Report

Pondicherry Precinct - Flooding and Water Cycle Management

Prepared for Department of Planning and Environment/Camden Council

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QUALITY ASSURANCE STATEMENT

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1. Background

1.1 Study Purpose and Methodology

This Flooding and Water Cycle Management Assessment has been prepared as part of the planning proposal for the Pondicherry Precinct.

The Precinct planning project has been managed by the Department of Planning and Environment and Camden Council to facilitate planning and development within the precinct. The precinct planning process involves input from specialist investigations, together with feedback from stakeholders to inform the land planning process.

This report has been prepared to outline the findings of the engineering investigations of the flooding and water cycle management. The report is structured to present each of these studies in separate sections, with a consistent style and manner.

The strategy outlined in this report has been developed using an integrated approach to flood risk management, water cycle management and urban design based on the principles of water sensitive urban design (WSUD). The Indicative Layout Plan incorporates urban design features with flood risk management measures, along with drainage, landscape, vegetation and habitat values, while addressing water quality targets. The findings of this report will be considered as part of the overall design process.

The water cycle management strategy for the precinct centres on a constructed lake at the location of the existing large farm dams. The lake provides flood mitigation to manage the flows and flood levels off the precinct. Additional basins have been provided for the western catchments.

The objective of the water cycle management measures for the Pondicherry Precinct are to achieve the treatment targets for reducing pollutant export loads to the requirements of Camden Council. The overall water management strategy for the Pondicherry Precinct involves the implementation of water sensitive urban design features, along with traditional drainage infrastructure to achieve the objectives.

The water quality modelling of the measures outlined in the Precinct Indicative Layout Plan indicate that the water cycle management has been designed as suitable to meet pollutant removal targets.

1.2 Study Conclusions

The development of the Indicative Layout Plan has included effective Masterplanning works in combination with drainage, water quality and flood management measures to achieve satisfactory planning outcomes for all stakeholders. The risks posed by flooding events up to and including the Probable Maximum Flood are tolerable and manageable.

The results of technical investigations developed as part of the precinct planning process, and the modelling of the measures outlined in this report, demonstrate that the Pondicherry area is suitable for urban development provided the measures proposed by this study and tested by runs of various hydraulic models are implemented. This includes ensuring development generally occurs as indicated in the Indicative Layout Plan.

The overall approach to water quality management and water volume management at Pondicherry will be further refined as individual development applications are lodged by the proponent and assessed by Council, assuming the Pondicherry Planning Proposal is approved.

2. Introduction

This report has been prepared to inform the precinct planning proposal for the site referred to as the Pondicherry Precinct, located in South-West Sydney, NSW. The report summarises the investigations into the flooding resulting from local and regional waterways and outlines the findings and proposed measures for water management on site within the Precinct.

2.1 Objective and Purpose of this Report

The objective of this report is to present the strategy for management of flooding, drainage and water quality from the Precinct.

The strategy outlined in this report has been developed using an integrated approach to flood risk management, water cycle management and urban design, based on the principles of water sensitive urban design (WSUD). This has involved incorporating urban design features with flood risk management measures. This process considers drainage, landscape, vegetation and habitat values, while addressing water quality targets.

Integrated Water Management outcomes are most effectively managed through incorporation of management plans into planning and development controls of future development areas. Effective Masterplanning works in combination with drainage, water quality and flood management measures to achieve satisfactory planning outcomes for all stakeholders.

2.1.1 Structure of the Report

This report has been prepared to outline the findings of the engineering investigations of the flooding and water cycle management. It has also been updated to take account of the requirements of the conditional Gateway Determination issued by the Department of Planning and Environment to Camden Council on 25 July 2023.

2.2 Project Description

The Pondicherry Precinct involved initial investigations by the Department of Planning and Environment, working with Camden Council, to facilitate planning and development within the precinct. Management of the planning process was transferred to Camden Council in December 2020 and is now being progressed as a proponent-led planning proposal. The precinct planning process involves input from specialist investigations such as:

- Water management and flooding (the subject of this report)
- Ecological and bio-diversity
- Heritage, including indigenous heritage
- Traffic and transport
- Infrastructure servicing

The studies, together with feedback from stakeholders, have been used to inform the land use planning process for the precinct. The culmination of these studies has contributed to the development of the precinct Indicative Layout Plan, discussed in Section 2.4.

2.3 Site Location and Project Area

The Pondicherry Precinct is located within the South West Growth Area within the suburb of Oran Park. The Precinct is located north of Oran Park Town Centre and west of South Creek. The precinct’s western boundary is The Northern Road. The northern boundary is formed by a future sub-arterial road known as Pivot Drive.

The precinct has an area of approximately 235 hectares and is located approximately 30 kilometres south west of Parramatta.

The original Pondicherry Precinct boundary is shown on Figure 2.1. The south-western portion of the Pondicherry Precinct, known as Tranche 41, was excised from the Precinct and managed as a separate planning proposal. This is discussed further below.

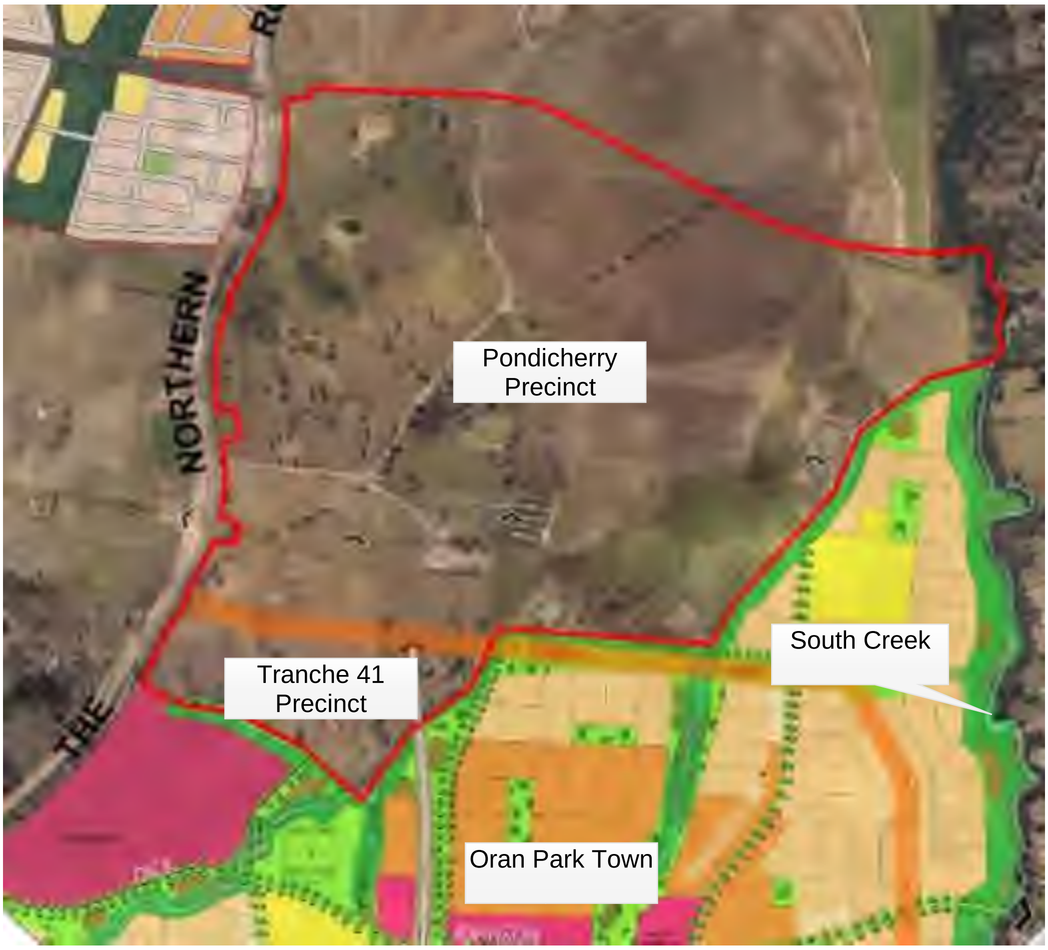

Figure 2.1: Pondicherry Precinct location

The Oran Park Precinct (upstream of Pondicherry) includes two major tributaries that discharge to South Creek via the existing dams in Pondicherry. The two catchments have a combined catchment area of 458 ha area that drains to South Creek. The largest of the two catchments is approximately 377 ha and drains to an existing large dam. A smaller catchment of approximately 81.3 ha also drains to this dam.

The catchment area is predominantly cleared, grazed land on ridges. Whilst some of the creek lines contain pockets of remnant vegetation, most are predominantly cleared. Average catchment slopes range between 1% and 4%.

Part of the Pondicherry Precinct, adjoining The Northern Road, was the subject of its own planning proposal. This area is known as Tranche 41. The planning proposal for Tranche 41 included its own Flooding and Water Cycle Management study. The Pondicherry study considers the outcomes of the Tranche 41 study and accounts for the water cycle and flooding impacts of Tranche 41 on the wider Pondicherry Precinct. The Tranche 41 area was rezoned for urban development in March 2022 and is currently under development (land subdivision works). The Pondicherry study also accounts for the progressive urbanisation of the upstream Oran Park release area.

The continued construction within Oran Park and the development of Pondicherry Precinct will introduce impervious areas to the catchment, increasing the volume of water arriving at the existing dams (future lakes) during regular storm events. The overall approach to stormwater management for Pondicherry ensures additional volume of flow can be captured in the future lakes, associated wetlands and smaller detention basins, and that excess runoff can be released in a controlled manner.

2.4 Indicative Layout Plan

The Indicative Layout Plan prepared by Design + Planning as part of the precinct planning process considers the various planning and specialist studies inputs, including but not limited to flooding, water cycle management and riparian corridor assessment. The latest iteration of the Indicative Layout Plan is provided in Figure 2.2.

Figure 2.2: Pondicherry Precinct Indicative Layout Plan (Design + Planning)

The Indicative Layout Plan sets out the types and distribution of land uses that are envisaged for Pondicherry under the planning proposal. If there are substantial changes to the Indicative Layout Plan at the conclusion of the public exhibition period, the Flooding and Water Cycle Management Strategy will need to be revisited to ensure it still meets its primary objectives.

3. Legislative and Planning Context

This section outlines the relevant state and Commonwealth legislation that is applicable to the planning, design and construction of the flooding and stormwater management infrastructure.

3.1 Relevant Legislation

This section introduces the legislation applicable to the project, providing explanations of how each Act relates to the development, including the relevant approvals required.

3.1.1 NSW Environmental Planning and Assessment Act 1979 (as amended)

This Act is the primary piece of land use and planning legislation in New South Wales. It allows for the creation, at various levels of government, of environmental planning instruments to control land use and planning. State environmental planning policies (SEPPs), Local Environment Plans (LEPs), development control plans (DCPs), and council codes and policies can all be established under Part 3 the Act. The rezoning of land as part of the precinct planning proposal is defined under Part 3 of the Act.

3.1.2 Biodiversity Conservation Act 2016

This Act replaces the *Threatened Species Conservation Act* and lists threatened species, populations and ecological communities in NSW. If a threatened species, population or ecological community or its habitat, is likely to be found in any area which may be affected by a development proposal, then a ‘seven-part test’ in accordance with Section 5A of the EP&A Act must be conducted to determine whether the proposal could have a significant impact. If it is concluded that there is likely to be a significant impact, then a Species Impact Statement (SIS) must be prepared and the proposed activity would then be subject to approval from the Chief Executive of the Office of Environment and Heritage (OEH).

The key provisions of the Act are outlined in Section 8.4(5) and do not apply to proposed activities on biodiversity certified land in the South West Growth Centre. For the South West Growth Centre Precincts (including Pondicherry), compliance with the biodiversity certification order is achieved by protecting areas of Existing Native Vegetation (ENV) identified on the SEPP Maps and as described in the Assessment of Consistency between Relevant Biodiversity Measures of the Biodiversity Certification Order report for each precinct.

Where an activity is proposed on protected Existing Native Vegetation on certified land, compliance with the conditions of the biodiversity certification order is required.

3.1.3 Water Act 1912 / Water Management Act 2000

The objectives of the Acts provide for the sustainable and integrated management of the water sources and to apply the principles of ecologically sustainable development. The Acts set guidelines for the preparation of water management plans and direct Water NSW in decision making. Water NSW is a separate entity within the NSW Department of Primary Industries. It is responsible for the management of the State's surface water and groundwater resources. The Office reports to the NSW Government for water policy and the administration of key water management legislation, including the Water Act 1912 and Water Management Act 2000.

3.1.4 Water Management Amendment (Controlled Activities) Regulation 2008

This Regulation of the *Water Management Act* 2000 replaces the *Rivers and Foreshores Improvement Act 1948* from 4 Feb 2008. Under this Regulation a *Controlled Activity Approval* (CAA) is required from Water NSW for works within 40 metres of top of bank. This permit application is developed at the detailed design stage of these proposals and needs to outline:

- A map of the area depicting the site to be affected by the works in relation to the waterway
- Plans indicating works to be undertaken including elevations

- Existing condition and values of the adjoining intertidal and aquatic environment (such as seagrass, rock platforms, and sandy beaches)
- Recent photographs of the site (preferably from the water);
- Details of excavations, earthworks and/or filling, including the type of materials to be affected, *i.e*. soil and rock
- The potential for disturbance of acid sulphate soils
- The potential for disturbance of contaminated material
- Stability assessment
- Location of existing drainage and any alteration to drainage
- A description of the construction methods to be used (including plant and equipment) and methods to be used to access the site
- Vegetation and landscape plans (including: details of vegetation to be retained, removed and/or planted; numbers of each species to be planted; general indication of the location of plantings)
- Methods to be employed to manage potential environmental impacts such as erosion and sediment control plans, and remedial action plans

A controlled activity permit is not required under Clause 39A of this regulation, which provides exemption for public authorities and local councils.

3.1.5 Local Land Services Act 2013

This Act establish a statutory corporation, Local Land Services, with responsibility for management and delivery of local land services in the social, economic and environmental interests of the State in accordance with State priorities. The Act establishes local boards for the purpose of devolving operational management and planning functions to regional levels to facilitate targeted local delivery of programs and services. This Act commenced on 1 January 2014 and replaced the *Catchment Management Authorities Act* 2003 which established catchment management authorities and committees to achieve coordinated, sustainable management of natural resources on a water catchment basis.

3.1.6 Local Government Act 1993

Creates local governments and grants them the power necessary to perform their functions, among which are the management, development, protection, restoration, enhancement and conservation of the environment of the area the local government is responsible for, in a manner that is consistent with and promotes the principles of ecologically sustainable development. The *Local Government (Ecologically Sustainable Development) Act* 1997 amended the *Local Government Act* so that ecologically sustainable development, including the sustainable use of resources, is now a guiding operational principle.

The *NSW Floodplain Development Manual: the management of flood liable land* relates to the management of flood liable land in accordance with Section 733 of the *Local Government Act*.

3.1.7 Environment Protection and Biodiversity Conservation Act 1999

This Act requires the approval of the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities for actions that have, or are likely to have, an impact on matters of National Environmental Significance, including matters of national environmental significance including:

- Ramsar wetlands.
- National threatened species and ecological communities.
- Migratory species.
- Water resources with regard to coal seam gas development and/or large scale coal mining development.

Under the EPBC Act, Commonwealth approval is required for any controlled action being a project or development that would have, or that would be likely to have, a significant impact on a matters of national environmental significance. Under the legislation, this action must be referred to the Commonwealth Minister for the Environment.

3.2 Planning Framework

This section introduces the planning documents that are applicable to the stormwater basin and associated infrastructure.

3.2.1 State Environmental Planning Policy (Precincts - Western Parkland City) 2021

State Environmental Planning Policy (Precincts - Western Parkland City) 2021 (SEPP) provides a planning framework for the delivery of key growth centre areas of Sydney including the south-west and north-west (which includes parts of the Camden LGA).

The SEPP establishes a number of precincts and precinct plans to guide development within the designated areas.

The proposed activity is located on land designated under the SEPP. The SEPP contains provisions in relation to protection of existing native vegetation.

1) Development for public utility undertakings (other than electricity generating works or water recycling facilities) may be carried out without consent on land to which this Policy applies.
2) A public authority, or a person acting on behalf of a public authority, must not carry out development comprising the clearing of native vegetation (within the meaning of the *Native Vegetation Act* 2003) on land that is not subject land (within the meaning of clause 17 of Schedule 7 to the *Threatened Species Conservation Act* 1995) unless the authority or person has:
    (a) given written notice of the intention to carry out the development to the Department of Planning and Infrastructure, and
    (b) taken into consideration any response to the notice that is received from that Department within 21 days after the notice is given.

Additional requirements in relation to clearing of native vegetation are listed in the precinct-specific appendices of the SEPP.

3.2.2 State Environmental Planning Policy (Transport and Infrastructure) 2021 (Infrastructure SEPP)

State Environmental Planning Policy (Transport and Infrastructure) 2021 (Infrastructure SEPP) is intended to facilitate the efficient delivery of transport and infrastructure projects and activities by public authorities such as Council.

The Infrastructure SEPP provides that development for the purpose of a flood mitigation work may be carried out by or on behalf of a public authority (which includes Council) without consent on any land. This includes construction, routine maintenance works and environmental management works.

The Infrastructure SEPP also provides that development for the purposes of a stormwater management facility may be carried out by, or on behalf of a public authority (which includes Council), without consent on any land. This includes construction, routine maintenance works and environmental management works.

3.2.3 Growth Centres Development Code 2006

This code established the process of precinct planning for the growth centres including a framework for the development of the Indicative Layout Plan. This document ensures that the technical analyses necessary to produce specific planning controls are carried out within the context of the formulation of an Indicative Layout Plan so that the appropriate infrastructure will support future development.

3.3 Camden Council Requirements

The precinct is located within the Camden Council local government area (LGA).

- Draft Upper South Creek Regional Flood Model and User Guide (WMA 2020)

The document is a draft user guide for use with the Upper South Creek Regional Model prepared by WMA. The document provides recommendations on methods to be followed when completing a flood impact assessment.

- *Engineering Design Specification* (Camden Council, 2020)

This specification contains technical design data for the calculation of flows, flood elevations and velocities along with technical standards for the design of drainage infrastructure. The hydrologic parameters include rainfall intensity charts and runoff parameters for flow estimation. The document also outlines hydraulic parameters and design requirements for pits, culverts and pipes.

- *Camden Local Environmental Plan 2010*

Local Environmental Plans (LEPs) guide planning decisions for local government areas (NSW Department of Planning & Environment, 2014). LEPs were standardised in 2006 to create a common format and content across councils and other consent authorities.

The *Camden Local Environmental Plan 2010* was gazetted in 2010. The LEP applies to all land within the Camden LGA, with the exception of land at Oran Park, Turner Road (Gregory Hills) and Catherine Field, which falls under *State Environmental Planning Policy (Precincts - Western Parkland City) 2021*

- *Camden Development Control Plan 2011* (Camden Council, 2011)

A Development Control Plan (DCP) is a non-legal document that supports the LEP with more detailed planning and design guidelines.

The Camden DCP applies to all land within the Camden LGA. The DCP also applies to Growth Centre precincts gazetted under the former *State Environmental Planning Policy (Sydney Region Growth Centres) 2006* that are subject to the Growth Centre specific DCPs, which contain additional provisions.

- *Flood Risk Management Policy* (Camden Council, 2006)

The *Flood Risk Management Policy* establishes flood risk management planning and development for all flood prone land within the Camden LGA. Flood prone land is susceptible to flooding by the Probably Maximum Flood (PMF) event. The policy has regard to the requirements of the *New South Wales Government Flood Risk Management Manual – June 2023*. Further, the 2022 Flood Inquiry Report contains further findings and recommendations about how to plan and manage land affected by the PMF. These have been considered in the context of this report (as updated in August 2023).

3.3.1 Oran Park Indicative Layout Plan (ILP) (2013)

In 2007, a master planning process coordinated by the Growth Centres Commission was used to develop an Indicative Layout Plan (ILP) for the Oran Park Precinct. Brown Consulting and Ecological Engineering jointly undertook the water cycle management assessment as part of the ILP development. Ecological (now AECOM) undertook the WSUD aspects and Brown Consulting developed the flooding and trunk drainage component of the water cycle management. The stormwater management strategies proposed in the masterplan included:

- Public detention and bio-retention systems proposed at various locations to manage the quantity and quality of stormwater flows.
- On-site detention devices proposed at non-residential lands such as light industrial, employment, educational and commercial areas that are required by the Oran Park DCP to be treated prior to discharge into public systems.

