



Job Number: 210086
Date: 23 November 2021
Rev B 16/07/2024

GRC Hydro
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Sydney NSW 2000

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Re: 30-46 Auburn Road, Regents Park – Flood Risk Assessment

Executive Summary

Development is proposed for 30-46 Auburn Road, Regents Park (the Site). The site currently houses two large warehouse style buildings surrounded by areas of open space. It is proposed to be redeveloped with a State Significant Development that will include residential and commercial buildings, as well as childcare. Secretary's Environmental Assessment Requirements (SEARs) have been provided by the NSW Department of Planning and Environment (DPIE), based on a concept design. The environmental assessment requirements list a number of criteria related to flooding. This letter, in response to each of the requirements related to flood risk, describes the site's flood behaviour and then assesses the flood risk associated with the proposed development.

Assessment found that flooding at the site is limited to the very north-east corner of the site, which lies on the edge of an overland flowpath that discharges to the north-west. A range of outputs including flood depths, level and hazard has been mapped for the 5% AEP, 1% AEP and PMF events.

The assessment finds the development meets all of the SEARs requirements with regards to flooding. The proposed development is above Council's Flood Planning Level of 30.96 mAHD. With regards to other controls, the assessment demonstrates that the site has minimal flood risk and does not require specific construction methods or evacuation procedures.

Site Description

The site is approximately 21,170 m² and consists of two large warehouse style buildings surrounded by areas of open space. The site has ground elevations of 28.8 to 36 mAHD and generally slopes from south to north. The site is bounded by Auburn Road along the eastern boundary, with three driveway entrances connecting to the site, a curving railway line on the south and east boundaries and Gunya Street properties to the north, which mostly have large buildings with their back walls running along the site boundary. Notable topographic features of the surrounding area are:

The railway line adjacent to the site is below the natural ground level, for example around 4 metres lower than the south end of the site.

There is a topographic sag on Auburn Street, near the north-east corner of the site. This is part of a topographic depression from Magney Reserve to the east through to Gunya Street properties to the north of the site. The depression does pass through the site itself.

The site is located in the Duck River catchment, a largely urbanised catchment of Sydney's western suburbs that drains north, flowing into Parramatta River near Silverwater. The site lies outside the floodplain of Duck River, but is affected by an overland flow path, as described in the following section.

Existing Flood Behaviour

Flooding at the site and in the wider catchment has been the subject of multiple investigations. The hydrologic and hydraulic models used to understand flooding at the site were first setup by the Duck River Stormwater Catchment Study (2009) on behalf of Bankstown Council (now Canterbury Bankstown Council). In 2021, Rhelm undertook a review of flooding and flood planning controls at the site on behalf of DPIE, and recommended the model be updated in the vicinity of the site. GRC Hydro then undertook the refinements on behalf of Tooker & Associates in July 2021. The changes included incorporation of survey near the site, use of newer LiDAR (2020), and inclusion of various features with a finer model grid resolution. A comparison of 1% AEP flows with the Council model showed an increase of approximately 20% in the overland flowpath's peak flow north of the site, giving a more conservative estimate of flood liability than previous adopted. The current assessment uses this updated assessment. One further change was made which was to exclude rainfall on the site itself, so as to more clearly show flood-affected portions of the site, as the model uses a direct rainfall approach. This has negligible effect on flooding and is solely to improve presentation of the model results.

Flooding at the site is limited to the north-east corner of the site. At this location, an overland flowpath floods a small portion of the site to a depth of around 0.3 m in the 1% AEP. The flowpath has a catchment of approximately 0.6 km², as shown on Figure 2. Flooding occurs when heavy rainfall over the catchment exceeds the stormwater drainage capacity and flows overland. Flood affectation at the site is slightly increased in the Probable Maximum Flood (PMF) which is around 0.5 m higher than the 1% AEP, however, the majority of the site is not flooded. Image 1 below is a diagram of the flood mechanism while detailed mapping is provided in the figures at the rear of this report.



Image 1: Flood Mechanism Overview

The modelled flood events considered were the 5% AEP, 1% AEP, PMF and modelling was also updated to include a climate change scenario. Climate change is expected to worsen flooding by increasing the depth of rainfall that falls and by increasing sea levels. The site is not affected by sea level rise and so the climate change scenario applies a percentage increase to the 1% AEP design rainfall. The percentage increase is 19.7%, available from the ARR Data Hub for the catchment, and equivalent to the worst emissions scenario (RCP 8.5) and the longest timeframe (2090).

The following model outputs were considered as part of the flood risk assessment:

- Peak flood depth and level in each design flood event

- Flood hazard in each event, based on the Australian Emergency Management hazard categories of H1 to H6.

- Hydraulic categories in each event, generally based on the Floodplain Development Manual definition, with a depth and velocity threshold used as per the method described in Howells et al., 2004.

Flooding at the site is presented in the following figures, while Table 1 presents an overview of each design event:

Figure 3: 5% AEP Peak Flood Depth and Level – Existing Case

- Figure 4: 5% AEP Flood Hazard – Existing Case
- Figure 5: 5% AEP Hydraulic Categories – Existing Case
- Figure 6: 1% AEP Peak Flood Depth and Level – Existing Case
- Figure 7: 1% AEP Flood Hazard – Existing Case
- Figure 8: 1% AEP Hydraulic Categories – Existing Case
- Figure 9: 1% AEP with Climate Change, Peak Flood Depth and Level – Existing Case
- Figure 10: 1% AEP with Climate Change, Flood Hazard – Existing Case
- Figure 11: 1% AEP with Climate Change, Hydraulic Categories – Existing Case
- Figure 12: PMF Peak Flood Depth and Level – Existing Case
- Figure 13: PMF Flood Hazard – Existing Case
- Figure 14: PMF Hydraulic Categories – Existing Case

| Design Event | Peak Depth and Level | Flood Hazard | Hazard | Hydraulic Category | Discussion |
|-----------------------------------|-------------------------|--------------|-----------------------------|---|---|
| 5% AEP | No flooding at the site | | | | The majority of the overland flowpath on Auburn Road is <0.3 m depth. The flowpath does not reach the site. |
| 1% AEP | 30.46 mAHD, 0.2-0.4 m | | H1 and H2 | Flood Fringe | The overland flowpath reaches the corner of the site. There is low flow, depth and velocity and so is categorised as Flood Fringe. |
| 1% AEP with Climate Change | 30.56 mAHD, 0.3-0.5 m | | H1 and H2, small area of H3 | Flood Fringe with small area of Flood Storage | The climate change scenario is slightly worse than the existing 1% AEP event but the increased depth and level does not significantly change flood risk at the site. |
| PMF | 30.96 mAHD, 0.5-0.9 m | | H1, H2 and H3 | Flood Storage and Flood Fringe | The overland flowpath inundates the north-east corner of the site, reaching around 30 m into the site from Auburn Road, but the majority of the site is not affected. Depths and velocities are not sufficient to create highly hazardous flooding (H4 and above) |

The results indicate the following in regards to the site’s flood liability:

The large majority of the site is completely outside of the floodplain (i.e. no PMF affectation)
 There is flooding in the 1% AEP of a small portion but with low depth and velocity, so no flood storage or floodway. This indicates the area could be filled without affecting flooding elsewhere (see following section)
 In a conservative estimate of climate change (high emissions scenarios and long term planning horizon), flooding is slightly increased but flood risk is largely the same.
 Flood mapping shows inundation immediately south-east of the site on the railway corridor beneath Auburn Road, which passes over the rail corridor with a bridge at the location, elevated approximately 4 metres above the railway line. This inundation is well below Auburn Road, and

hence the subject site has access to the south in the event of a flood, up to and including a Probable Maximum Flood. See Image 2.

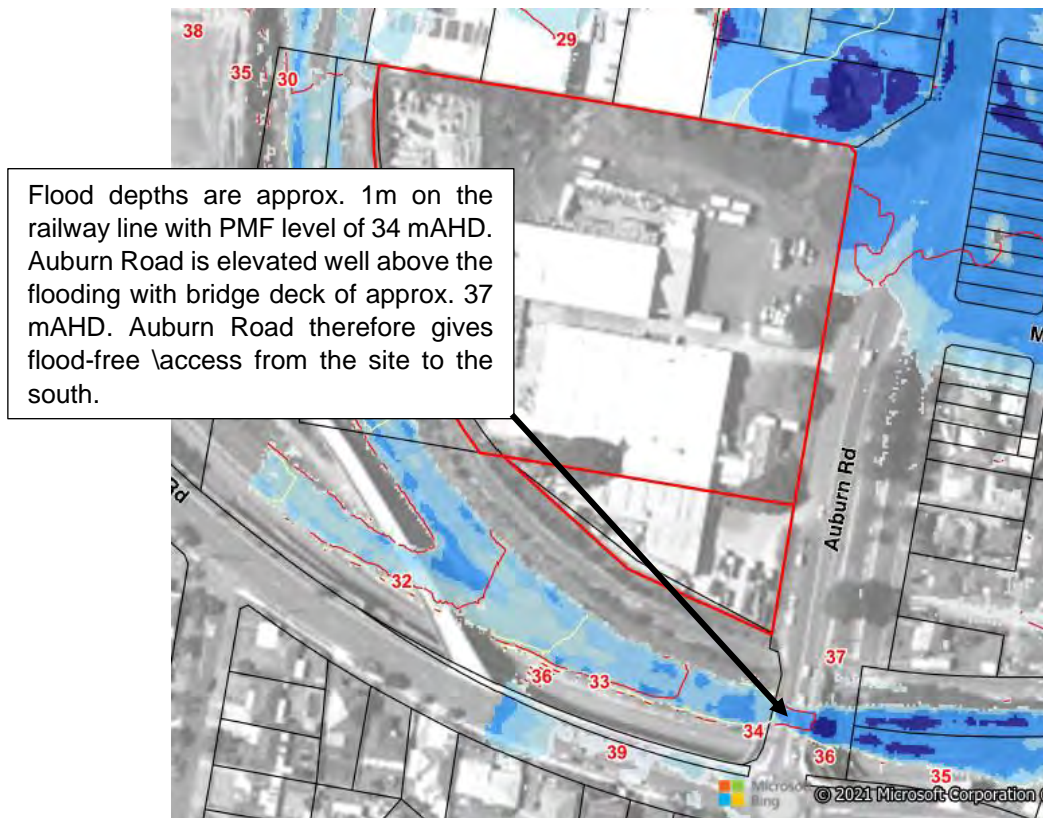


Image 2: Clarification of inundation below Auburn Road

Assessment of the Proposed Development

The proposed development consists of new multi-storey buildings across the site combined with park and open space areas. Buildings are arranged in a U-shaped configuration with park areas in the centre. A childcare centre is located to the south in the highest part of the site. The only building in the previously north-east corner of the site is a residential building with residential units and retail on the ground floor, with a proposed floor level of 31.0 mAHD. There is a basement car park entrance to the building, outside of the 1% AEP flood extent. Ground levels in this area will be raised from what currently exists to generally match the 31.0 mAHD floor level. The road entering the north-east corner of the site will slope up slightly from Auburn Road and rise to 30.6 mAHD, above the 1% AEP flood level.

