BMT Commercial Australia Pty Ltd
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Ultimo, NSW, 2007
Australia

ABN: 54 010 830 421

Our ref: L.A10908.002.00.Addendum02.docx

10 July 2023

Goodman Property Services (Aust) Pty Ltd
The Hayesbury
1-11 Hayes Road
Rosebery NSW 2018

Attention: Guy Smith

Dear Guy,

RE: FLOOD ASSESSMENT FOR OAKDALE EAST INDUSTRIAL ESTATE MASTERPLAN AND STAGE 2 WORKS – ADDENDUM NO. 2

This letter forms Addendum No. 2 to the 'Flood Assessment for Oakdale East Industrial Estate Masterplan and Stage 2 Works' (BMT, 2022). It outlines the updated flood modelling and assessment completed for AT&L's updated design that incorporates a retaining wall along the eastern extent of the Precinct 5 fill platform to reduce the encroachment of the Precinct 5 embankment into the flood extent of Reedy Creek.

We trust this addendum meets the project requirements. Please feel free to contact the undersigned (ph.: (02) 8960 7755 or email: nick.depaolis@apac.bmt.org) if you require any further information or clarification.

Yours Sincerely,
BMT

Nicola De Paolis
Senior Engineer

Introduction

In June 2022, BMT Commercial Australia Pty Ltd ("BMT") completed a flood assessment to address the Planning Secretary's Environmental Assessment Requirements (SEARs) related to flooding for State Significant Development Application SSD-37486043 for the Concept Plan and Stage 2 works for the Oakdale East Industrial Estate located at 2 and 10 Old Wallgrove Road, Horsley Park (the "site"). This assessment was documented within the 'Flood Assessment for Oakdale East Industrial Estate Masterplan and Stage 2 Works' (BMT, 2022) (reference: L.A10908.001.01.FIA_Oakdale_Estate_SSDA' and hereafter referred to as the "Oakdale East Flood Assessment (2022)").

The proponent's submission has since been undergoing assessment through the State Significant Development Application (SSDA) process, with flood-related submissions received from WaterNSW and Fairfield City Council ("Council"). 'Flood Assessment for Oakdale East Industrial Estate Masterplan and Stage 2 Works – Addendum No. 1' (BMT, 21 March 2023) was prepared by BMT to provide additional information requested by WaterNSW in relation to pre- and post-development flows in the vicinity the WaterNSW pipeline adjacent to the proposed development site. However, Council has raised concerns regarding the extent and magnitude of predicted flood impacts offsite. Specifically, Council's letter dated 2 June 2023 states:

"The Applicant has not satisfactorily addressed the flood impacts raised in Council's previous response to submission. The applicant is to provide further information to clarify the outstanding issues:

A. Flood Impact

The updated flood report, Flood Addendum No 1 dated 21 March 2023 is focussed specifically on the impact to the Water NSW pipeline. It does not provide any additional afflux mapping, in particular to the privately owned property to the east.

Therefore, the response provided is not satisfactory as extent of afflux in flooding located in neighbouring property is too high. The development should have negligible impact on neighbouring properties. Council defines this as no more than 0.01m afflux for the 1% AEP event."

In order to mitigate flood impacts on neighbouring properties and seek to comply with Council's afflux requirements, an updated design for Precinct 5 was prepared by AT&L and provided to BMT on 22 June 2023. This updated design incorporates a retaining wall (rather than batter slope) along the eastern boundary of the Precinct 5 fill platform, thereby reducing the potential encroachment of fill into the Reedy Creek flood extent. Accordingly, BMT were engaged by Goodman to update the flood and impact modelling to assess the flood behaviour and impacts associated with this latest design, as outlined in the following sections.

Please note that the updated modelling and resultant impact mapping was prepared in accordance with Fairfield City Council's 'Developer Agreement'. This agreement allows BMT to model the impact of the proposed development on flooding based on Council's existing flood models, however BMT cannot assess the development against flood-related development controls or make a statement regarding the adequacy of the design.

Updated Flood Modelling

Review of Baseline and Developed Scenario Model

In 2021, BMT completed flood impact modelling associated with the Rehabilitation Development Application (DA) that sought approval for site rehabilitation and bulk earthworks within Precinct 1 expansion and Precincts 2 to 4 (i.e. excluding works to Precinct 5). This modelling and its outcomes were documented in 'Flood Impact Modelling for Oakdale East Industrial Development Earthworks' (BMT, 4 August 2021) (reference: 'L.A11103.001.00.FIA_Oakdale_Estate_Earthworks' and hereafter referred to as the "2021 Earthworks FIA").

Baseline conditions for the Oakdale East Flood Assessment (2022) incorporated earthworks across the Precinct 1 expansion and Precincts 2 to 4 of the development that form fill platforms for future structures, hardstand areas and associated infrastructure. Accordingly, the Developed Scenario TUFLOW model from the 2021 Earthworks FIA was directly applied (i.e. unmodified) as the Baseline Scenario TUFLOW model for the Oakdale East Flood Assessment (2022) and used to define baseline flood conditions against which flood impacts associated with the proposed Masterplan and Stage 2 works were assessed.

Before commencing this latest modelling work, a review of the TUFLOW modelling assumptions from the for the Oakdale East Flood Assessment (2022) was completed to ensure the model's suitability for this updated flood assessment. The focus of this review was on the low-lying quarry pit between proposed Basin C and Precinct 5, as shown in Figure 1.1. This area was modelled as follows for the Oakdale East Flood Assessment (2022):

- Baseline Scenario: The quarry pit was modelled as a water storage incorporating an Initial Water Level (IWL) equivalent to the lowest point around the top perimeter of the pit, with the waterbody assumed to be 100% impervious for the purposes of applying initial and continuing losses in the rainfall-on-grid TUFLOW model.
- Developed Scenario: Based on email correspondence from Mr Anthony McLandsborough of AT&L to BMT dated 4 May 2022, the low-lying land between Basin C and Precinct 5 and to the west of Access Road was infilled, with overland flow from this area draining eastwards to Reedy Creek via a culvert crossing beneath the roadway (to be incorporated in future design).

However, Mr Anthony Landsborough of AT&L advised on 29 June 2023 that the quarry pit in Precinct 5 will be infilled as part of remediation works to be completed onsite by others prior to the construction of Precinct 5 works considered in this SSDA. Therefore, the following modifications were made to the Baseline Scenario TUFLOW model as part of the updated flood assessment documented herein:

- Infill of Precinct 5 quarry pit to tie in with ground surface elevations around the perimeter of the quarry pit to reinstate pre-quarry conditions.
- Adjusting surface material and roughness of the quarry pit infill area from waterbody to earth infill to ensure the initial/continuing losses and Manning's n values are consistent with conditions following quarry rehabilitation.

The modelling assumptions and Baseline Scenario TUFLOW model updates listed above were also carried over to the updated Developed Scenario TUFLOW model (i.e. rather than the previous 2022 flood assessment infilling of low-lying land between Basin C and Precinct).

These model modifications ensure that this updated flood assessment only considers flood impacts resulting from the proposed Oakdale East Industrial Estate Masterplan and Stage 2 works, rather than from quarry rehabilitation works.