The masterplan has been revised multiple times and the most recent revision was produced in 2013. This report is based on the Oran Park Water Cycle Masterplan and the revised stormwater Master Plan (Brown Consulting, 2013) developed for the Indicative Layout Plan (Brown Consulting, 2013).

The Oran Park Precinct Masterplan identified a large basin to detain the 100 year flows off the Oran Park Precinct within Pondicherry (in the general location of an existing farm dam).

The precinct strategy did not account for the existing farm dam capacity, as the dams were considered to be for irrigation and farm purpose and not for flood mitigation and therefore not a permanent part of the landscape. This assumption is consistent with the existing criteria outlined within the South West Growth Centres Structure Plan. The strategy identified the basin/lakes as discharging directly to South Creek.

3.3.2 Integrated Water Cycle Management Study – WSUD Component (Ecological Engineering, 2007)

The *Integrated Water Cycle Management strategy* (Ecological Engineering, 2007) for the Oran Park Precinct outlines the overall strategy for water management with the design component describing features for WSUD. The key principles of WSUD for Oran Park are aimed at achieving integrated water cycle management of the three urban water streams potable water, wastewater and stormwater by:

- Reducing potable mains water consumption through demand management and substitution with treated reclaimed water and stormwater.
- Treating urban stormwater to meet water quality objectives for reuse or discharge to waterways.
- Using stormwater in the urban landscape to maximise visual and recreational amenity of developments, and where appropriate influence the microclimate of the area.

3.3.3 Growth Centres Development Code (Growth Centres Commision, 2006)

The *Growth Centres Development Code* provides the basis for the planning and design of precincts and neighbourhoods in the Growth Centres. It is intended to be a reference work, to stimulate ideas and provide a guide to best practice. Sections of the *Growth Centres Development Code* that provide guidance relevant to the design are:

- B-2 Water Sensitive Urban Design and Stormwater Management

This section introduces WSUD, which encompasses all aspects of urban water cycle management, including water supply, wastewater and stormwater management. It emphasises the importance of linking water infrastructure, landscape design and the urban built form, in a manner that is more attuned to natural hydrological and ecological processes than conventional design.

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3.3.4 Oran Park Development Control Plan 2007 (Department of Planning and Environment, 2007)

The *Oran Park Precinct Development Control Plan 2007* (Department of Planning and Environment, 2007) applies specifically to the Oran Park development. The most recent revision was released in 2014. The purpose of this DCP is to communicate the planning, design and environmental objectives and controls against which Camden Council will assess future DAs. Sections of the DCP specifically relevant to the design are:

- Environmental management
- Riparian corridors
- Flooding and water cycle management
- Salinity and soil management.

3.3.5 USC Regional Model Draft User Guide (WMA Water, 2020)

This document is a first draft of the Upper South Creek Regional Model User Guide, to accompany the handover of Camden Council's Upper South Creek flood model to consultants that propose to model more intensive development scenarios within the catchment, such as new urban release areas like Pondicherry. It outlines the approach to the modelling and makes recommendations on methods to apply when completing flood impact assessments for proposed development. It is intended that this draft will be reviewed and possibly updated based on feedback from Council and other consultants. This document has been used to inform some of the parameters used in the XP-Rafts model involved in the analysis at the planning proposal stage.

4. Data sources

This section of the document outlines the sources of data used in the flooding and water cycle management.

4.1 Topographic Data

Initial topographic data for the base model was obtained from existing WMA Water Tuflow model for the Upper South Creek Regional Model for Camden Council. This model uses data obtained from a number of sources, the majority of terrain was obtained from Light Detection and Ranging Systems Technology (LiDAR). The LiDAR data captured the terrain of the model area as measured on November 2018 at a 1m grid resolution.

Where possible, existing survey data was obtained for the rural farm dams including surface levels below the water line and has been used to set the bathymetry of the dams. Additionally, all roads were included in the Tuflow models with breaklines, the elevations for the breaklines were sampled from the LiDAR and survey data to ensure that the road crests are correctly represented within the model. In addition, all road gutters have been modelled using breaklines to lower the terrain by 0.1m to represent the conveyance of flows within the gutter.

All creeks were also included with breaklines, to ensure that the creek inverts are correctly represented in the TuFLOW model and conveyance between cells for the base of the creek is adequate and does not contain unnecessary trapped low points due to gridding of the original LiDAR data.

Information for the developed scenario involved proposed works and any relevant developments that have occurred in the area of this investigation and were either incomplete or not present in the 2018 model data was provided by 12d models developed by Calibre Professional Services. These 3d terrain models were exported as 12da tins and read direct into the TuFLOW model.

Discrete and localised structures required for the developed scenario above that present in the 12d data was modelled through the use of polygonal and linear shapefiles created by Calibre Professional Services using the QGIS software package.

The residential areas that will be developed as part of the Pondicherry development was modelled simply with polygons that lifted the terrain by 10 metres as the final levels of these areas have yet to be designed.

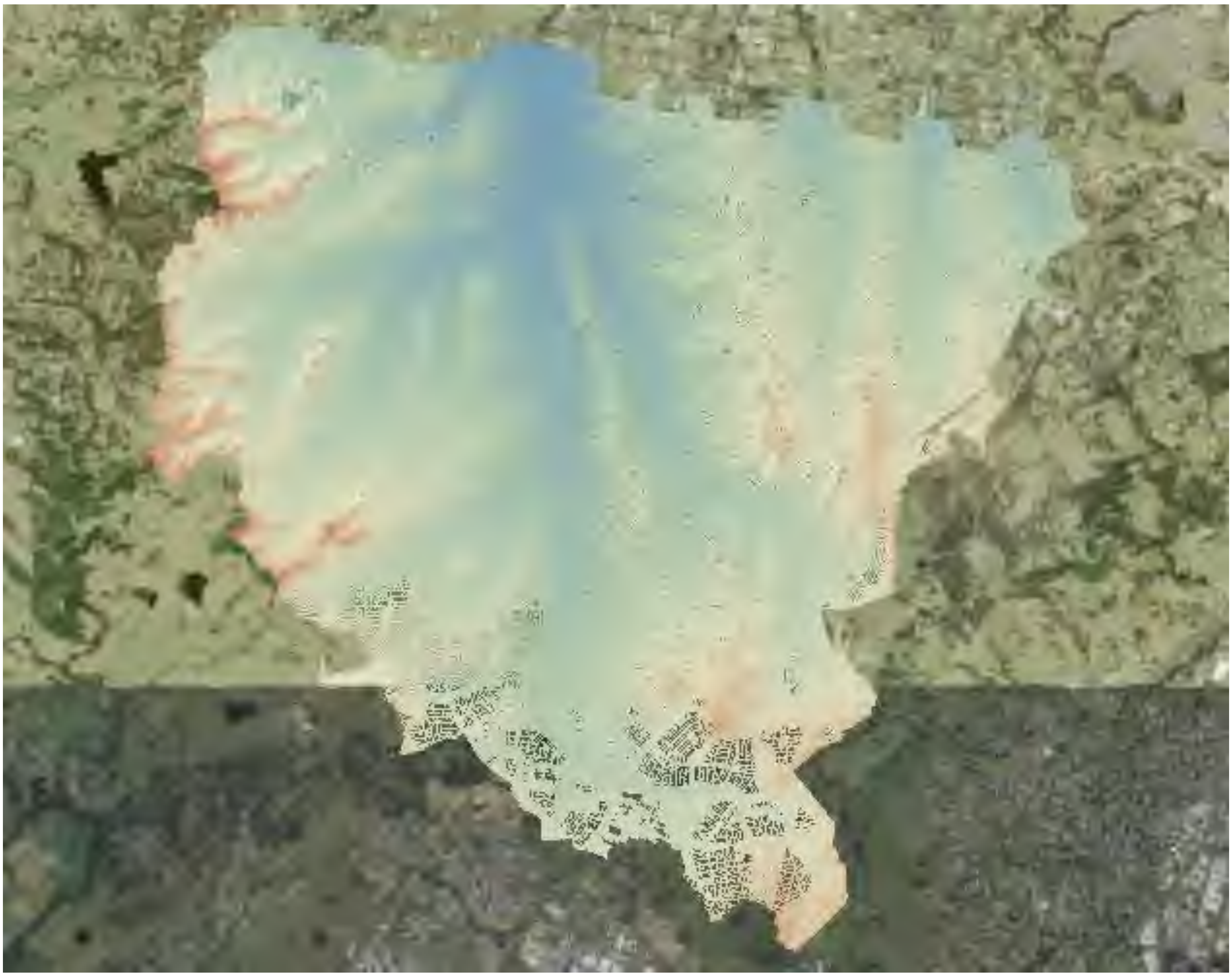


Figure 4.1: Existing Terrain

Figure 4.2: Developed Terrain

4.1.1 Buildings

Existing buildings within the study area were represented as solid obstructions by fully blocking them out of the TuFLOW grid. The size and location of the existing buildings were obtained by extracting the relevant data from the LiDAR data used for the model terrain. In the developed scenario existing buildings were retained as they were located outside of the area impacted, in addition, no proposed buildings were modelled as the final size and location of any buildings within the precinct area have yet to be determined.

4.1.2 Farm Dams

The existing waterways within the precinct, prior to the construction of the farm dams, directly discharged to South Creek at the location of Dam 2 (refer to figure 4.3). While the farm dams were never constructed for the purpose of flood mitigation and could have been removed by the landowner at any time while the subject land was being used for agricultural purposes, the upper South Creek flood model has included the farm dams within the terrain. This has effectively made them a part of the local hydrology network and a *de facto* flood management structure. The flow regime in the model had dams 4 and 3 cascading into dam 2 prior to discharging into South Creek.

Figure 4.3 Stream order (Ecological Australia 2020)

Figure 4.4: Farm Dams

4.2 Stormwater Management

The stormwater strategy involves converting the existing dams in Pondicherry into a formalised lake system. The online existing dam currently provides a large permanent water body. The proposed lake will maintain the concept of permanent water and allow the water body to have multi purposed uses. The detention volume required for effective stormwater management will be above the permanent water level of the proposed lake, and the lake's outflow will be controlled through weirs and culverts to ensure that the existing pre-development flow rate is achieved.

The detained water within the lakes ultimately discharges around the proposed playing fields to South Creek. The ultimate strategy returns the discharge point to South Creek to reflect the natural (pre farm dam) location. Until such time as the development of the Precinct to the north (Greenway Precinct) occurs, a temporary basin will be located on the future playing fields to discharge flows to the farm dam to the north in Greenway, prior to entering South Creek. The interim solution will mimic the existing stormwater flows.

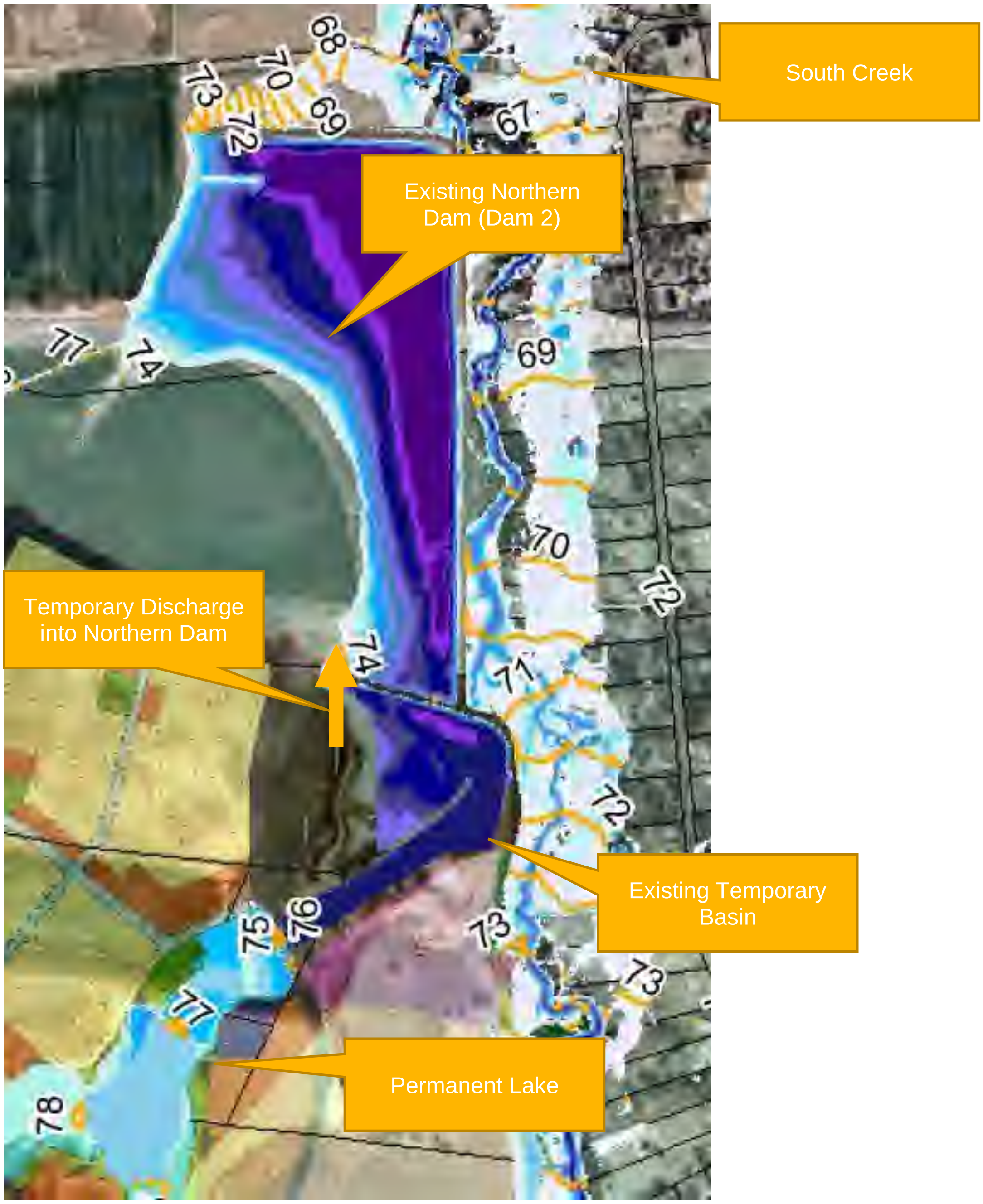


Figure 4.5: Interim Stormwater Strategy

5. Flood Study

This section discusses the flooding investigation undertaken as part of the precinct planning process. The impact of different flood events and durations within the precinct boundary has helped shape the precinct layout.

5.1 Hydrologic (XP-RAFTS) Modelling

Camden Council supplied an *XP-RAFTS* model for the existing scenario for the entire South Creek catchment from Gledswood Hills to the downstream side of Bringelly Road. This model had included the Oran Park Areas as developed land, but the Pondicherry Precinct was not included as developed in the regional model. As part of a sensitivity check, the existing XP RAFTS model was updated to model the complete Oran Park and Pondicherry Precinct as impervious. The findings of the modelling have been included in Appendix F.

This model was adjusted for the developed scenario by updating the impervious percentage of the catchments for all catchments draining via the Pondicherry basins. Calibre created a developed *XP-RAFTS* model for the precinct to account for changes in impervious areas and flow characterises. This model included works undertaken within Pondicherry and Oran Park Precincts.

The Tuflow modelling has been done in accordance with the USC Regional Draft User Guide (WMAwater,) and the agreed flood brief (Appendix D).

Table 5.1 – Flood Modelling Specifications

Event	Duration (mins)
PMF	60
	120
	240
1%	30
	360
	720
5%	60
	360
	1080

The local and total flow hydrographs were export from XP-Rafts as the above storms in the developed model. These data files were converted into .ts1 file types using the TuFLOW utilities to reduce the time required on model initialisation to import the data into the software. The developed .ts1 files have been included in the model files supplied to Council. These are the basis of all developed runs where the Pondicherry Precinct has been considered as developed. As required the location of the shape file applying the hydrograph has been adjusted slightly within the catchment area to ensure that flows have not been introduced in locations that are not hydraulically consistent with the developed contours. For example, if the current location is at the top of a proposed embankment, the inflow has been moved to the bottom of the embankment or at the location where the pit and pipes from the developed area would discharge.

The XP-RAFTS modelling was undertaken for the pre-developed and post-developed flows. Model outputs are presented in Appendix F. The results show that at the Pondicherry Lake location the difference in peak flow is only 0.3m3/s as a result of the increase in impervious areas. This is a result of the timing of the catchment areas.

It should be noted that the results presented are for the entire catchment area entering the future Pondicherry Lake, however the local catchment hydrographs that were entered into the post development TUFLOW model have a greater increase than the pervious catchment areas.

5.2 Hydraulic (TUFLOW) Modelling

5.2.1 Flood Planning Mapping

The hydraulic modelling for this investigation was undertaken based on the TUFLOW (Build: 2018-03-AE HPC engine) model developed as part of the Upper South Creek Regional Flood Model (WMAwater, 2020). Modelling parameters are detailed in the USC Regional Model User Guide.

The results of the hydraulic modelling undertaken for this investigation are discussed in Section 5.3. This modelling investigation uses the flows generated in the hydrologic modelling.

5.3 Results and Mapping

This section provides a summary of the results of the flood modelling for existing and developed conditions, along with a discussion of the impacts on flooding that would result from the development of the Pondicherry Precinct. Mapping demonstrates correlation between existing modelling undertaken for Council of South Creek.

5.3.1 Flood Mapping - Existing

5.3.1.1 100 Year Results

The flood extent map for existing conditions calculated in the hydraulic modelling of the 100-year critical local storm event is presented on Figure 5.1.

The flood mapping on figure 5.1 shows that the 100-year storm event with 100-year tail water in South Creek generates a significant flooded area in the vicinity of the three basins / farm dams at the north end of the precinct, and significant flows within the South Creek riparian corridor. Flooding within the three dams occurs due to the berms being included in the terrain model. The dams ‘daisy chain’ and flow into each other, prior to flows ultimately entering South Creek downstream of the northern dam (future Greenway Precinct). Currently in the model these dams act as active storage, although they have been modelled with an initial water level equal to the outlet weir from each dam.

Due to the weirs’ impact on upstream flows, the berms cause ponding behind each weir to generate the head required to allow the weir to pass the required flow. This results in the dams having an increase in water levels across the surface of the storage area, thereby causing temporary detention of flows within the dam. The temporary storage presented in the model is of a significant volume given the large surface area of the dams.