With only the small area in the north-east corner affected by shallow flooding, filling as part of the proposed development will have negligible effect on existing flood behaviour in virtually all flood events. This has been assessed in detail using the TUFLOW model for the range of design events. Figures 15 to 26 show the same outputs as Figures 3 to 14 but for the proposed case. Figures 27 to 30 show the impact in each flood event by comparing flood levels in the base case (i.e. existing conditions) and proposed case (where it is assumed the site is raised to 31.0 mAHD and above). The figures show:

- 5% AEP: no impact on flooding as the site is not flood affected
- 1% AEP (primary design event for assessing flood impacts): negligible change in flooding elsewhere (i.e. <0.01 m change) due to the corner of the site being no longer flooded
- 1% AEP with climate change: as above, site is no longer flooded but negligible change elsewhere

PMF: adverse impacts of up to 0.02 to 0.03 m over surrounding areas, and just over 0.03 m in the roadway/footpath adjacent to the site. There is a slight reduction in flooding in the rail corridor, and on part of the neighbouring property at the north-east corner.

The impact maps show raising of the site has no significant effect on flooding in the area with the exception of the PMF event. The PMF is an extreme flood event with a return period of around 1 in 10 million years. For this reason, the 1% AEP is the most important event when assessing flood impacts. The climate change scenario results also show events significantly larger than the current 1% AEP event will be unaffected due to the proposed changes.

Compatibility of the Proposed Development

The proposed development will not cause detrimental increases to the flood affectation of neighbouring properties and infrastructure. As previously described, the activities in the flood affected area are located in the flood fringe and will cause no loss of conveyance capacity. There will be no localised increase in flood level at the upstream or downstream properties, or creation of new or changed flow paths that would change flood liability.

With regard to flood risk at the site itself, the majority of the site is outside the floodplain and does not require specific measures to mitigate flood risk. The north-east corner, where there is some minor flooding present in the 1% AEP, will be elevated and will have a floor level of 31.0 mAHD. The proposed development is broadly compatible with the low flood risk of the site.

To further assess the compatibility, the development has been considered using Bankstown Development Control Plan. This also sets the Flood Planning Level at the site and ensure the development is consistent with Council floodplain risk management. The development is not affected by creek or river flooding and so the relevant DCP controls are those in Schedule 5 (“Catchments Affected by Stormwater Flooding”). The flood-affected portion of the site is a mix of Medium Precinct (affected in the 1% AEP by low hazard flooding) and Low Precinct (above the 1% AEP but flooded in the PMF). There are no planning controls for residential/commercial development in Low precincts. For the small portion of the site with Medium, the controls are:

Habitable floors to be at or above 1% AEP plus freeboard (0.5 m).

Comment: This is satisfied as the Flood Planning Level would be 30.96 mAHD and the floor is proposed at 31.0 mAHD

A restriction on the use of the land is to be registered on the Certificate of Title where the lowest floor level is elevated more than 1.5 metres above finished ground level, requiring that the undercroft area is not to be enclosed.

Comment: No such elevated floor or undercroft is proposed

All structures to have flood compatible building components below the 100-year flood level plus freeboard. Applicant to demonstrate that the structure can withstand the forces of floodwater, debris, and buoyancy up to and including a 100-year flood plus freeboard, or up to the probable maximum flood (PMF) if required to satisfy the evacuation requirement

Comment: Not applicable as all structures will be above the flood planning level/PMF

Applicant to demonstrate to Council's satisfaction (by way of an engineers report if requested) that the development will not increase flooding effects elsewhere, having regard to: loss of flood storage; changes in flood levels, flows and velocities; the cumulative impacts of multiple developments in the vicinity.

Comment: This report demonstrates no increase in flooding in a range of events including the 1% AEP.

The minimum surface level of open car parking spaces or carports shall be as high as practical, and not below: (i) the 20 year flood level or (ii) the level of the crest of the road at the location where the site has access (which ever is the lower).

Garages capable of accommodating more than 3 vehicles on land zoned for urban purposes, or enclosed car parking must be protected from inundation from the 100 year flood. The level of the driveway providing access between the road and the parking spaces should be as high as practical, and not lower than 0.3 metres below the 100-year flood level. Flood-affected car parking shall have adequate warning signs, signage and exits. Restraints or vehicle barriers to be provided to prevent floating vehicles leaving the site in a 100-year flood.

Comment: All car parking areas will be above the PMF level under the proposed design, except for the car park entrance near the north-east corner. This location is outside the 1% AEP flood extent (in existing and proposed cases) and so is a 'Low Risk' precinct in Council's DCP, which has no requirements on car parking. All requirements relating to car parking will therefore be met.

Reliable access for pedestrians or vehicles is required from the building, commencing at a minimum level equal to the lowest habitable floor level to an area of refuge above the PMF. Such a refuge may comprise a minimum of 20% of the gross floor area of the dwelling being above the PMF level. An engineers report may be required. The development should be consistent with any flood evacuation strategy, flood plan or similar strategy that has been adopted by Council.

Comment: The site will be above the PMF and with overland flow likely to last a matter of hours, evacuation is not required or recommended.

In summary, review of Council requirements show the development is consistent with their floodplain risk management approach and compatible with flood risk at the site. The proposed development is above Council's Flood Planning Level of 30.96 mAHD. Other controls demonstrate that the site has minimal flood risk and does not require specific construction methods or evacuation procedures.

Emergency Management at the Site

The proposed development does not require specific measures to manage risk to life from flood, nor are emergency management procedures necessary. The site is located in a small urban catchment and as such the area is affected by short-duration flood events with little to no available warning time. Occupants of the site will be safe during a flood event. The only risk is posed to pedestrians and vehicles accessing or egressing the site who cross a flooded road such as Auburn Road north of the site. This risk is not specific to the site (i.e. anyone in the wider area faces the same hazards) and people should follow standard precautions to not cross flooded roads or other areas.

Based on the flood risk described above, the proposed development will not impact upon existing community emergency management arrangements for flooding. There is no scenario in which the site would require evacuation due to flooding or other flood-related activities that would involve NSW SES or Council assistance. Similarly, the development will not have any impact in the form of social and economic costs to the community.

Environmental Impacts

Items 9 to 13 in the SEARs requirements relate to flooding. These have largely been address in the previous sections of this report. Remaining items in the SEARs not previously addressed are as follows:

Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site.

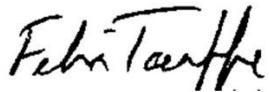
Comment While the site is located in the Duck River catchment, which has a significant floodplain environment in some areas, flooding near the site is overland flow in a fully urbanised area. There

is no floodplain environment in the vicinity of the site and development will not affect any floodplain environments.

Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses.

Comment: Similarly to the previous point, there are no riverbanks or other watercourses in the vicinity of the site that could be affected by the development.

Yours Sincerely

A handwritten signature in black ink that reads 'Felix Taaffe'.

Felix Taaffe

Senior Engineer

Email: felix@grhydro.com.au

Tel: +61 422 224 754

Figures



- Study Area
- Cadastral Boundaries



TITLE : Subject Site

PROJECT: 30-46 Auburn Road, Regents Park,
Flood Assessment

PROJECT No. 210086

DATE: Nov. 2021

SCALE: 1:3000

FIGURE No. 01



- Study Area
- Catchment Area
- Cadastral Boundaries



| | | | | | |
|-------------------------------|---|---------------------------|------------------------|----------------------|----------------------|
| TITLE : Catchment Area | PROJECT: 30-46 Auburn Road, Regents Park, Flood Assessment | PROJECT No. 210086 | DATE: Nov. 2021 | SCALE: 1:7000 | FIGURE No. 02 |
|-------------------------------|---|---------------------------|------------------------|----------------------|----------------------|



Flood Depths (m)

| | |
|-------------|------------|
| 0.05 to 0.1 | 0.5 to 1.0 |
| 0.1 to 0.3 | 1.0 to 2.0 |
| 0.3 to 0.5 | 2.0 to 5.0 |

— Major Flood Level Contours
(Spacing = 1.0 m)

— Minor Flood Level Contours
(Spacing = 0.5 m)

