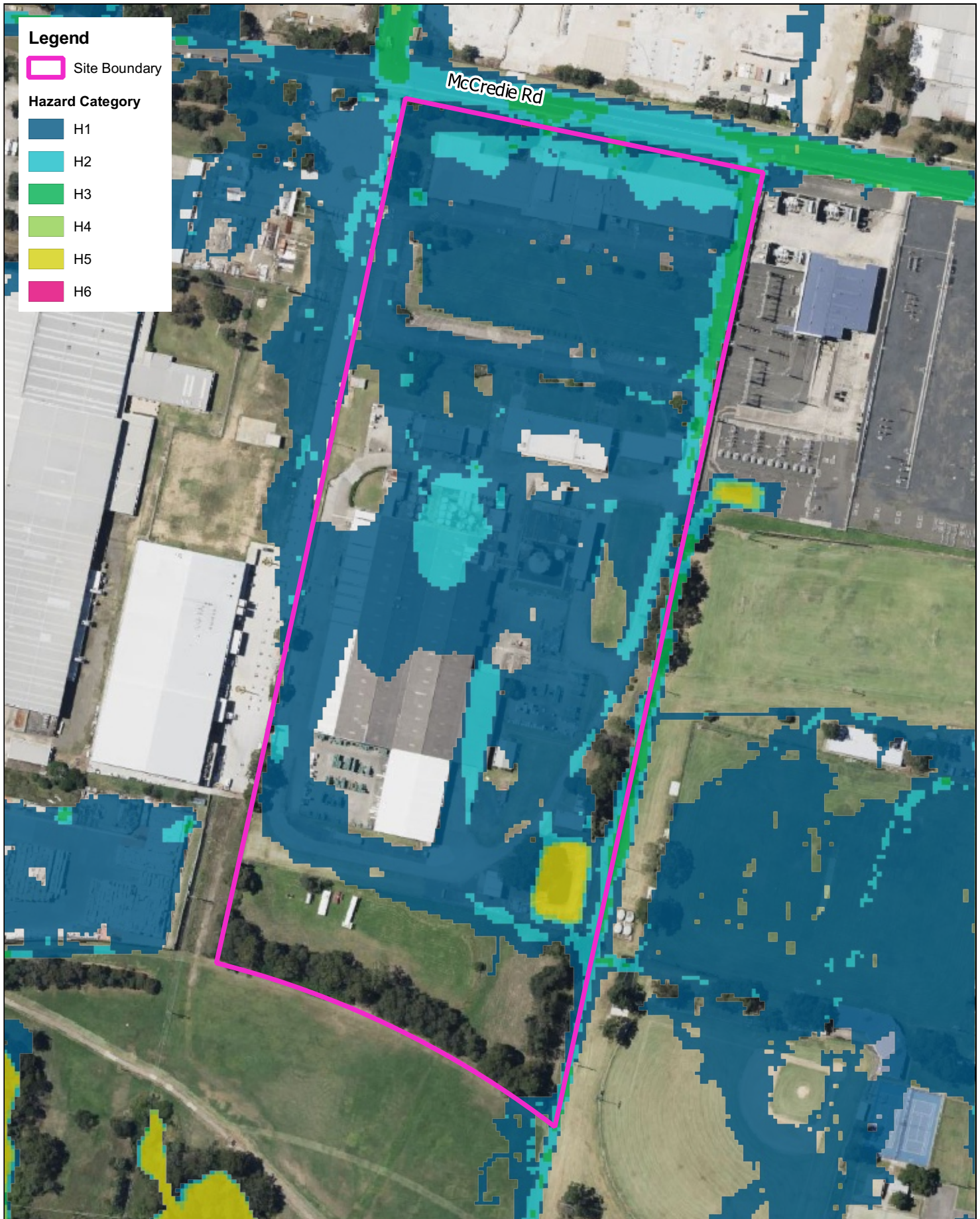
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Legend

- Site Boundary
- Hazard Category**
- H1
- H2
- H3
- H4
- H5
- H6

Title:
Peak Flood Hazard - Existing Conditions - 5% AEP Event

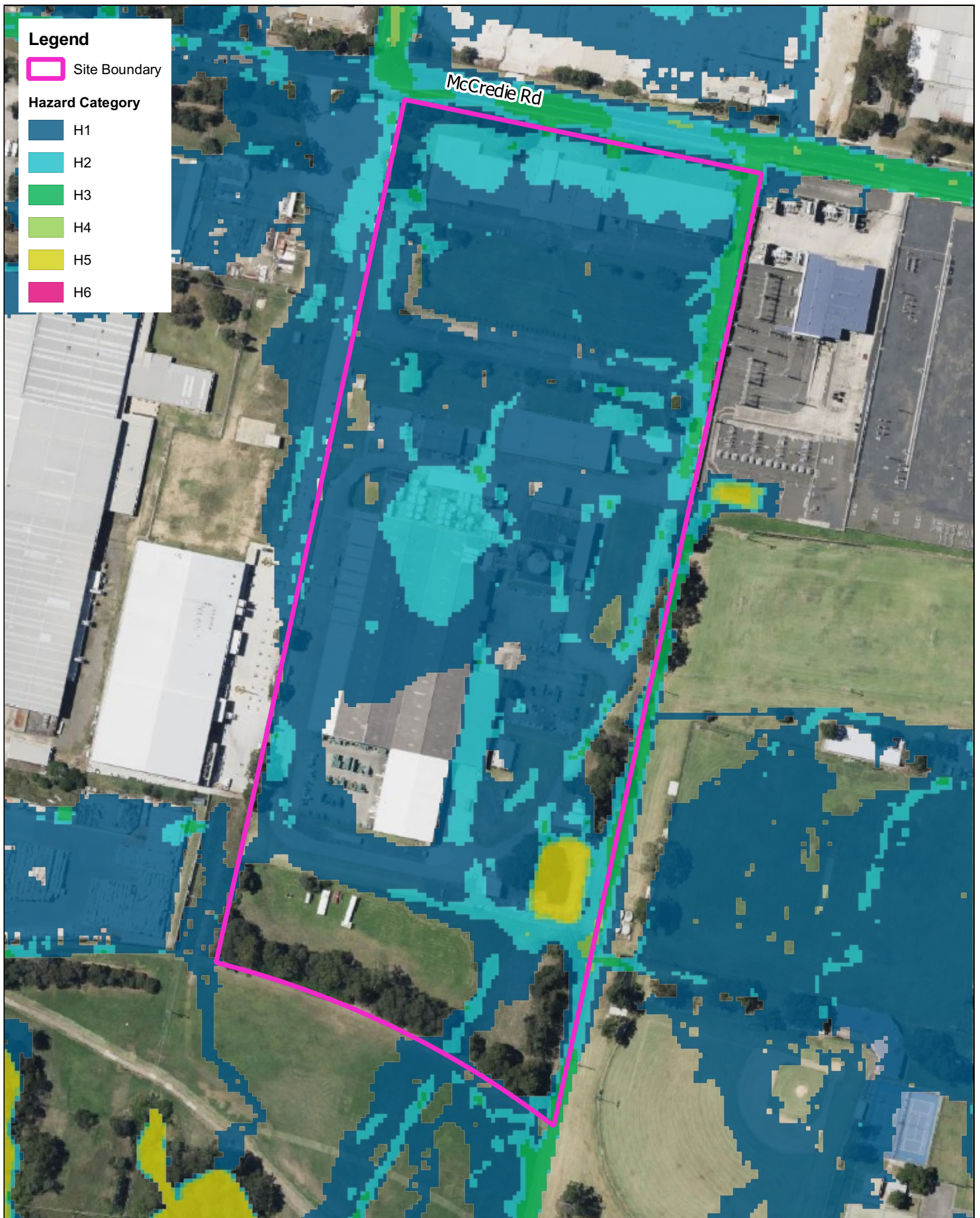
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Title:

Peak Flood Hazard - Existing Conditions - 1% AEP Event

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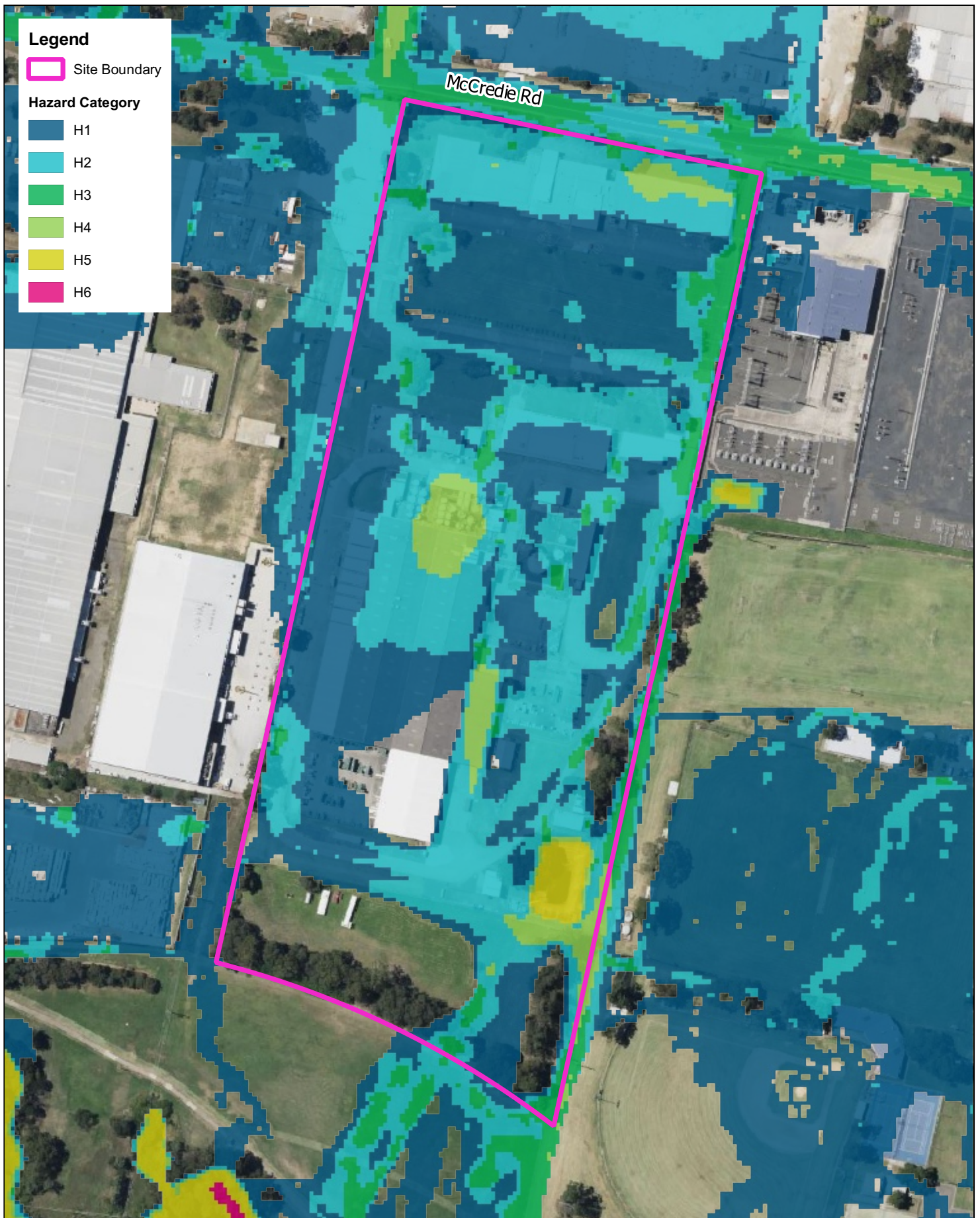
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Legend

 Site Boundary

Hazard Category

H1

H2

H3

H4

H5

H6

Title:

Peak Flood Hazard - Existing Conditions - 1% AEP Event with Climate Change (30% Increase in Rainfall)

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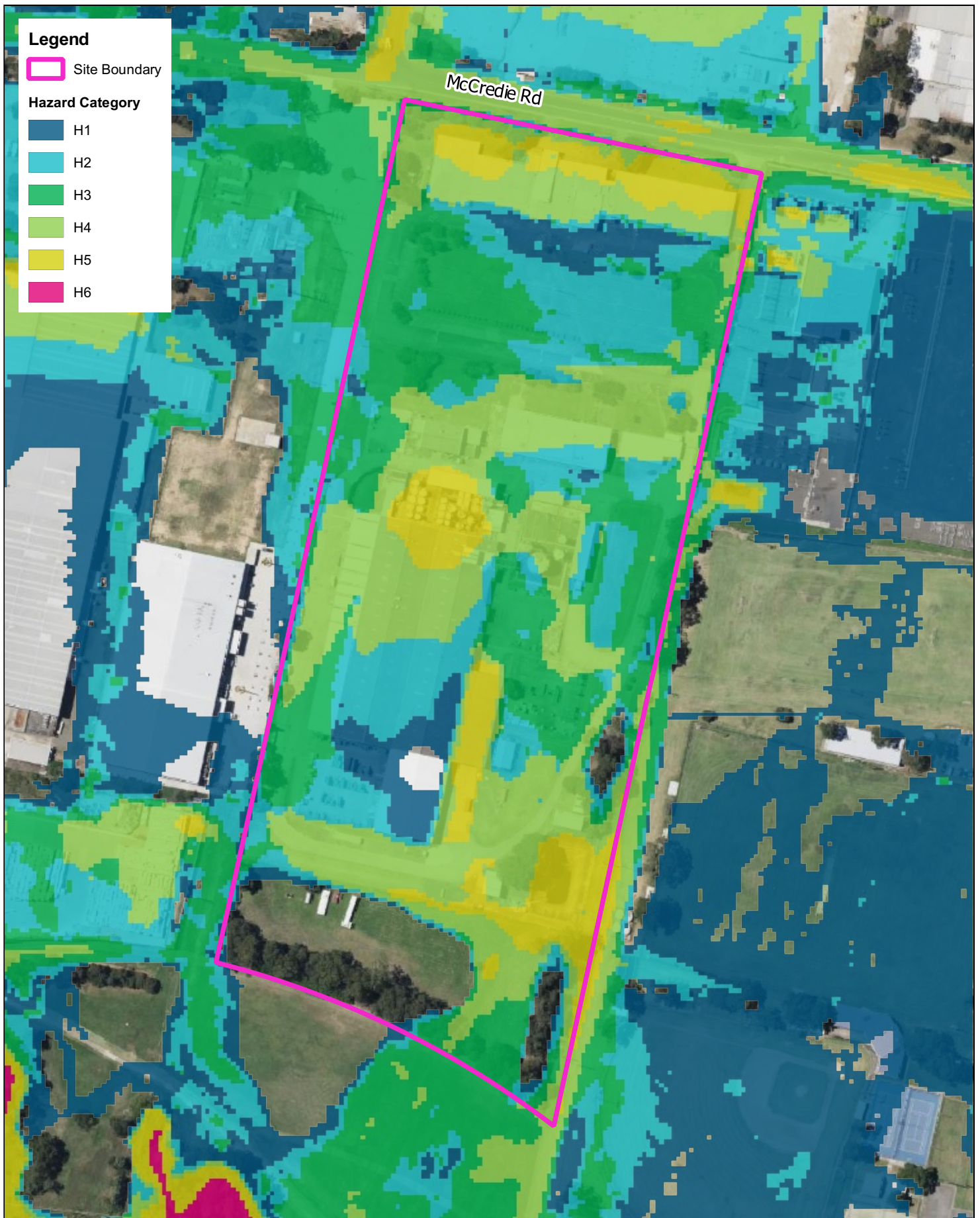
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Legend