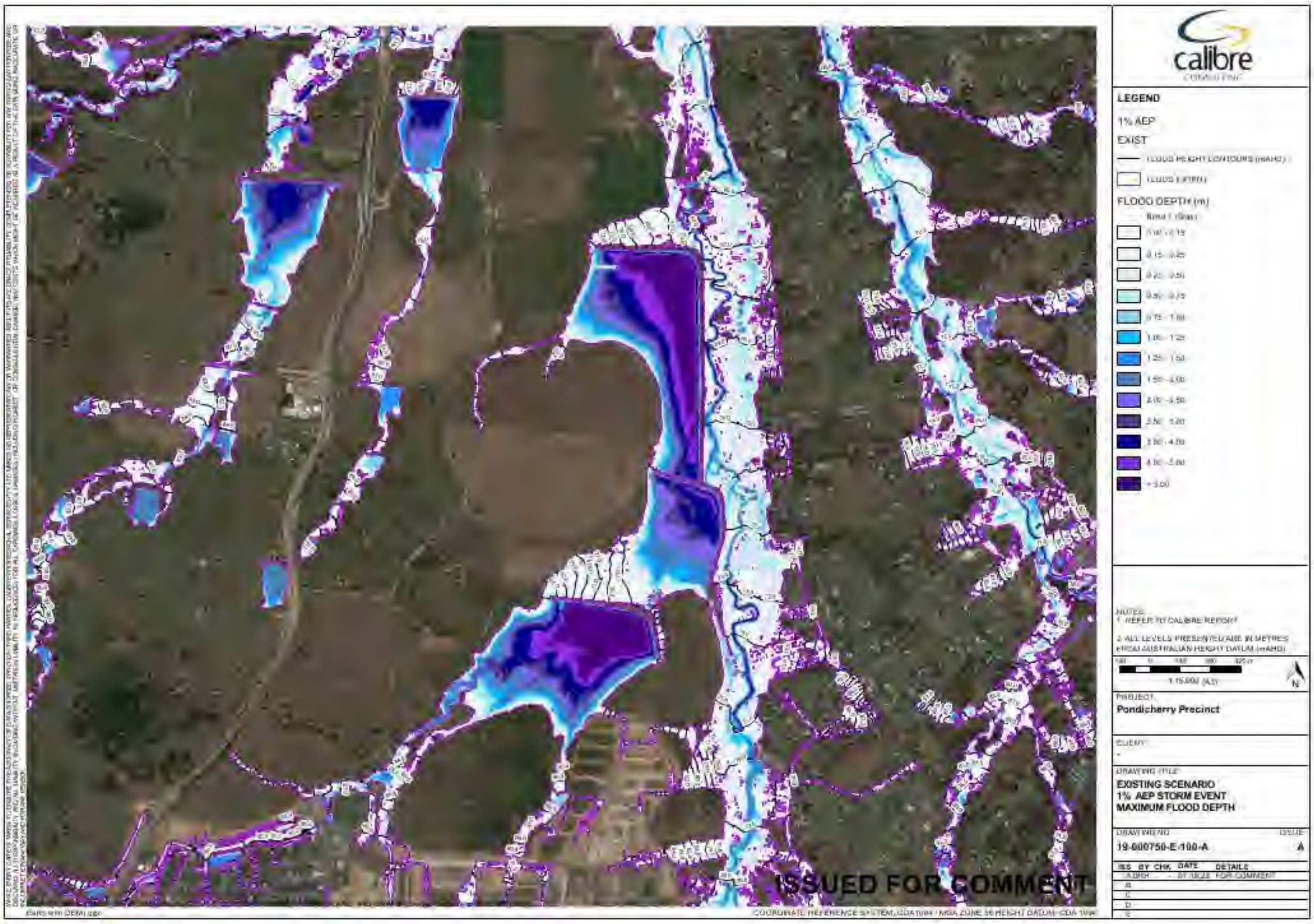


Figure 5.1: Existing 100 yr Flood depth

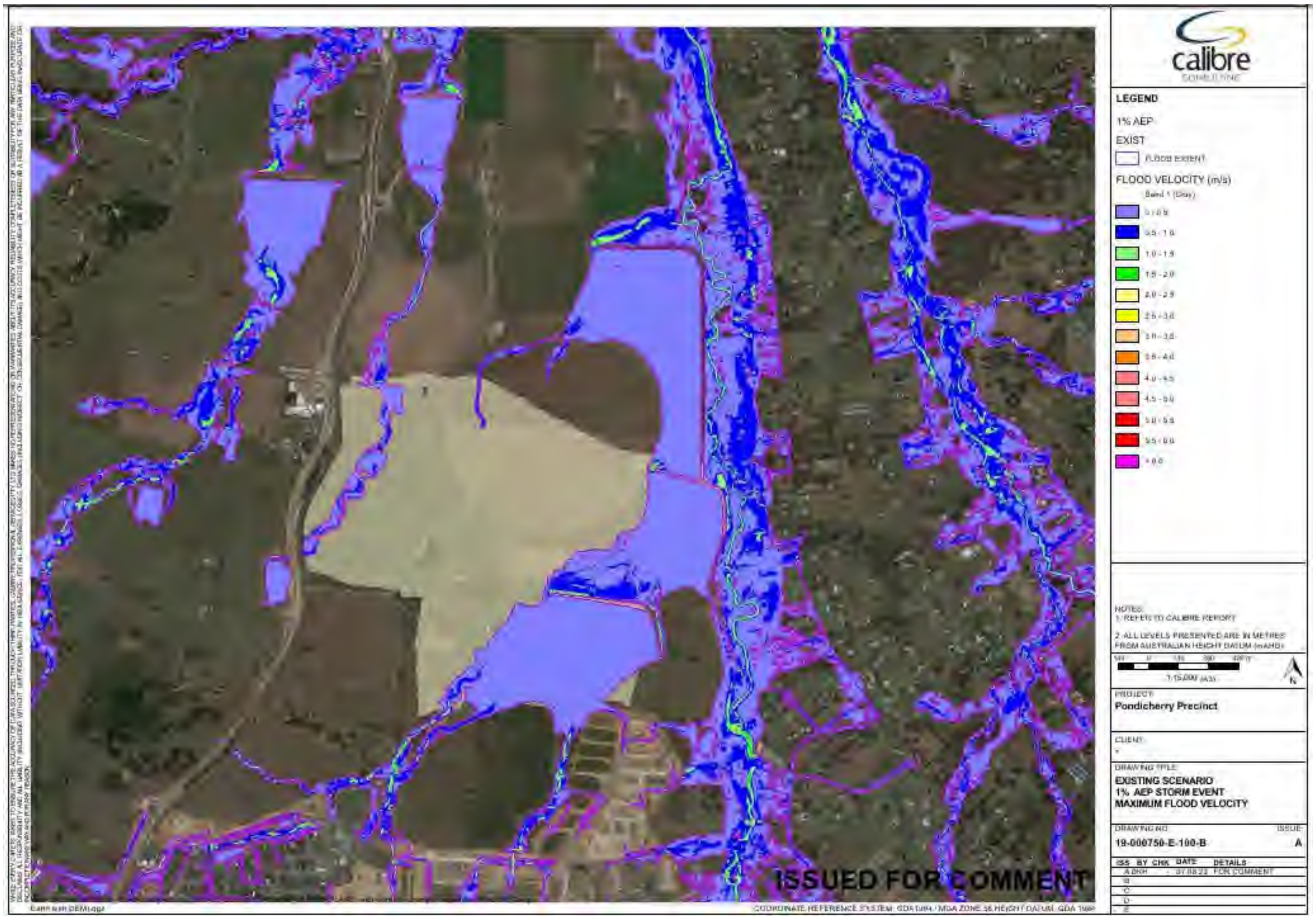


Figure 5.2: Existing 100 yr Flood velocity

5.3.2 Flood Mapping – Developed Urban Area Scenario

The existing model of South Creek was modified by raising the development areas proposed by the Indicative Layout Plan in Figure 2.2 above the flood extents demonstrated in Figure 5.1; suitable for precinct planning.

The ultimate solution proposes to discharge flows directly into South Creek, post implementation of the Greenway Precinct Water Cycle Management Strategy to the north of the Pondicherry Precinct. The interim and ultimate stormwater strategies were detailed in Calibre's Memorandum to the Department of Planning/Camden Council dated Wednesday 16 September 2020 (Refer Attachment B). The Memorandum has been summarised below for reference.

5.3.2.1 Ultimate Solution

The flood level alterations as a result of returning the Pondicherry Precinct discharge to the natural location can be managed as part of the Greenway Precinct to the North.

There are opportunities to widen the flood plain within the riparian corridor once urban development commences in Greenway. The development footprint for the Greenway Precinct can be located on the western side of the existing dam embankment as shown in Figure 5.3. This provides for a wider floodplain that has a greater conveyance than that which occurs under the existing conditions.

Figure 5.3: Future Greenway Precinct Development Area

The wider floodplain and the stormwater mitigation measures that will be incorporated into the Greenway Precinct will ultimately manage the flooding within South Creek. Any flood level difference due to direct discharge to South Creek is considered temporary until such time as Greenway has been developed.

The ultimate development inclusive of the future Greenway Precinct development will ensure that the existing flood levels will be maintained downstream. It is anticipated that the Pondicherry and Greenway Precincts will be constructed prior to the release of the Catherine Fields Precinct to the east.

The flood assessment and report will focus on the interim solution and the overall strategy will be revised when the future Greenway Precinct is assessed for urban development capability.

5.3.2.2 Interim Solution

The flood modelling has demonstrated that the Council's existing flood model is reliant on the farm dams providing an active storage role in local flood mitigation. Excluding active flood storage in the existing scenario (pre farm dams) shows the development scenario results in flood level improvements within South Creek. However, the flood assessment for this report has been undertaken using the region's Upper South Creek flood model that has included active flood storage within the farm dams. The results presented are assessed against the farm dam storage model.

The development of the Greenway Precinct will include stormwater mitigation measures. However, to ensure the development scenario mimics the flood regime as modelled in the Council Upper South Creek model (with active storage in farm dams) then an alternate solution for Pondicherry was investigated by Calibre. In order to maintain the flood regime as modelled in the Council existing flood model, the lower dam (dam 3) within Pondicherry Precinct will need to remain, and the direct discharge to South Creek deferred until the Greenway Precinct is developed (the Ultimate Solution). The permanent Pondicherry Lake has been designed to provide detention to manage the increase in impervious area as a result of the Oran Park and Pondicherry Precinct. The lake within the Pondicherry Precinct will have a standing water level of 77.3m AHD and the water will pond in this lake to 78.3m AHD (1m deep ponding).

In order to replicate Councils flood model that included farm dams, the preservation of the existing farm dam embankment (temporarily) will result in temporary flooding in the location of an area capable of accommodating two future playing fields. These playing fields are not required to meet Pondicherry's active recreation needs and the timing of their provision can be deferred until the Ultimate Solution can be implemented. Additionally, the timing of flow from the proposed precinct has resulted in Dam 2 (future Greenway) spilling earlier then the base model, to manage the timing of flows and detention through the dam the strategy includes locating a low flow dewatering pipe (220mm) 500mm below the spillway in Dam 2.

It should be noted that the detention requirements for Oran Park (based on the Stormwater Masterplan) only had a requirement to detain the 100 year ARI flood and did not consider additional detention as a result of the temporary farm dam embankments. The temporary solution therefore provides a flood management regime that works for both Council and the development.

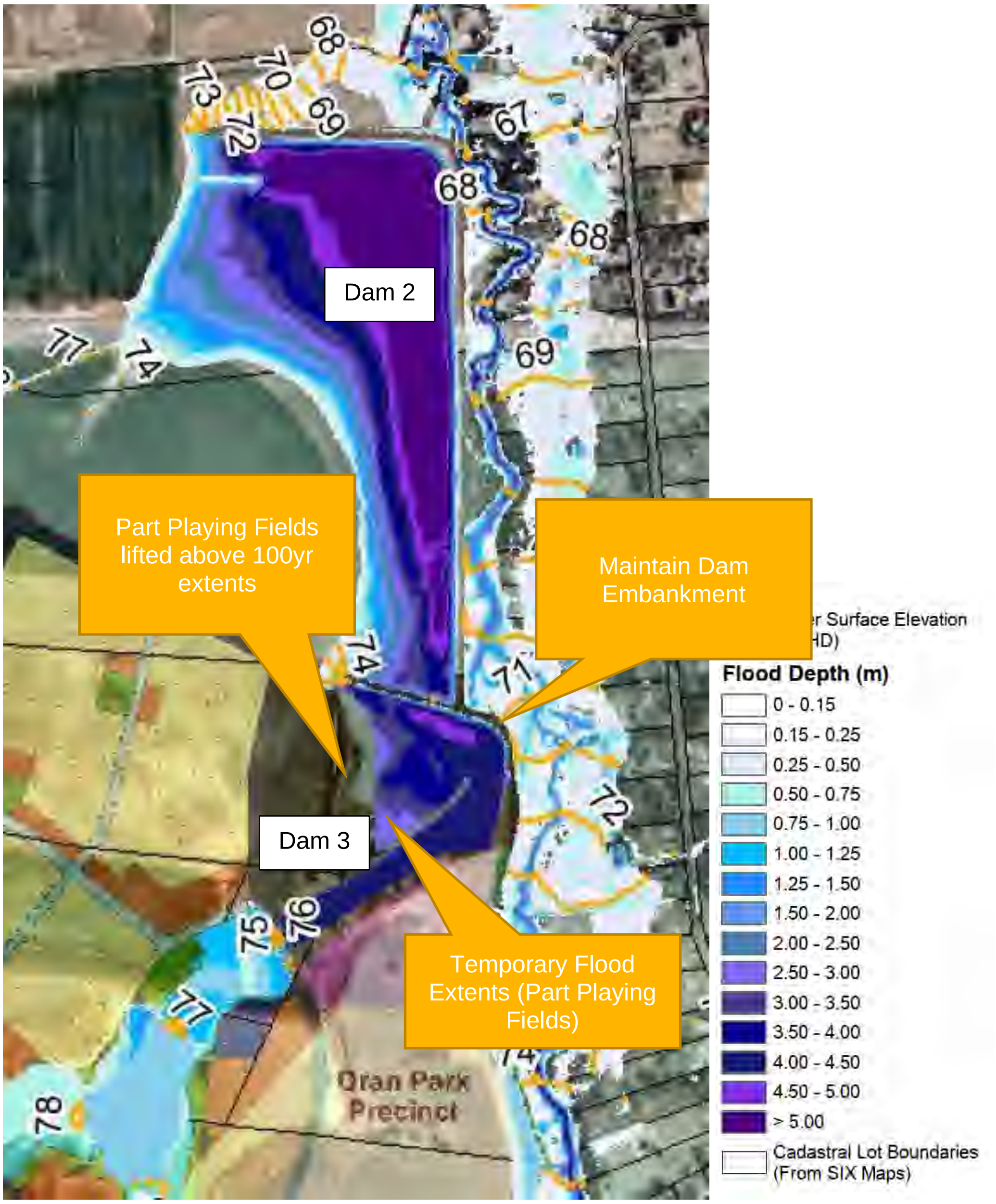


Figure 5.4: Option for temporarily maintaining dam embankment.

Preserving the lower dam embankment allows the flow to discharge into the northern dam (dam 2) in the future Greenway Precinct and not directly into South Creek, maintaining the flow regime when compared to the existing flood model with active storage in farm dams. The lowering of the permanent water in Dam 2 aids in managing the temporary changes in flow timing.

The temporary basin scenario will mimic the existing flood scenario as modelled by Council. The temporary basin arrangement will direct flows to the northern farm dam in Greenway and maintain the existing scenario flows within South Creek.

5.3.2.3 Detention Assessment

Analysis was undertaken in XPRAFTS, a memo of the hydrology assessment has been included in Appendix F. The assessment included the Council base model, the predeveloped scenario (Oran Park and Pondicherry Precinct) and the post development scenario. The results are shown in table 5.2 below

Table 5.2: XP RAFTs Results

STORM EVENT	COUNCIL MODEL (M3/S)	PRE-DEVELOPED SCENARIO (M3/S)	POST-DEVELOPED SCENARIO (M3/S)	STORAGE (M3)	OUTFLOW (M3/S)
1% AEP 30-minute TP1	40.4	35.4	36.9	90,000	16
1% AEP 360-minute TP5	39.1	38.5	38.2	140,000	31
1% AEP 720-minute TP8	34.0	33.6	34.7	135,000	27.2

The results show that the lake has sufficient volume to ensure that the existing flows (Council Base model and Predeveloped model) are not aggravated as a result of the Oran Park and Pondicherry Precincts.

5.3.2.4 TUFLOW Modelling

5.3.2.4.1 Interim Solution model control files

The flood modelling for the interim solution has been modelled in the TuFLOW hydraulic modelling software, the control file used for the current set of results is Pondicherry-2020_~e1~_~e2~_~s1~_~s2~_221101_HQ1_ILP_rev_J2.tcf with the following option flags.

- -e1 Storm return interval as set by WMAwater’s modelling guideline
- -e2 Storm duration as set by WMAwater’s modelling guideline
- -s1 g3 (to set grid size to 3m to match prior modelling data)
- -s2 dev_interum (to read in the options used for the interim models)

5.3.2.4.2 Lake Outlet Control

The Pondicherry Lake outlet provides for a 18m wide control pit. The pit has been designed using weir calculations and created as a rating curve for use in the Tuflow model. The TuFLOW model used a Q type culvert with the calculated depth-discharge rating curve applied to the culvert.

Depth (m)	Flow(m3)
0	0
0.2	2.227124
0.4	6.299257
0.6	11.57247
0.8	17.81699
1	24.9
1.2	32.7319
1.4	36.29649
1.6	38.80258
1.8	41.15635
2	43.38261
2.2	45.50006
2.4	47.52326
2.6	49.46378
2.8	51.33099
3	53.13262
3.2	54.87514
3.4	56.564
3.6	58.20387
3.8	59.7988
4	61.35227

It should be noted that the model pit is suitable for the high level design stage and the outlet and volumes will be further refined and detailed as part of the detailed design phase, if the rezoning proceeds.

5.3.2.4.3 Lake Volumes

The Pondicherry lake consists of a single large area with smaller storage located upstream. The stage storage relationship for the lake upstream of the outlet structure is given below.

RL	Total delta vol	Total vol
77	-	-
77.1	11,210.4	11,210.4
77.2	11,409.2	22,619.6
77.3	11,552.5	34,172.2
77.4	11,683.7	45,855.9
77.5	11,811.6	57,667.5
77.6	13,059.5	70,727.0
77.7	13,244.3	83,971.3
77.8	13,409.0	97,380.3
77.9	13,569.9	110,950.2
78	13,733.4	124,683.6
78.1	13,915.3	138,599.0
78.2	14,174.6	152,773.6
78.3	14,481.5	167,255.0
78.4	14,744.4	181,999.5
78.5	15,083.8	197,083.3
78.6	15,362.2	212,445.4
78.7	14,539.4	226,984.8
78.8	14,769.7	241,754.5

The volumes in the lake under several storm events are given in the table below.

Storm	Volume in Pondicherry Lake (m3)	Volume in lower Dam (m3)
50% AEP	69,520	50,355
20% AEP	85,143	65,484
10% AEP	98,296	77,130
5% AEP	109,599	87,156
2% AEP	131,792	106,722
1% AEP	148,315	114,804

Additional volume is obtained in Dam 3 and in Dam 4 as part of the interim measures and final OSD storage will be incorporated as part of the development of the Greenway Precinct.

5.3.2.4.4 Dam Initial Water Levels

The initial water levels in the three Dams within the Pondicherry and Greenways precinct have been adjusted to account for the developed landform and partial de-watering of the Greenway dam (dam 2). To achieve the partial de-watering of the Greenway dam, a Ø225 low flow pipe is proposed to be inserted into the berm in the northwest corner of the dam at a level to ensure the dam drains back to the starting initial water level once storm flows have passed through the storage.

Dam	Initial Water Level (m AHD)
Dam 4 (Pondicherry Lake)	77.00
Dam 3	73.70
Dam 2 (Greenway dam)	72.27

5.3.2.4.5 Model terrain and material mapping

The Pondicherry Precinct and Oran Park developed terrain were created from the use of design tins layered to produce the proposed landform. These design tins were extracted from the individual stages of Oran Park and Pondicherry and read into the model in the order of design and construction to ensure that the final landform is a suitable representation of the proposed terrain within the two precincts. The Oran Park Precinct has the materials extended from the current 80% developed scenario as previously documented to include the area between Oran Park and Pondicherry. A map showing the developed materials is included below.