▭ Study Area

▭ Cadastral Boundaries



TITLE : **5% AEP Flood Depths & Levels
- Existing**

PROJECT: **30-46 Auburn Road, Regents Park,
Flood Assessment**

PROJECT No. **210086**

DATE: **Nov. 2021**

SCALE: **1:2000**

FIGURE No. **03**

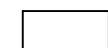


Flood Hazard Categories

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



Study Area



Cadastral Boundaries



TITLE : 5% AEP Flood Hazard
- Existing

PROJECT: 30-46 Auburn Road, Regents Park,
Flood Assessment

PROJECT No. 210086

DATE: Nov. 2021

SCALE: 1:2000

FIGURE No. 04



- Hydraulic Categories
- Flood Fringe
 - Flood Storage
 - Flood Way

- Study Area
- Cadastral Boundaries



TITLE **5% AEP Flood Hydraulic Categories - Existing**

PROJECT: **30-46 Auburn Road, Regents Park, Flood Assessment**

PROJECT No. **210086**

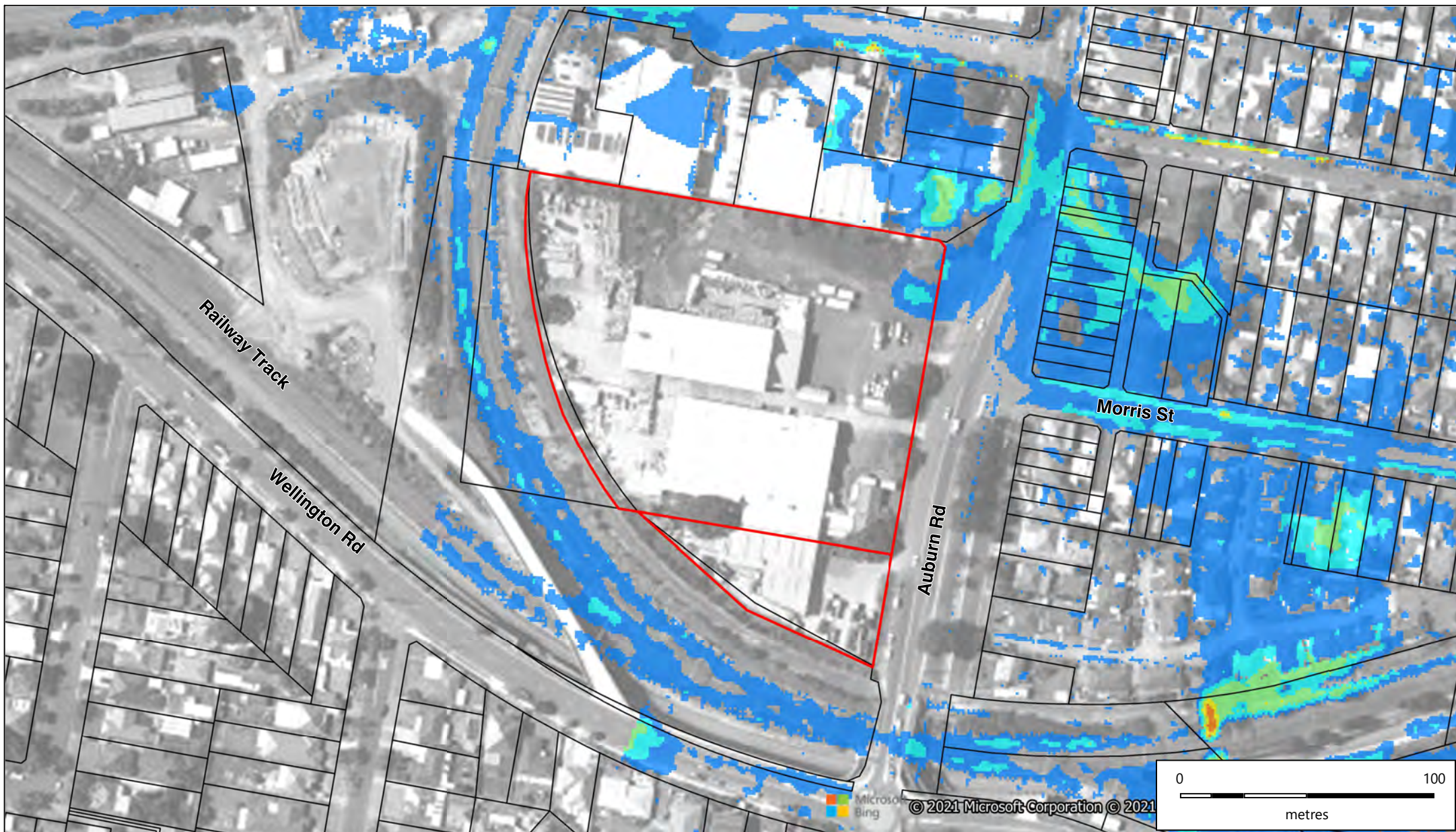
DATE: **Nov. 2021**

SCALE: **1:2000**

FIGURE No. **05**



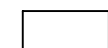
| | | | | | | | | | | |
|---|--|--|----------------------------------|-------------------------------|-----------------------------|-----------------------------|------------|---|---|--|
| | <p>Flood Depths (m)</p> <table border="0"> <tr> <td style="background-color: #e0f2f1;">0.05 to 0.1</td> <td style="background-color: #2196f3;">0.5 to 1.0</td> </tr> <tr> <td style="background-color: #bbdefb;">0.1 to 0.3</td> <td style="background-color: #00008b;">1.0 to 2.0</td> </tr> <tr> <td style="background-color: #90caf9;">0.3 to 0.5</td> <td style="background-color: #000000;">2.0 to 5.0</td> </tr> </table> | 0.05 to 0.1 | 0.5 to 1.0 | 0.1 to 0.3 | 1.0 to 2.0 | 0.3 to 0.5 | 2.0 to 5.0 | <p>— Major Flood Level Contours (Spacing = 1.0 m)</p> <p>— Minor Flood Level Contours (Spacing = 0.5 m)</p> | <p>▭ Study Area</p> <p>▭ Cadastral Boundaries</p> | |
| 0.05 to 0.1 | 0.5 to 1.0 | | | | | | | | | |
| 0.1 to 0.3 | 1.0 to 2.0 | | | | | | | | | |
| 0.3 to 0.5 | 2.0 to 5.0 | | | | | | | | | |
| <p>TITLE : 1% AEP Flood Depths & Levels - Existing</p> | | <p>PROJECT: 30-46 Auburn Road, Regents Park, Flood Assessment</p> | <p>PROJECT No. 210086</p> | <p>DATE: Nov. 2021</p> | <p>SCALE: 1:2000</p> | <p>FIGURE No. 06</p> | | | | |



Flood Hazard Categories



Study Area



Cadastral Boundaries



TITLE : 1% AEP Flood Hazard
- Existing

PROJECT: 30-46 Auburn Road, Regents Park,
Flood Assessment

PROJECT No. 210086

DATE: Nov. 2021

SCALE: 1:2000

FIGURE No. 07



- Hydraulic Categories
- Flood Fringe
 - Flood Storage
 - Flood Way

- Study Area
- Cadastral Boundaries



TITLE **1% AEP Flood Hydraulic Categories - Existing**

PROJECT: **30-46 Auburn Road, Regents Park, Flood Assessment**

PROJECT No. **210086**

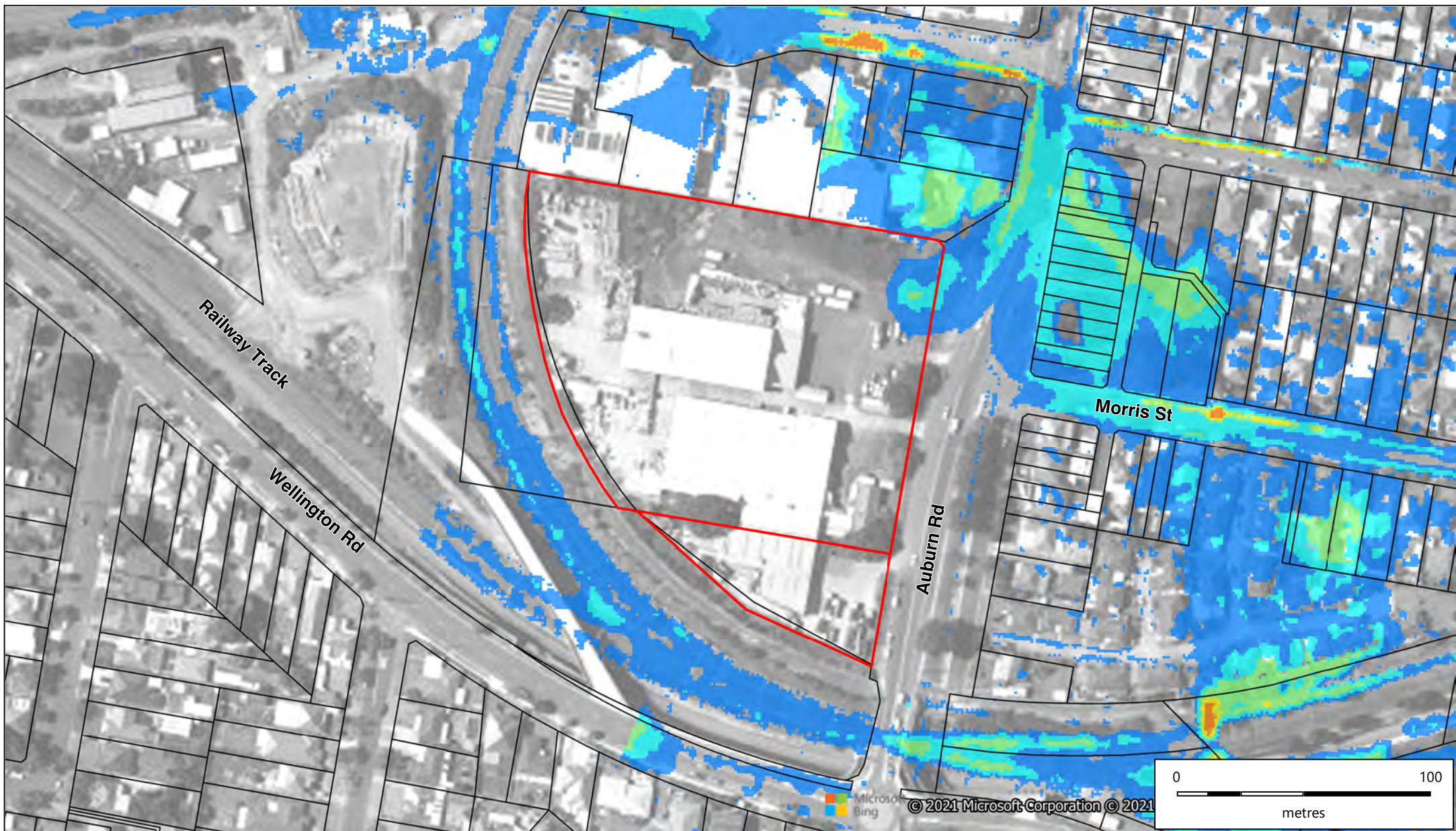
DATE: **Nov. 2021**

SCALE: **1:2000**

FIGURE No. **08**



| | | | | | |
|--|--|---|--|--|--|
| | Flood Depths (m) 0.05 to 0.1 0.1 to 0.3 0.3 to 0.5 0.5 to 1.0 1.0 to 2.0 2.0 to 5.0 | | — Major Flood Level Contours (Spacing = 1.0 m) — Minor Flood Level Contours (Spacing = 0.5 m) | [Red Outline] Study Area [Black Outline] Cadastral Boundaries | |
| | TITLE Climate Change Flood Depths & Levels - Existing | PROJECT: 30-46 Auburn Road, Regents Park, Flood Assessment | PROJECT No. 210086 | DATE: Nov. 2021 | |