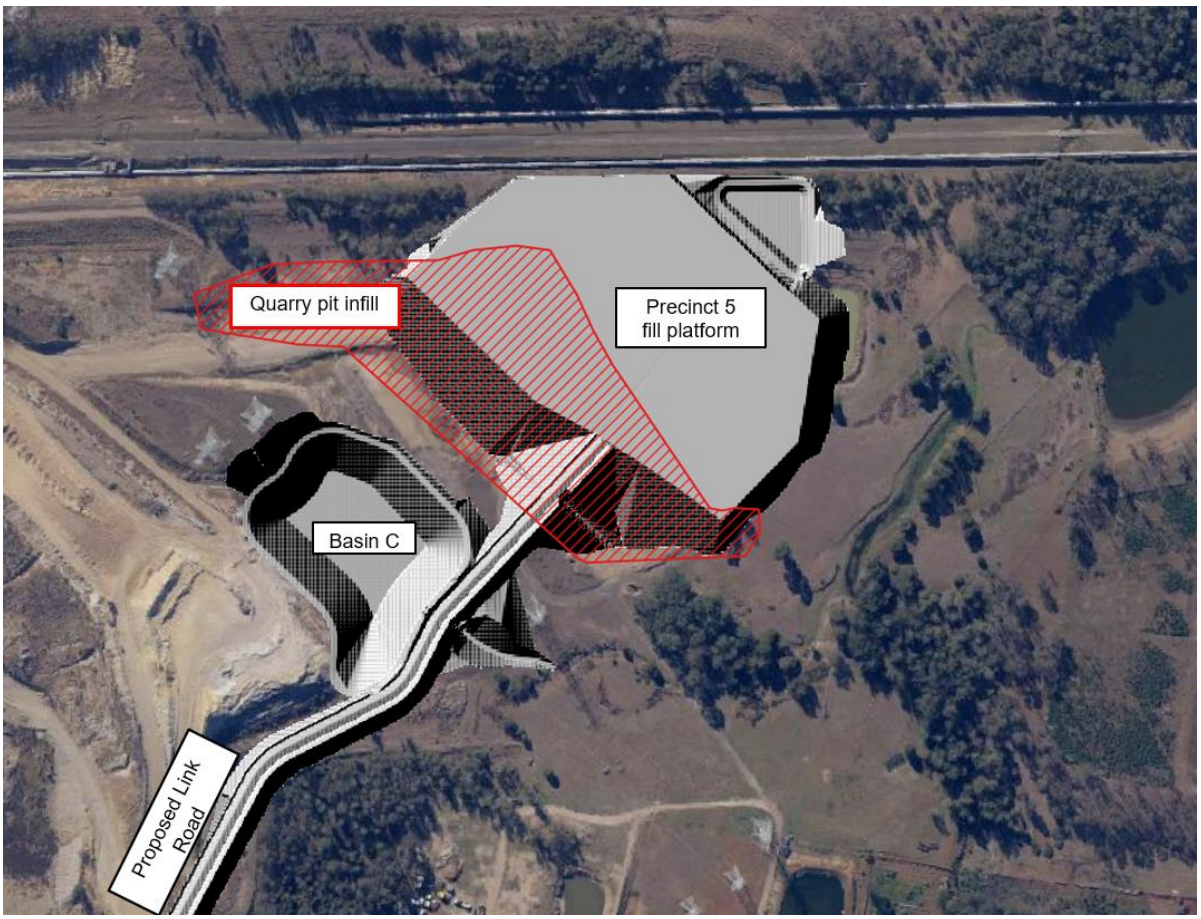


Figure 1.1 Location of Quarry Pit Infill Area Adjacent to Precinct 5

Updated Developed Scenario Model

The Developed Scenario TUFLOW model was also updated to incorporate the updated design prepared by AT&L, which incorporates a retaining wall (rather than batter slope) along the eastern boundary of the Precinct 5 fill platform. This is shown in Figure 1.2.

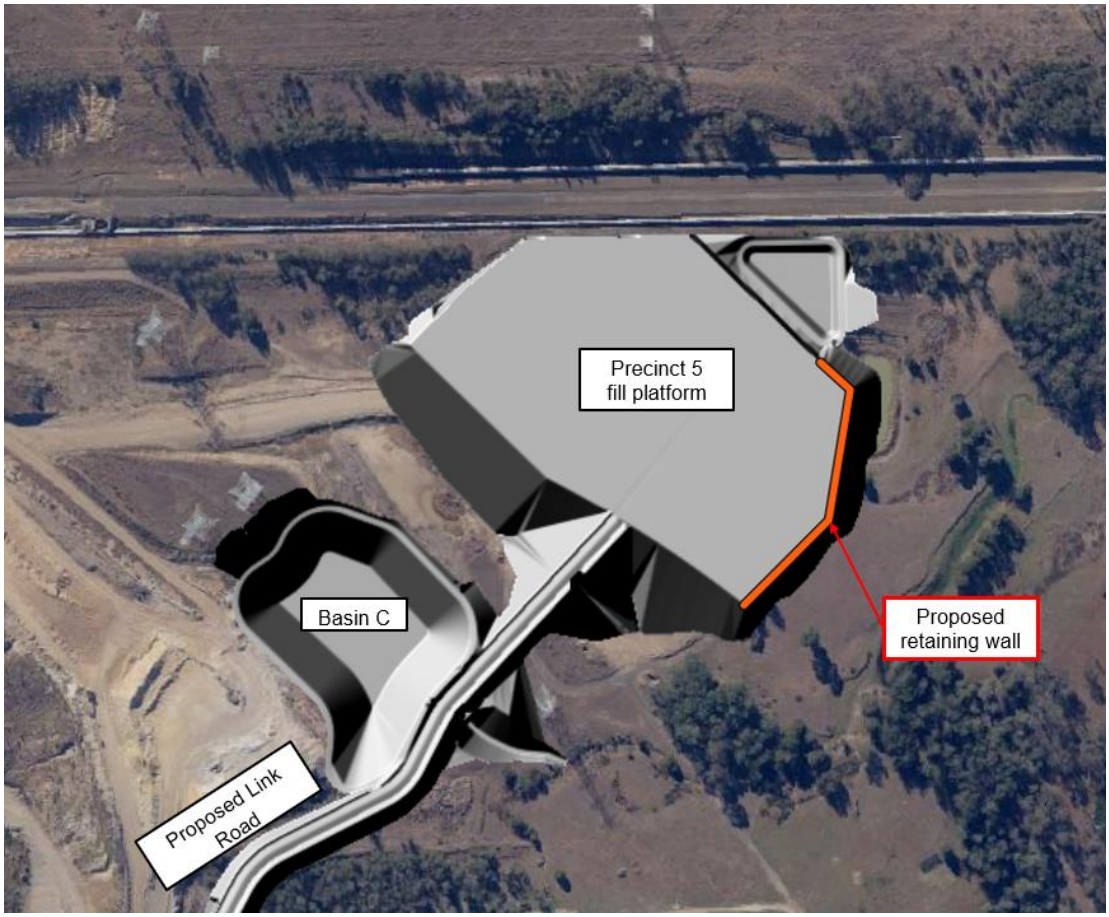


Figure 1.2 Proposed Retaining Wall Alignment Along Precinct 5 Fill Platform

Model Simulations

Flood conditions for the 1% AEP and 5% AEP were determined by simulating the updated Baseline and Developed Scenario TUFLOW models described above and assessing an ensemble of design storm durations ranging from 2 hours to 18 hours. The results of these simulations were combined into design flood envelopes that were used as the basis for flood and impact mapping.

Flood Results and Mapping

A range of flood mapping has been produced based on the outputs of the updated TUFLOW modelling and is provided in Annex A. Please note that these maps supersede those previously provided in the Oakdale East Flood Assessment (2022).

The change in peak flood level, velocity and velocity-depth maps provide a visual representation of the differences between the Baseline and Developed Scenarios. The difference maps were created by subtracting results for the Baseline Scenario from the results for the Developed Scenario and show the location and magnitude of changes in flood level, velocity and VxD associated with the proposed development. Note that filtering of results has been undertaken by removing areas with depths below 150 mm, in line with Council's 'Fairfield Rural Area Flood Study (Ropes, Reedy & Eastern Creeks)' (BMT, 2013). Flood level impacts have been mapped at 0.01 m intervals, as per Fairfield City Council's requirements for Developer Agreement assessments.

The maps indicate a reduction in afflux within Reedy Creek and across neighbouring private properties when compared to the results presented in the Oakdale East Flood Assessment (2022).