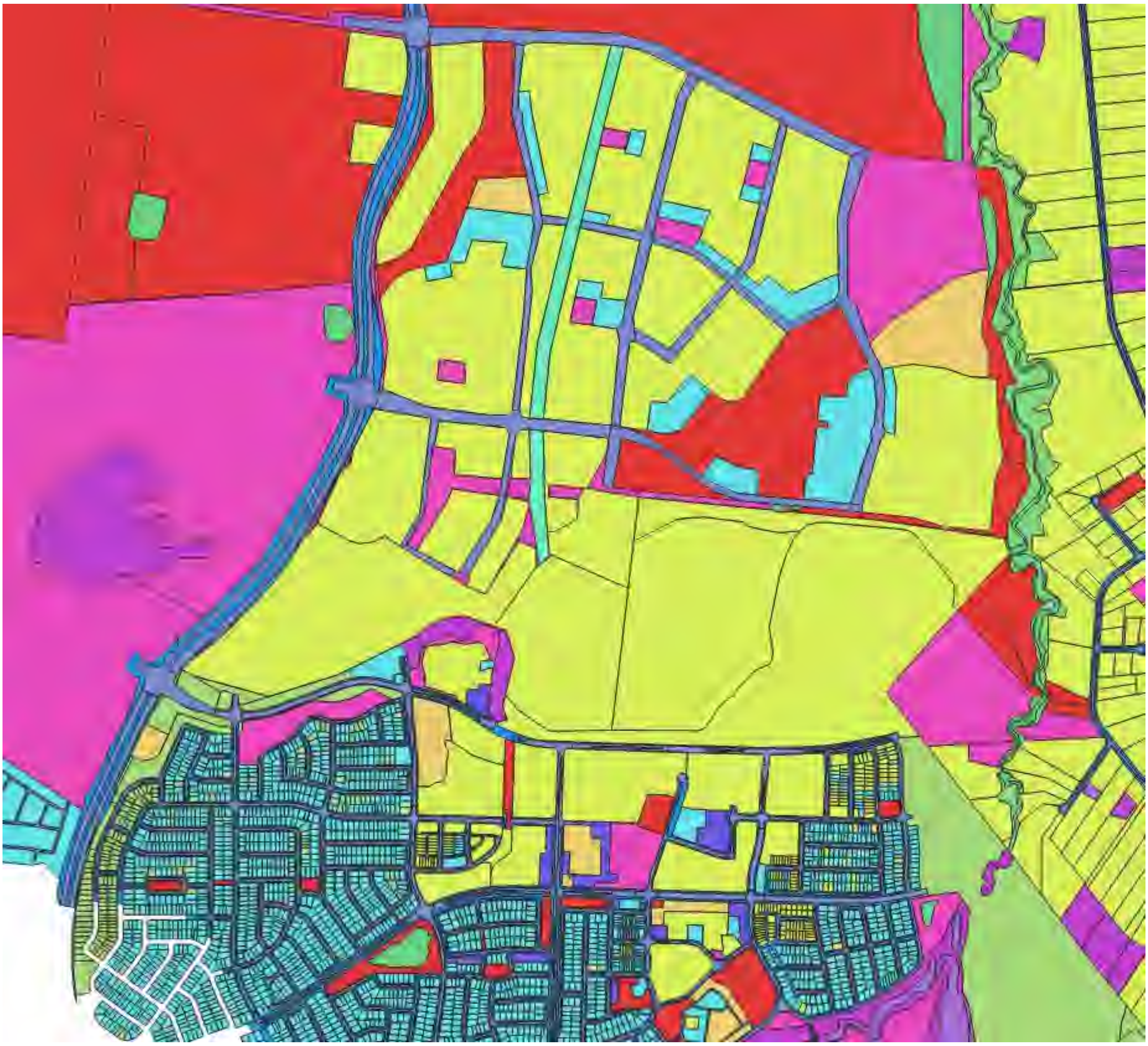


Figure 5.5: Revised Material mapping zones.

5.3.2.5 100 Year Results

The flood extent map for developed conditions calculated in the hydraulic modelling of the 100-year critical local storm event with 100-year tail water within South Creek, is presented on Figure 5.6.

The flood mapping in Figure 5.6 shows that the proposed lake ponds above the permanent water level and provides detention for the Oran Park and Pondicherry Precinct. The temporary dam downstream provides additional storage that directs flows to the northern dam (dam 2 in Greenway), prior to discharging into South Creek as per current arrangements.

Figure 5.6: Developed 100 yr Flood depth

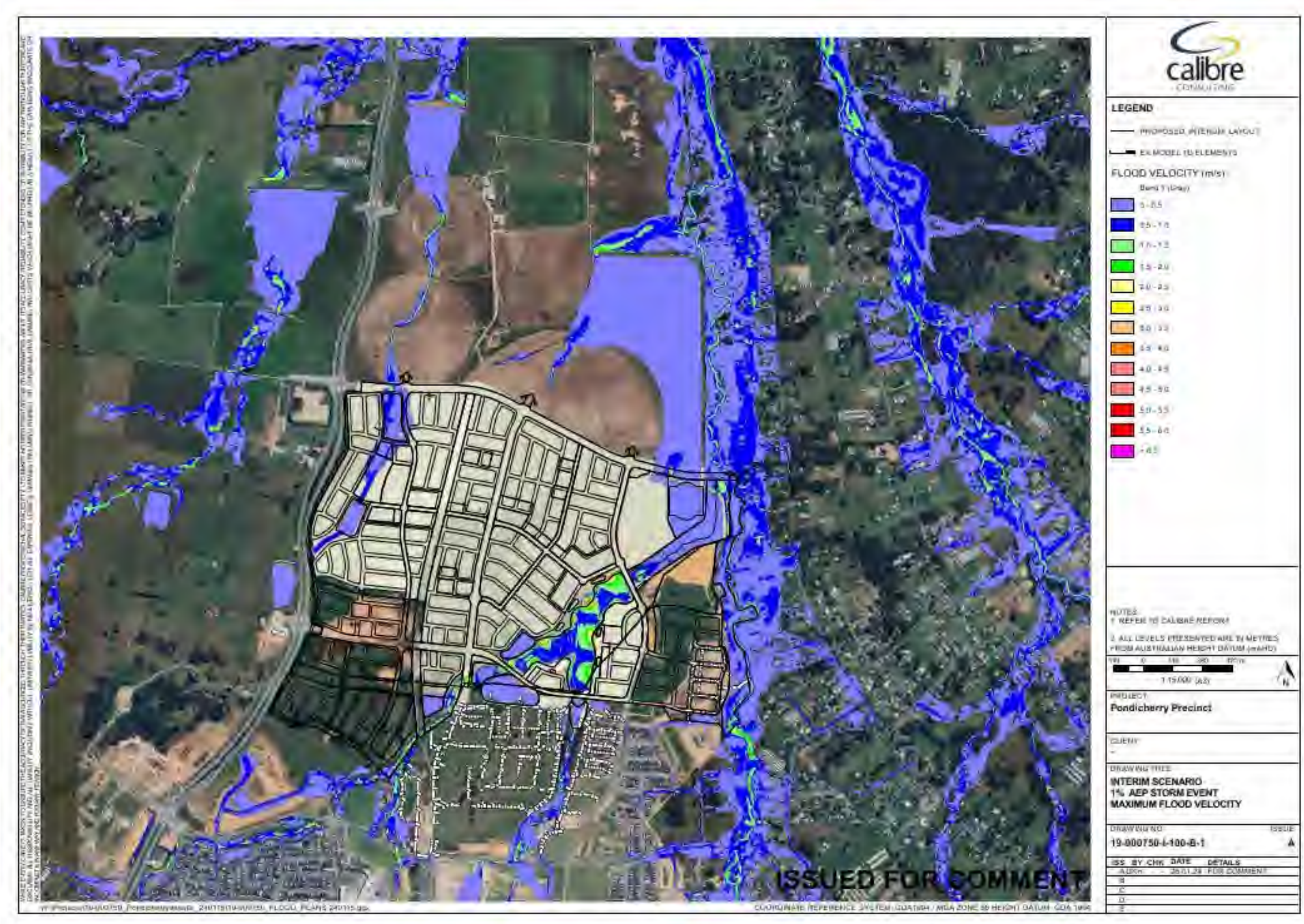


Figure 5.7: Developed 100 yr Flood velocity

5.3.2.6 Flood Difference Mapping

The flood level difference mapping (afflux) for the Council model and the developed (Oran Park and Pondicherry Precinct) has been presented in Appendix A in accordance with the user manual. The flood modelling was also assess against the predeveloped model and the level difference mapping the critical storm event presented in Appendix A.

The flood modelling has shown that the stormwater strategy ensures no aggravating of flood levels within South Creek.

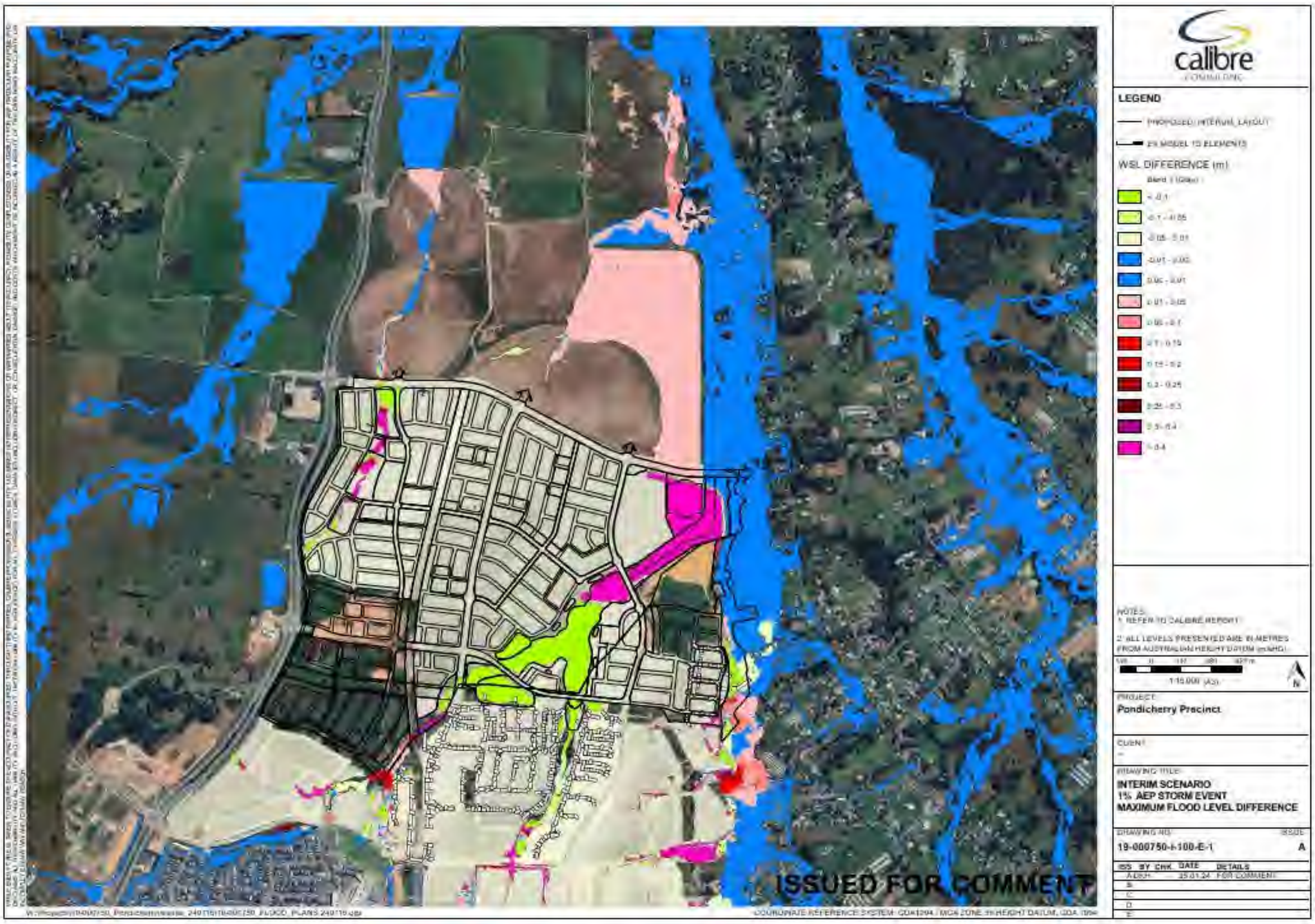


Figure 5.8: Developed 100 yr Flood Afflux

The impacts on South Creek would not adversely affect flood behaviour, nor would they result in detrimental increases in potential flood affectation of other developments or properties. The impacts on South Creek would not significantly impact the likely future uses or redevelopment potential of land downstream of Pondicherry.

As seen in Appendix A flood mapping, the flood level difference for the 1% occurs during the 720min duration as a result of timing of flows with the upstream catchment. It can be seen that during the 360min duration there is no afflux within the South Creek land downstream of the Greenway dam. The flood level differences are limited to the future Greenway Precinct boundary and there is no flood level difference in South Creek or on neighbouring properties.

Figure 5.9 Developed 100 yr Flood Afflux 360min

5.3.2.7 Hazard

Flood hazard is typically derived from a combination of peak flood depth and velocity. The analysis of flood hazard provides for a better understanding of the potential risk within the study area. Understanding the flood hazard rating within the flood zone informs the assessment for feasibility of evacuation during flooding events.

Australian Rainfall and Runoff 2019 prescribes the 6-tiered general flood hazard vulnerability curves by the Australian Institute for Disaster Resilience as presented in Figure 5.8. The flood hazard categorisation aims to provide restrictions for people and vehicles attempting to traverse flood waters.

The results for the Pondicherry Precinct (Appendix A) show that the areas of H6 and H5 in the 100-year flood event are restricted to the water bodies, temporary detention basins, and waterways, which are areas where people and vehicles are restricted from entering. During the PMF the overbank areas of the waterbody experience H3 and H4 for a short duration, however these areas have a rising grade out of the PMF flood zone. All areas with flood waters (including low hazard areas) have a rising grade away from PMF flood levels, under the classifications for emergency response (Support for Emergency Management Planning, NSW Government 2023) these locations will be identified as “C2.2 Areas with rising access out of floodplain – Areas with rising road access”.

The hazard assessment shows that the location of proposed land uses and supporting road infrastructure in Pondicherry (and Oran Park) are adequate to effectively manage the risks presented by events up to and including the PMF.

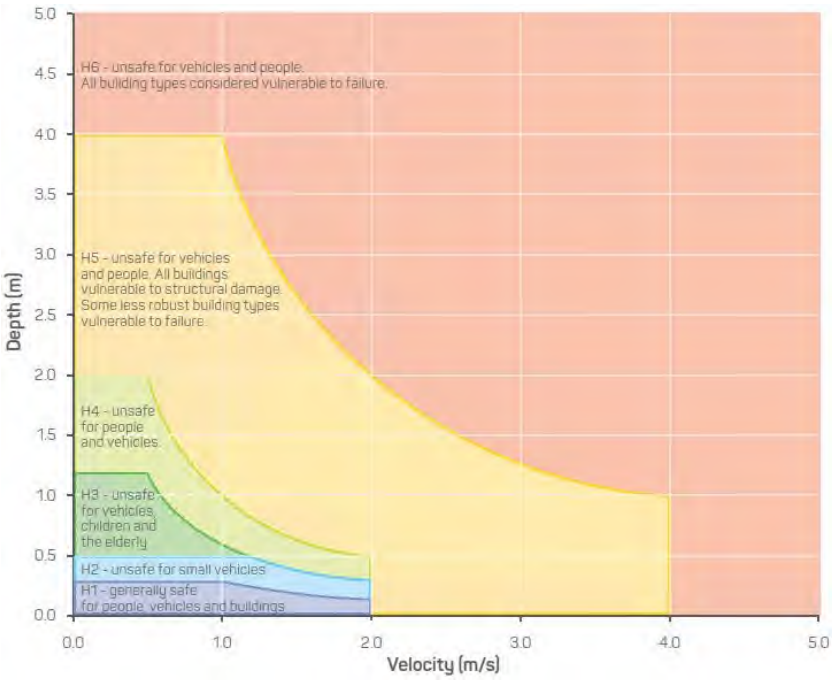


Figure 5.10: General Flood Hazard Vulnerability curves (AIDR, 2017)

Figure 5.11: Developed 100 yr Flood Hazard

5.3.2.8 Flood Distribution and Velocities

The Upper South Creek flood model included the farm dams, and the flow regime had dams 4 and 3 cascading into dam 2 prior to discharging into South Creek. The proposed interim strategy has maintained the modelled existing flood regime and flow distributions. The proposal allows all flows to discharge into dam 2 prior to entering South Creek.

All existing and proposed velocities are within tolerance for the vegetation and will not cause erosion/scour or siltation. The existing flow regime has been maintained and does not adversely affect the potential risk for salinity issues to arise.

5.3.2.9 Climate Change Sensitivity Analysis

To understand the impact that climate change may have on the precinct, the intensity of the storms was increased in line with documentation provided by the Bureau of Meteorology for RCP 8.5 for the year 2090 as recommended by ARR. Under this scenario it is expected that rainfall intensities will increase by approximately 20% (19.7%) above current storm data. We have adopted the 2090 data for our analysis. This is currently the 'worst case scenario' data series and is a very conservative analysis..

Table 5.2 – DataHub climate change factors

Interim Climate Change Factors

	RCP 4.5	RCP6	RCP 8.5
2030	0.869 (4.3%)	0.783 (3.9%)	0.983 (4.9%)
2040	1.057 (5.3%)	1.014 (5.1%)	1.349 (6.8%)
2050	1.272 (6.4%)	1.236 (6.2%)	1.773 (9.0%)
2060	1.488 (7.5%)	1.458 (7.4%)	2.237 (11.5%)
2070	1.676 (8.5%)	1.691 (8.6%)	2.722 (14.2%)
2080	1.810 (9.2%)	1.944 (9.9%)	3.209 (16.9%)
2090	1.862 (9.5%)	2.227 (11.5%)	3.679 (19.7%)

To model the climate change condition, the existing rainfall patterns used in the XP-Rafts Hydrologic model were extracted and increased by a factor of 1.2 for all storms. The resultant local flow hydrographs were then exported from XP-Rafts and used as the inflow data for the Climate Change Tuflow models. The critical storms and durations modelled were in accordance with Table 3 of WMA's USC Regional Model User Guide.

Under the climate change sensitivity analysis, the flood velocities have increased withing the South Creek riparian corridor by approximately 0.1-0.25 m/sec, with only small, localised zones of concentrated flows displaying an increase in velocity higher than 0.5 m/sec. As these are discrete areas that will be contained within the zoned riparian corridor, it can be reasonably concluded that climate change will not impact the developable areas of the precinct and any additional hazards posed by climate change can be appropriately managed within the riparian corridor.

Water levels have increased by approximately 150-200mm within the riparian corridor due to the increased climate change flows. Given that all developed lots would require a freeboard of 500mm, above the 100-year event, this increase will not cause any additional inundation on developed lots or result in the loss of buildings. In addition, all development areas will have emergency escape routes (roads) with a rising grade from the PMF-affected areas. Even if blockages were to occur in the road drainage system and cause localised flooding, any impacted properties would still have safe paths of egress out of and away from the flood waters.

For the PMF climate change scenarios, the high hazard areas remain within the waterways and water bodies, and all areas with PMF flooding. This shows that the proposed flood strategy is resilient to changed hydrology resulting from climate change.

5.3.2.10 Flood Evacuation

Generally, the proposed lakes will control localised flooding, and the majority of the Pondicherry Precinct is not considered flood prone. Therefore, the issue of flood evacuation does not significantly influence urban design as areas beyond the flood fringe (PMF) of South Creek are proposed to be filled to create suitable development pads. A flood evacuation plan will be required as part of the future development application process. Given that flood free ground is readily accessible, and that "islands" are not created in times of flood, evacuation should be considered an acceptable solution to manage flood risk.

As recommended by Camden Council and Australian Rainfall and Runoff, a 'minor' and 'major' drainage system approach is proposed to manage local runoff. This allows safe passage of flood flows along the road once the drainage pipe capacity is exceeded. Flows are also accommodated in the drainage corridors where riparian buffers are located.

Proposed lot and habitable floor levels would at a minimum conform to the Growth Centres DCP, with the habitable floor levels being a minimum of 500 mm above the 100 year ARI flood levels throughout the site. The relevance of this planning control is restricted to lots fronting riparian corridors and South Creek.

During the PMF storm event the low level areas surrounding the Pondicherry Lake will experience minor inundation. This will be contained to the immediate vicinity of the lake and its fringing open space, and over the road (the continuation of Dransfield Drive) at the lake outlet control. These areas of inundation are outside the 100 year extents, are contained and dissipate quickly with inundation lasting for approximately 1 hour to 2.5 hours depending on the location. This is demonstrated in Figure 5.11 noting the road crest at the location is approximately RL 79.55.