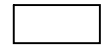


Flood Hazard Categories

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



Study Area



Cadastral Boundaries



TITLE : Climate Change Flood Hazard - Existing

PROJECT: 30-46 Auburn Road, Regents Park, Flood Assessment

PROJECT No. 210086

DATE: Nov. 2021

SCALE: 1:2000

FIGURE No. 10



- Hydraulic Categories
- Flood Fringe
 - Flood Storage
 - Flood Way

- Study Area
- Cadastral Boundaries



TITLE **Climate Change Flood Hydraulic Categories - Existing**

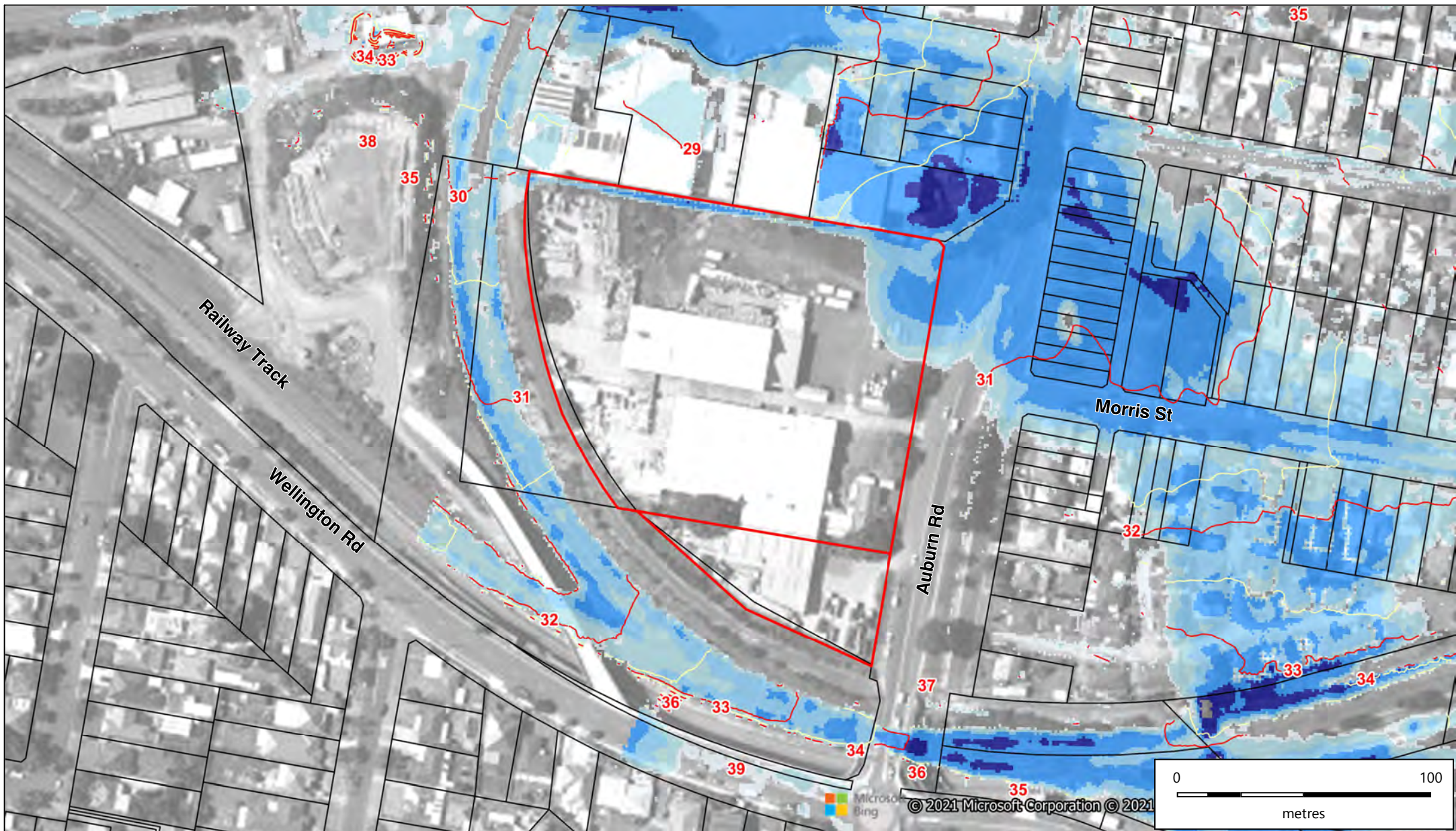
PROJECT: **30-46 Auburn Road, Regents Park, Flood Assessment**

PROJECT No. **210086**

DATE: **Nov. 2021**

SCALE: **1:2000**

FIGURE No. **11**



Flood Depths (m)

| | |
|-------------|------------|
| 0.05 to 0.1 | 0.5 to 1.0 |
| 0.1 to 0.3 | 1.0 to 2.0 |
| 0.3 to 0.5 | 2.0 to 5.0 |

— Major Flood Level Contours
(Spacing = 1.0 m)

— Minor Flood Level Contours
(Spacing = 0.5 m)

▭ Study Area

▭ Cadastral Boundaries



TITLE: **PMF Flood Depths & Levels**
- Existing

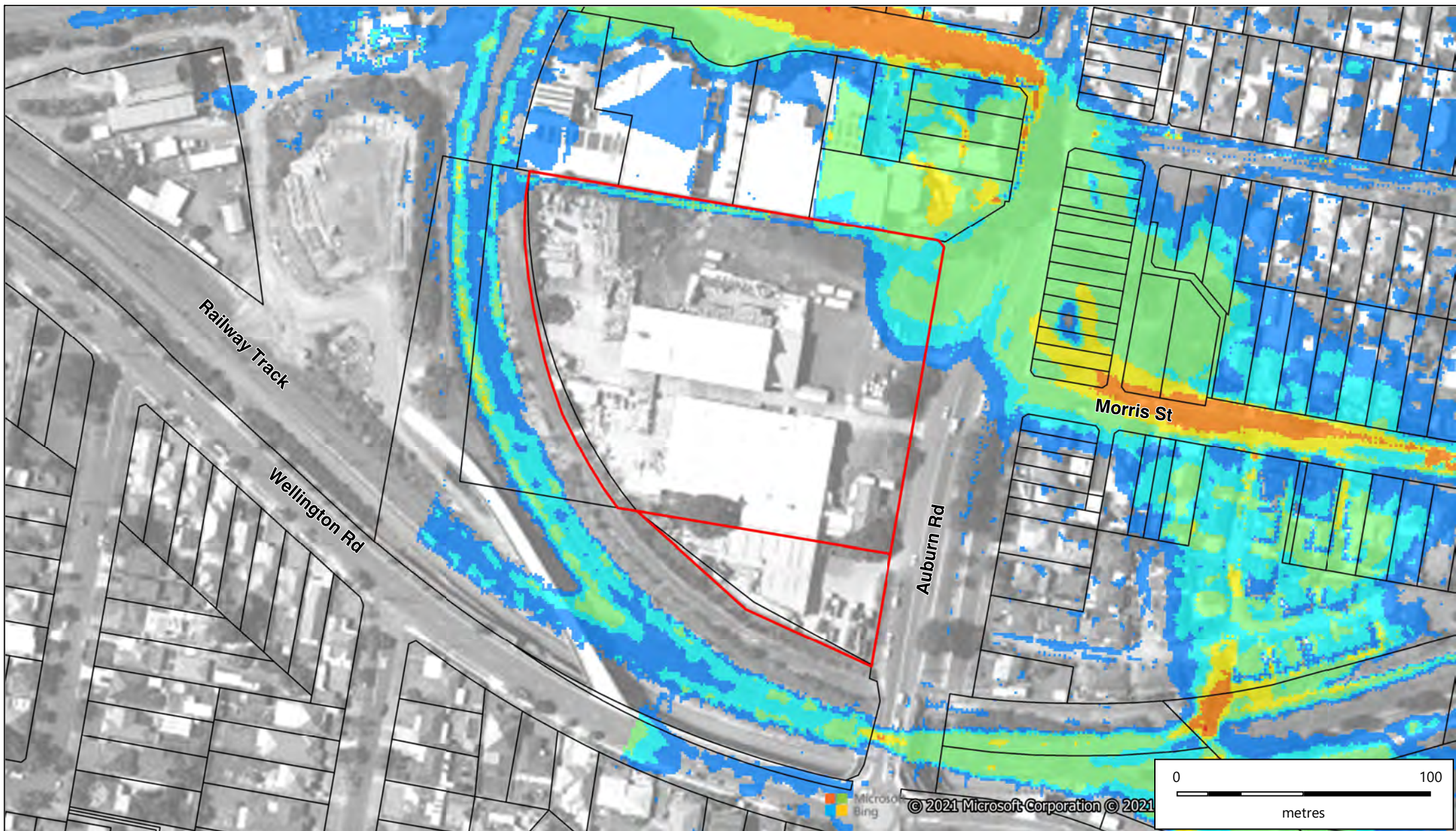
PROJECT: **30-46 Auburn Road, Regents Park,**
Flood Assessment