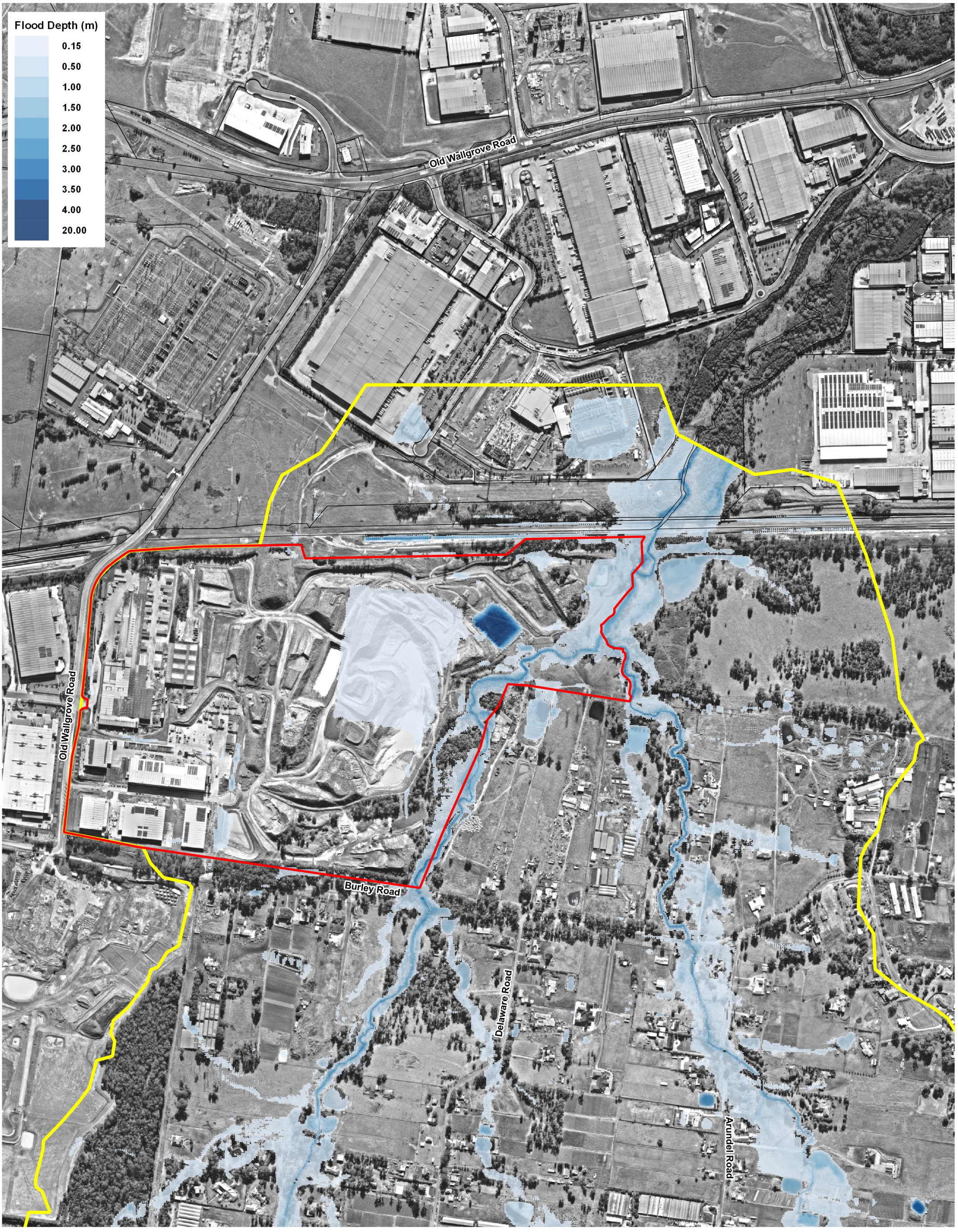
Conclusions

This Addendum No. 2 to the Oakdale East Flood Assessment (2022) documents the results of updated flood and impact modelling completed by BMT that involved:

- Updated Baseline Scenario TUFLOW modelling including infill of the quarry pit adjacent to Precinct 5.
- Updated Developed Scenario TUFLOW modelling including infill of the quarry pit adjacent to Precinct 5, as well as AT&L's updated design for Precinct 5 which includes a retaining wall along the eastern extent of Precinct 5 fill platform and aims to mitigate flood impacts offsite by reducing encroachment of the Precinct 5 embankment into the flood extent of Reedy Creek.

It also includes updated flood mapping in Annex A that supersedes flood mapping previously provided in the Oakdale East Flood Assessment (2022). The results documented herein indicate that the updated design is predicted to result in a reduction in peak 1% AEP flood level impacts across neighbouring properties relative to those impacts presented in the Oakdale East Flood Assessment (2022). Peak 1% AEP flood level impacts across private property to the east of the site is predicted to be less than 0.01 m.

Annex A Updated Flood Maps



LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Peak Flood Depth - Baseline Scenario - 1% AEP Flood

Drawing: A2

Rev: A

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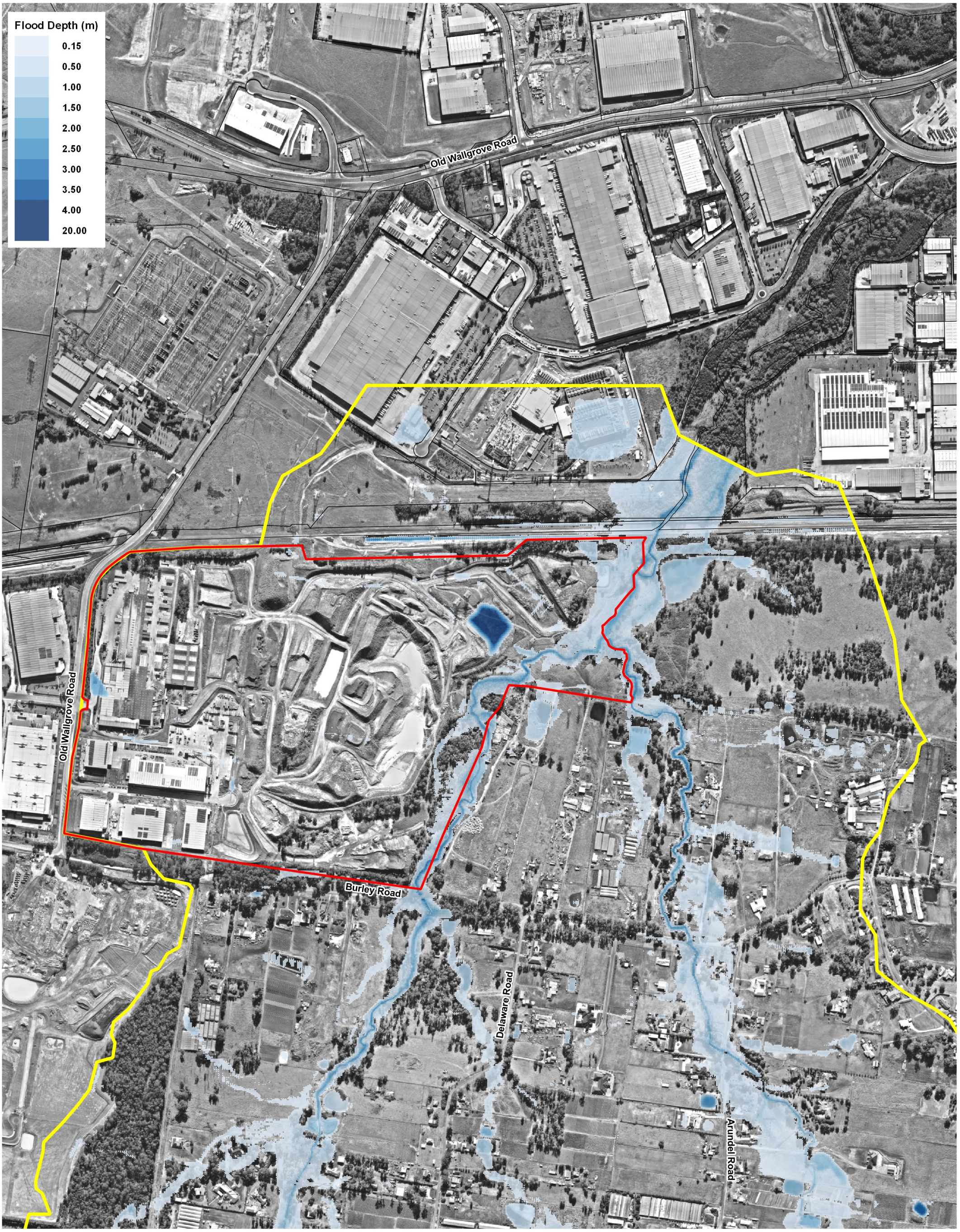

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Peak Flood Depth - Developed Scenario - 1% AEP Flood

Drawing: A3

Rev: A

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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
- > 5.0

Old Wallgrove Road

Old Wallgrove Road

Burley Road

Delaware Road

Arundel Road

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Peak Flood Velocity - Baseline Scenario - 1% AEP Flood