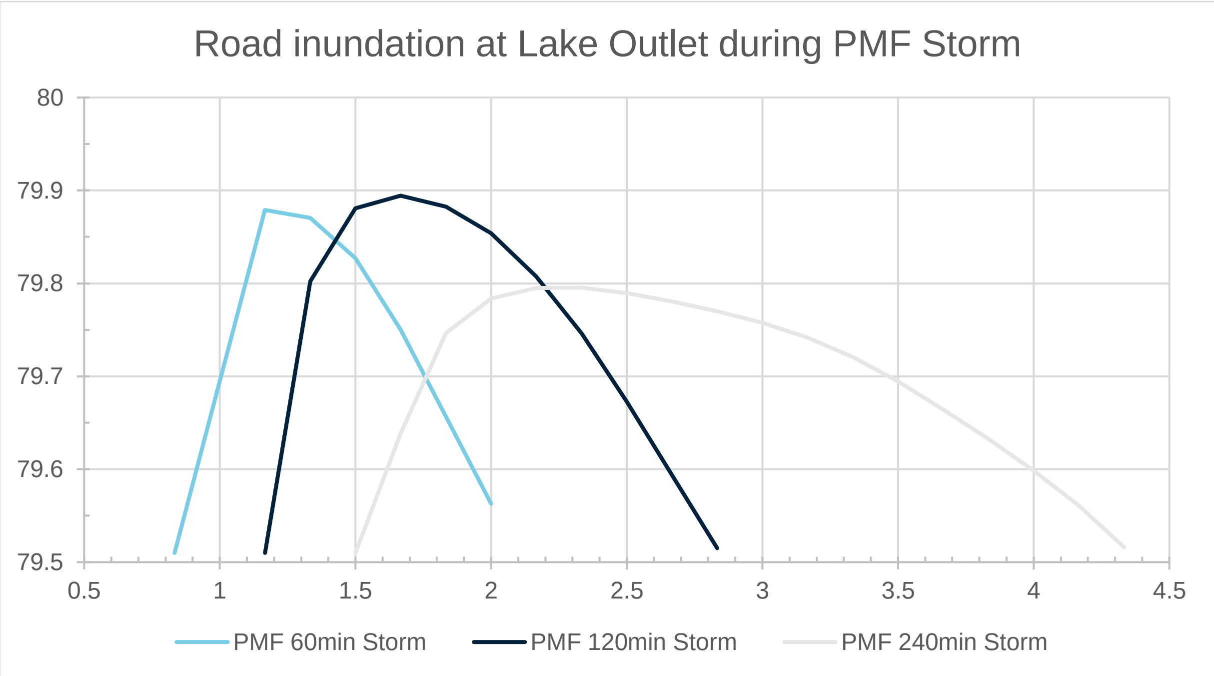
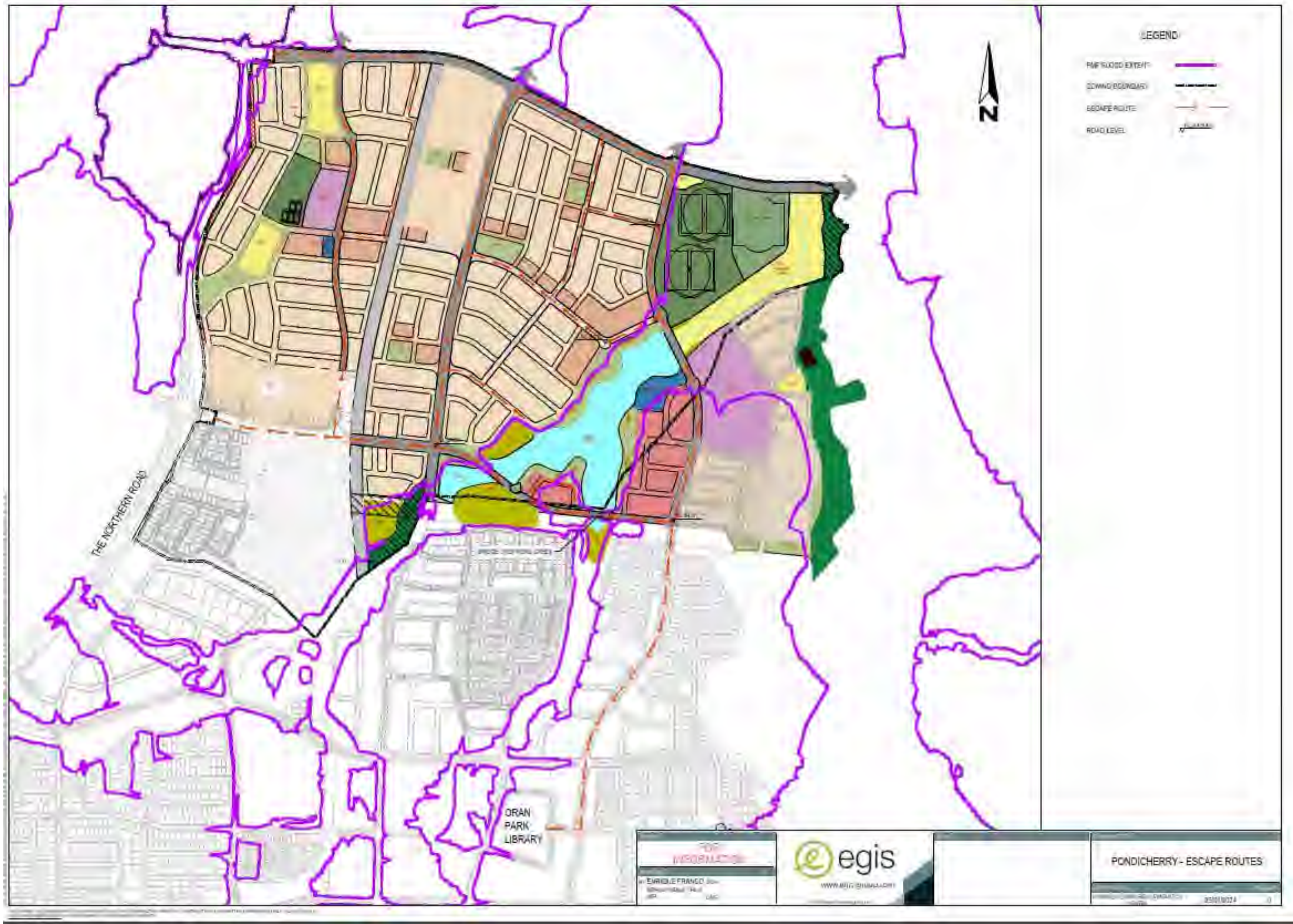


Figure 5.11: Inundation time (downstream of Lake)

A sketch plan has been prepared by Egis to show possible evacuation routes out of the floodplain. Affected residents located to the east of the lake may evacuate to the south along Dransfield Drive and seek shelter at (for example) Oran Park Library or Council's Administrative building both of which are located above the PMF floodplain. It is noted that parts of Dransfield Drive are inundated with floodwaters during the PMF however the mapping shows that flood hazard is H1 ('no restrictions') along the road fronting the residential properties. Therefore, evacuation can take place safely along this route.

Evacuation routes connecting to The Northern Road are also available towards the west. It is also noted that majority of the development to the west of the lake is above the PMF floodplain as is the undeveloped land further west of The Northern Road. As such, the community will be able to easily evacuate to higher ground in these areas.



5.4 Western Catchments

The western catchments within the Pondicherry Precinct drain to a green corridor prior to discharging into Lowes Creek via the future Greenway Precinct. The objectives of the western catchments will be achieved with strategically placed detention basins to manage the 100 year ARI storm flows off the catchment. These detention basins will generally include a water quality component (bioretention) with the stormwater detention occupying approximately 1 m to 1.5 m of extended detention depth above the basin floor in the case of a dry detention basin.

The stormwater detention surface areas as estimated by the RAFTS hydrological model are shown in Table 5.

Figure 5.12: Western Catchment basin locations

Table 5.2 – Catchment Breakdown

Basin No.	Catchment Area (Ha)	Volume (m3)
Basin B41	18.5	9,100
Basin B1	30.8	11,100
Basin B2	34	12,200
Northern Basin	17.4	6,300

5.4.1 Western Catchment Flooding

Under existing conditions, the western part of the development area as well as the catchment to the west of The Northern Road drain to the north along a series of flowpaths. These flowpaths bypass the existing Pondicherry farm dams and drain to Lowes Creek which confluences with South Creek in the Greenway Precicnt.

A formalised channel is proposed as part of the Pondicherry development that will convey runoff from the western catchments and drain towards the north into the future Greenway Precinct. Modelling results show that the 1% AEP flows are contained within the 25m wide channel.

Changes in peak flood level are generally contained within the precinct noting minor increases in peak flood levels modelled further downstream along the flowpath will be mitigated as part of the future Greenway Precinct design.

6. Water Cycle Management Plan

This section outlines the strategy and measures that are proposed as part of the Pondicherry Precinct Plan that will meet the water management targets. These requirements are set in Section 3.3 of the 2009 Camden Council Engineering Design Specifications which sets water quality targets.

6.1 Objectives

The objective of the water cycle management measures for the Pondicherry Precinct are to achieve the treatment targets for the reducing export loads to the requirements of Camden Council.

The per cent reduction in pollutant load targets for the project are from Table 3.3.9 of the *Camden Council Engineering Specifications*:

- Gross pollutant (>5 mm) 90%
- Total suspended solids 85%
- Total phosphorus 65%
- Total nitrogen 45%
- Hydrocarbons 90%

These targets are consistent with other documentation, including the requirements of the *Sydney Metropolitan Catchment Management Authority, Draft NSW MUSIC Modelling Guidelines*.

6.2 Strategy

The overall water management strategy for the Precinct involves the implementation of water sensitive urban design features, along with traditional drainage infrastructure to achieve the objectives for water quality. Stormwater and drainage measures within the precinct could include the following components:

- Source control features including rainwater tanks, street trees and permeable landscape features
- Transfer of flows through a traditional pit, pipe and overland flow network
- Water quality (bio-retention) basins incorporating gross pollutant traps, filter media and vegetation, including provision for open water bodies. The location of the bioretention could be at the ‘end of pipe’ or scattered through the catchment.
- Proprietary treatment devices

6.3 Water Management Infrastructure

The preliminary design and layout of the water management infrastructure has informed the preparation of the Indicative Layout Plan, with the development of the drainage and layout plans occurring in consultation with Design + Planning. The catchments have been mapped based on the existing topography and the indicative road layout in the Indicative Layout Plan. Catchment sizing, WSUD design and pipe sizing will be refined as part of the detailed design process at the Development Application stage.

6.3.1 Rainwater Tanks and Street Trees

Water quality treatment to manage runoff could be incorporated at source by the use of rainwater tanks on dwellings and street trees within the road. Camden Council WSUD policy promotes the re-use of rainwater that falls on the site to reduce the demand on the potable water system. The installation of rainwater tanks is capable of meeting ~ 50 per cent of the potable water demand for outdoor use, toilets and/or laundry.

The roof runoff will be collected in standard roof guttering and collected in rainwater tanks draining to a *Building and Sustainability IndeX* (BASIX) compliant reuse system. Overflow from the roof drainage capture system will drain to the pit and pipe drainage network, from where it will ultimately be discharged into the precinct bio-retention basins.

Street trees will be incorporated into the road design with filtration media included within the tree pits to further polish the surface runoff during a storm event. Street trees will be irrigated passively by allowing for breaks in kerbs, appropriate set-down paths graded to drain to landscaped areas and scour protection at the edge of the landscaped bed. The Street Tree Masterplan prepared for Pondicherry has as one of its objectives to increase the number of street trees provided, to increase tree canopy. The increased number of street trees planned for Pondicherry will provide marginal improvements to stormwater polishing and will also increase the proportion of pervious land to impervious land. Both outcomes will contribute to better stormwater management in Pondicherry

6.3.2 Pit, Pipe and Overland Flowpath Drainage System

Stormwater runoff from lots and roads in excess of the capacity of source control measures will be directed to a trunk drainage system for minor storm events in a conventional pit and pipe system.

Pipe diameters will be designed to be in accordance with Camden Council guidelines, including gradient and cover requirements. The overland flow network has been incorporated into the road layout of the Indicative Layout Plan. This road layout has been designed to allow free drainage of all roads to discharge to the ponds within the precinct and South Creek. The road layout will be designed at the detailed design stage to avoid trapped low points, which can result in localised flooding.

6.3.3 Water Quality Basin Strategy

Water quality basins proposed for the Pondicherry Precinct are bio-retention systems, to be designed in accordance with the requirements of Camden Council. Bio-retention basins (also known as bio-retention systems, bio-filters, and rain gardens), are a form of water treatment that use natural processes to achieve water quality improvements from stormwater flows. They can be located at the end of pipe or throughout the catchment (tree pits etc.).

Bio-filtration systems use vegetated soil-based filters to attenuate flows, reduce runoff volumes, and improve water quality through sedimentation, filtration, sorption, and biological uptake by reed and sedge types of vegetation. Bio-retention basins have advantages over open water treatment systems such as wetlands or ponds due to decreased risk to human health via contact with untreated water. This lack of ponding water also provides mosquito control, odour control and minimises wildlife interactions with treatment of water prior to discharging into the lakes.

Treatment of stormwater entering large waterbodies, like the proposed Pondicherry Lake, allows the design of the water bodies to be specifically targeted to manage and address issues associated with the water body health and function, and to mitigate and ameliorate any potential adverse impacts. In the case of the Pondicherry Lake, further water quality mitigations are proposed via the mechanical water re-circulation system.

The preliminary design of bio-retention basins for the Pondicherry Precinct have been prepared in accordance with the Camden Council guidelines and incorporate typical design features including:

- Gross pollutant trap
- Flow distribution/inlet structure
- Bio-retention filter comprising of:
  - filter media (coarse sand and organic material)
  - planting (grass and sedge species to remove pollutants)
  - sub-soil drainage and flow collection
- outlet control

The design of basins will receive flows from the developed sub-catchments, typically directed to a splitter pit, or high flow weir. Where possible this weir directs high flows away from the bio-retention basin to prevent damage to the vegetation and filter media during high energy events with the split flows discharging directly into the Pondicherry lake. Flows lower than the design recurrence interval (to be set at four exceedances-per-year or the 3-month peak event) will be directed to a gross pollutant trap (GPT). The purpose of the gross pollutant trap is to remove litter, debris and sediment to prevent blockage of the basin. Flow from the gross pollutant trap will be directed through a pipe network into a bio-retention treatment area. Flow in excess of the design event bypass the basin. The configuration will be refined as part of the detailed design process.

The bio-retention cell consists of a filter media, an enriched coarse sand, planted with nutrient removing vegetation. Nutrient removal occurs through sorption to soil particles, decomposition by subsoil biota, and removal by plants. An extended detention depth (ponding above the filtration media) will be provided to increase treatment volumes within a basin.

Bioretention basins can be the combination of end of source basins collecting flows from the upstream catchment and/or at source treatment located through the catchments as swales, tree pits or smaller raingardens

6.4 Water Quality Modelling

Preliminary assessment and stormwater quality modelling has identified 12 potential catchments within the precinct as shown on figure 6.1. This modelling of the preliminary design, undertaken using the *MUSIC* water quality modelling software (6.3.0) has been prepared in accordance with Camden Council guidelines and is used to determine the required bio-retention areas throughout the catchments needed to meet the pollutant removal targets provided Section 6.1.

The catchment map is shown below in Figure 6.1 and Table 6.1; the preliminary catchment based on the existing catchment and subject to more detailed road grading and design.

Each Catchment has been split into various land types, Road areas, open space/Riparian, Roof areas (to a rainwater tank and bypassing), driveways (sealed roads), Courtyards and paths (unsealed roads) and pervious areas.

The preliminary catchment sizing and bioretention requirements is provided below in table 6.1.

Figure 6.1: Catchments

The preliminary catchment sizing and bioretention requirements is provided below in table 6.1.

Table 6.1 – Catchment Breakdown

Basin No.	Catchment Area (Ha)	Bioretention Filter Surface Area (m2)	Wetland Surface Area (m2)
2	24.6	2460	
3	21	2098	
4	4.9		2600
5	6.5		12000
6	27.7	2770	
7	7.8	780	
8	5.9	590	
9	2.2	220	
10	3.1	310	
11	1.38	138	
12	22	2200	
Northern Basin	19	1900	

The catchment identified as the Northern Basin drains to Greenway Precinct to the north. Consistent with existing regional planning strategies, it is expected that Greenway will be developed for urban land uses in the future. A future basin can form part of this future precinct and has been sized on a preliminary basis.
Calibre has completed high level preliminary grading which suggests that the area will converge at a local low point, which would be best served by a single basin. This is still a preliminary assessment and may change as further lot and road grading becomes available. This matter can be resolved at development application stage when more detailed information is available.

Figure 6.3 – ILP Music Setup

The resulting performance of each basin is shown in Table 6.2.

Table 6.2 – Preliminary MUSIC model results

	Gross Pollutant (%)	Total Suspended Solids (%)	Total Phosphorus (%)	Total Nitrogen (%)
Removal Target	**90**	**85**	**65**	**45**
Eastern Catchments	95	88.3	68.9	49.6
Western Catchments	100	89	66.7	49
Overall	95.9	88.4	68.6	49.5

The results in Table 6.2 indicate that the water cycle management system indicated in Table 6.1 and Figure 6.1 is sufficient to address the pollutant removal targets.

Basin B2, B3 and Northern Basin will incorporate a 100-year detention volume into the water quality basin.

7. Conclusion and Recommendations

The stormwater hydrological and hydraulic analysis has shown that the flooding impacts have been considered by the Indicative Layout Plan and are acceptable for the Precinct Planning Proposal. Flooding risks for events up to and including the PMF have been considered in the analysis and the risks are shown to be both tolerable and manageable for the subject land in Pondicherry and for downstream properties. Further refinement of the strategy will need to occur at the detailed development application stage stage to ensure the modelled results are realised.

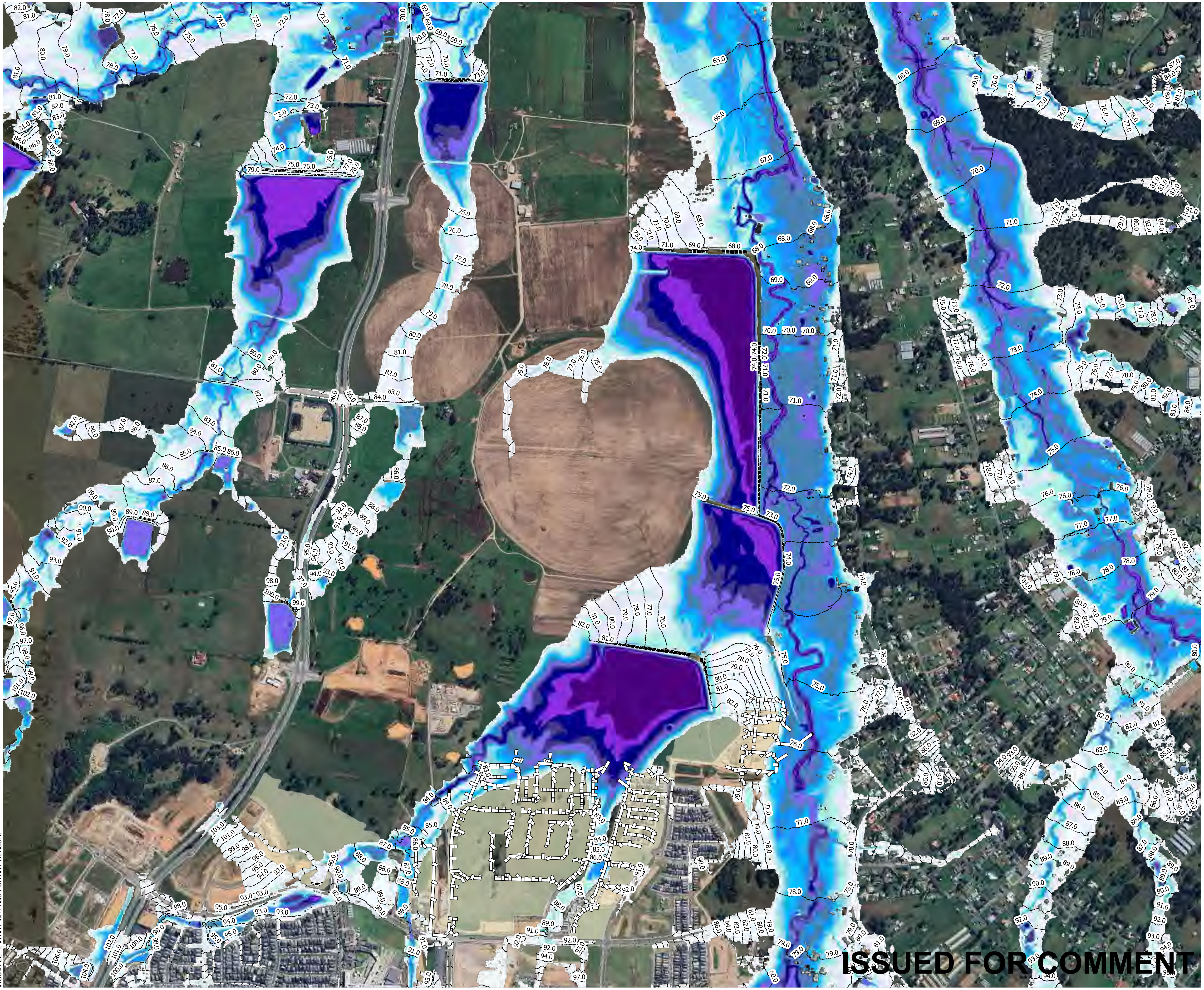
The proposed stormwater management strategy complies with the relevant state and local government requirements. The objectives of the stormwater quantity management strategy for the Pondicherry Precinct have been achieved by;

- No adverse flooding of neighbouring properties that result in detrimental, increased or significant impact on likely future uses. The strategy utilises a combined detention/lake system to manage potential impacts from the eastern catchments. Additional basins will be provided for the western catchments to manage localised impacts;
- Providing fill levels within South Creek flood fringe that achieve Camden Council requirement of finished floor levels for dwellings to be 500mm above the proposed 100-year ARI flood level;
- Managing major and minor stormwater flows using structures;
- Ensuring the water quality reducing targets are met and
- Ensuring development does not encroach into riparian zones.