PROJECT No. 210086







DATE: Nov. 2021

SCALE: 1:2000

FIGURE No. 12

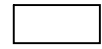


Flood Hazard Categories

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



Study Area



Cadastral Boundaries



TITLE : **PMF Flood Hazard - Existing**

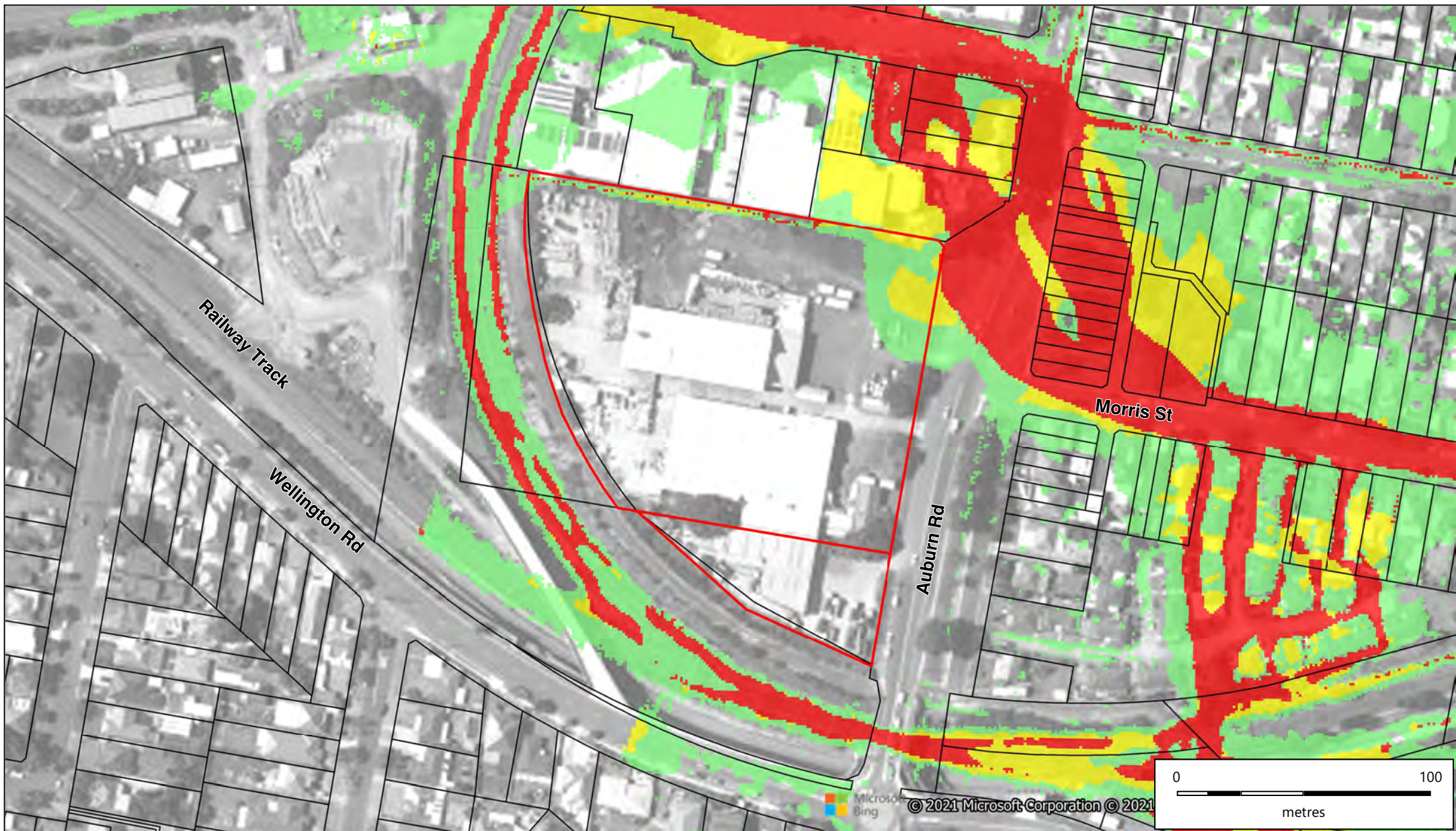
PROJECT: **30-46 Auburn Road, Regents Park, Flood Assessment**

PROJECT No. **210086**

DATE: **Nov. 2021**

SCALE: **1:2000**

FIGURE No. **13**






| | | | | | |
|---|--|----------------------------------|-------------------------------|-----------------------------|-----------------------------|
| | <p>Hydraulic Categories</p> <ul style="list-style-type: none"> Flood Fringe Flood Storage Flood Way | | | | |
| <p>TITLE PMF Flood Hydraulic Categories - Existing</p> | <p>PROJECT: 30-46 Auburn Road, Regents Park, Flood Assessment</p> | <p>PROJECT No. 210086</p> | <p>DATE: Nov. 2021</p> | <p>SCALE: 1:2000</p> | <p>FIGURE No. 14</p> |




| | | | | | | | | | | |
|---|--|----------------------------------|-------------------------------|-----------------------------|-----------------------------|------------|------------|---|---|--|
| | <p>Flood Depths (m)</p> <table border="0"> <tr> <td style="background-color: #e0f0ff;">0.05 to 0.1</td> <td style="background-color: #0070c0;">0.5 to 1.0</td> </tr> <tr> <td style="background-color: #90d0e0;">0.1 to 0.3</td> <td style="background-color: #000080;">1.0 to 2.0</td> </tr> <tr> <td style="background-color: #40a0e0;">0.3 to 0.5</td> <td style="background-color: #000000;">2.0 to 5.0</td> </tr> </table> | 0.05 to 0.1 | 0.5 to 1.0 | 0.1 to 0.3 | 1.0 to 2.0 | 0.3 to 0.5 | 2.0 to 5.0 | <p>— Major Flood Level Contours (Spacing = 1.0 m)</p> <p>— Minor Flood Level Contours (Spacing = 0.5 m)</p> | <p>▭ Study Area</p> <p>▭ Cadastral Boundaries</p> | |
| 0.05 to 0.1 | 0.5 to 1.0 | | | | | | | | | |
| 0.1 to 0.3 | 1.0 to 2.0 | | | | | | | | | |
| 0.3 to 0.5 | 2.0 to 5.0 | | | | | | | | | |
| <p>TITLE : 5% AEP Flood Depths & Levels - Proposed</p> | <p>PROJECT: 30-46 Auburn Road, Regents Park, Flood Assessment</p> | <p>PROJECT No. 210086</p> | <p>DATE: Nov. 2021</p> | <p>SCALE: 1:2000</p> | <p>FIGURE No. 19</p> | | | | | |