Drawing: A4

Rev: A

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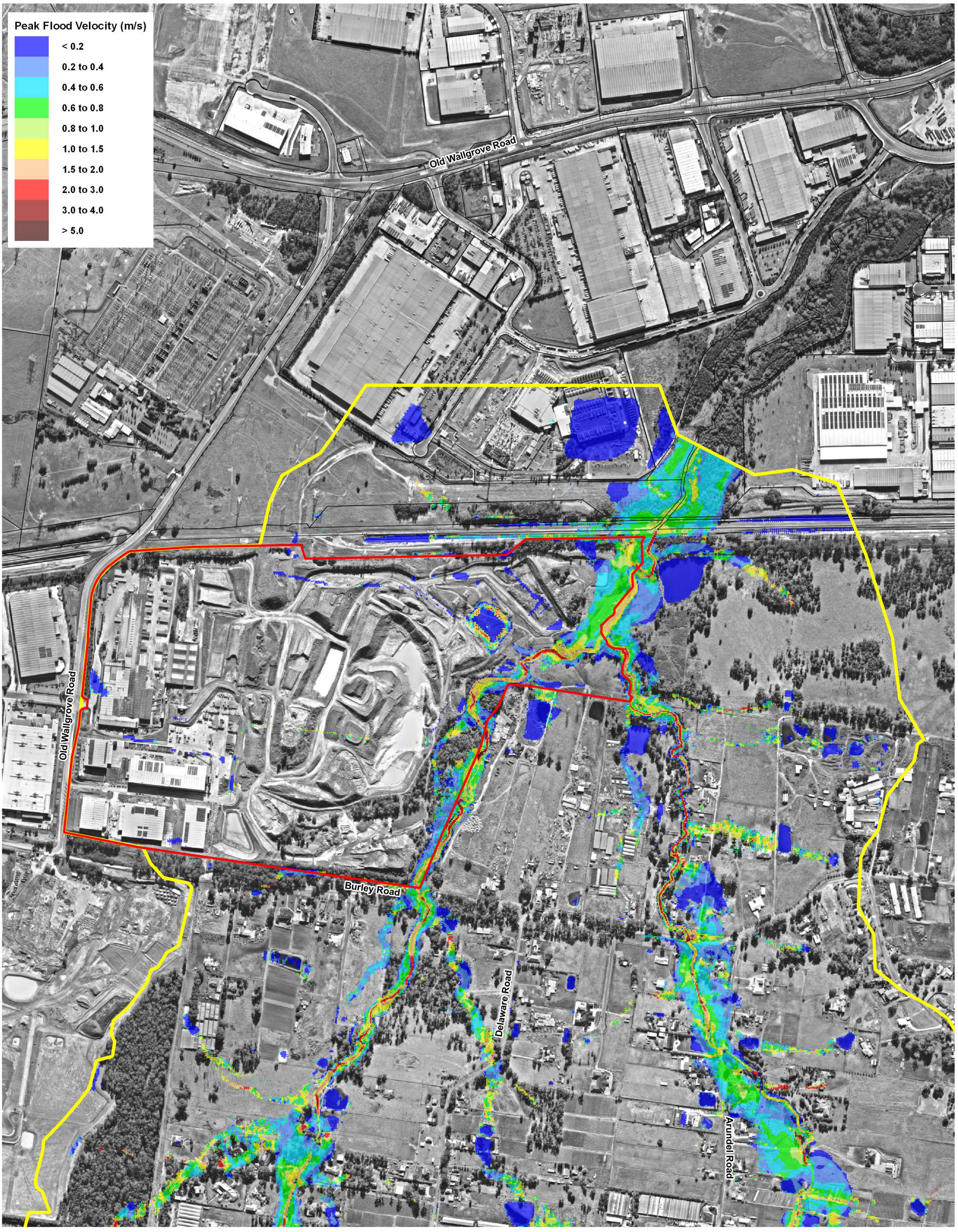

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Peak Flood Velocity - Developed Scenario - 1% AEP Flood

Drawing: A5

Rev: A

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Peak Velocity-Depth Product (m²/s)

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

Old Wallgrove Road

Old Wallgrove Road

Burley Road

Delaware Road

Arundel Road

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Peak Velocity-Depth Product - Baseline Scenario - 1% AEP Flood

Drawing: A6

Rev: A

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Peak Velocity-Depth Product (m²/s)

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

Old Wallgrove Road

Old Wallgrove Road

Burley Road

Delaware Road

Arundel Road

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Peak Velocity-Depth Product - Developed Scenario - 1% AEP Flood

Drawing: A7

Rev: A

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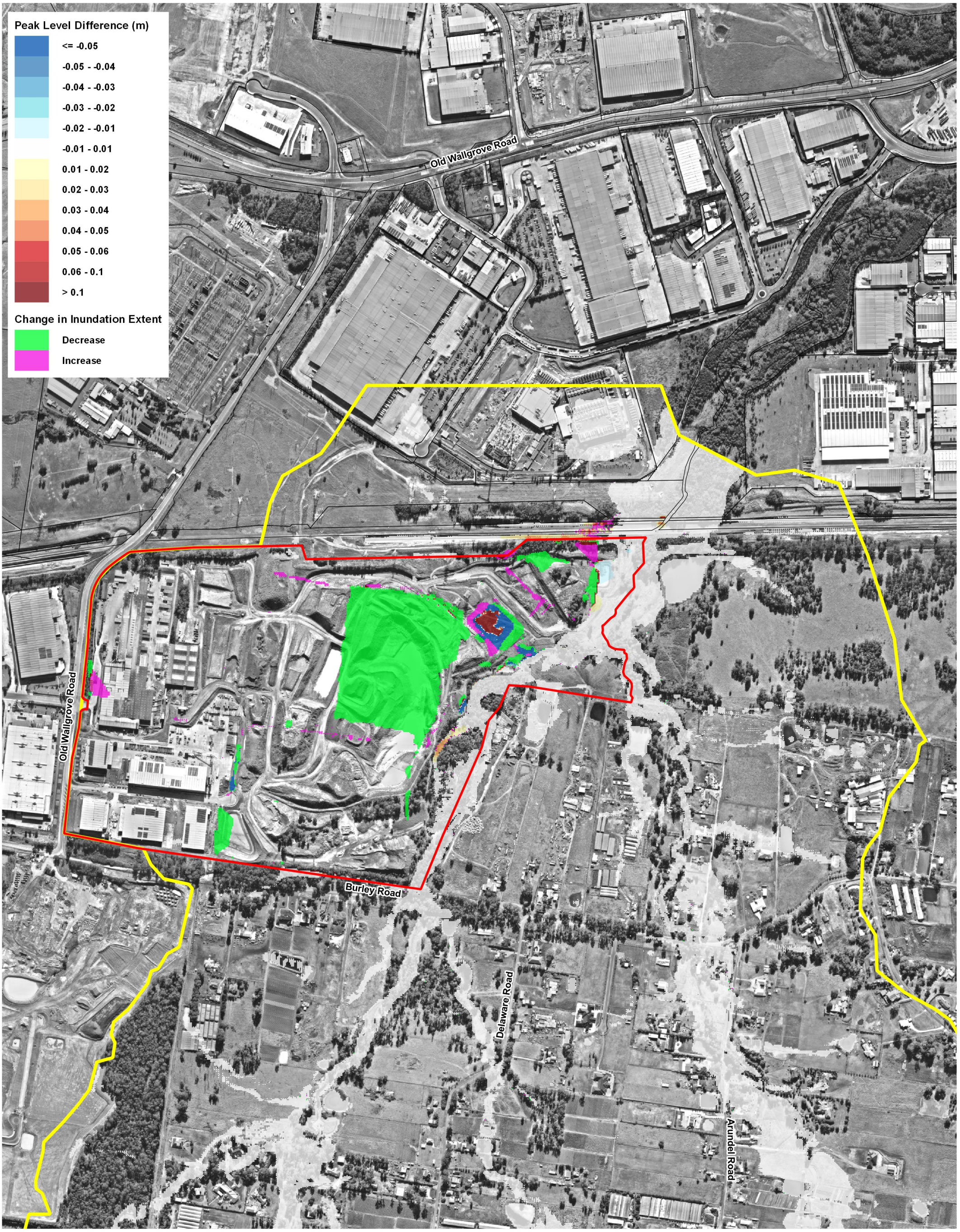

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Change in Peak Flood Level - 1% AEP Flood