 Site Boundary

Hazard Category

- H1
- H2
- H3
- H4
- H5
- H6

Title:

Peak Flood Hazard - Existing Conditions - PMF Event

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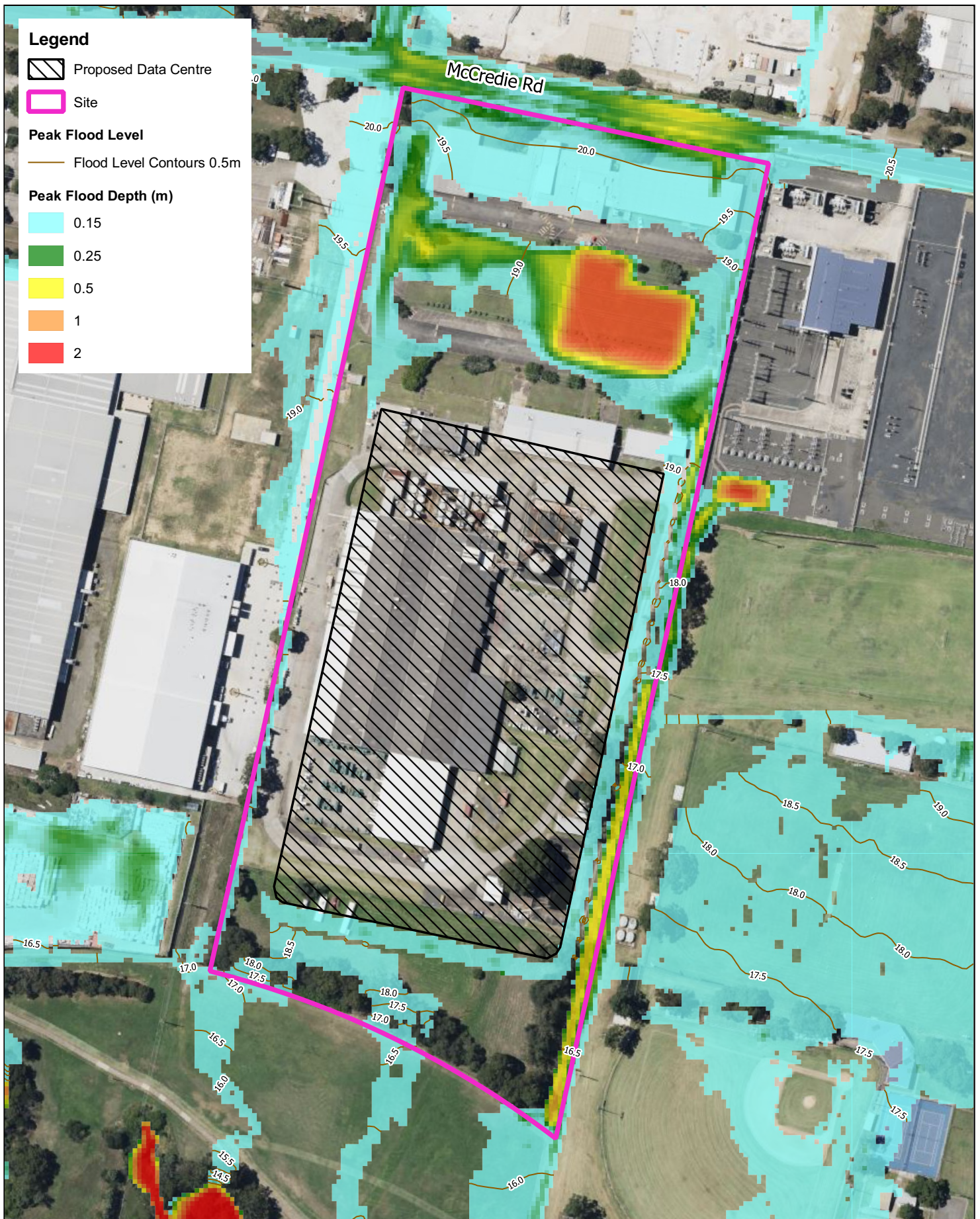
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Annex B Post-Development Scenario Flood Mapping



Title:

Peak Flood Depths and Levels - Post-Development Conditions - 5% AEP Event

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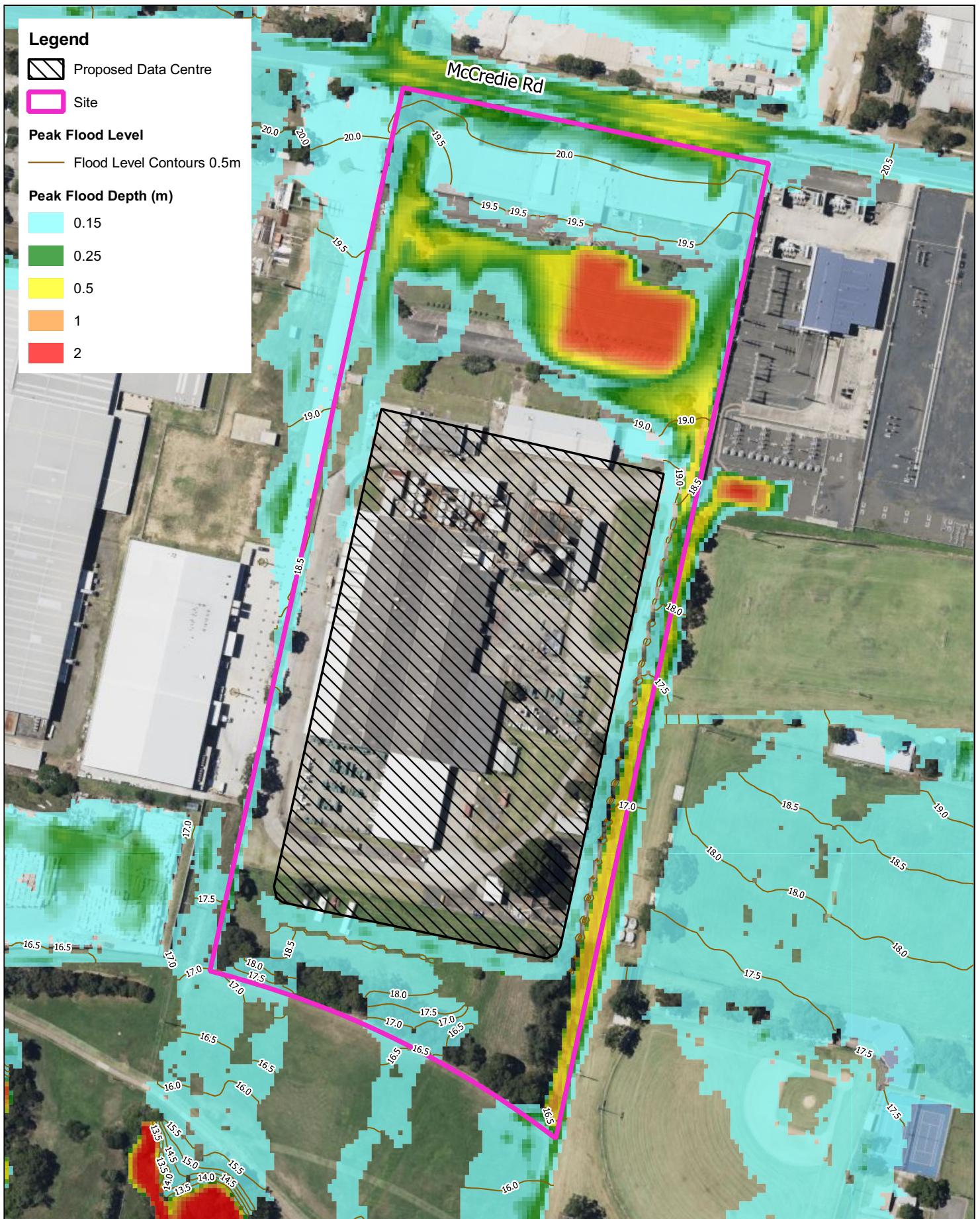
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Title:

Peak Flood Depths and Levels - Post-Development Conditions - 1% AEP Event

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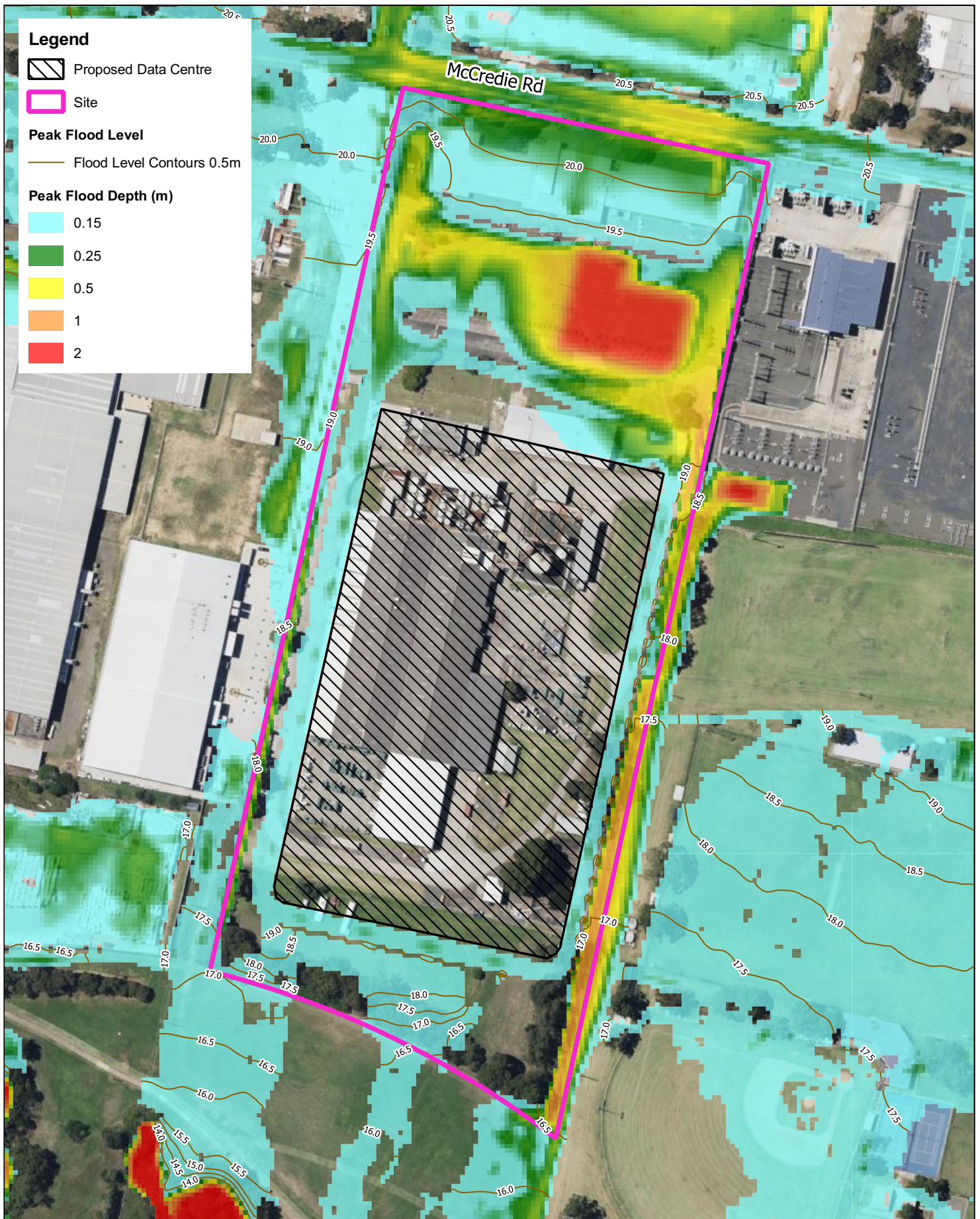
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Title:

Peak Flood Depths and Levels - Post-Development Conditions - 1% AEP Event with Climate Change (30%)