Flood Hazard Categories

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

 Study Area

 Cadastral Boundaries



TITLE : 5% AEP Flood Hazard
- Proposed

PROJECT: 30-46 Auburn Road, Regents Park,
Flood Assessment

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DATE: Nov. 2021

SCALE: 1:2000

FIGURE No. 16



- Hydraulic Categories
- Flood Fringe
 - Flood Storage
 - Flood Way

- Study Area
- Cadastral Boundaries



TITLE **5% AEP FloodHydraulic Categories - Proposed**

PROJECT: **30-46 Auburn Road, Regents Park, Flood Assessment**

PROJECT No. **210086**

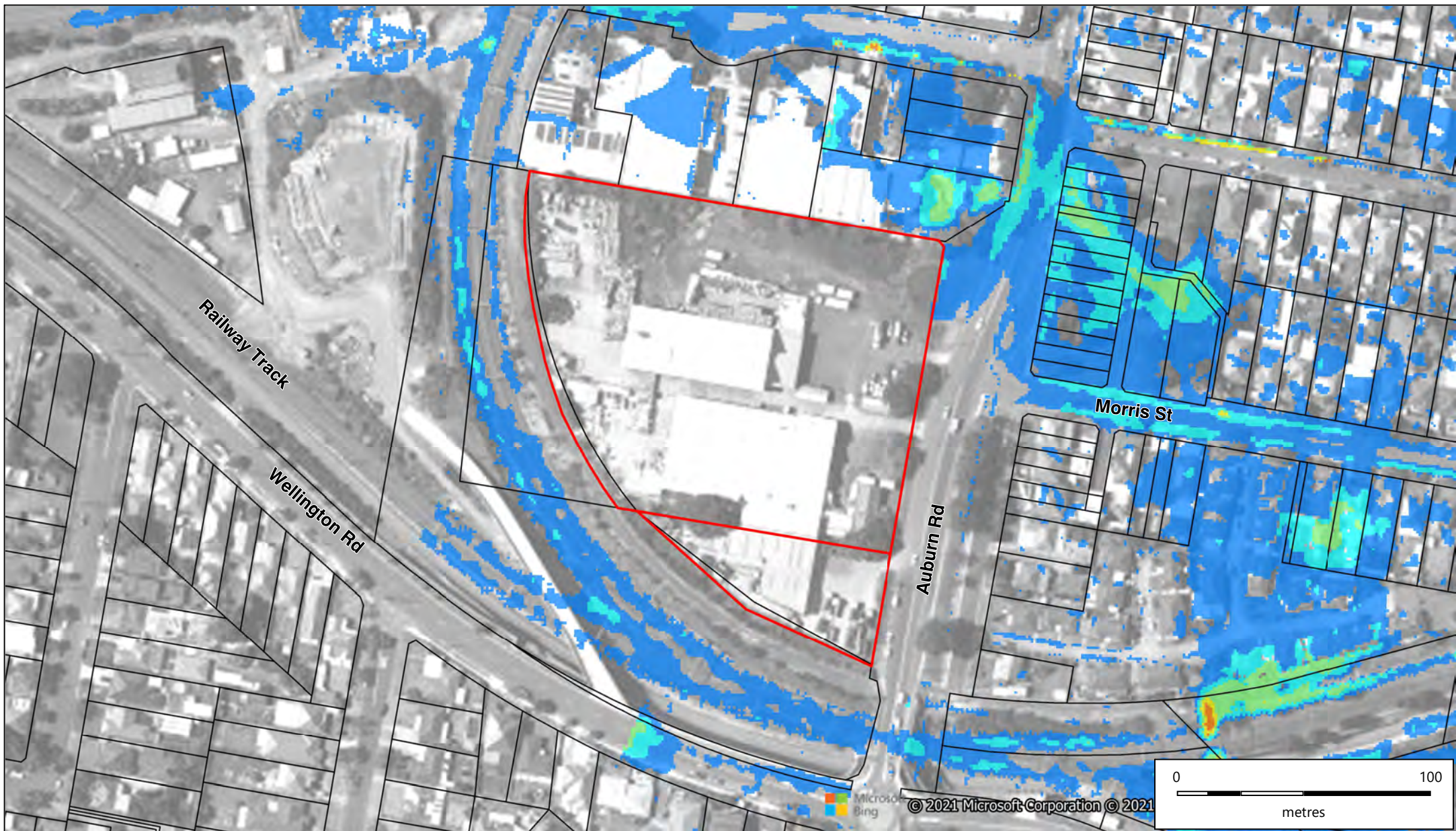
DATE: **Nov. 2021**

SCALE: **1:2000**

FIGURE No. **17**




| | | | | | | | | | | |
|---|--|----------------------------------|-------------------------------|-----------------------------|-----------------------------|------------|------------|---|---|--|
| | <p>Flood Depths (m)</p> <table border="0"> <tr> <td style="background-color: #e0f0ff;">0.05 to 0.1</td> <td style="background-color: #0000ff;">0.5 to 1.0</td> </tr> <tr> <td style="background-color: #00b0f0;">0.1 to 0.3</td> <td style="background-color: #000080;">1.0 to 2.0</td> </tr> <tr> <td style="background-color: #0070c0;">0.3 to 0.5</td> <td style="background-color: #000000;">2.0 to 5.0</td> </tr> </table> | 0.05 to 0.1 | 0.5 to 1.0 | 0.1 to 0.3 | 1.0 to 2.0 | 0.3 to 0.5 | 2.0 to 5.0 | <p>— Major Flood Level Contours (Spacing = 1.0 m)</p> <p>— Minor Flood Level Contours (Spacing = 0.5 m)</p> | <p>▭ Study Area</p> <p>▭ Cadastral Boundaries</p> | |
| 0.05 to 0.1 | 0.5 to 1.0 | | | | | | | | | |
| 0.1 to 0.3 | 1.0 to 2.0 | | | | | | | | | |
| 0.3 to 0.5 | 2.0 to 5.0 | | | | | | | | | |
| <p>TITLE : 1% AEP Flood Depths & Levels - Proposed</p> | <p>PROJECT: 30-46 Auburn Road, Regents Park, Flood Assessment</p> | <p>PROJECT No. 210086</p> | <p>DATE: Nov. 2021</p> | <p>SCALE: 1:2000</p> | <p>FIGURE No. 18</p> | | | | | |



Flood Hazard Categories



 Study Area

 Cadastral Boundaries



TITLE : 1% AEP Flood Hazard
- Proposed

PROJECT: 30-46 Auburn Road, Regents Park,
Flood Assessment

PROJECT No. 210086

DATE: Nov. 2021

SCALE: 1:2000

FIGURE No. 19



Flood Hydraulic Categories

- Flood Fringe
- Flood Storage
- Flood Way

- Study Area
- Cadastral Boundaries



TITLE: **1% AEP Flood Hydraulic Categories - Proposed**

PROJECT: **30-46 Auburn Road, Regents Park, Flood Assessment**

PROJECT No. **210086**

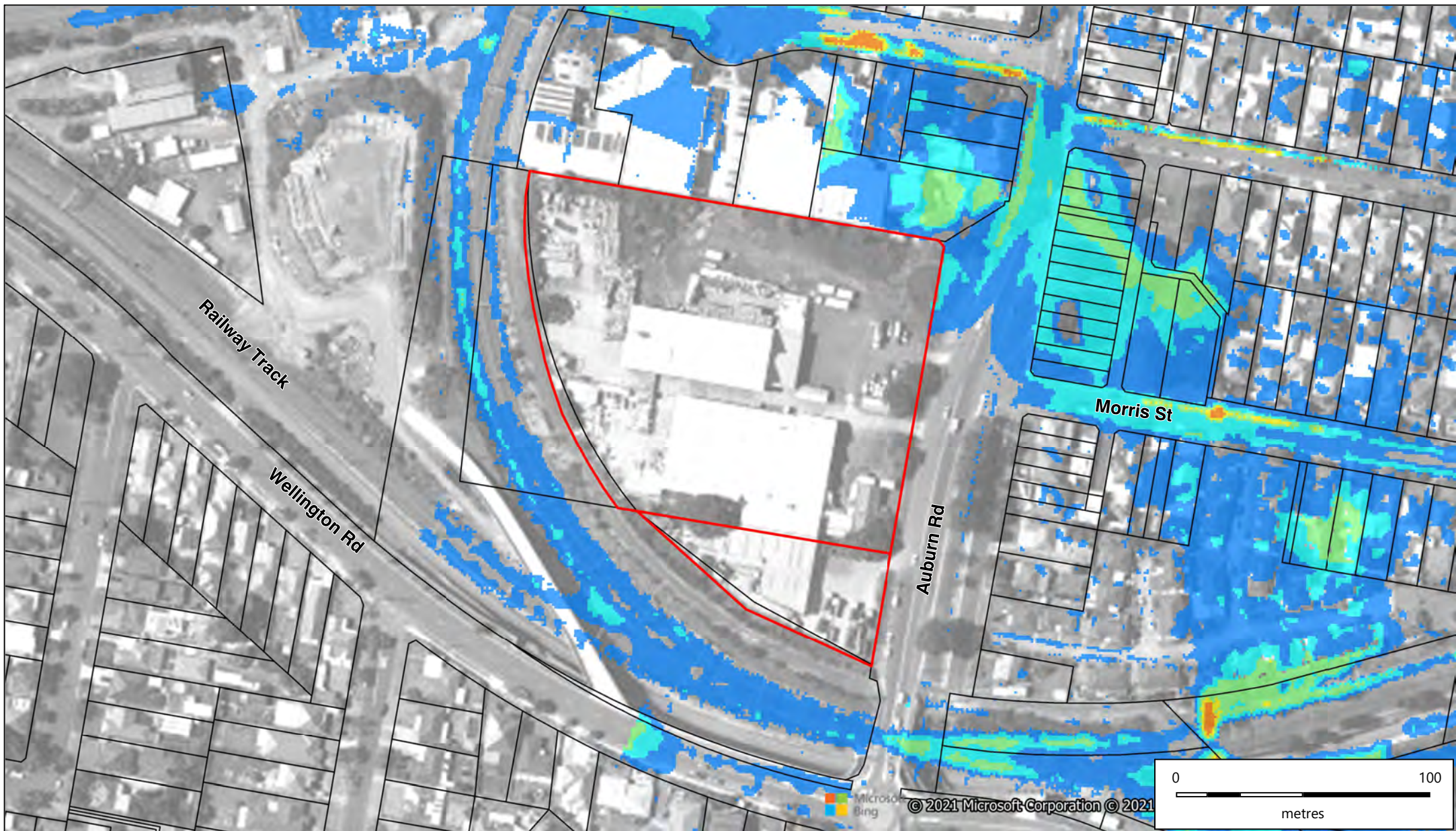
DATE: **Nov. 2021**

SCALE: **1:2000**

FIGURE No. **20**



| | | | | | |
|--|---|--|--|--|----------------------|
| | Flood Depths (m) | | Major Flood Level Contours (Spacing = 1.0 m) Minor Flood Level Contours (Spacing = 0.5 m) | Study Area Cadastral Boundaries | |
| | 0.05 to 0.1 0.1 to 0.3 0.3 to 0.5 | 0.5 to 1.0 1.0 to 2.0 2.0 to 5.0 | | | |
| TITLE Climate Change Flood Depths & Levels - Proposed | PROJECT: 30-46 Auburn Road, Regents Park, Flood Assessment | PROJECT No. 210086 | DATE: Nov. 2021 | SCALE: 1:2000 | FIGURE No. 21 |