Drawing: A8

Rev: A

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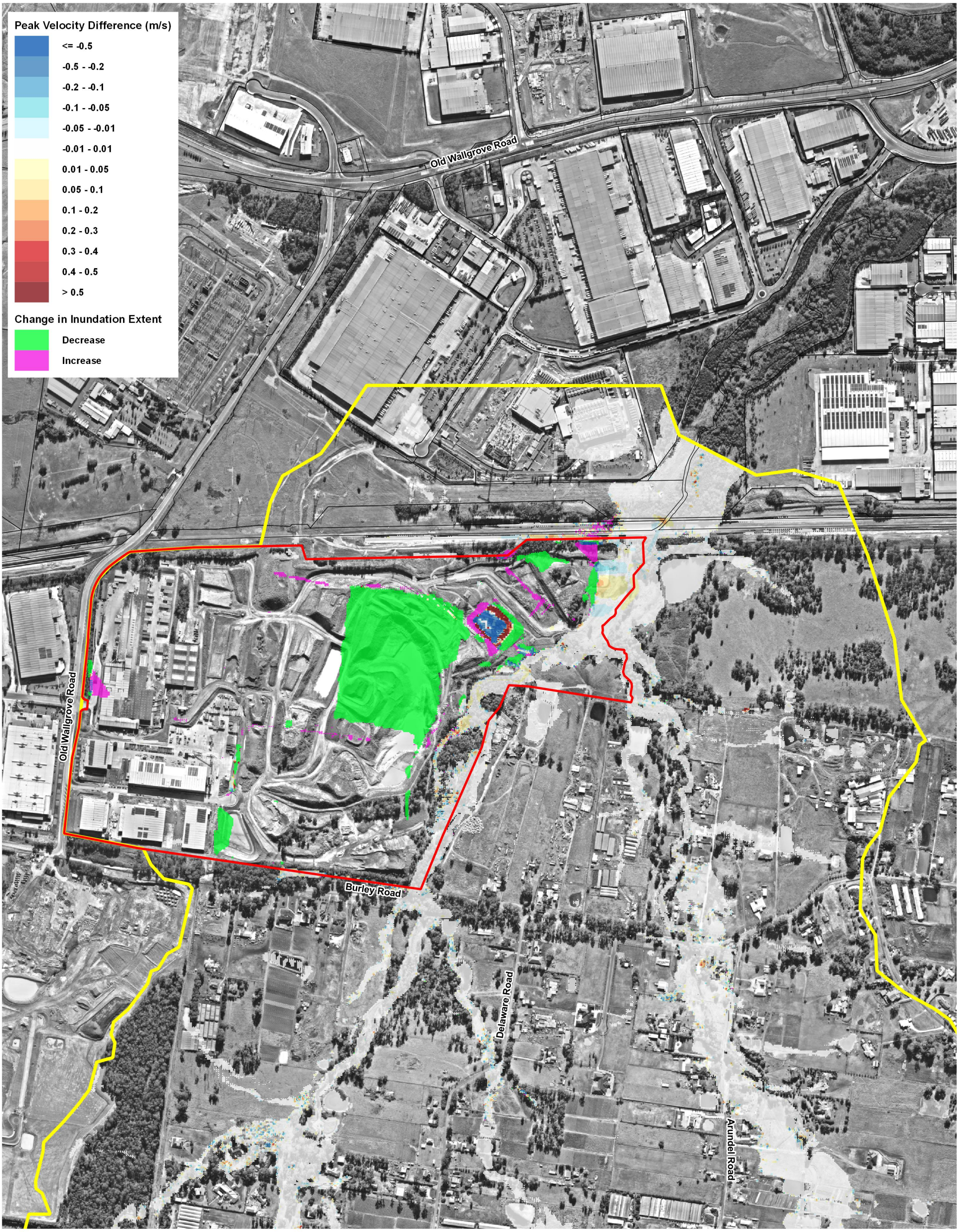

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Change in Peak Flood Velocities - 1% AEP Flood

Drawing: A9

Rev: A

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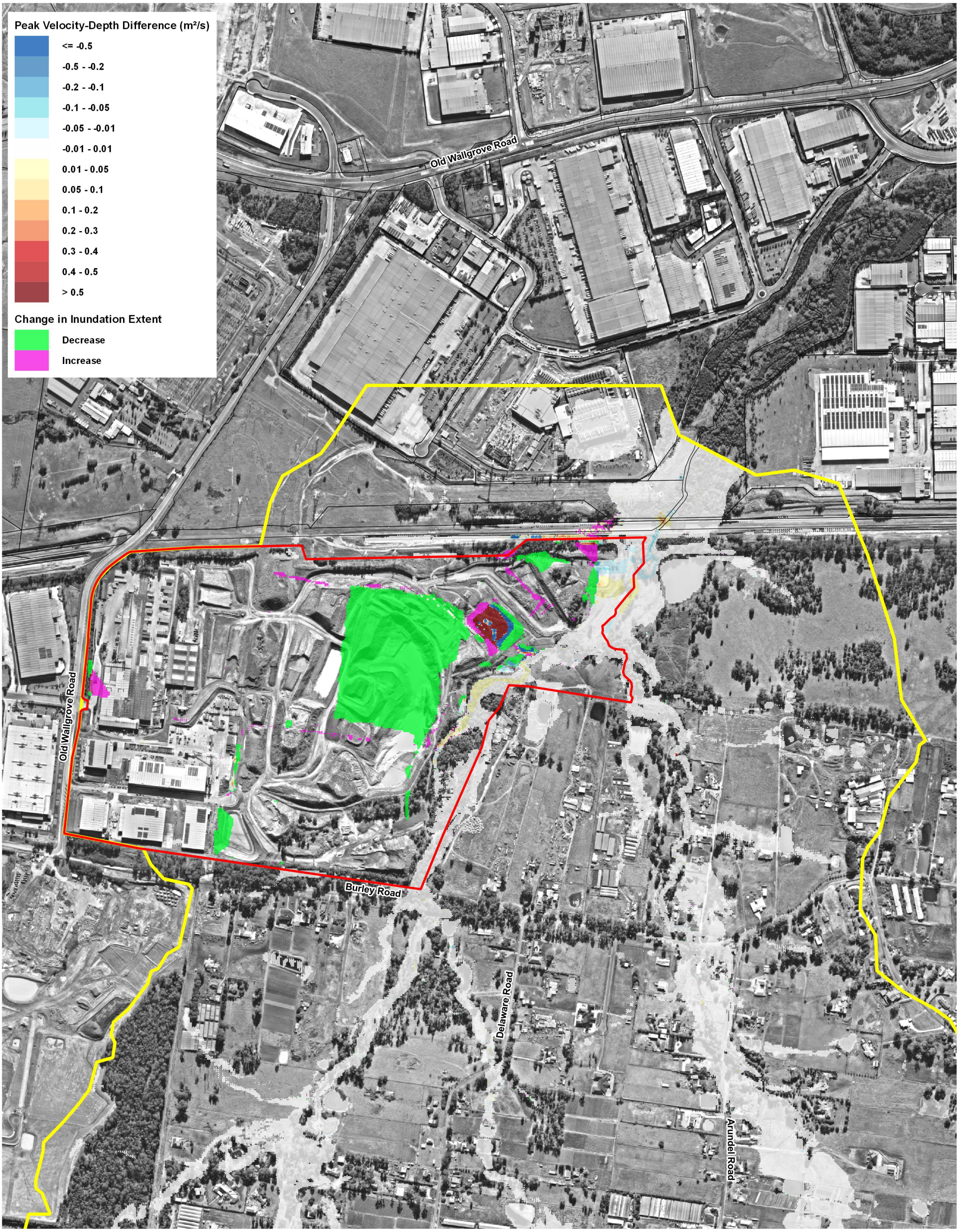

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Change in Peak Flood Velocity-Depth Product - 1% AEP Flood

Drawing: A10

Rev: A

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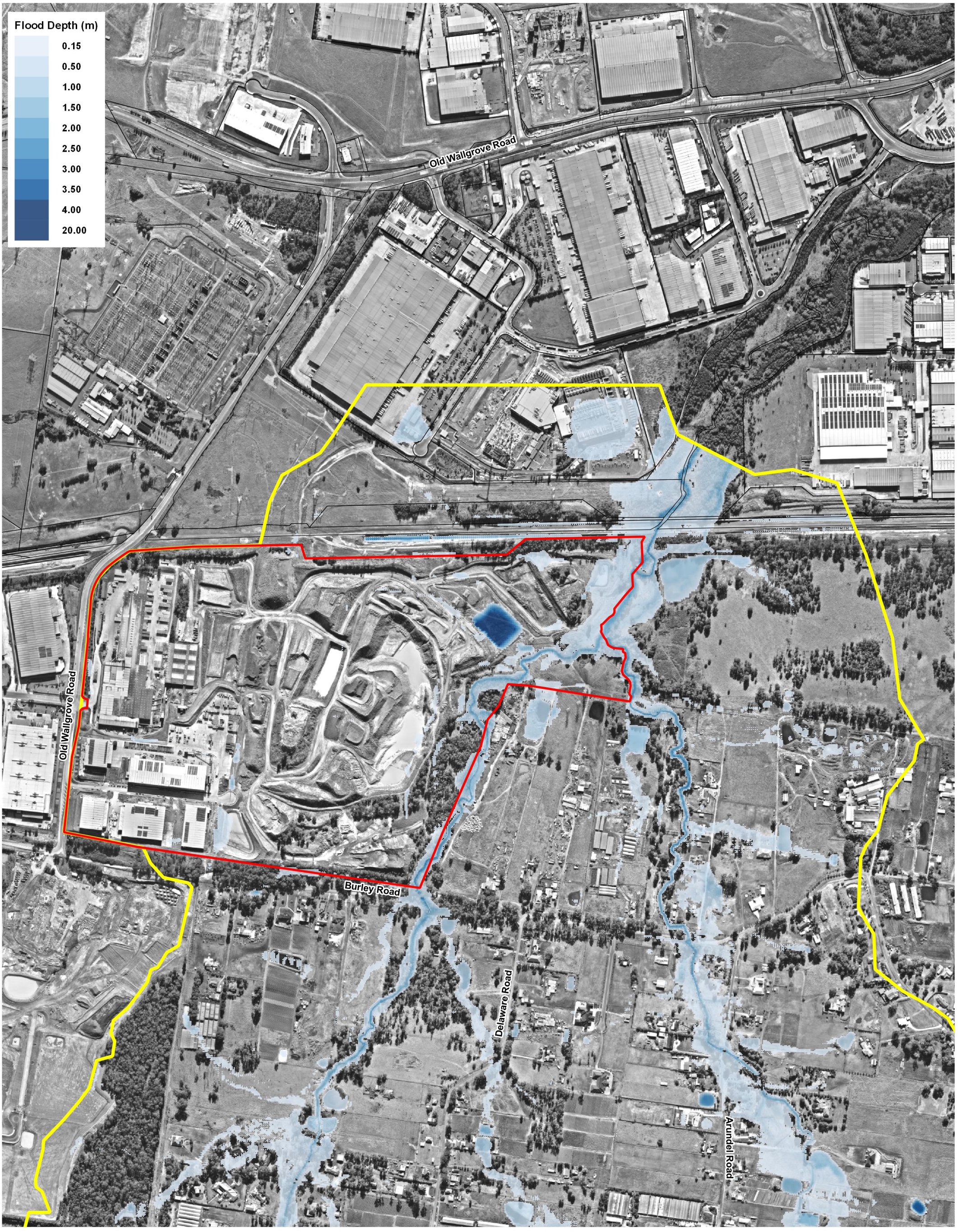