Furthermore, the proposed lake system meets the desire to retain water in the landscape (consistent with emerging Government policy) and assumptions in Council's flood model which effectively assumes the active storage capacity/detention in the existing farm dams remains available in Pondicherry's developed state. The recommended strategy also reflects Council engineers' preference for flood levels in South Creek to be maintained as a temporary solution, resulting in temporary detention in areas ultimately designated for playing fields, until such time as the ultimate drainage strategy associated with the Greenway Precinct can be implemented.

The proposed water quantity and quality modelling has demonstrated that the land in Pondicherry is suitable for urban development and the flooding impacts and water quality requirements can be appropriately managed in line with Council’s policies and community expectations. The Indicative Layout Plan has been prepared to manage the water cycle objectives for the Pondicherry Precinct and as design occurs in later stages of the planning process, the preferred strategy can be refined and detailed as required.

Attachment A – Flood Maps



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD HEIGHT CONTOURS (mAHD)

FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

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PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
PMF STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-PMF-A-1**

ISSUE: **A**

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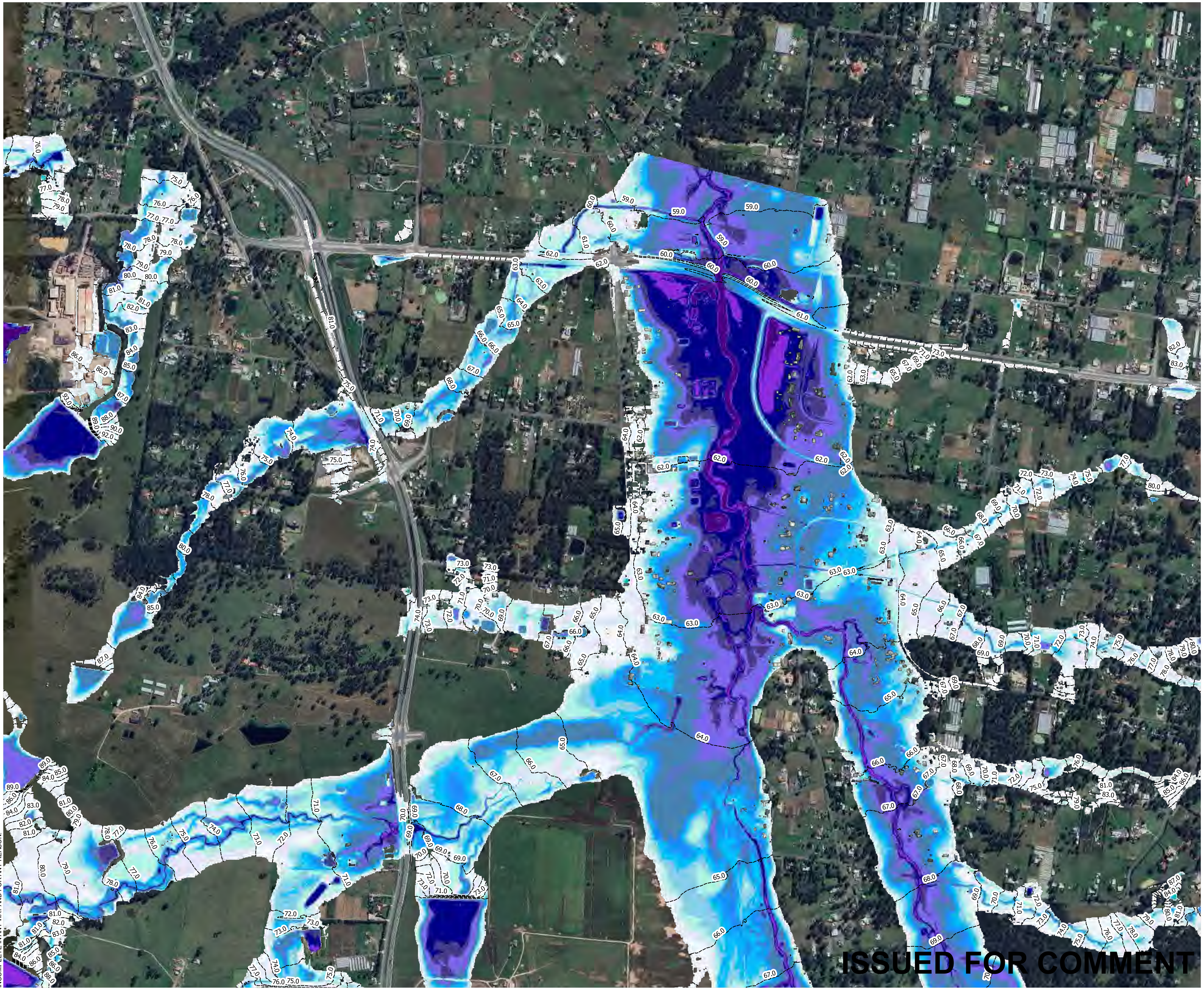

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calibre CONSULTING

LEGEND

FLOOD HEIGHT CONTOURS (mAHD)

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

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1:15,000 (A3) N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
PMF STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-PMF-A-2**

ISSUE: **A**

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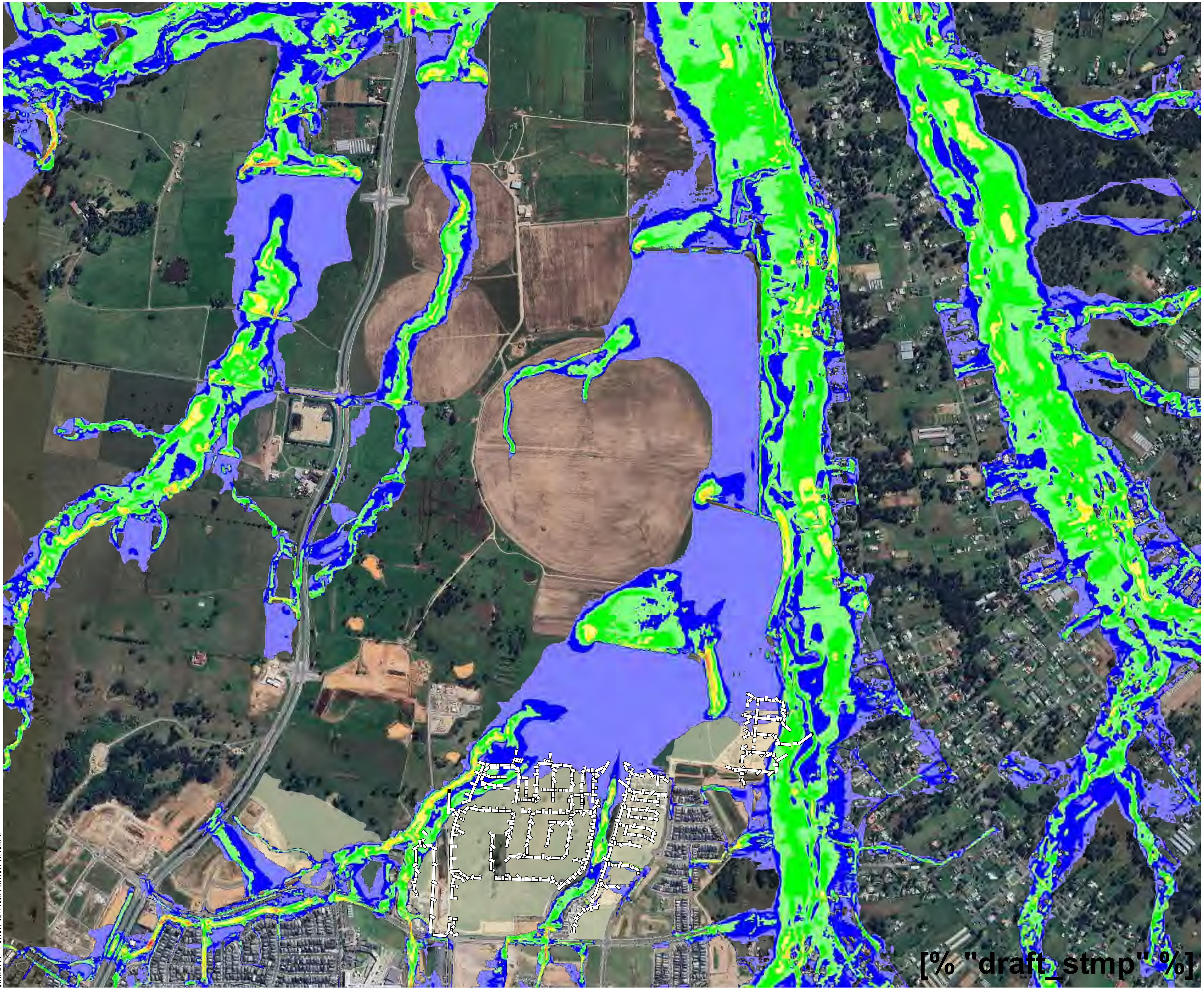

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calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

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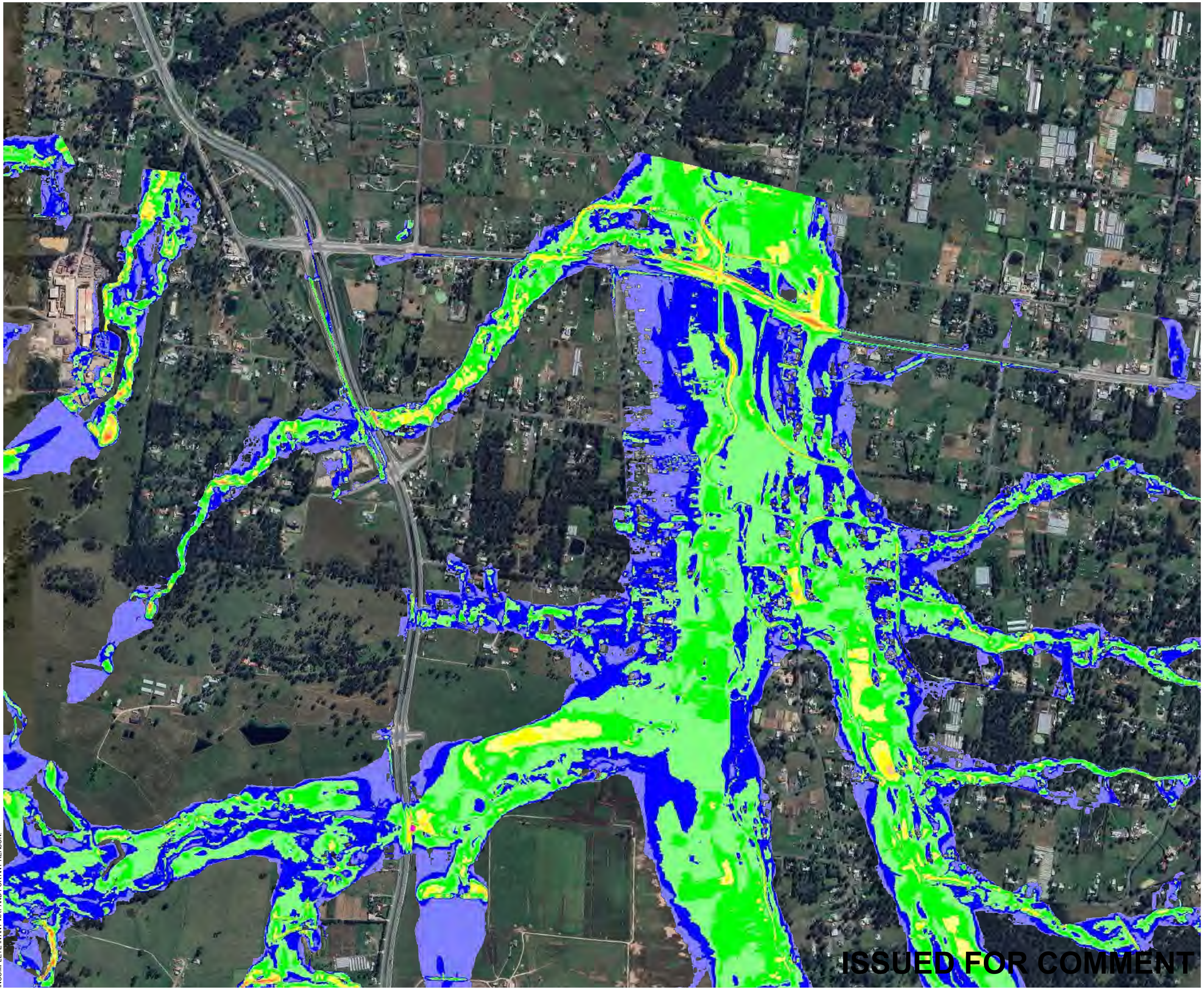

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LEGEND

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

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PROJECT:
Pondicherry Precinct

CLIENT:
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DRAWING TITLE:
COUNCIL MODEL
PMF STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-E-PMF-B-2**

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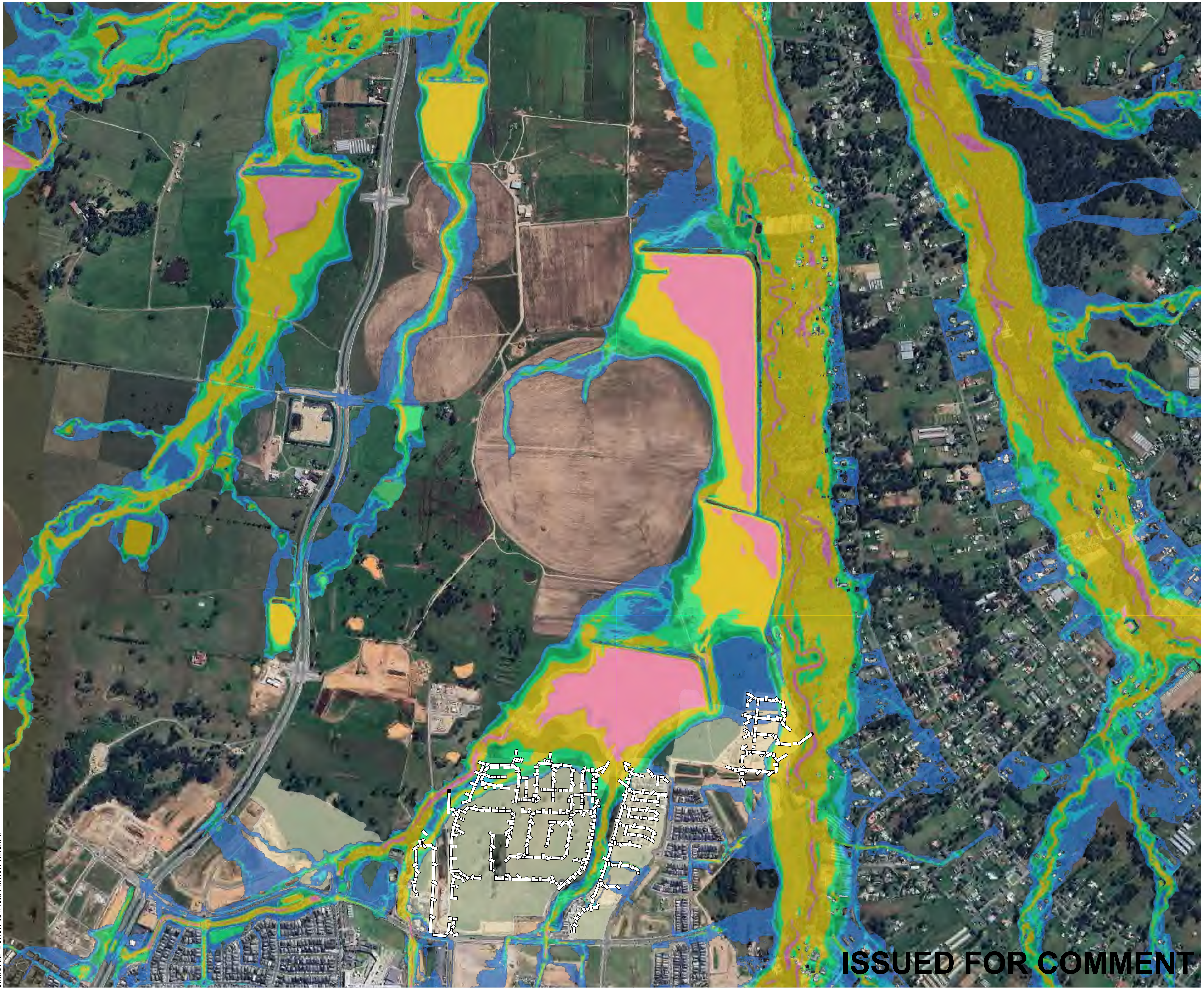

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

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PROJECT:
Pondicherry Precinct

CLIENT:
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DRAWING TITLE:
COUNCIL MODEL
PMF STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-PMF-D-1**

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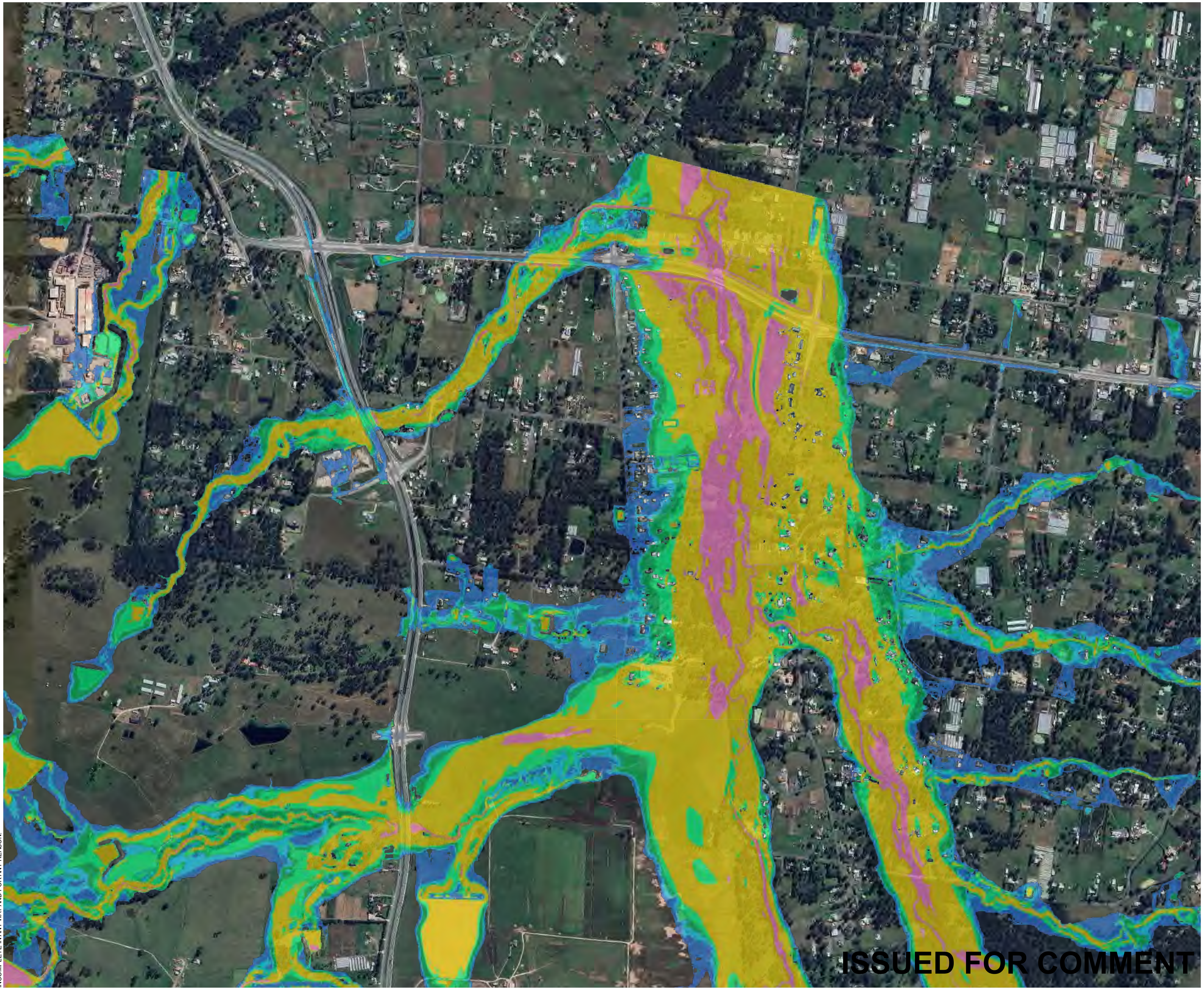