Flood Hazard Categories

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

 Study Area

 Cadastral Boundaries



TITLE : **Climate Change Flood Hazard - Proposed**

PROJECT: **30-46 Auburn Road, Regents Park, Flood Assessment**

PROJECT No. **210086**

DATE: **Nov. 2021**

SCALE: **1:2000**

FIGURE No. **22**



- Hydraulic Categories
- Flood Fringe
 - Flood Storage
 - Flood Way

- Study Area
- Cadastral Boundaries



TITLE: **Climate Change Flood Hydraulic Categories - Proposed**

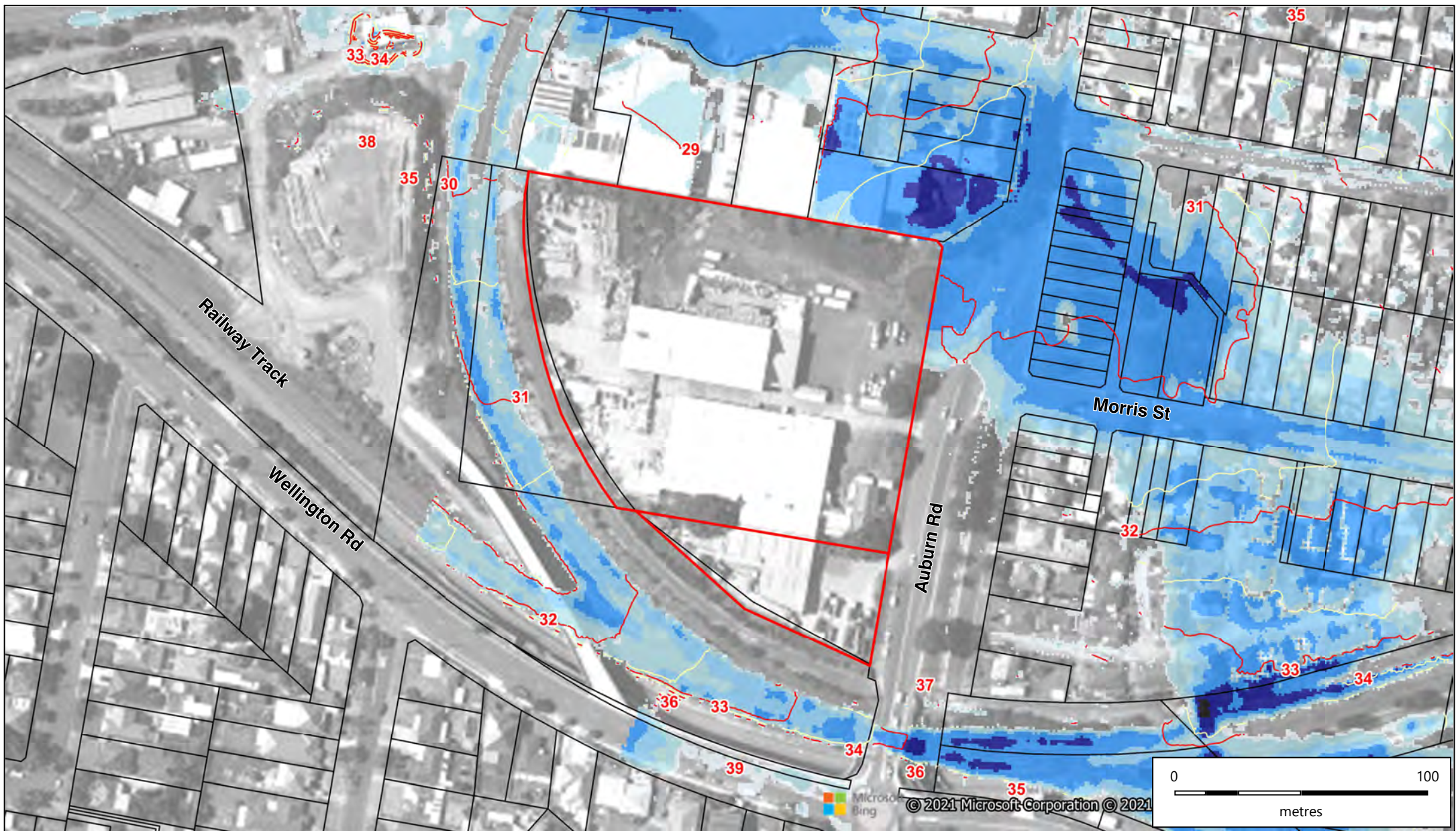
PROJECT: **30-46 Auburn Road, Regents Park, Flood Assessment**

PROJECT No. **210086**

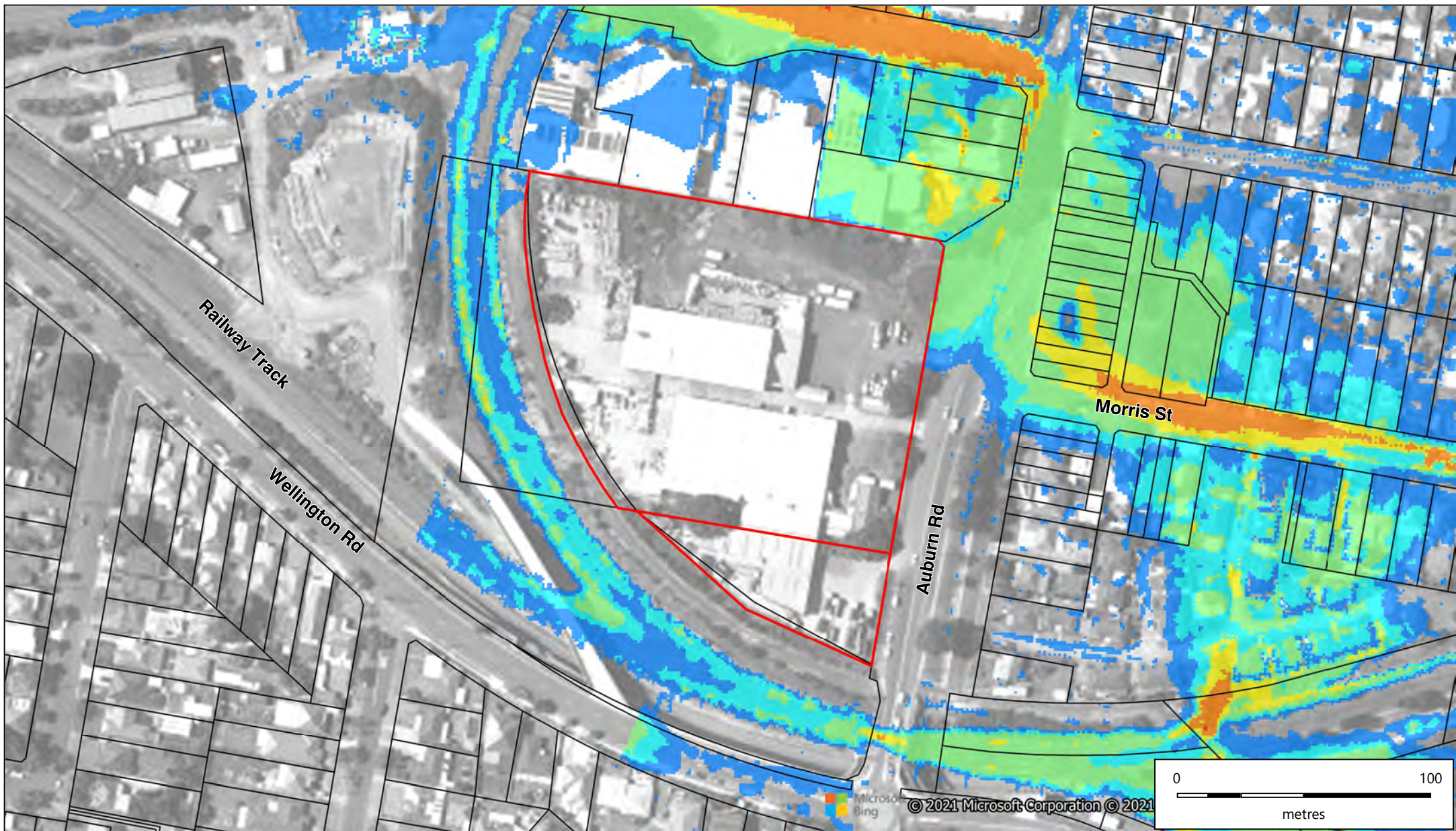
DATE: **Nov. 2021**

SCALE: **1:2000**

FIGURE No. **23**




| | | | | | | | | | | |
|--|--|----------------------------------|-------------------------------|-----------------------------|-----------------------------|------------|------------|---|---|--|
| | <p>Flood Depths (m)</p> <table border="0"> <tr> <td style="background-color: #e0f0ff;">0.05 to 0.1</td> <td style="background-color: #0070c0;">0.5 to 1.0</td> </tr> <tr> <td style="background-color: #90d0d0;">0.1 to 0.3</td> <td style="background-color: #000080;">1.0 to 2.0</td> </tr> <tr> <td style="background-color: #66b3ff;">0.3 to 0.5</td> <td style="background-color: #000000;">2.0 to 5.0</td> </tr> </table> | 0.05 to 0.1 | 0.5 to 1.0 | 0.1 to 0.3 | 1.0 to 2.0 | 0.3 to 0.5 | 2.0 to 5.0 | <p>— Major Flood Level Contours (Spacing = 1.0 m)</p> <p>— Minor Flood Level Contours (Spacing = 0.5 m)</p> | <p>▭ Study Area</p> <p>▭ Cadastral Boundaries</p> | |
| 0.05 to 0.1 | 0.5 to 1.0 | | | | | | | | | |
| 0.1 to 0.3 | 1.0 to 2.0 | | | | | | | | | |
| 0.3 to 0.5 | 2.0 to 5.0 | | | | | | | | | |
| <p>TITLE : PMF Flood Depths & Levels - Proposed</p> | <p>PROJECT: 30-46 Auburn Road, Regents Park, Flood Assessment</p> | <p>PROJECT No. 210086</p> | <p>DATE: Nov. 2021</p> | <p>SCALE: 1:2000</p> | <p>FIGURE No. 24</p> | | | | | |