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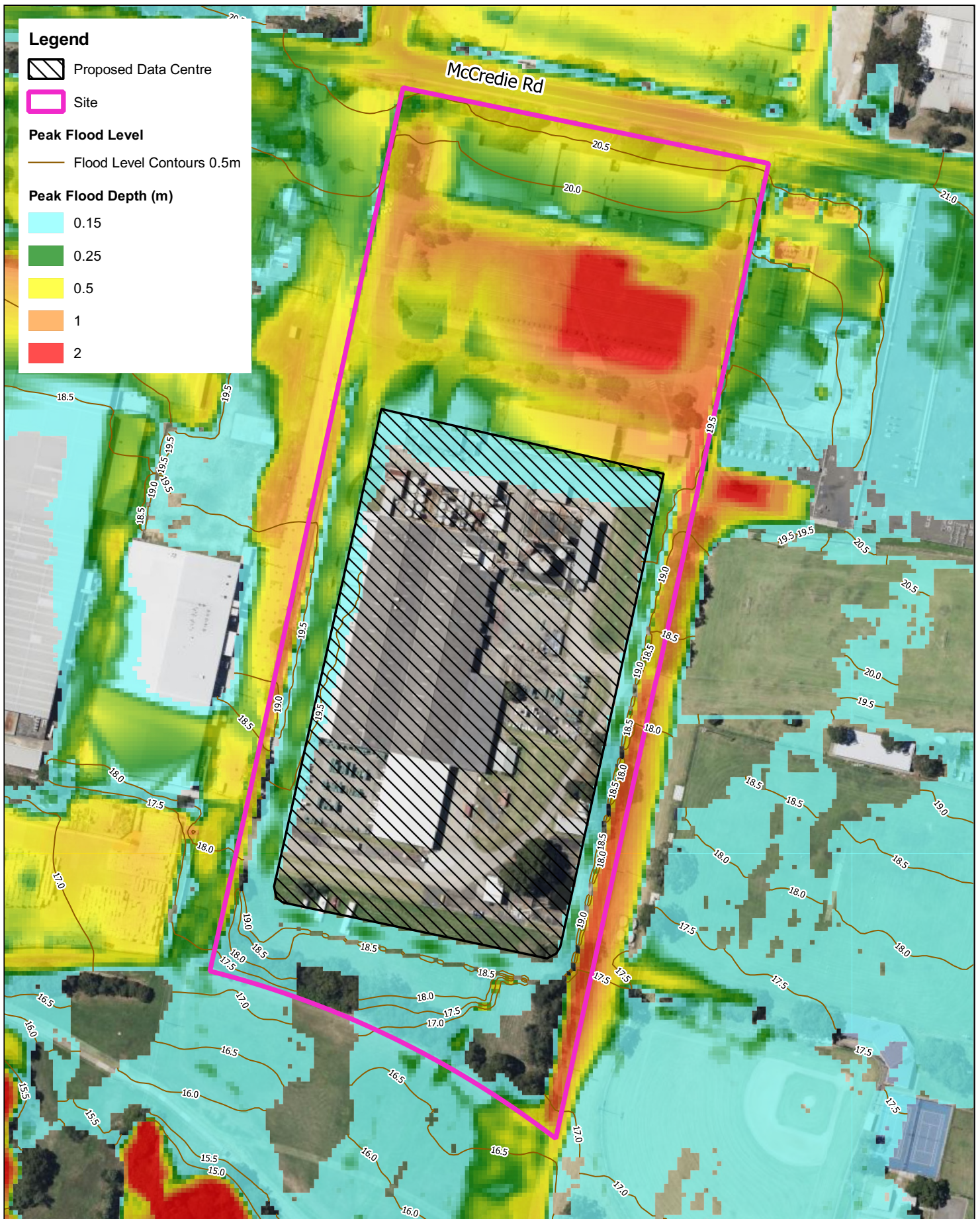
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Title:

Peak Flood Depths and Levels - Post-Development Conditions - PMF Event

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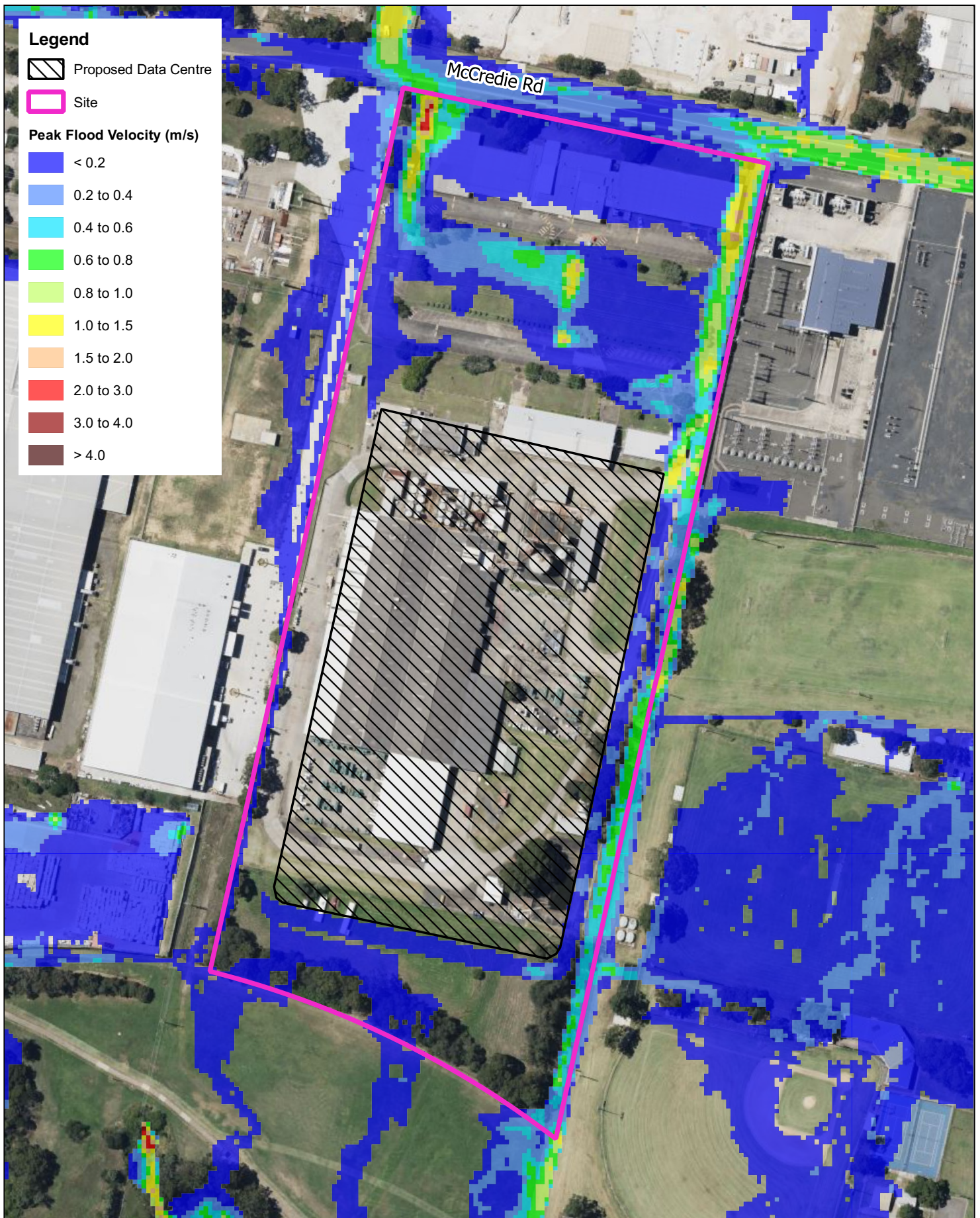
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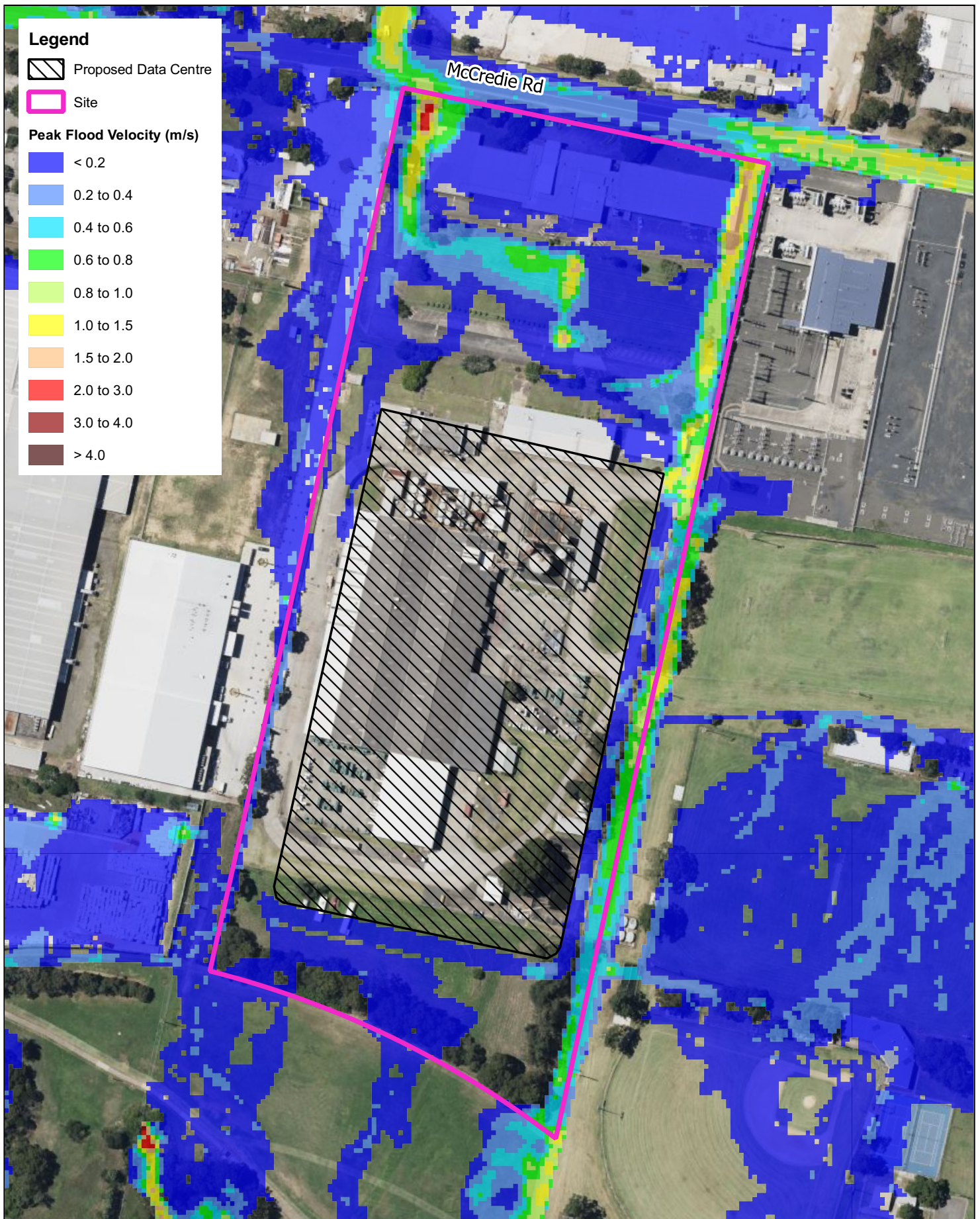
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Title: Peak Flood Velocities - Post-Development Conditions - 5% AEP Event	Figure: B-05	Rev: A
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Title:

Peak Flood Velocities - Post-Development Conditions - 1% AEP Event

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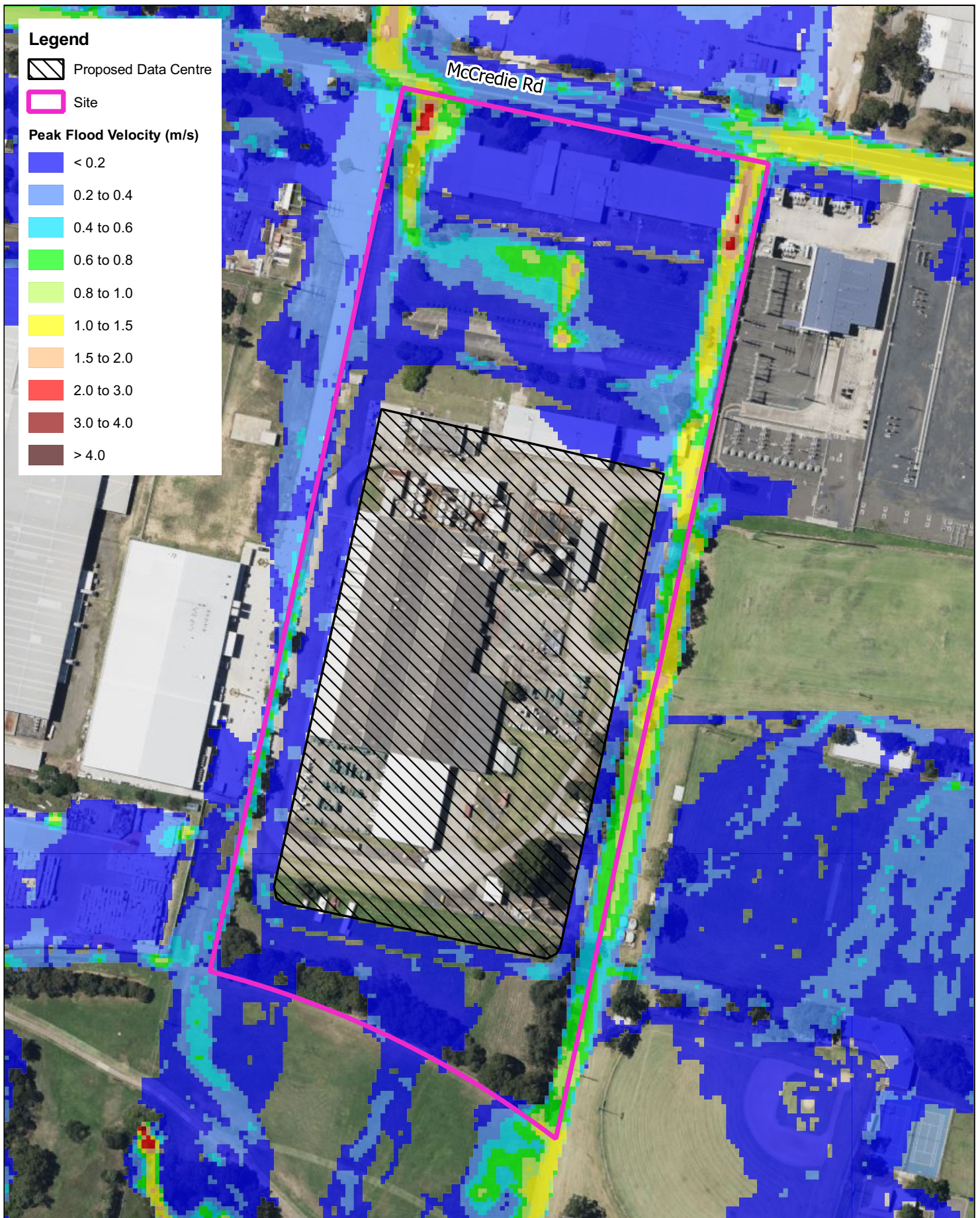
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Title:

Peak Flood Velocities - Post-Development Conditions - 1% AEP Event with Climate Change (30% Increase in Rainfall)

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0 50 100 m



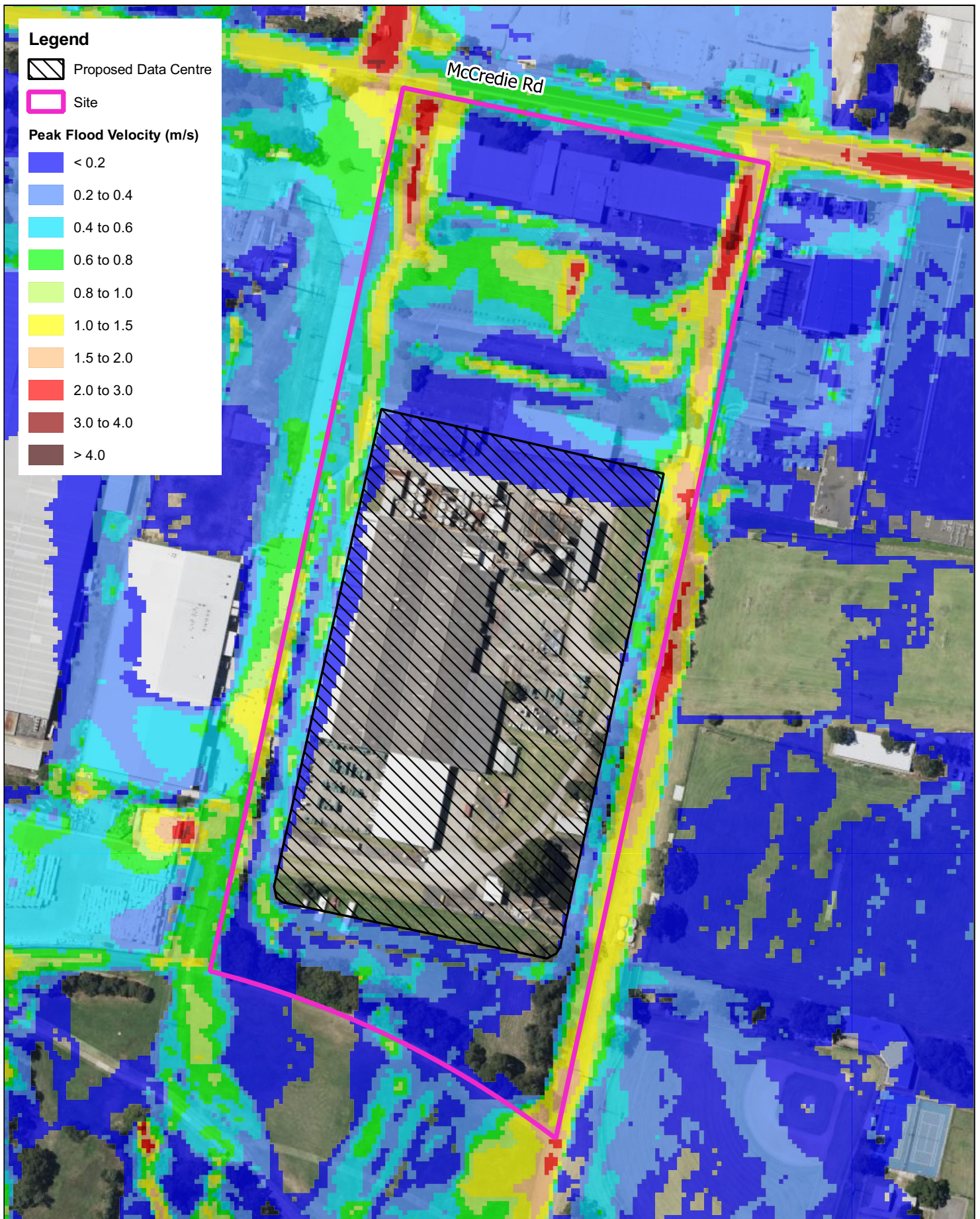
Figure:

B-07

Rev:

A





Title:

Peak Flood Velocities - Post-Development Conditions - PMF Event

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0 50 100 m

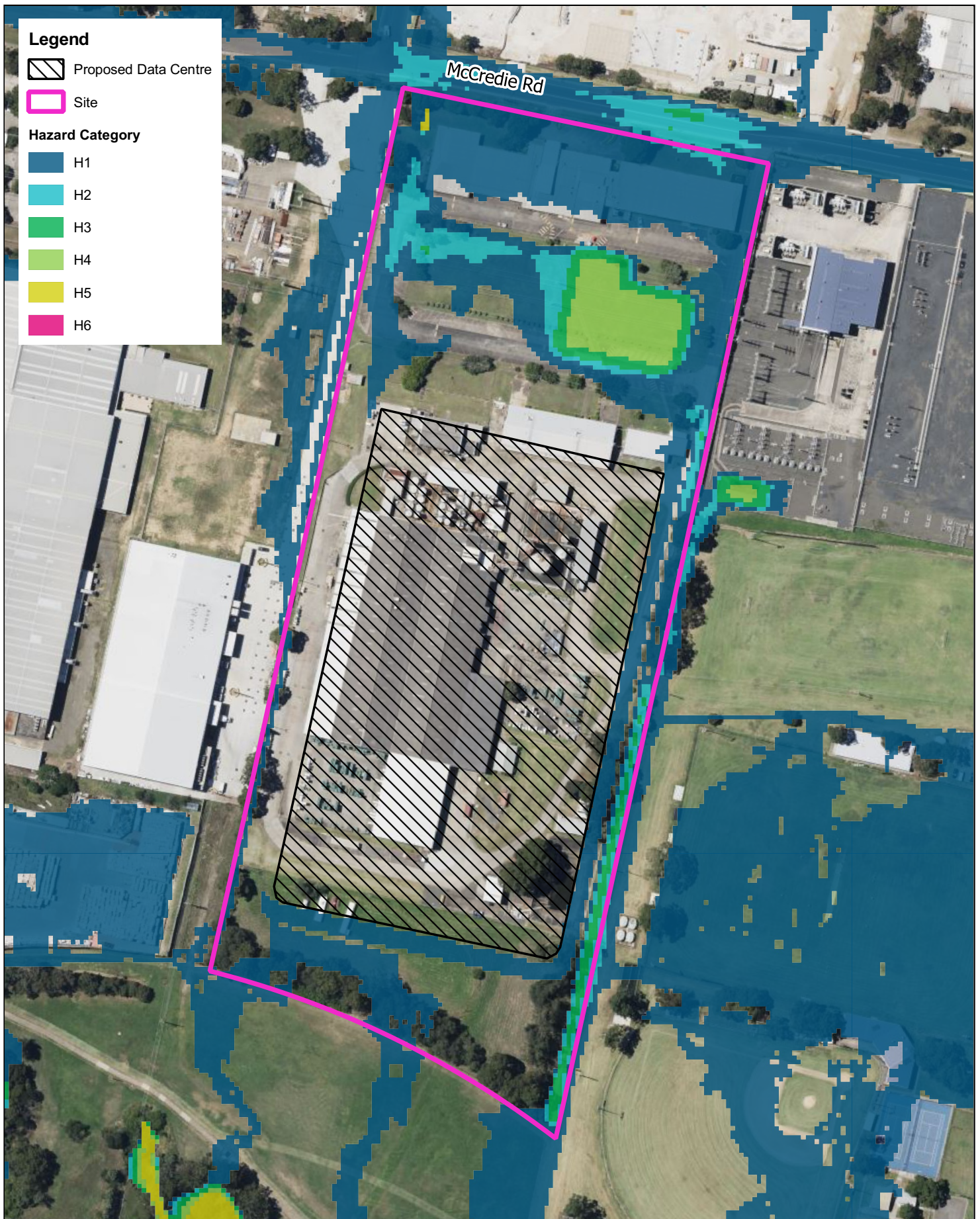
Figure:

B-08

Rev:

A





Title:

Peak Flood Hazard - Post-Development Conditions - 5% AEP Event

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0 50 100 m



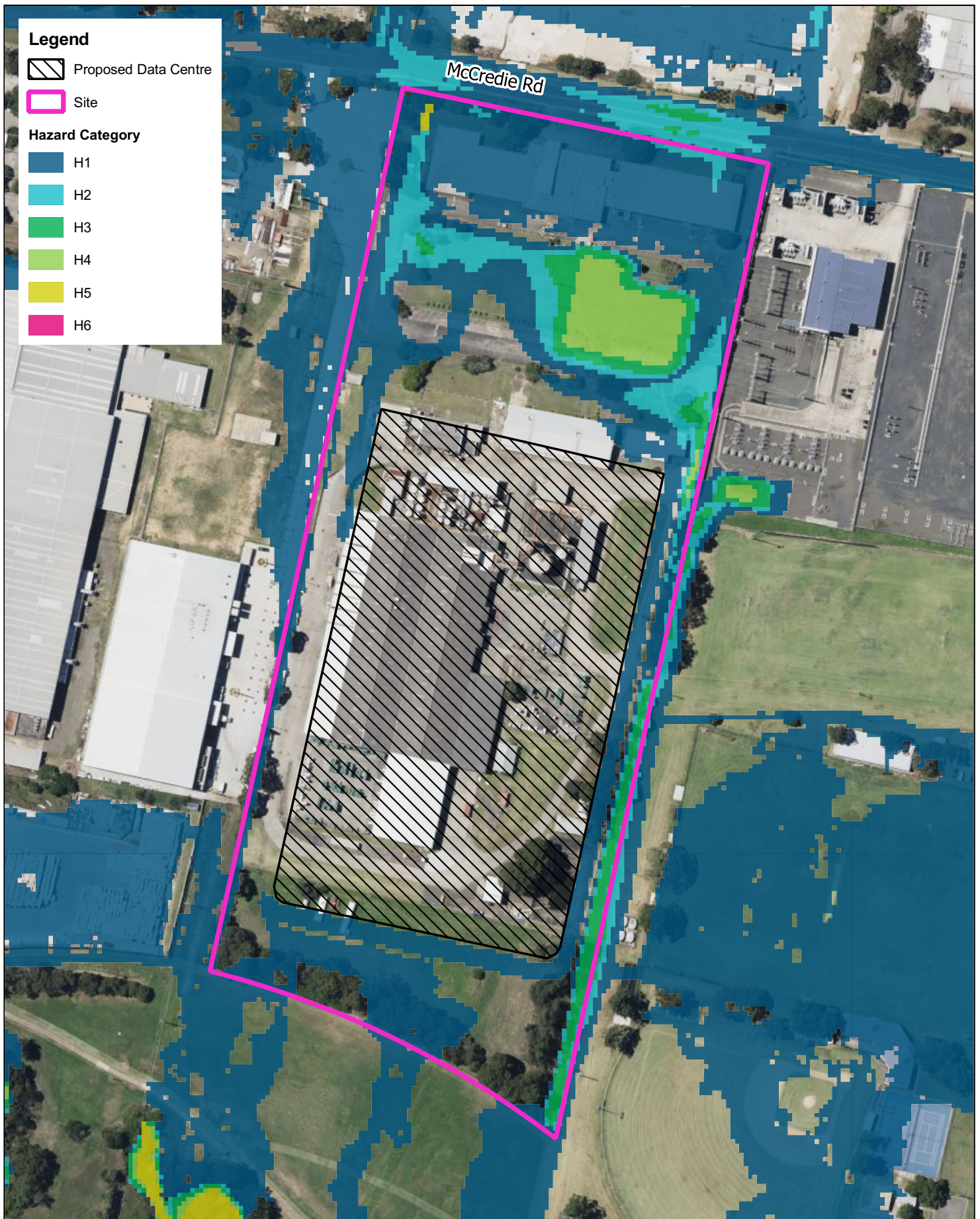
Figure:

B-09

Rev:

A





Title:

Peak Flood Hazard - Post-Development Conditions - 1% AEP Event

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0 50 100 m

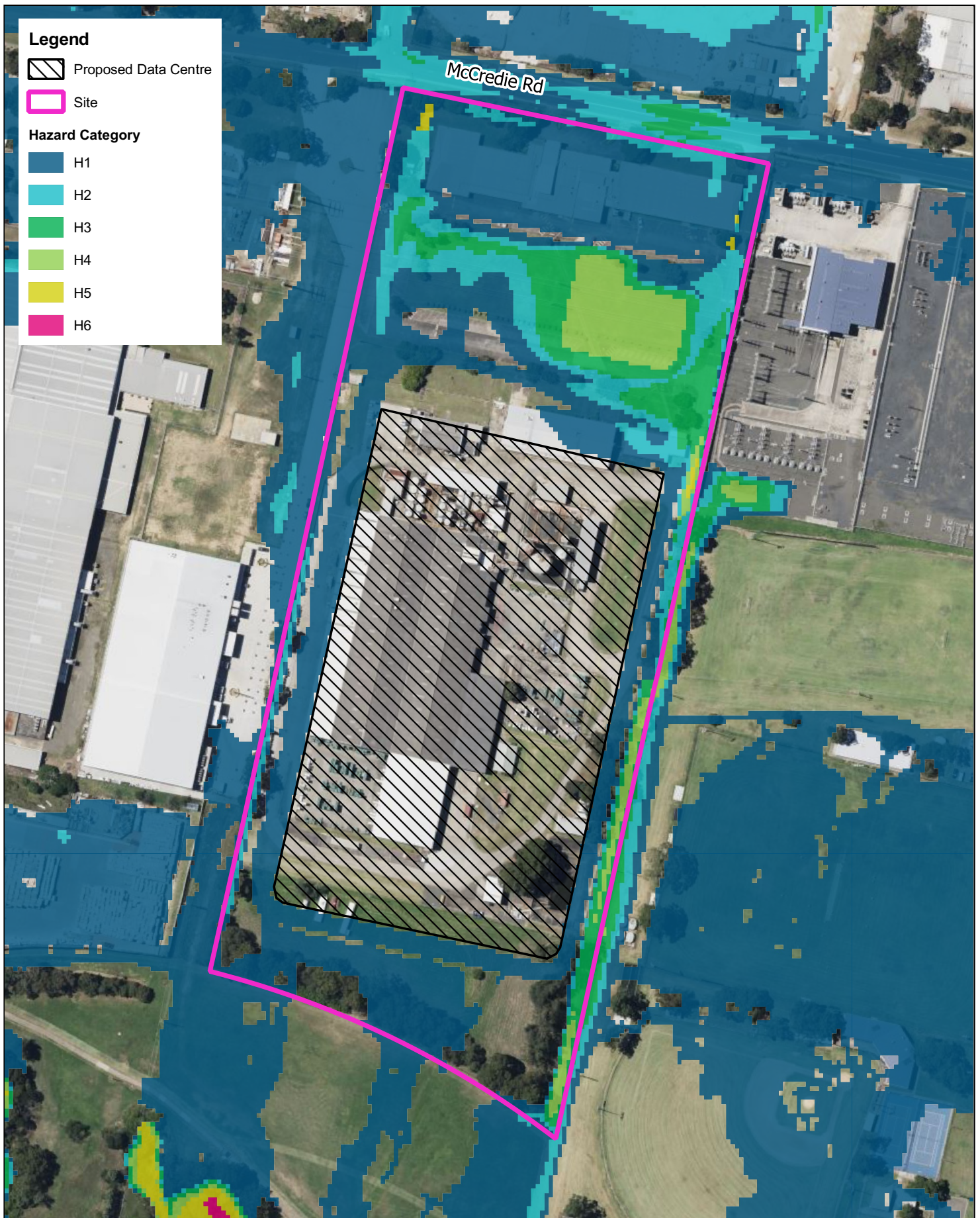
Figure:

B-10

Rev:

A





Legend

Proposed Data Centre

Site

Hazard Category

H1

H2

H3

H4

H5

H6

Title:

Peak Flood Hazard - Post-Development Conditions - 1% AEP Event with Climate Change (30% Increase in Rainfall)

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0 50 100 m



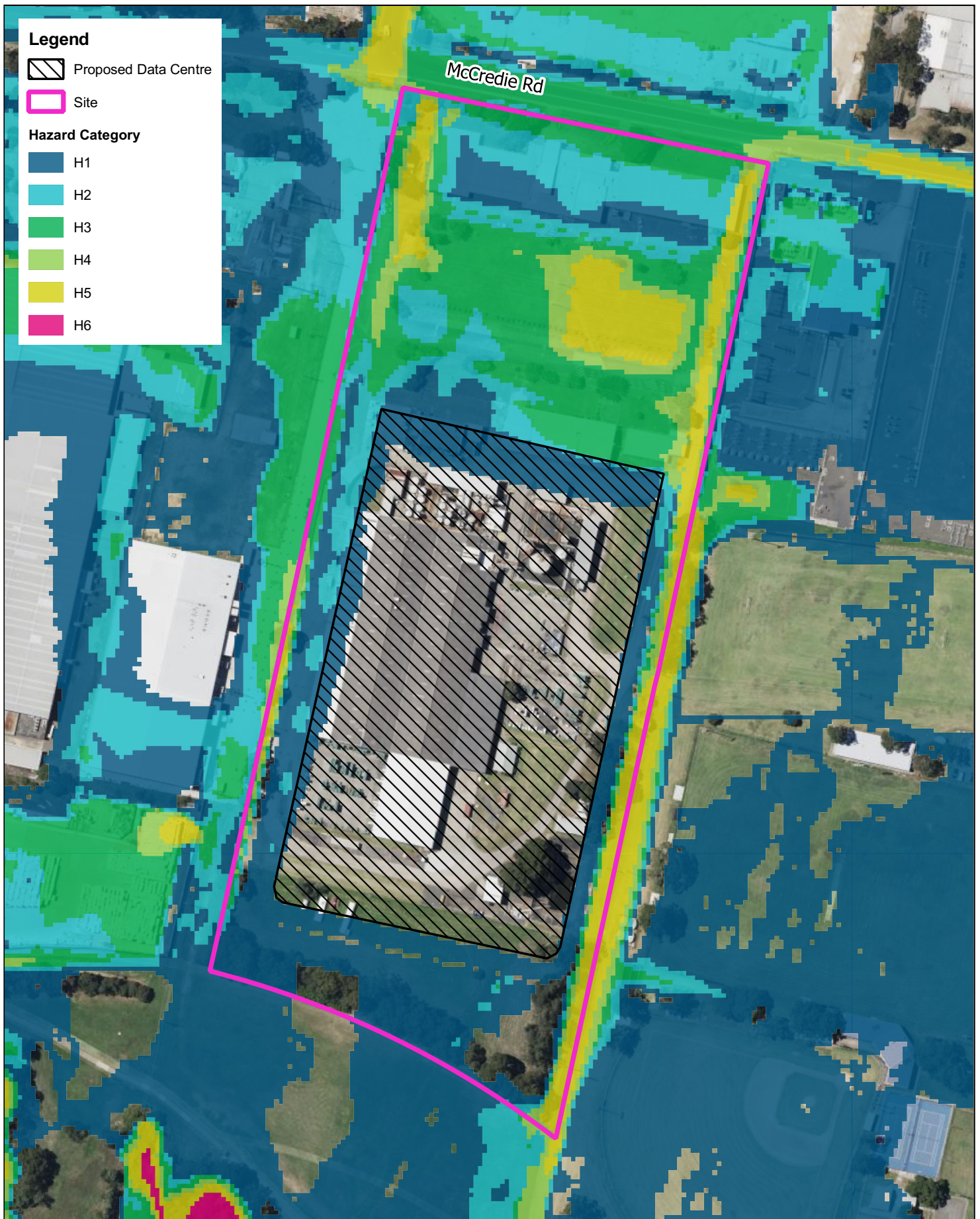
Figure:

B-11

Rev:

A





Title:

Peak Flood Hazard - Post-Development Conditions - PMF Event

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0 50 100 m



Figure:

B-12

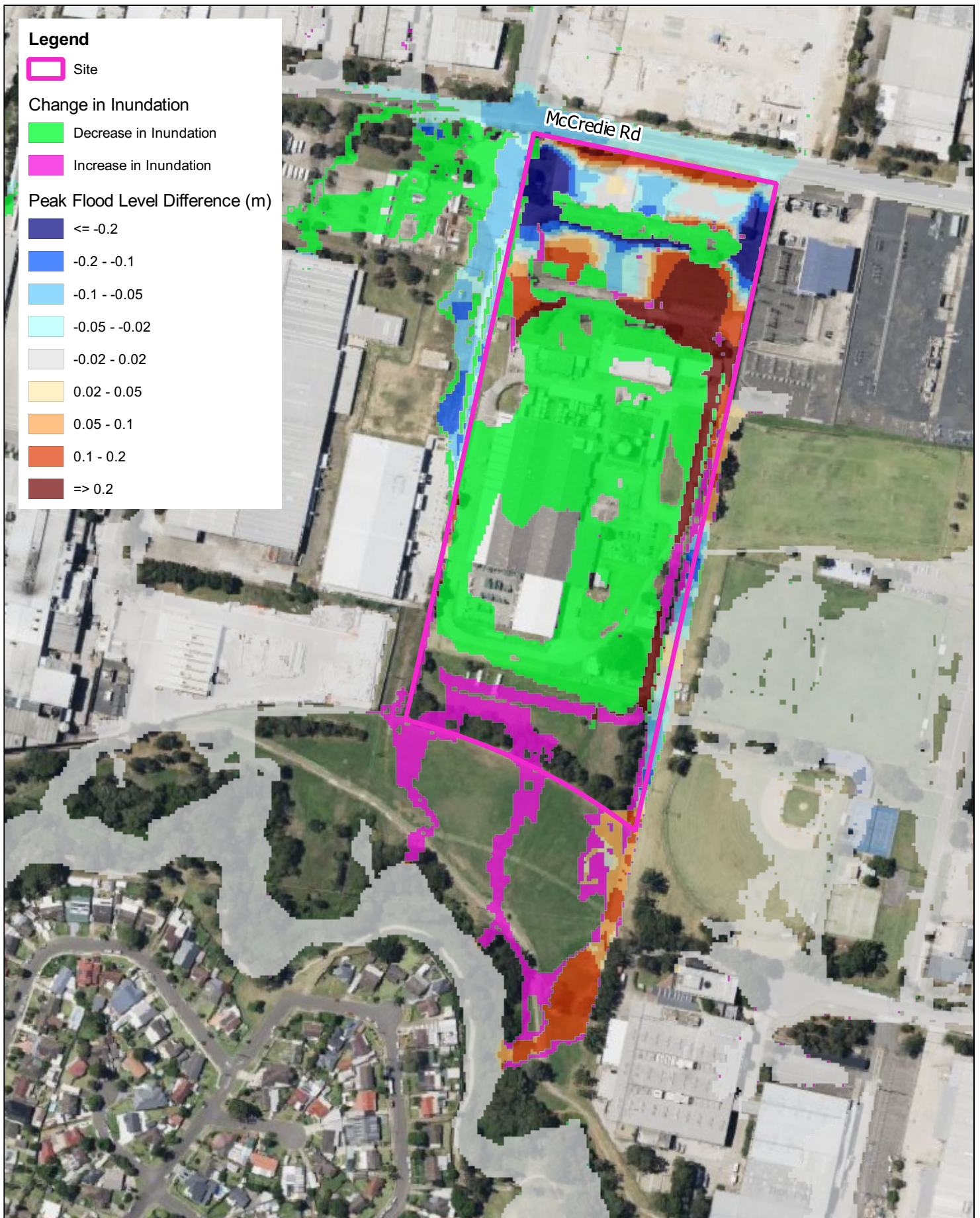
Rev:

A



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Annex C Flood Impact Mapping