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Peak Flood Depth - Baseline Scenario - 5% AEP Flood

Drawing: A11

Rev: A

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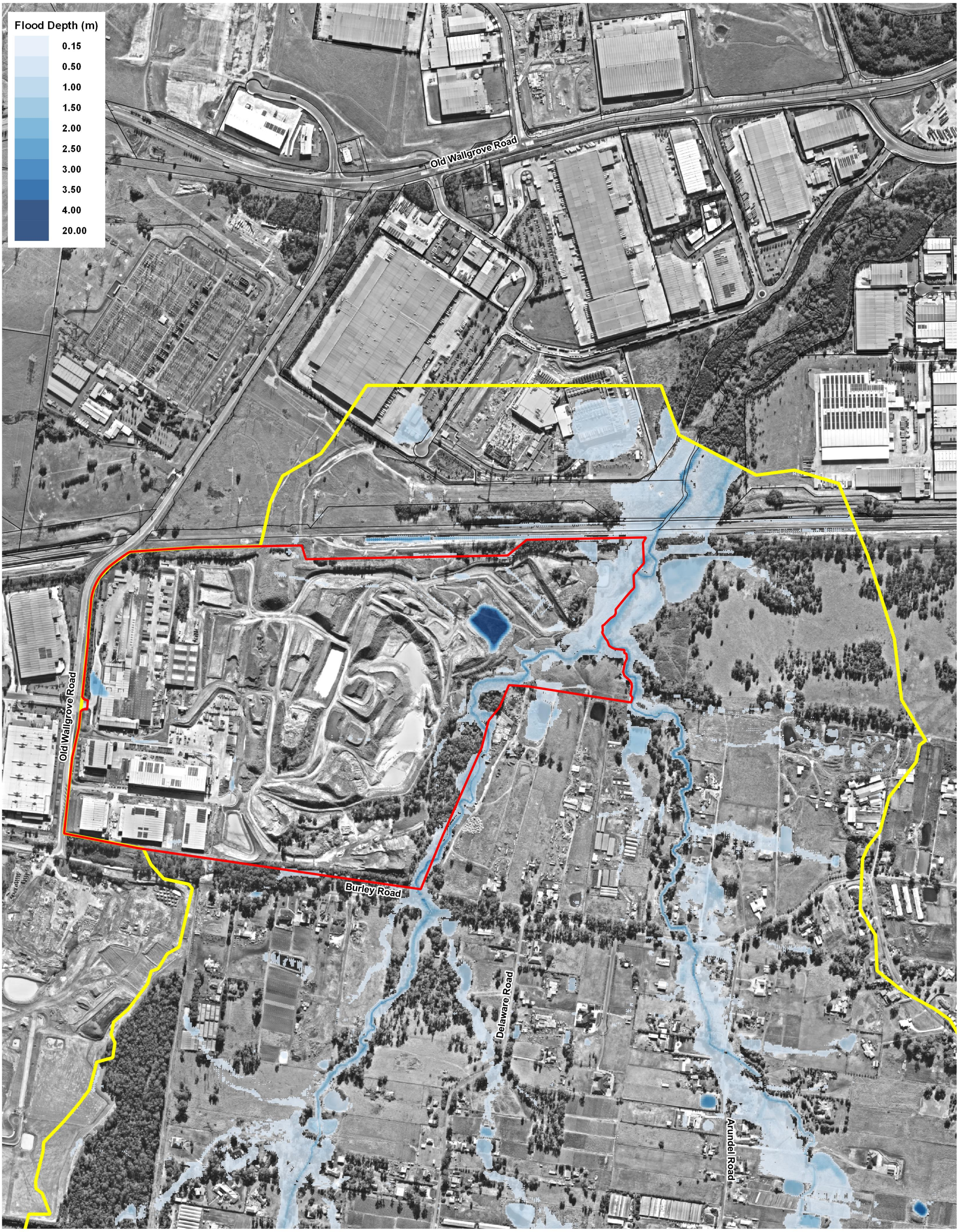

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Peak Flood Depth - Developed Scenario - 5% AEP Flood

Drawing: A12

Rev: A

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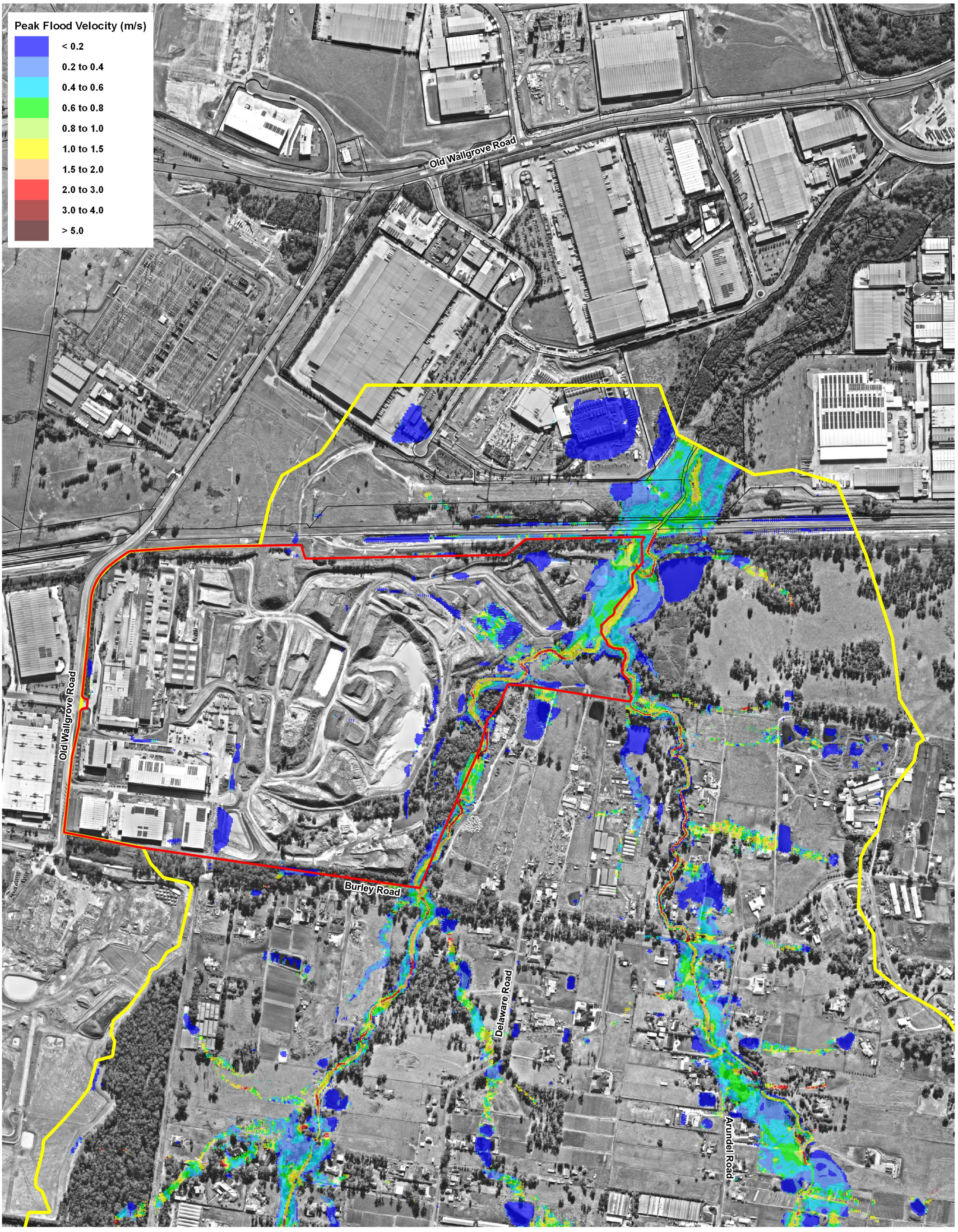