Flood Hazard Categories



 Study Area

 Cadastral Boundaries



TITLE : **PMF Flood Hazard - Proposed**

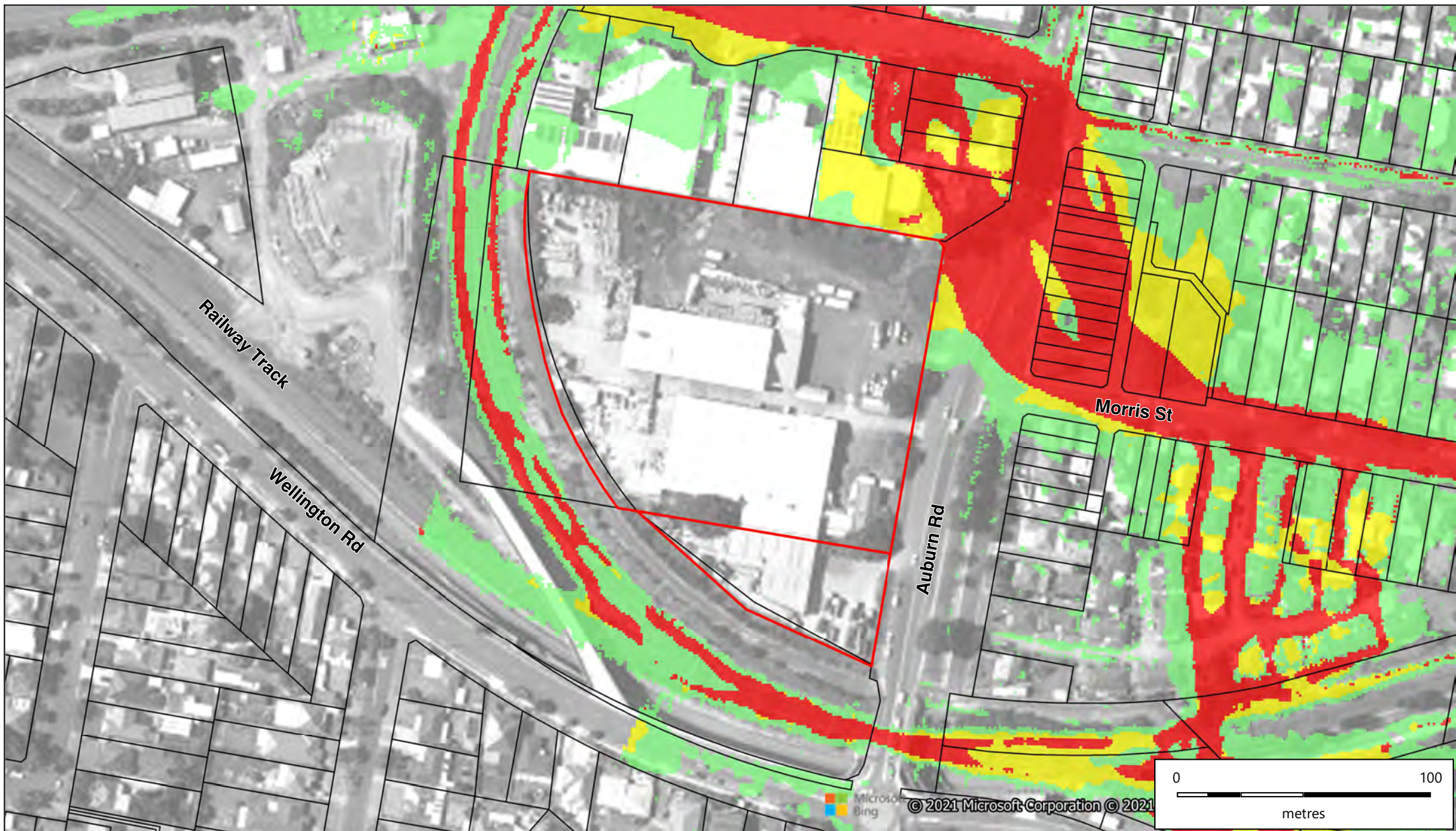
PROJECT: **30-46 Auburn Road, Regents Park, Flood Assessment**

PROJECT No. **210086**

DATE: **Nov. 2021**

SCALE: **1:2000**

FIGURE No. **25**



- Hydraulic Categories
- Flood Fringe
 - Flood Storage
 - Flood Way

- Study Area
- Cadastral Boundaries



TITLE **PMF Flood Hydraulic Categories - Proposed**

PROJECT: **30-46 Auburn Road, Regents Park, Flood Assessment**

PROJECT No. **210086**

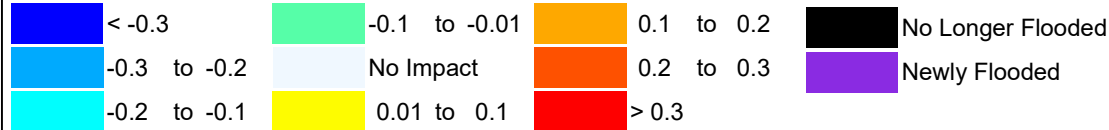
DATE: **Nov. 2021**

SCALE: **1:2000**

FIGURE No. **26**



Flood Level Impact (m)



 Study Area

 Cadastral Boundaries



TITLE : 5% AEP Flood Levels Impact

PROJECT: 30-46 Auburn Road, Regents Park,
Flood Assessment

PROJECT No. 210086

DATE: Nov. 2021

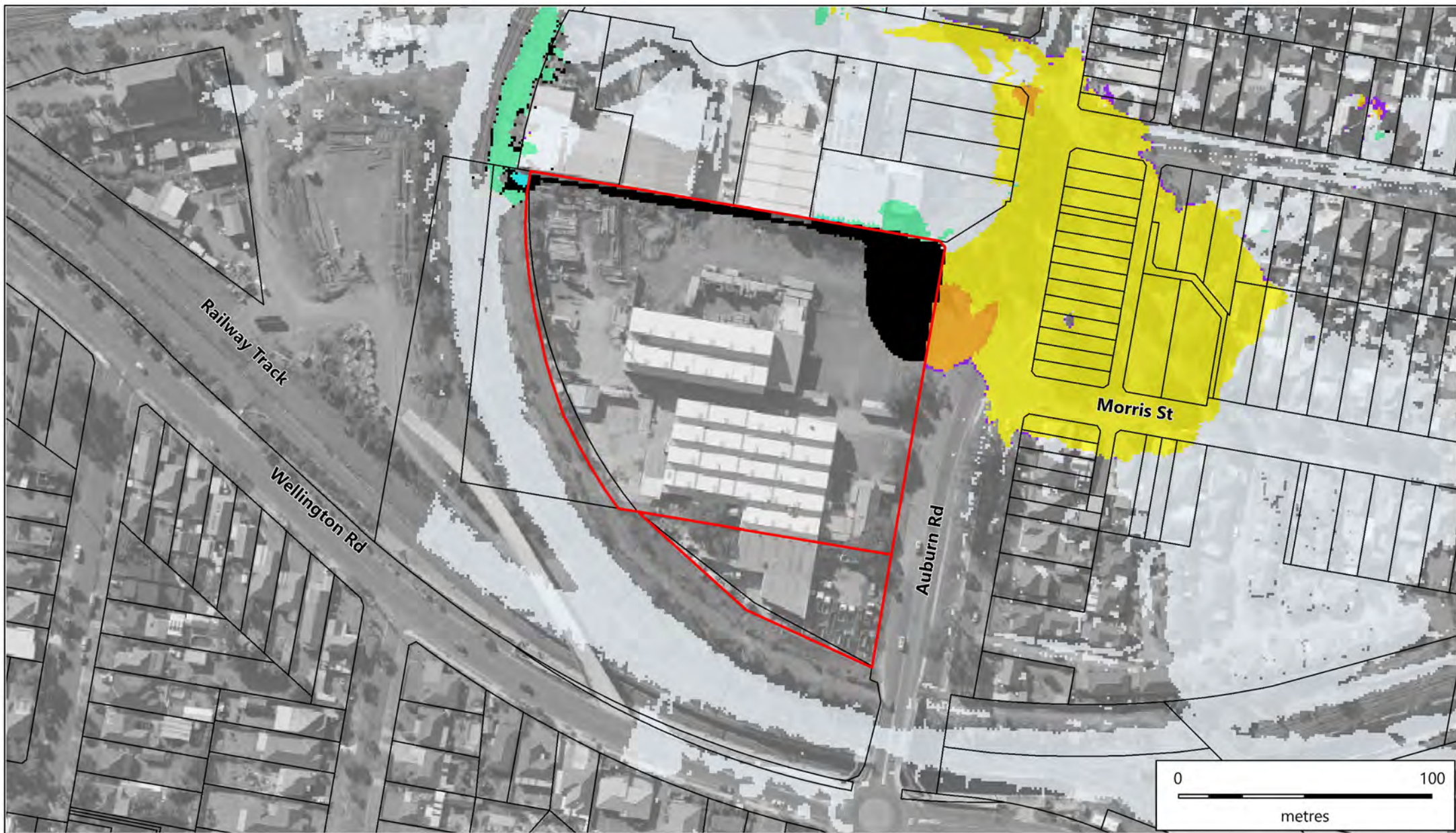
SCALE: 1:2000

FIGURE No. 27



| | | | | | | |
|--|--|---|-----------------------------------|------------------------------------|------------------------------------|--|
| | Flood Level Impact (m) | | | | Study Area Cadastral Boundaries | |
| | < -0.3 -0.3 to -0.2 -0.2 to -0.1 | -0.1 to -0.01 No Impact 0.01 to 0.1 | 0.1 to 0.2 0.2 to 0.3 > 0.3 | No Longer Flooded Newly Flooded | | |





| | | | | | | | | | | | | | | |
|--|--|---------------------------|------------------------|----------------------|----------------------|--------------|-----------|------------|---------------|--------------|--------------|-------|--|--|
| | <p>Flood Level Impact (m)</p> <table border="0"> <tr> <td> < -0.3</td> <td> -0.1 to -0.01</td> <td> 0.03 to 0.2</td> <td> No Longer Flooded</td> </tr> <tr> <td> -0.3 to -0.2</td> <td> No Impact</td> <td> 0.2 to 0.3</td> <td> Newly Flooded</td> </tr> <tr> <td> -0.2 to -0.1</td> <td> 0.01 to 0.03</td> <td> > 0.3</td> <td></td> </tr> </table> <p> Study Area</p> <p> Cadastral Boundaries</p> | < -0.3 | -0.1 to -0.01 | 0.03 to 0.2 | No Longer Flooded | -0.3 to -0.2 | No Impact | 0.2 to 0.3 | Newly Flooded | -0.2 to -0.1 | 0.01 to 0.03 | > 0.3 | | |
| < -0.3 | -0.1 to -0.01 | 0.03 to 0.2 | No Longer Flooded | | | | | | | | | | | |
| -0.3 to -0.2 | No Impact | 0.2 to 0.3 | Newly Flooded | | | | | | | | | | | |
| -0.2 to -0.1 | 0.01 to 0.03 | > 0.3 | | | | | | | | | | | | |
| TITLE : PMF Flood Levels Impact | PROJECT: 30-46 Auburn Road, Regents Park, Flood Assessment | PROJECT No. 210086 | DATE: Nov. 2021 | SCALE: 1:2000 | FIGURE No. 30 | | | | | | | | | |