Title:
Peak Flood Level Impact - 5% AEP Event

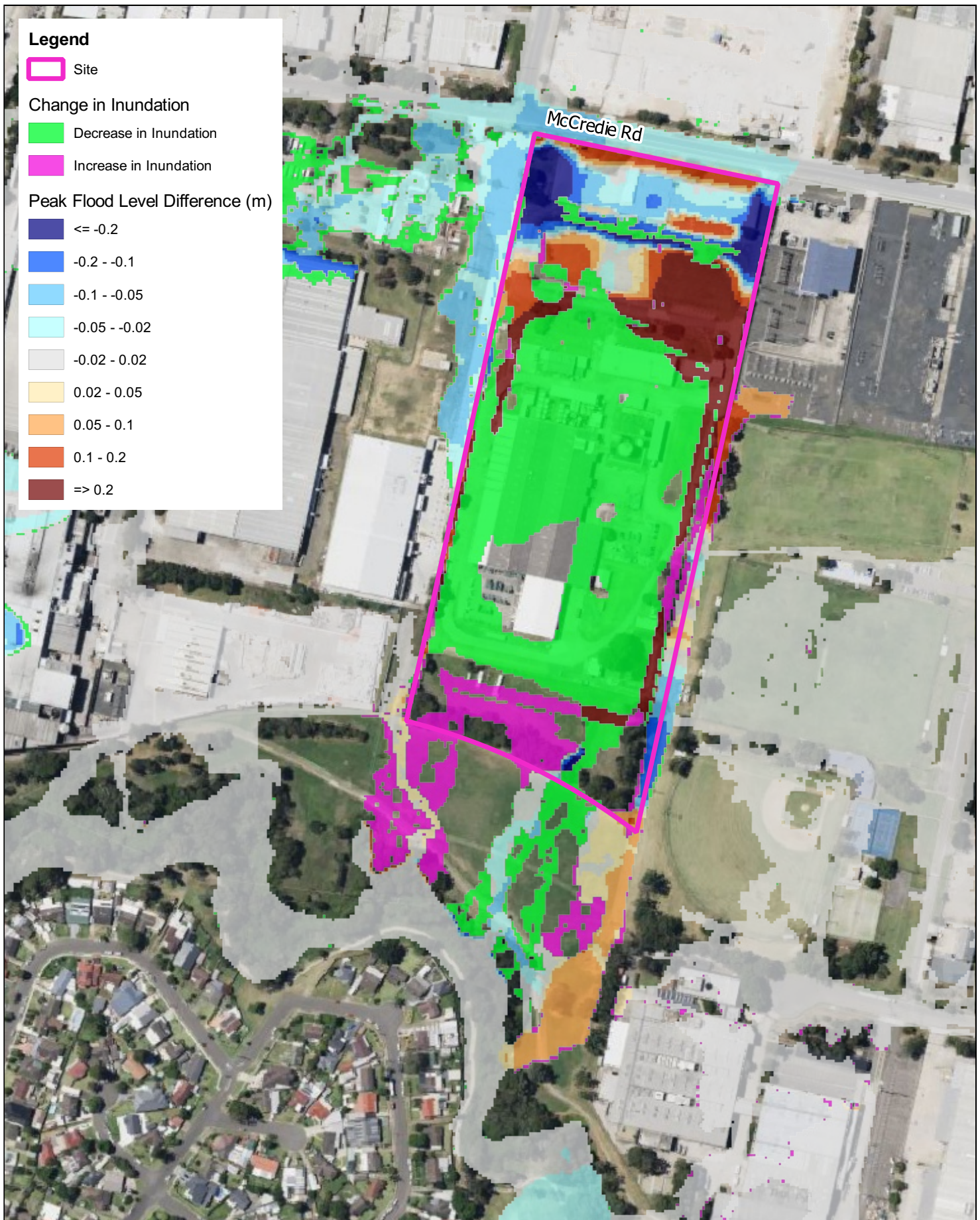
Figure:
C-01

Rev:
A

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0 80 160 m





Title:
Peak Flood Level Impact - 1% AEP Event

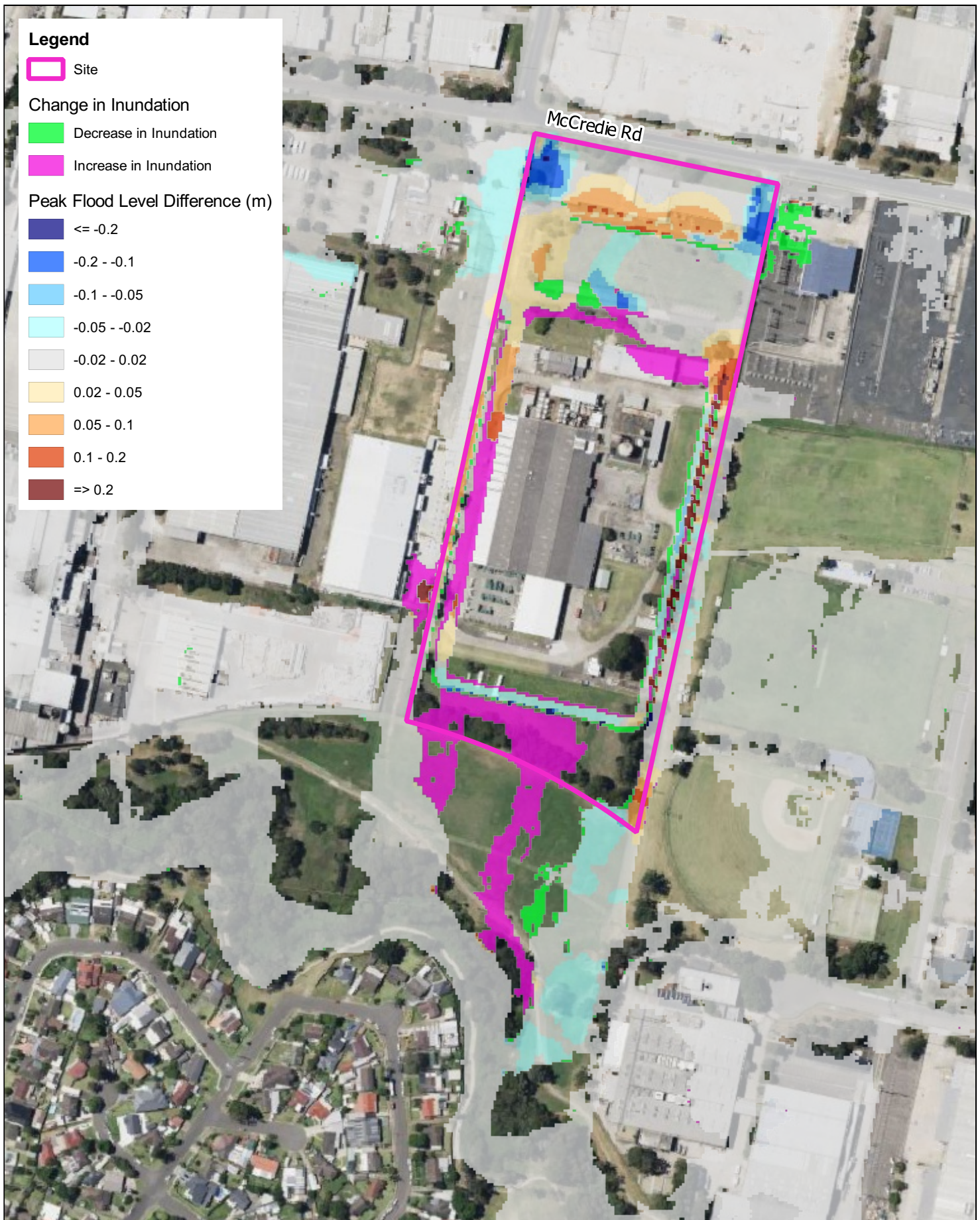
Figure:
C-02

Rev:
A

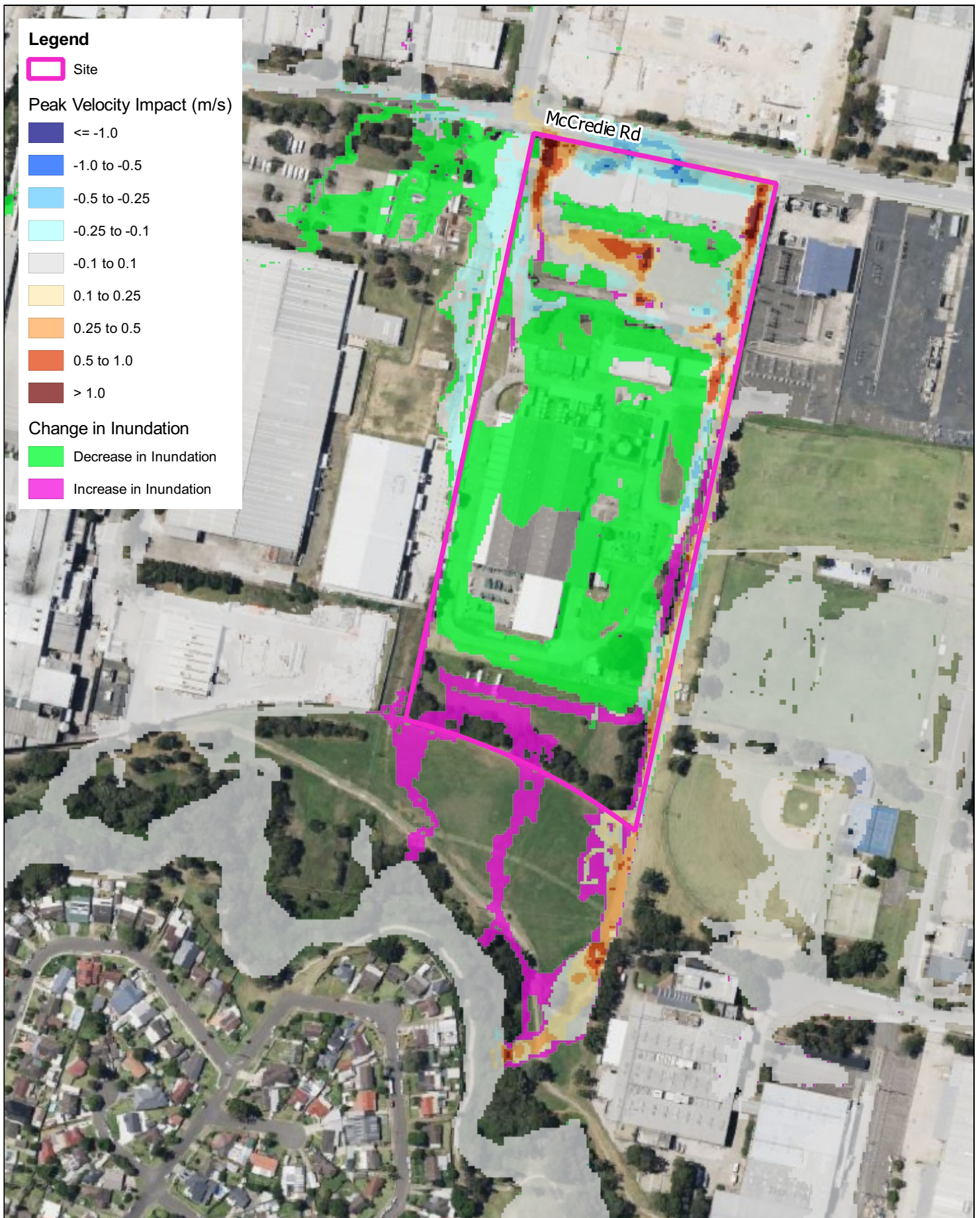
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0 80 160 m





Title:		Figure:	Rev:
Peak Flood Level Impact - 1% AEP Event with Climate Change (30% Increase in Rainfall)		C-03	A
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080160 m			
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Title:

Peak Flood Velocity Impact - 5% AEP Event

Figure:

C-04

Rev:

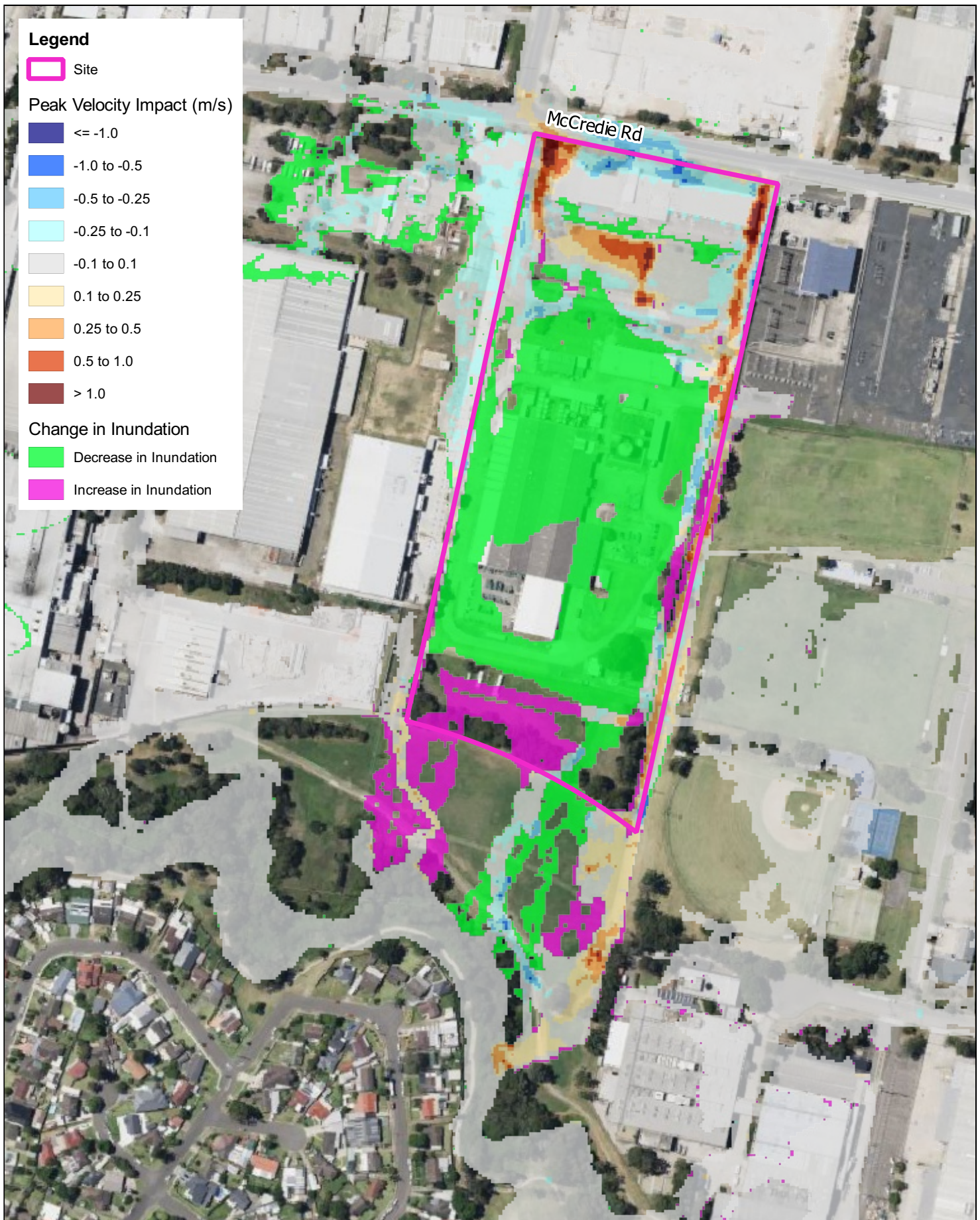
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0 80 160 m



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Title:
Peak Flood Velocity Impact - 1% AEP Event