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LEGEND

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

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PROJECT:
Pondicherry Precinct

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DRAWING TITLE:
COUNCIL MODEL
PMF STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-PMF-D-2**

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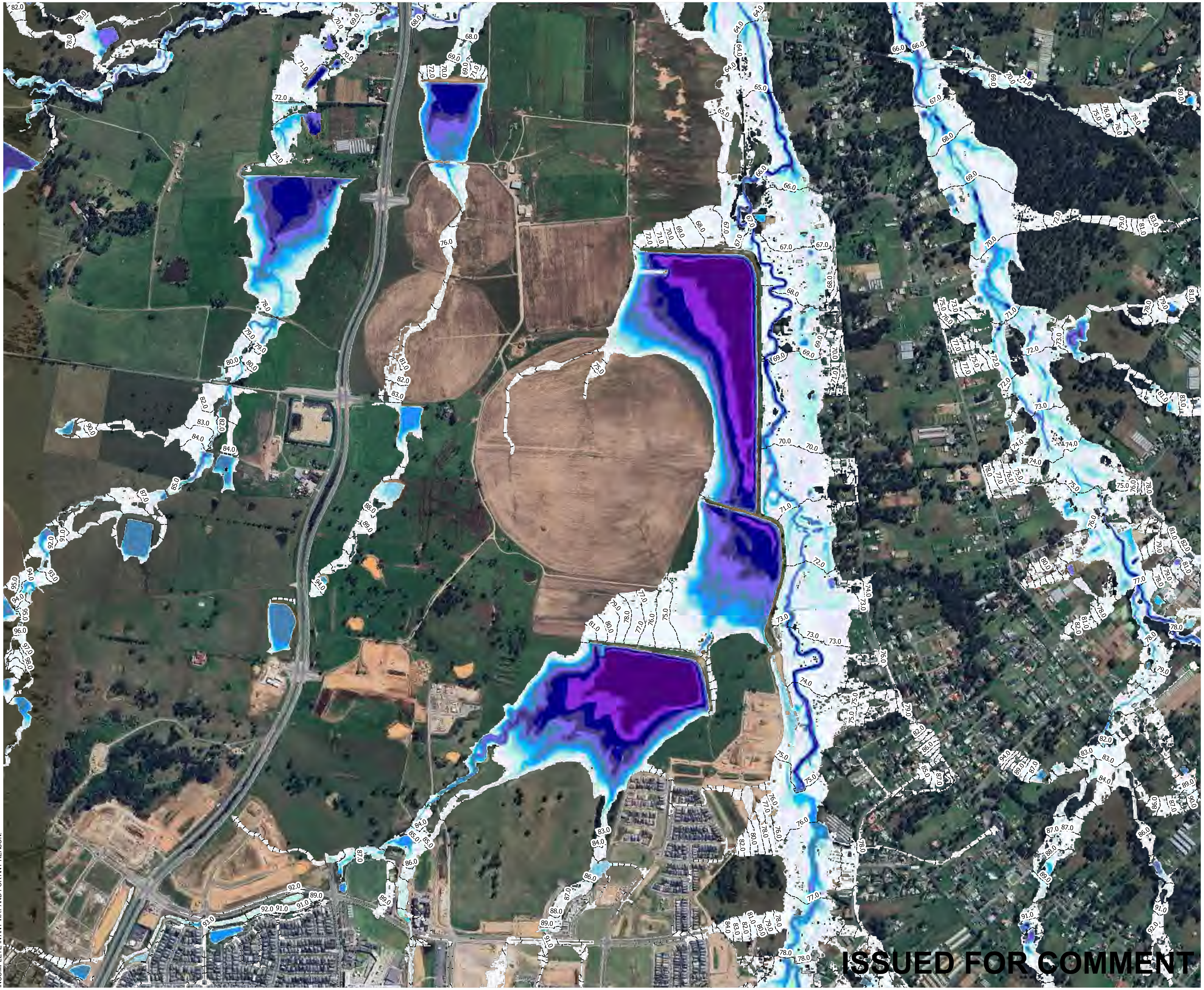

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

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LEGEND

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.
2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

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PROJECT:
Pondicherry Precinct

CLIENT:
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DRAWING TITLE:
COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-100-A-1**

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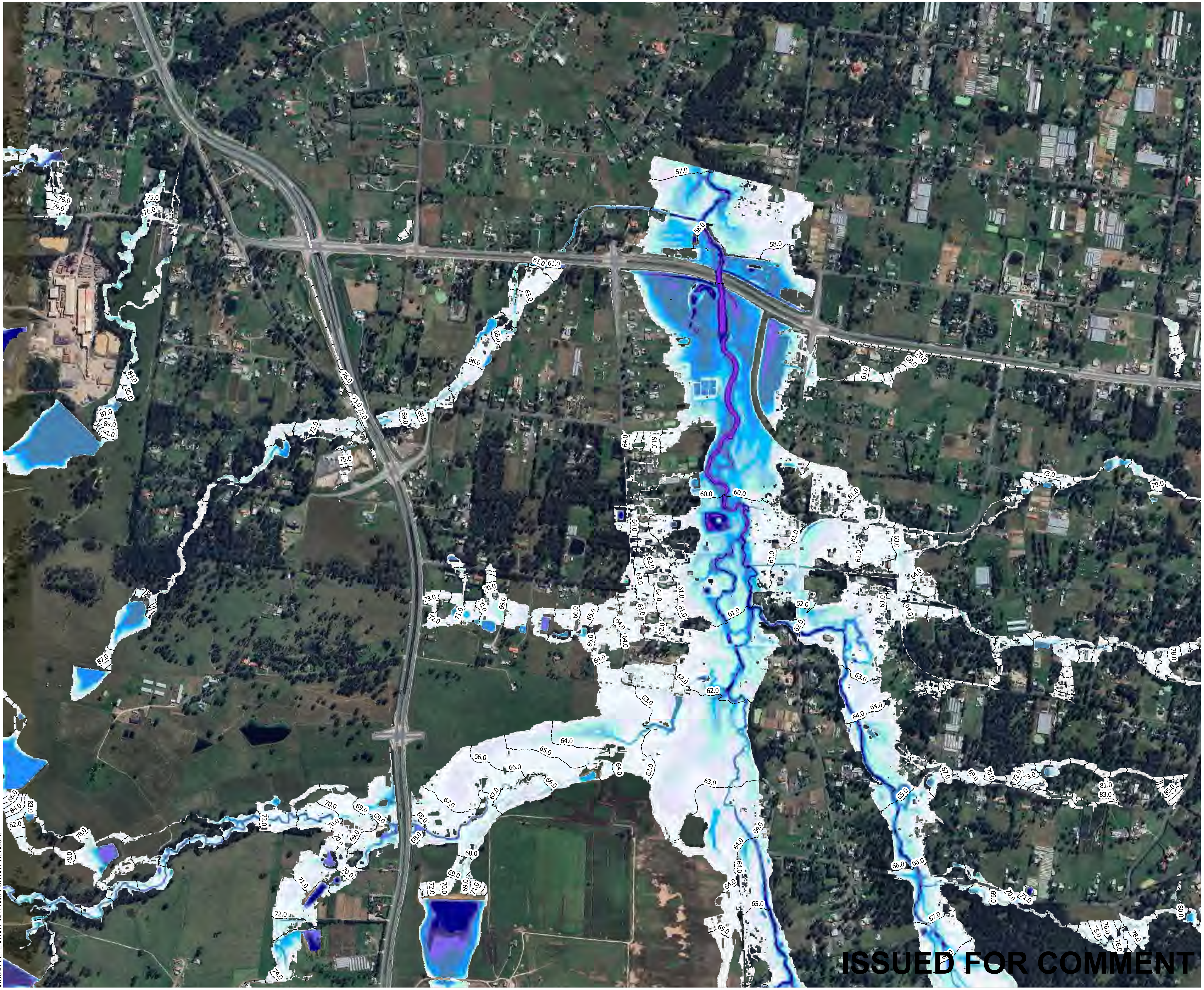

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LEGEND

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

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PROJECT:
Pondicherry Precinct

CLIENT:
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DRAWING TITLE:
COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-100-A-2**

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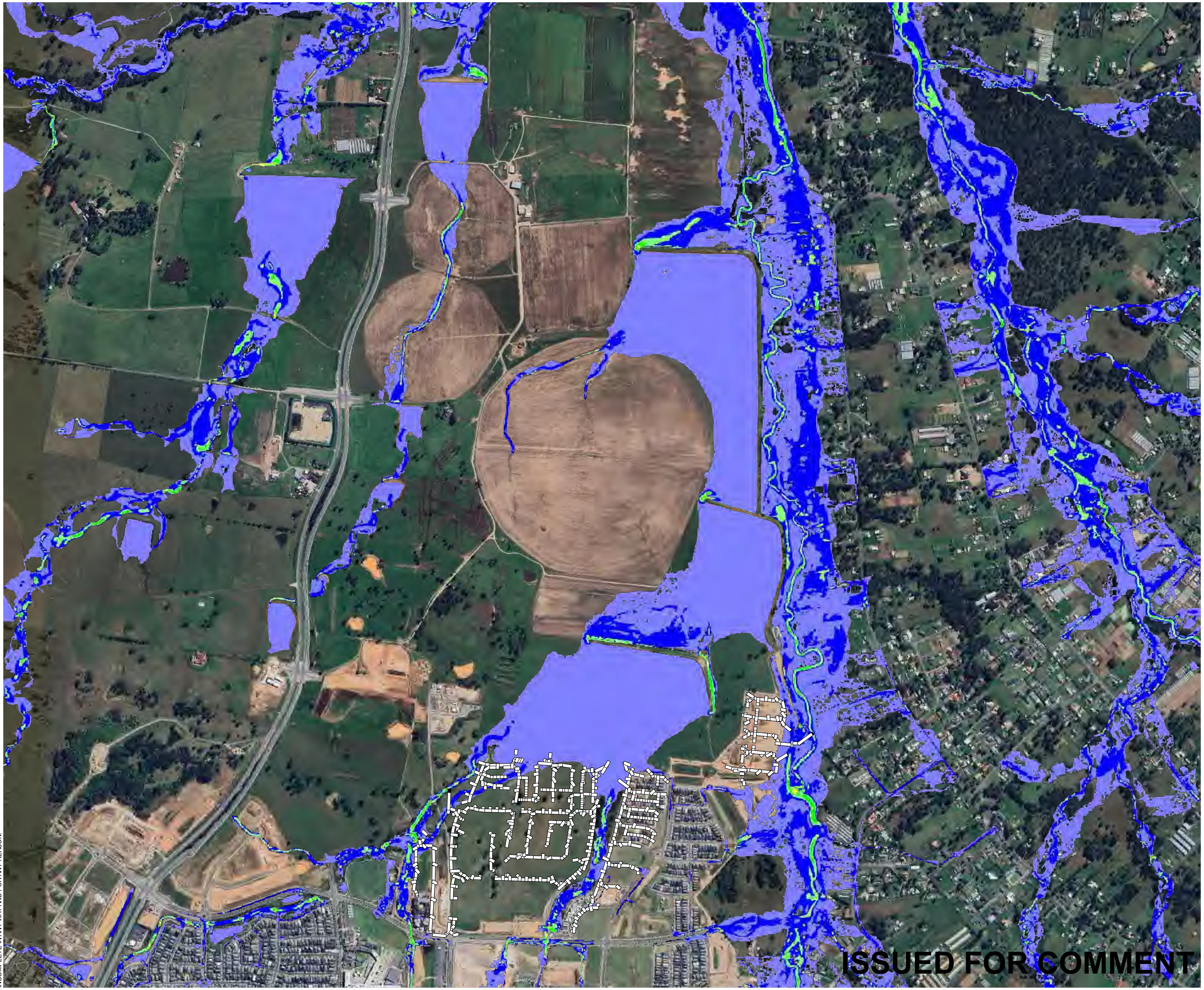

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

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1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-E-100-B-1**

ISSUE: **A**

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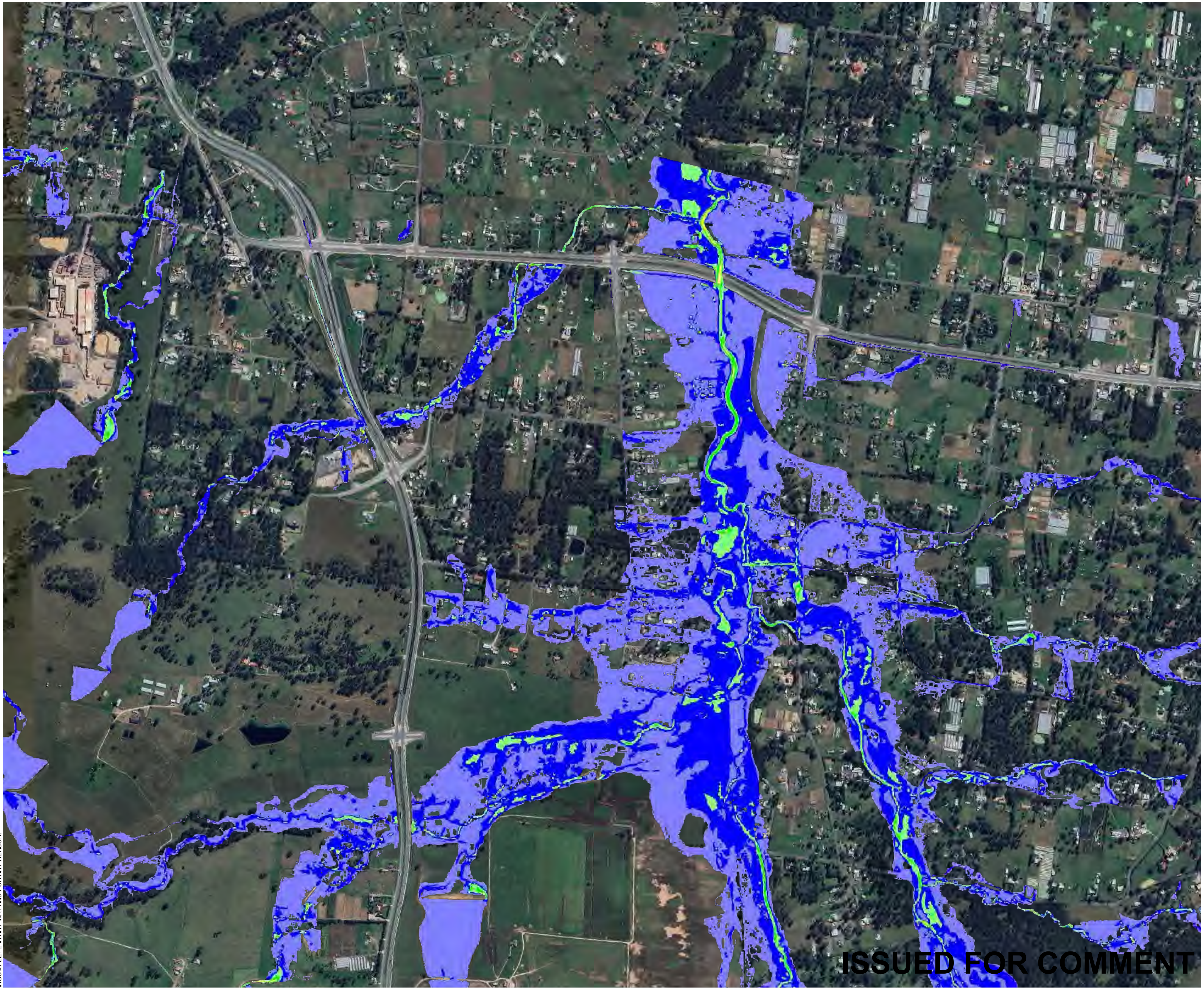

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

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1:15,000 (A3)

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PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-E-100-B-2**

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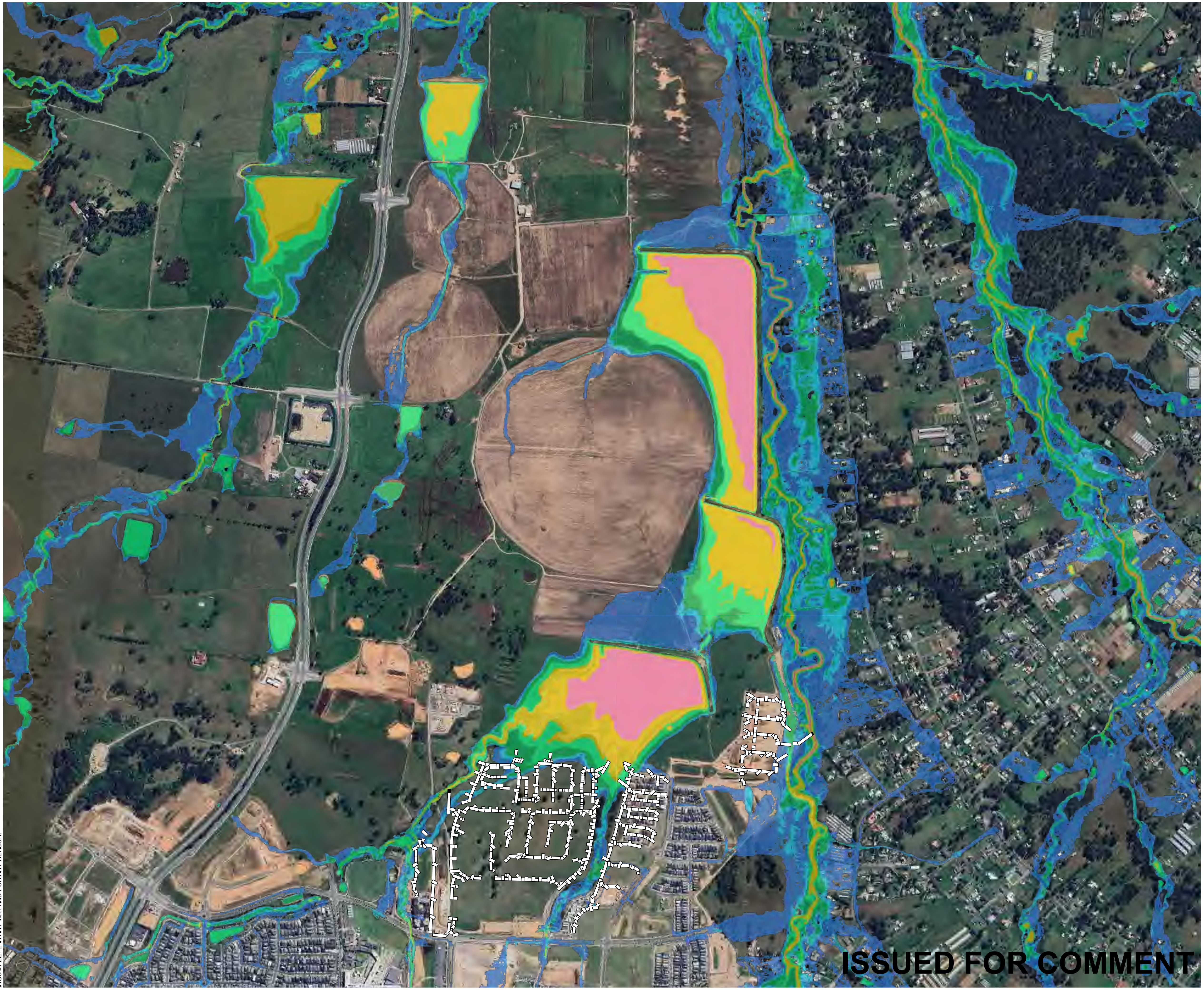