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Peak Flood Velocity - Baseline Scenario - 5% AEP Flood

Drawing: A13

Rev: A

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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
- > 5.0

Old Wallgrove Road

Old Wallgrove Road

Burley Road

Delaware Road

Arundel Road

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Peak Flood Velocity - Developed Scenario - 5% AEP Flood

Drawing: A14

Rev: A

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Peak Velocity-Depth Product (m²/s)

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

Old Wallgrove Road

Old Wallgrove Road

Burley Road

Delaware Road

Arundel Road

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Peak Velocity-Depth Product - Baseline Scenario - 5% AEP Flood

Drawing: A15

Rev: A

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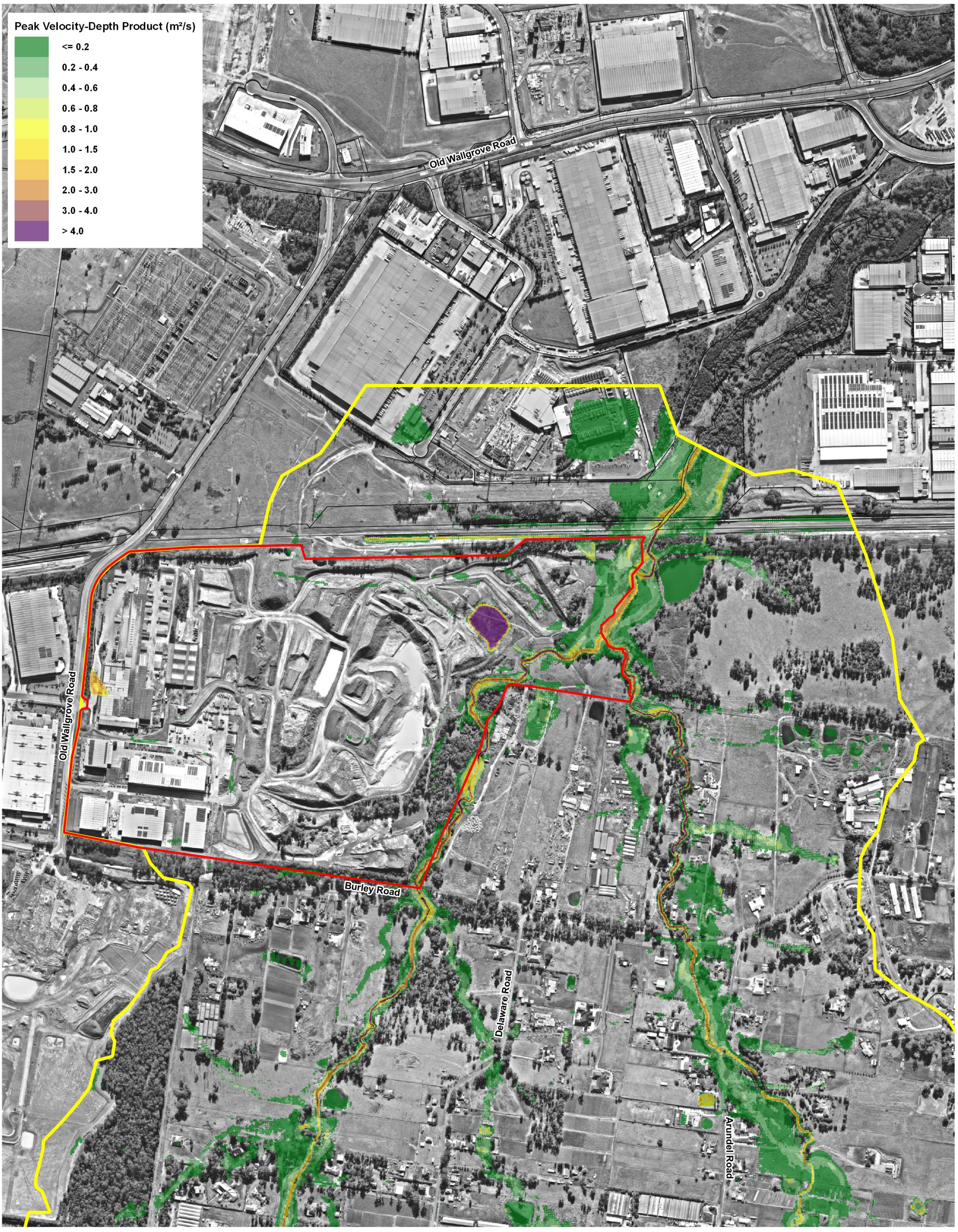

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Peak Velocity-Depth Product - Developed Scenario - 5% AEP Flood

Drawing: A16

Rev: A

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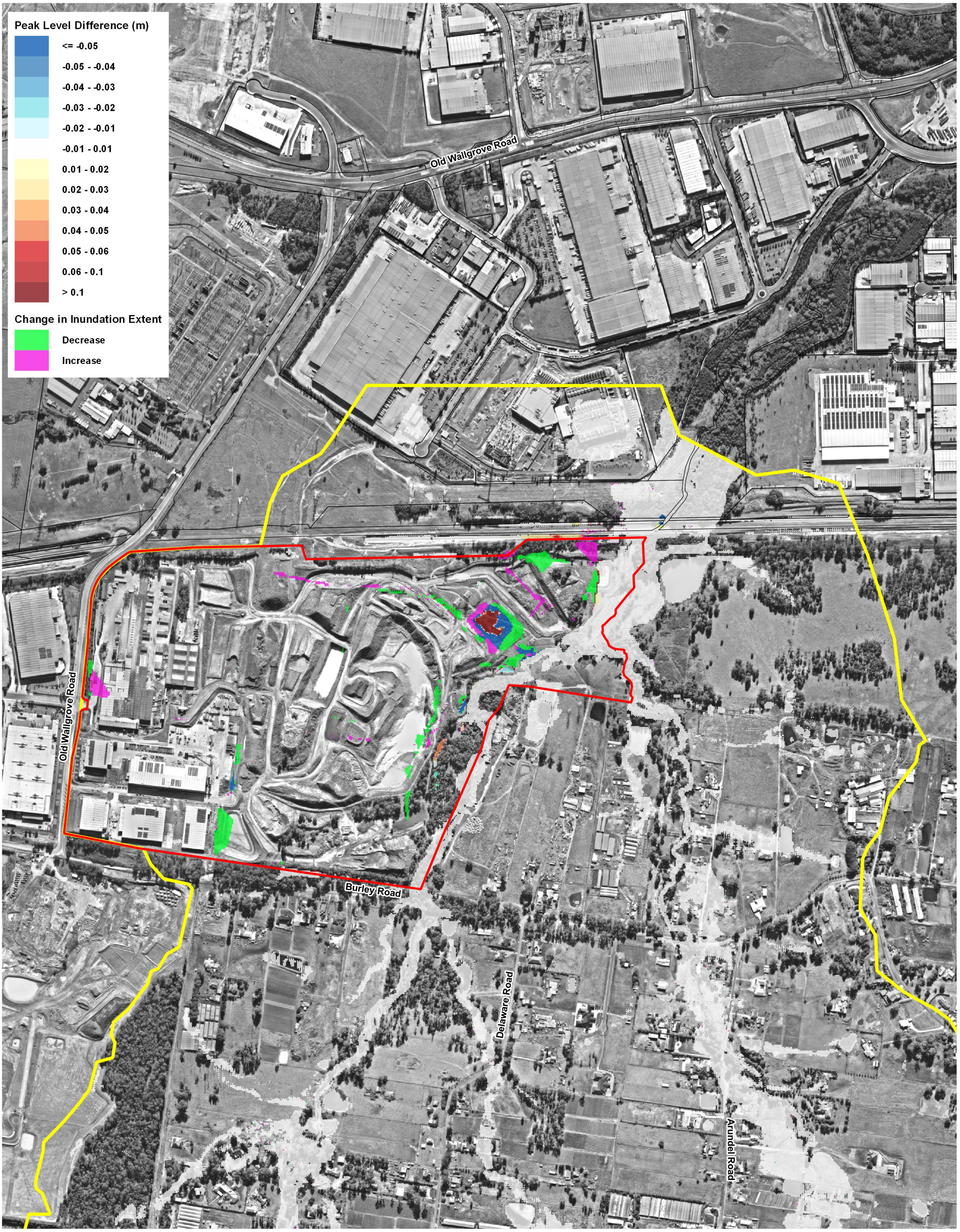