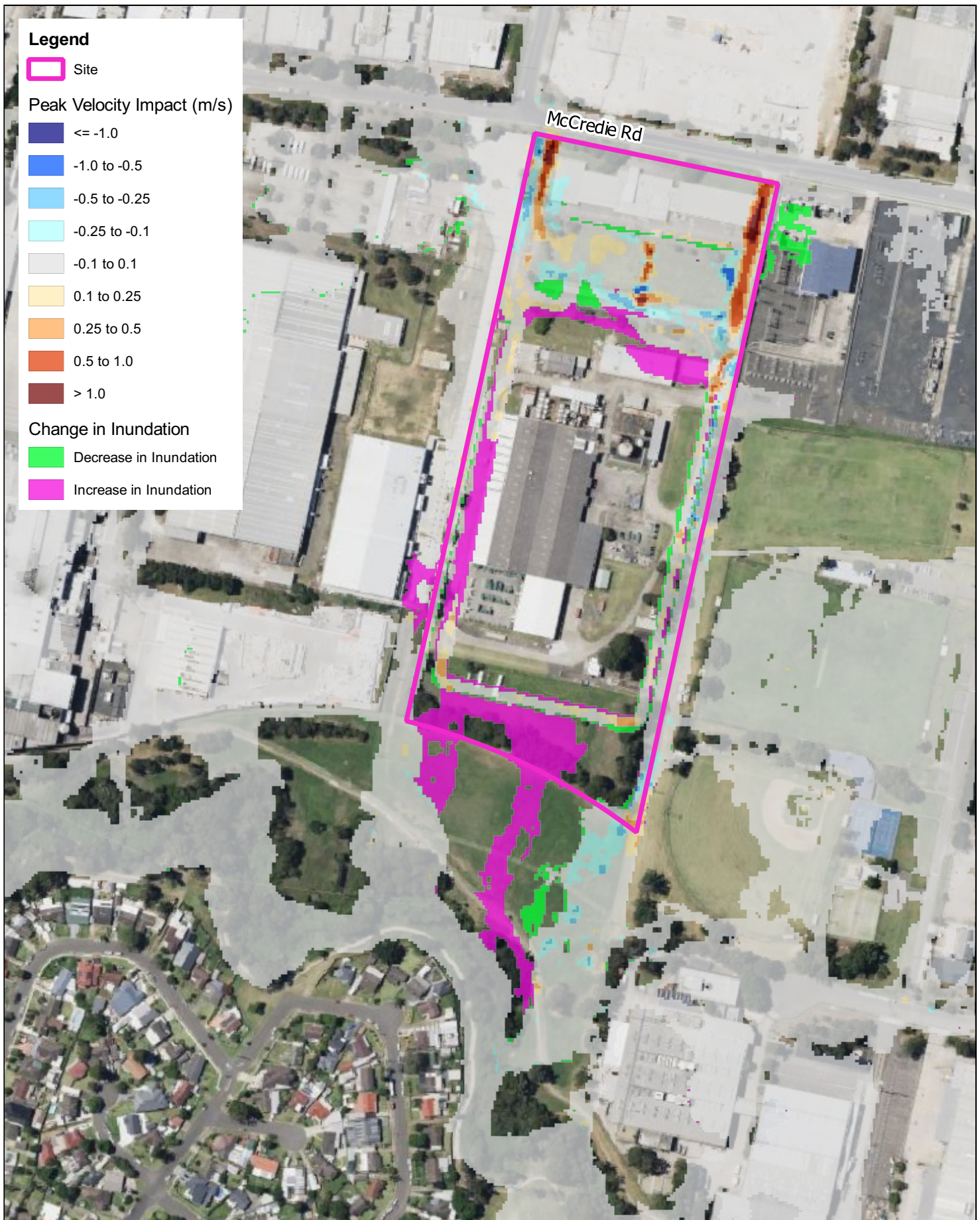
Figure:
C-05

Rev:
A

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0 80 160 m

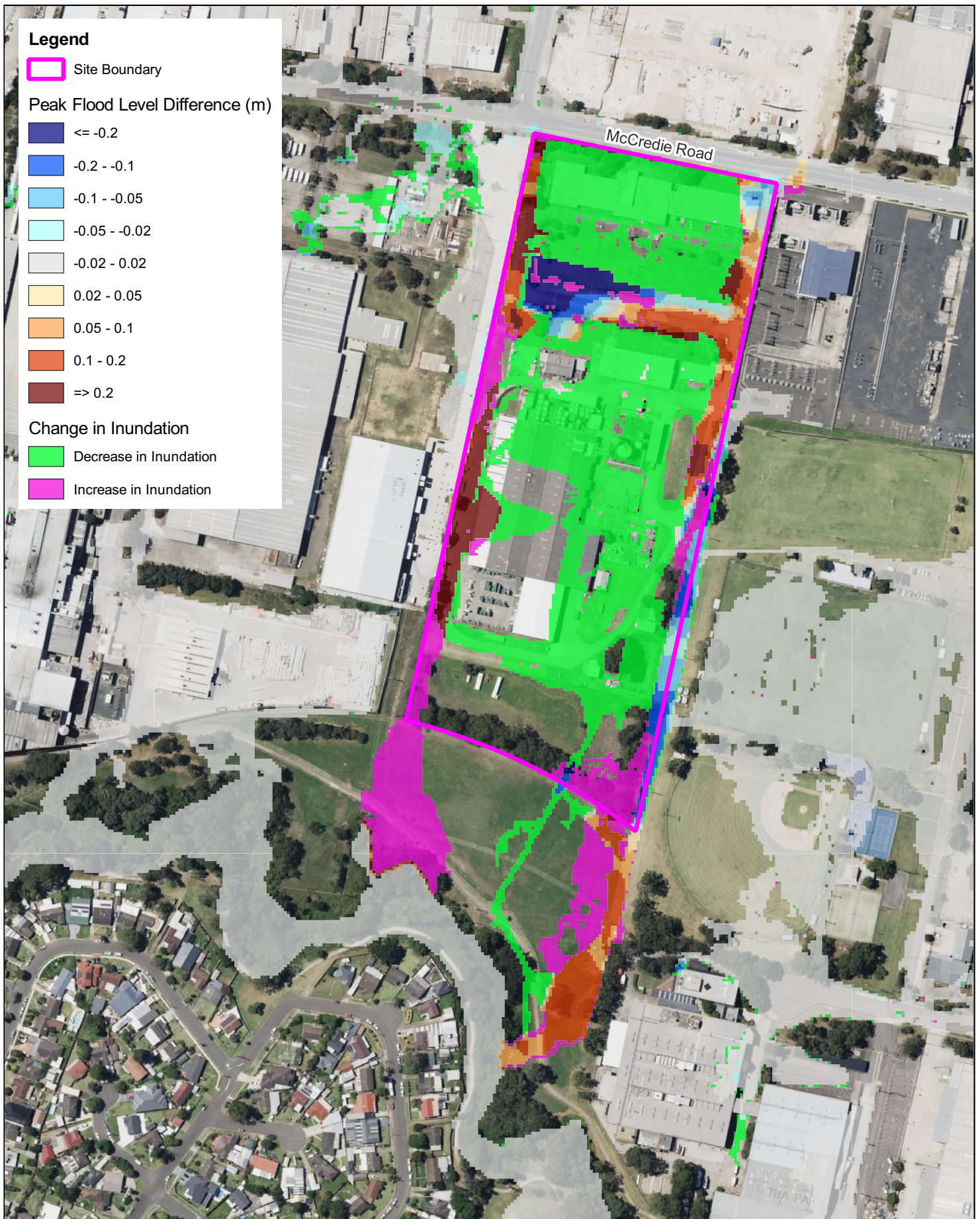




Title:		Figure:	Rev:
Peak Flood Velocity Impact - 1% AEP Event with Climate Change (30% Increase in Rainfall)		C-06	A
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 www.bmt.org			
Filepath: \\BMT-SYD-FS01\wbmsyd\WATER\PROJECTS\003327_McCredieSEARS\GIS\Figure\03_AnnexC_Impacts_03\03_AnnexC.qgz			

Annex D Warehouse DA – Flood Impact Mapping – For Reference Only

The following figures are extracts from *FLOOD IMPACT ASSESSMENT FOR 132 McCREDIE ROAD, SMITHFIELD* (BMT, 2024). They have been provided as an example of flood impacts previously approved by Council for development at the Site (see Section 4.3 for discussion). The Figures are provided for reference only and do not relate to any works associated with the data centre facility.



Title:

Peak Flood Level Impact - 5% (1 in 20) AEP Event

Figure:

D-01

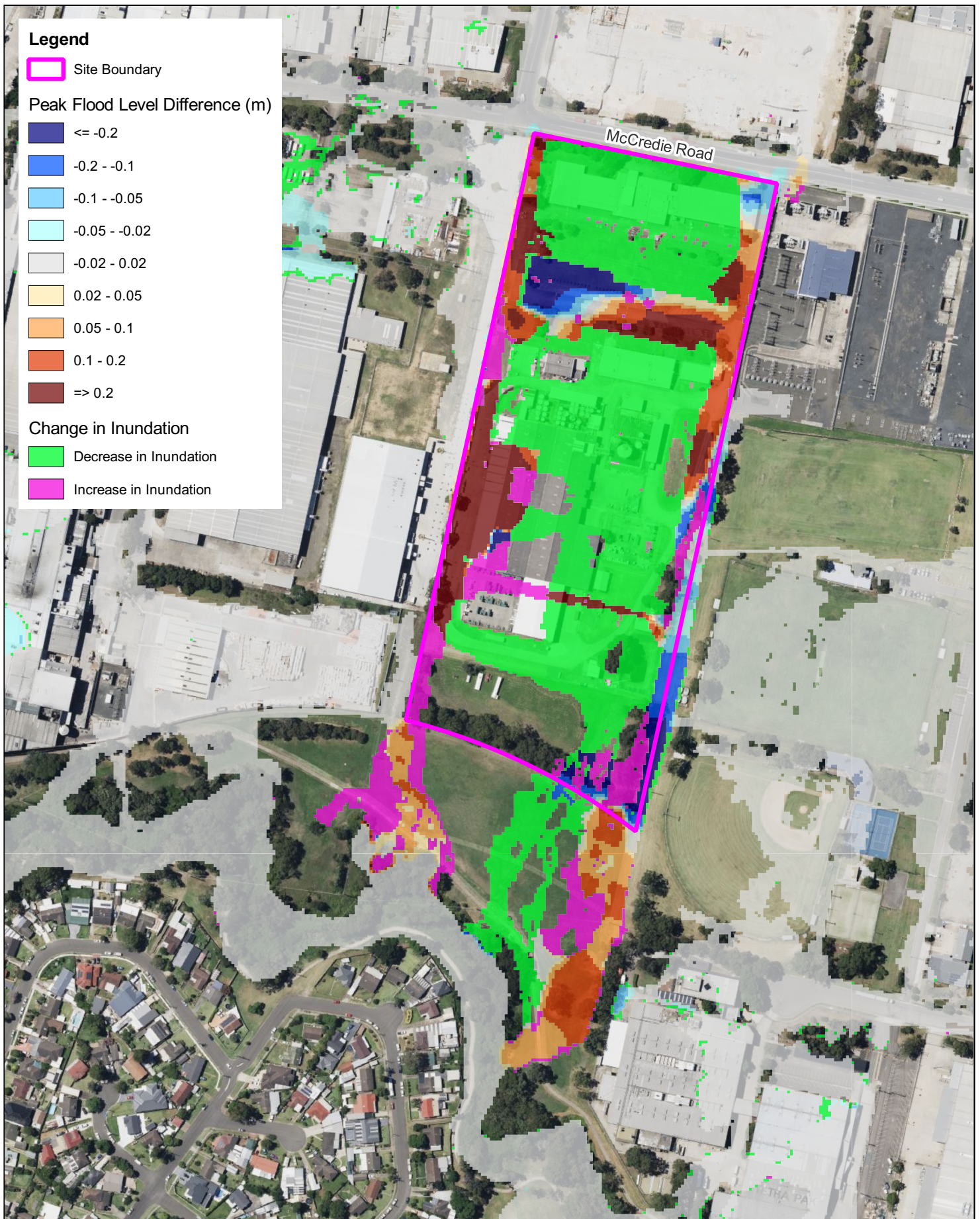
Rev:

A

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0 80 160 m





Title:

Peak Flood Level Impact - 1% (1 in 100) AEP Event

Figure:

D-02

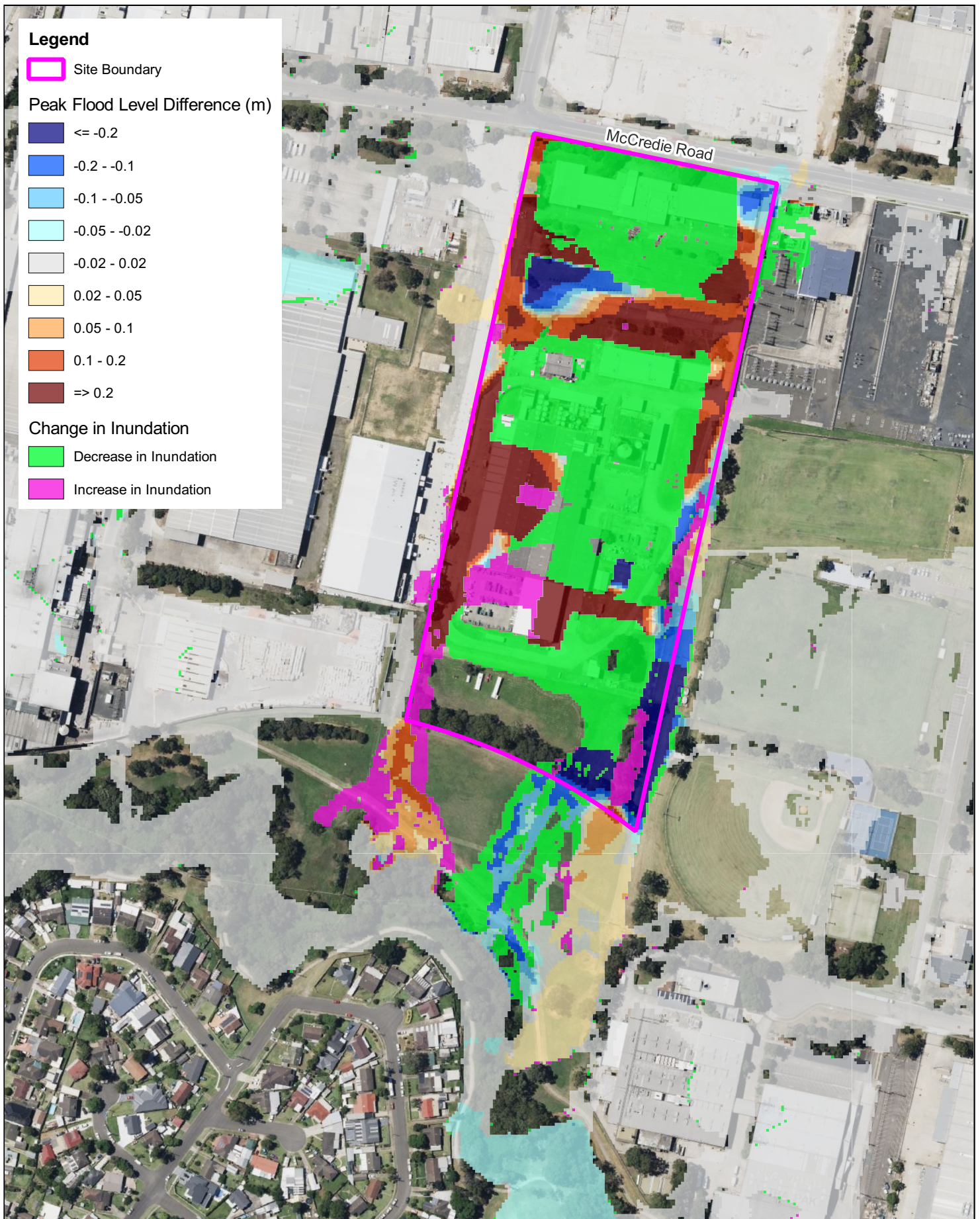
Rev:

A

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0 80 160 m





Title:

Peak Flood Level Impact - 1% (1 in 100) AEP Event with Climate Change

BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

0 80 160 m

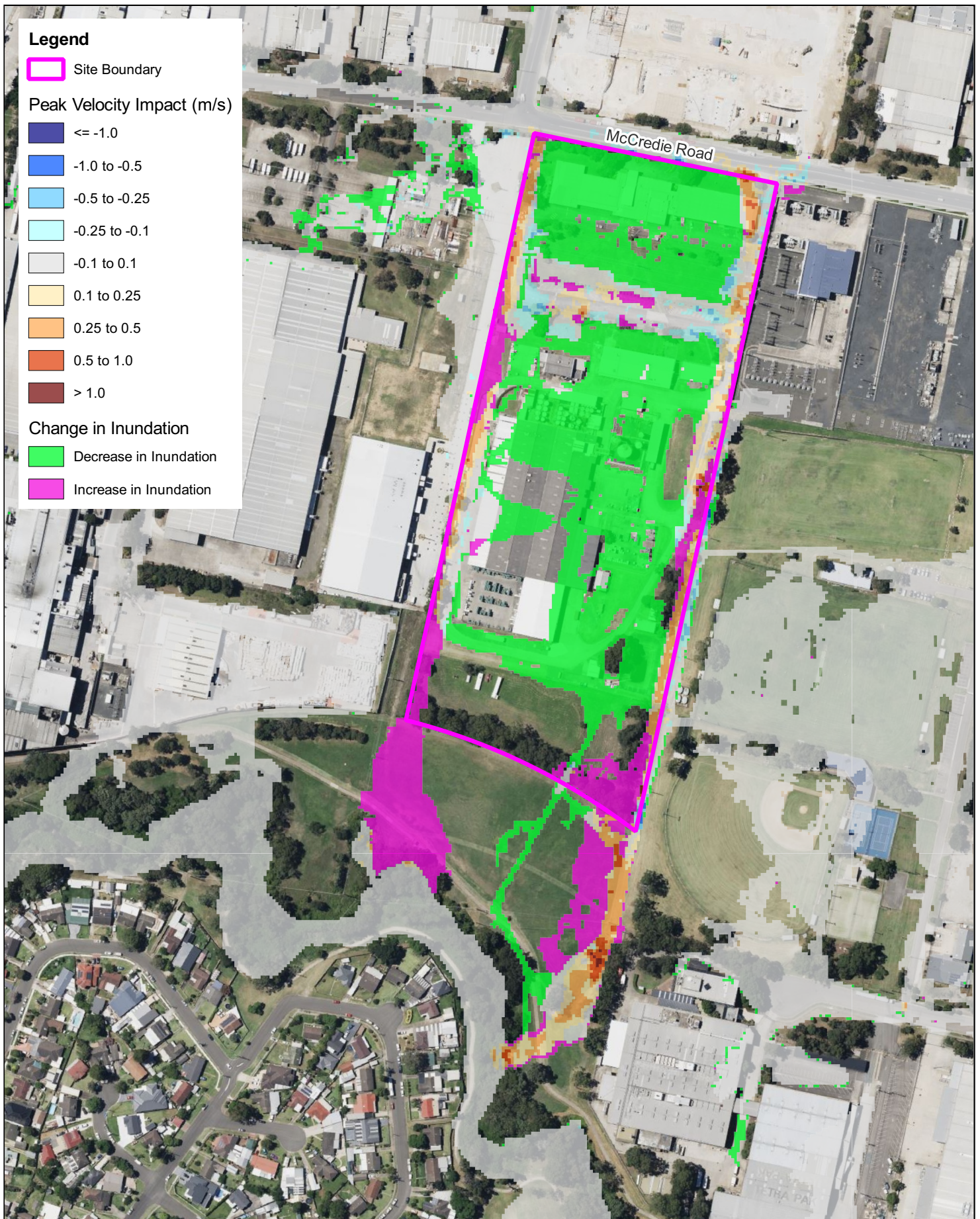
Figure:

D-03

Rev:

A





Title:

Peak Flood Velocity Impact - 5% (1 in 20) AEP Event

Figure:

D-04

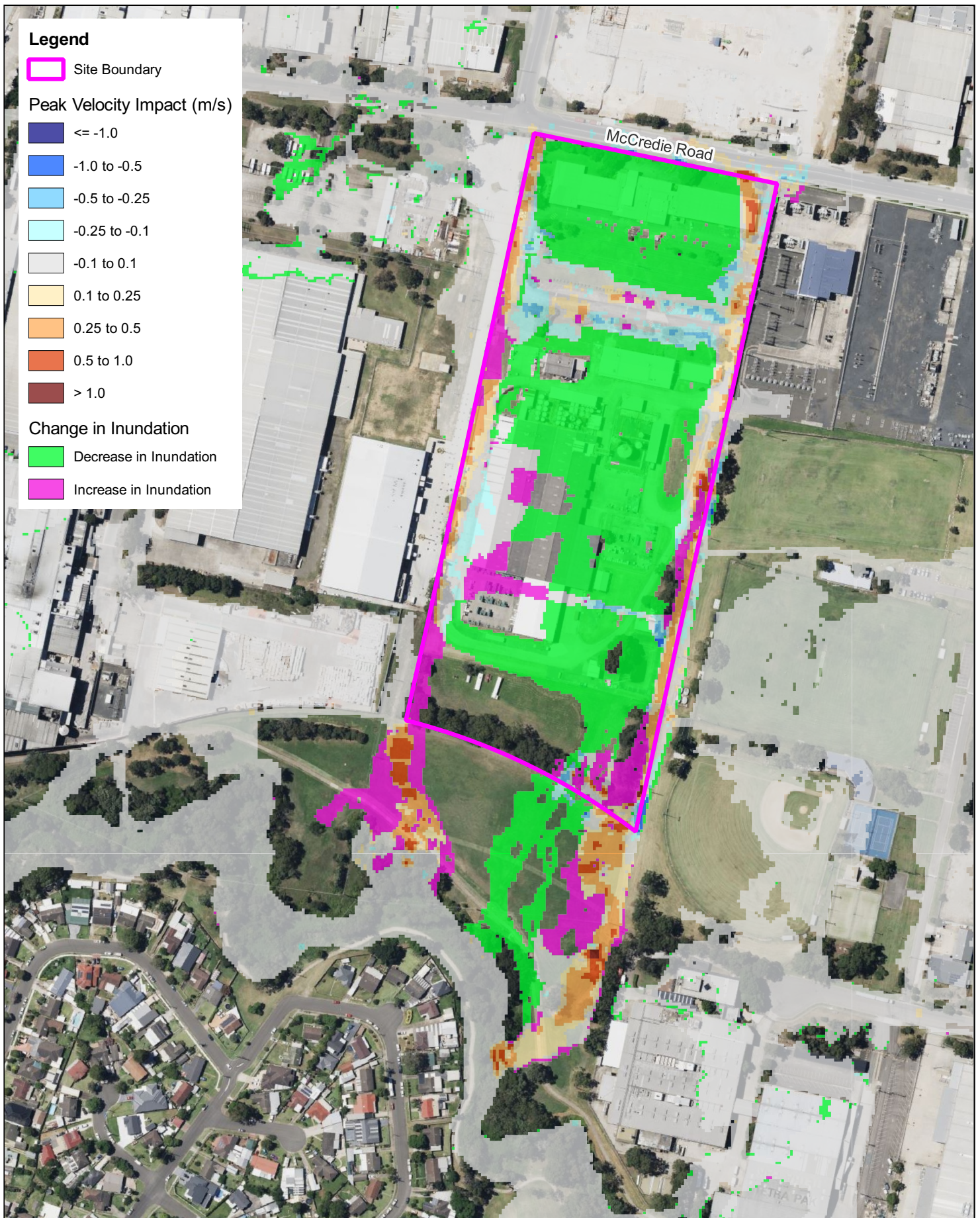
Rev:

A

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0 80 160 m





Title:

Peak Flood Velocity Impact - 1% (1 in 100) AEP Event

Figure:

D-05

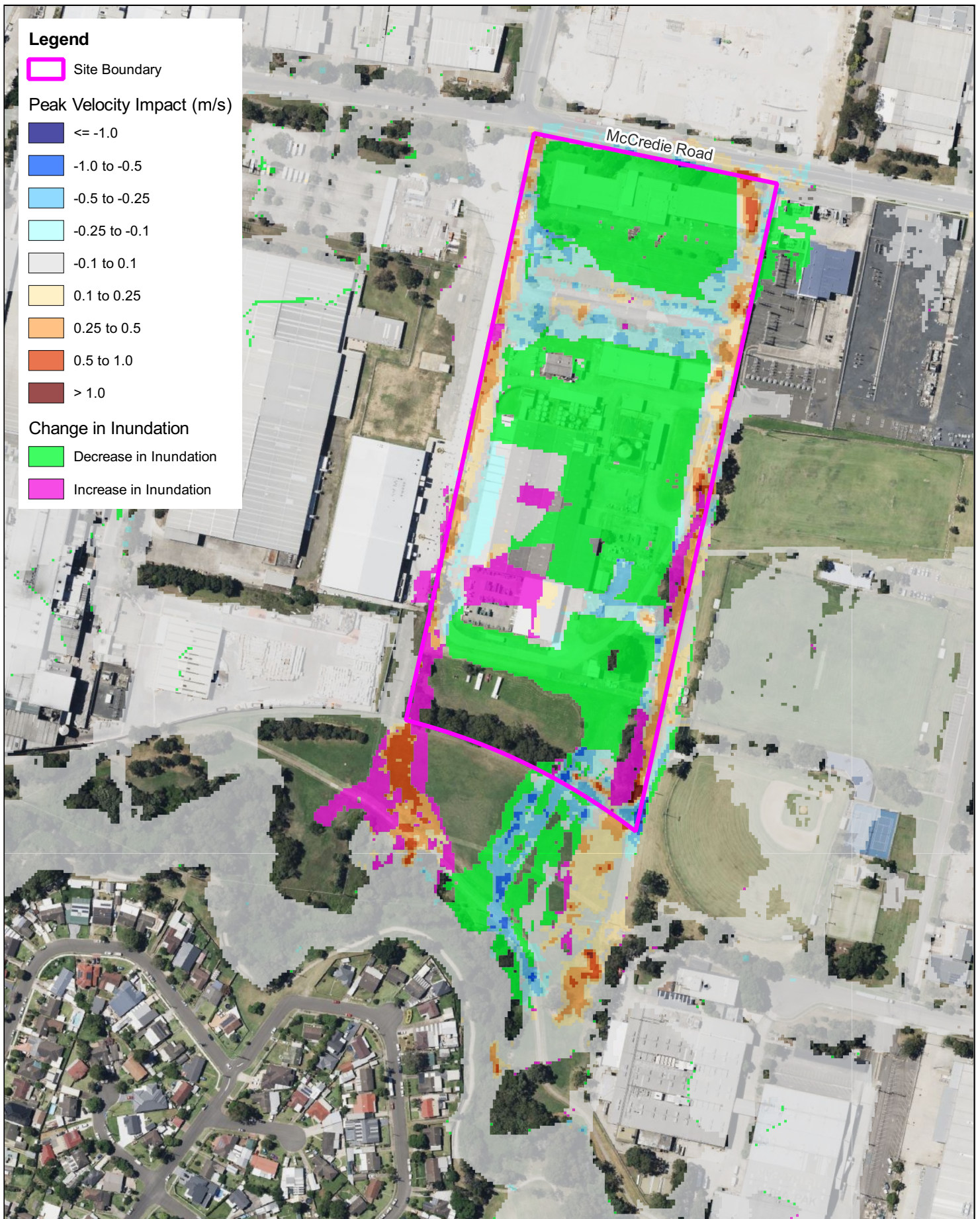
Rev:

A

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0 80 160 m





Title:

Peak Flood Velocity Impact - 1% (1 in 100) AEP Event with Climate Change

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0 80 160 m

Figure:

D-06

Rev:

A