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Change in Peak Flood Level - 5% AEP Flood

Drawing: A17

Rev: A

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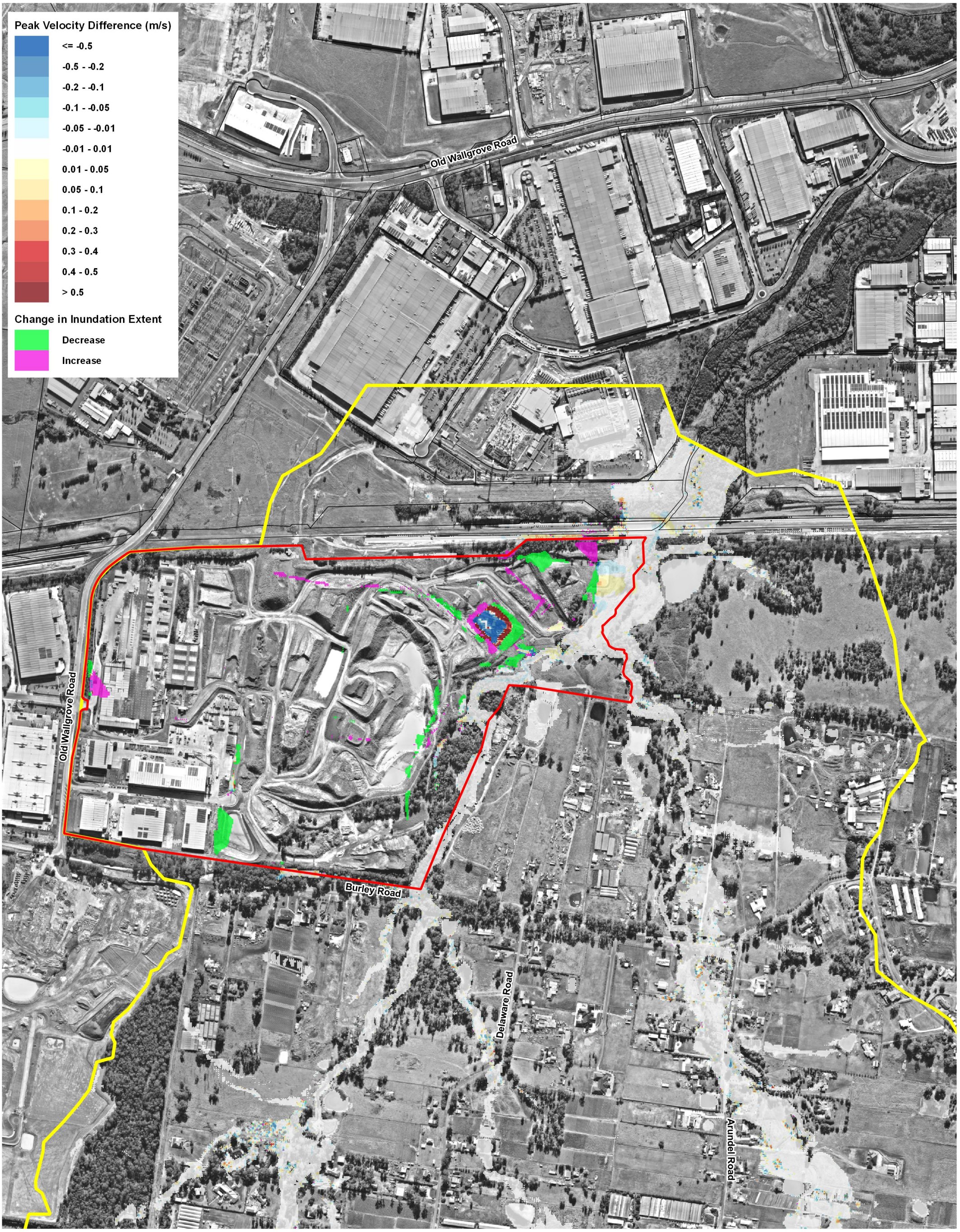

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Change in Peak Flood Velocities - 5% AEP Flood

Drawing: A18

Rev: A

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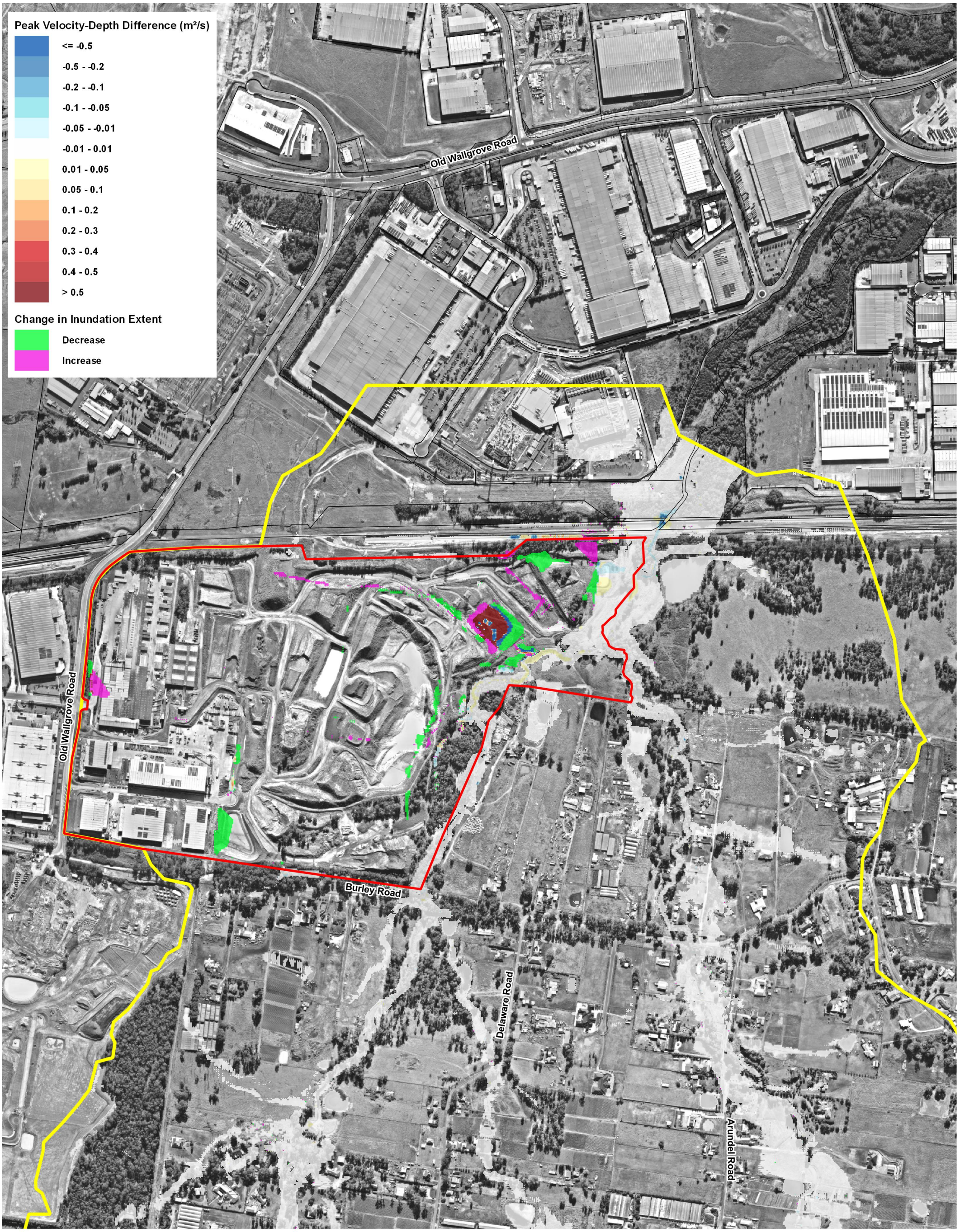

LEGEND

- Site Property
- Extent of Modelling
- Cadastral Boundaries

Title:

Change in Peak Flood Velocity-Depth Product - 5% AEP Flood

Drawing: A19

Rev: A

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