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calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

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1:15,000 (A3)

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PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-100-D-1**

ISSUE: **A**

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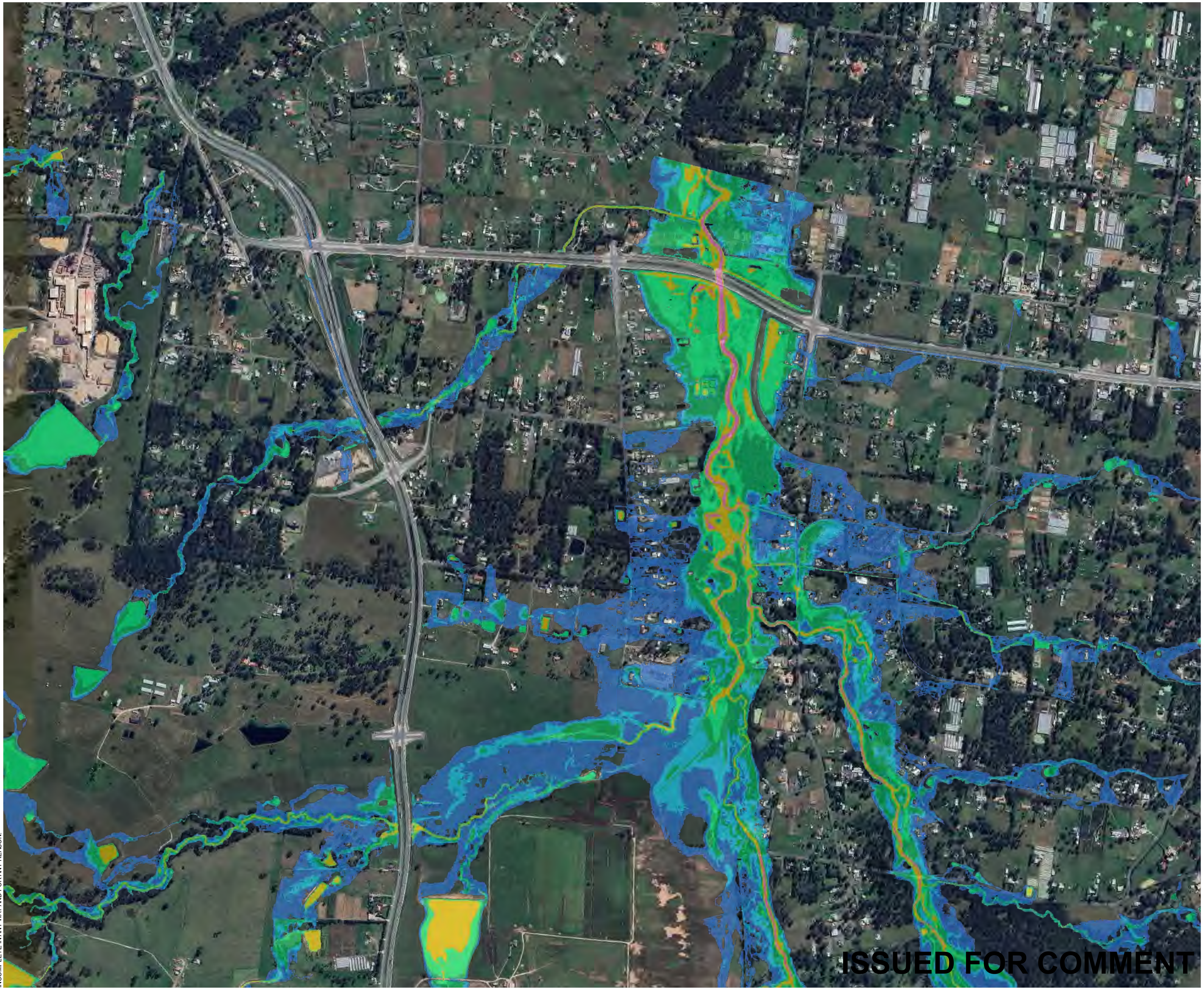

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

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PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-100-D-2**

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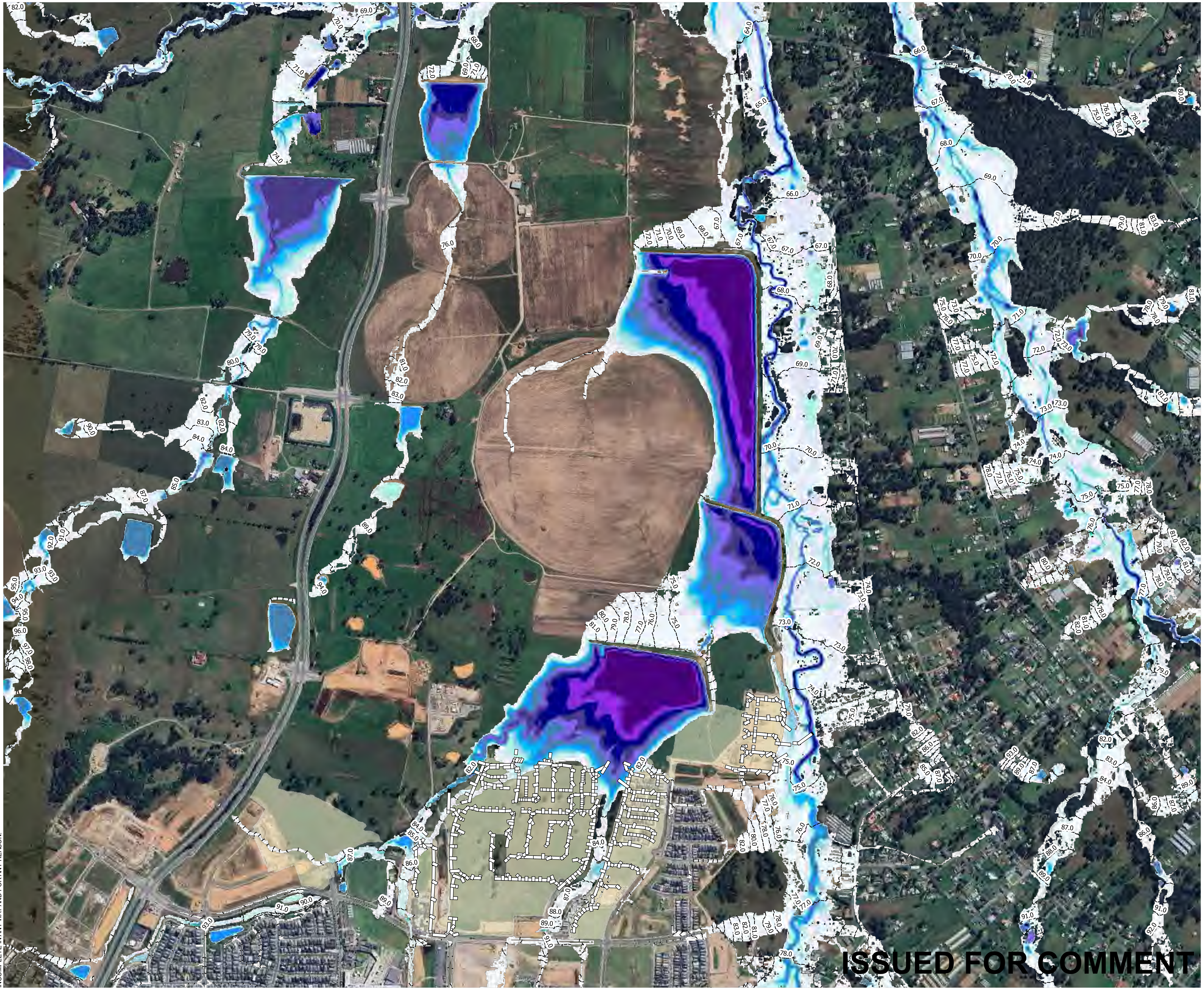

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calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

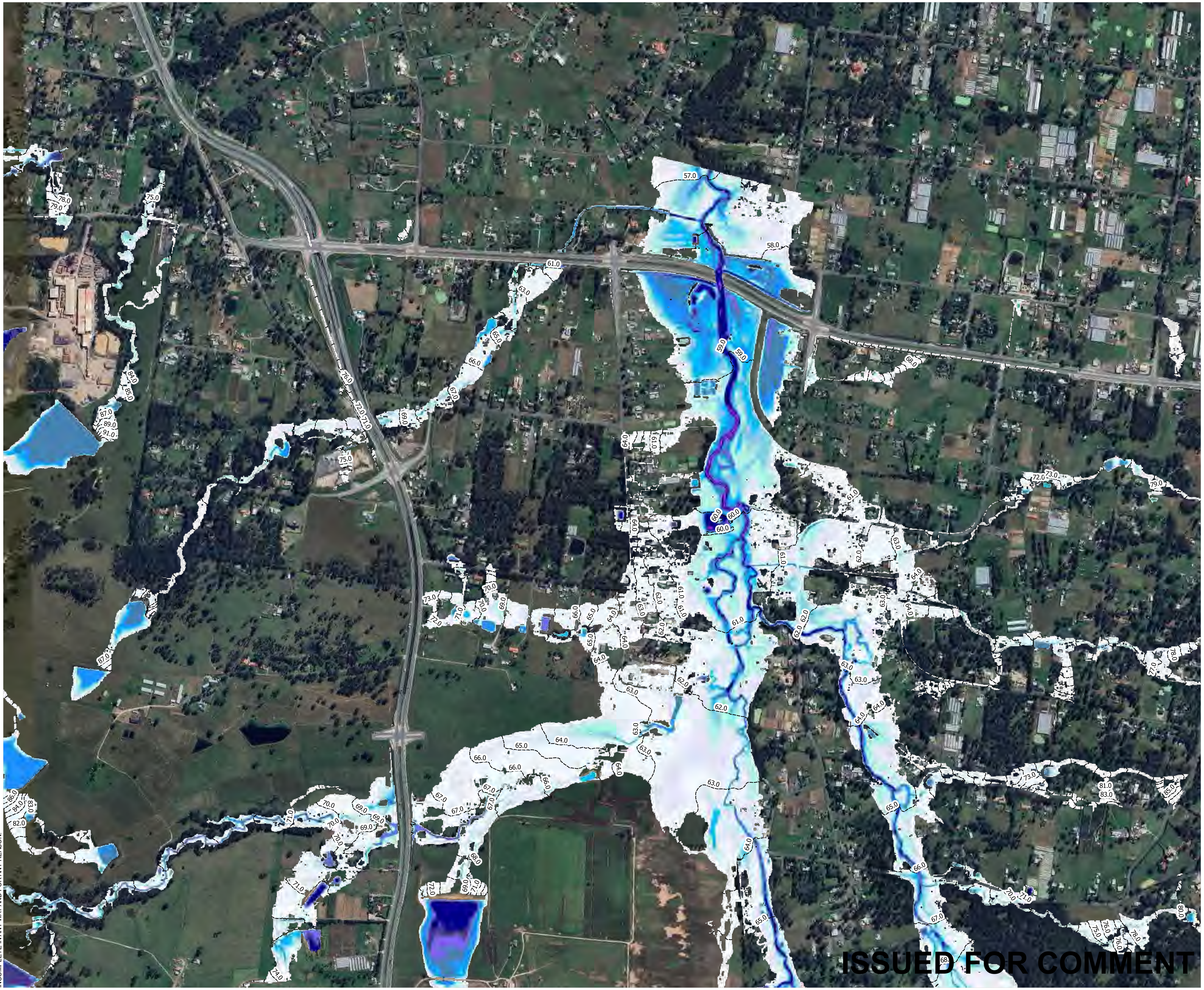
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
2% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-050-A-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
2% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-050-A-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
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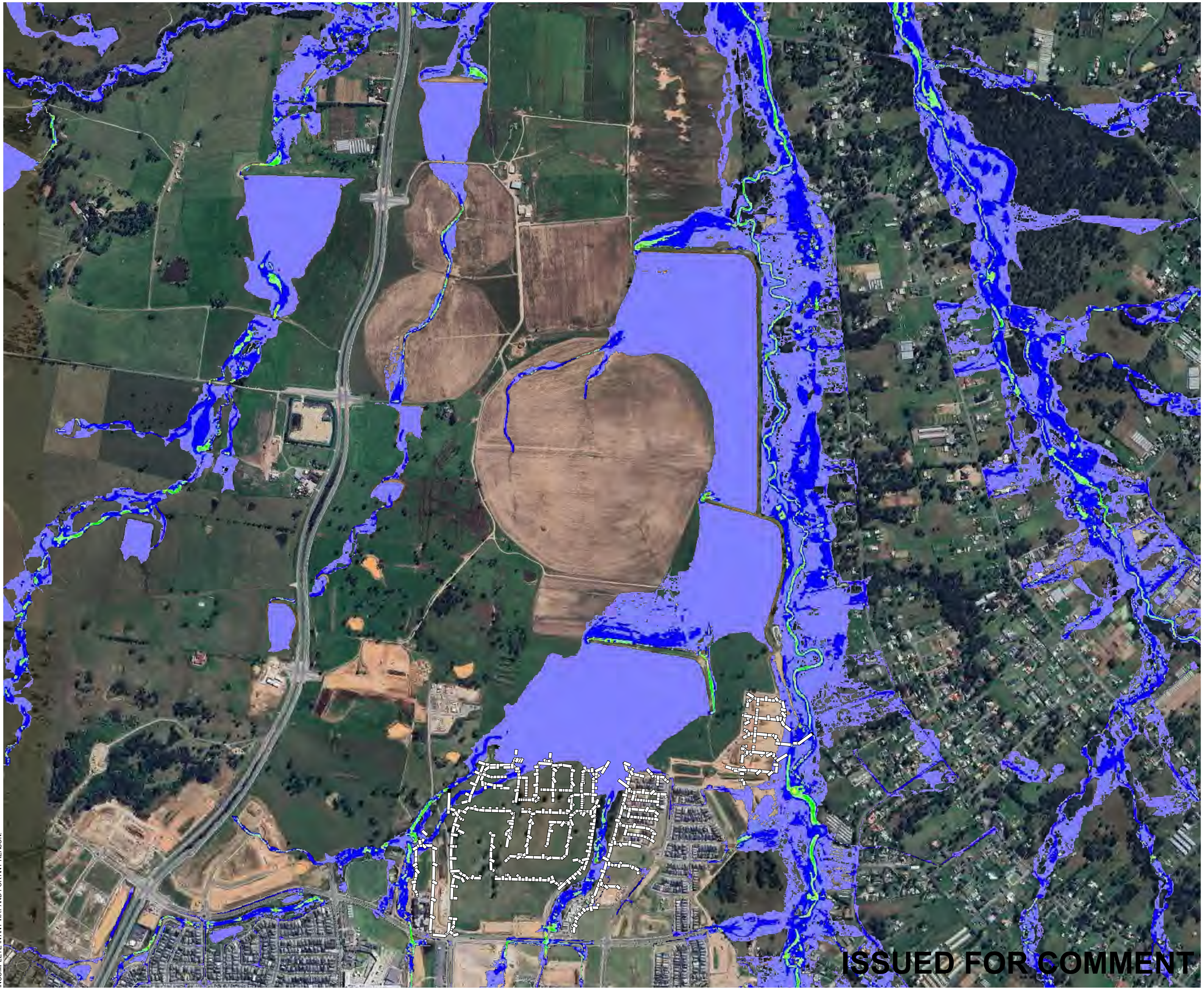

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
2% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-E-050-B-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
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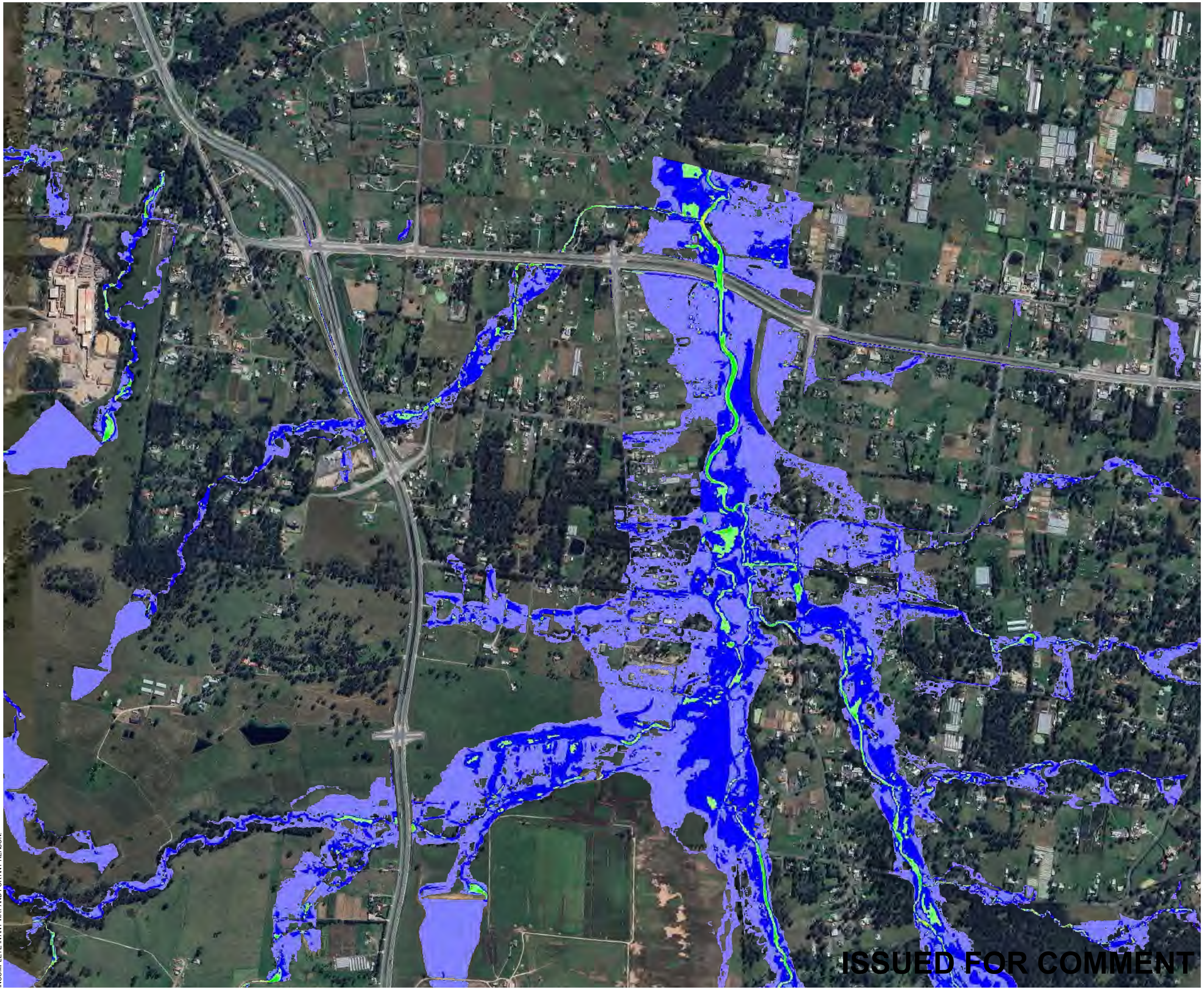

ISSUED FOR COMMENT

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
2% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-E-050-B-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
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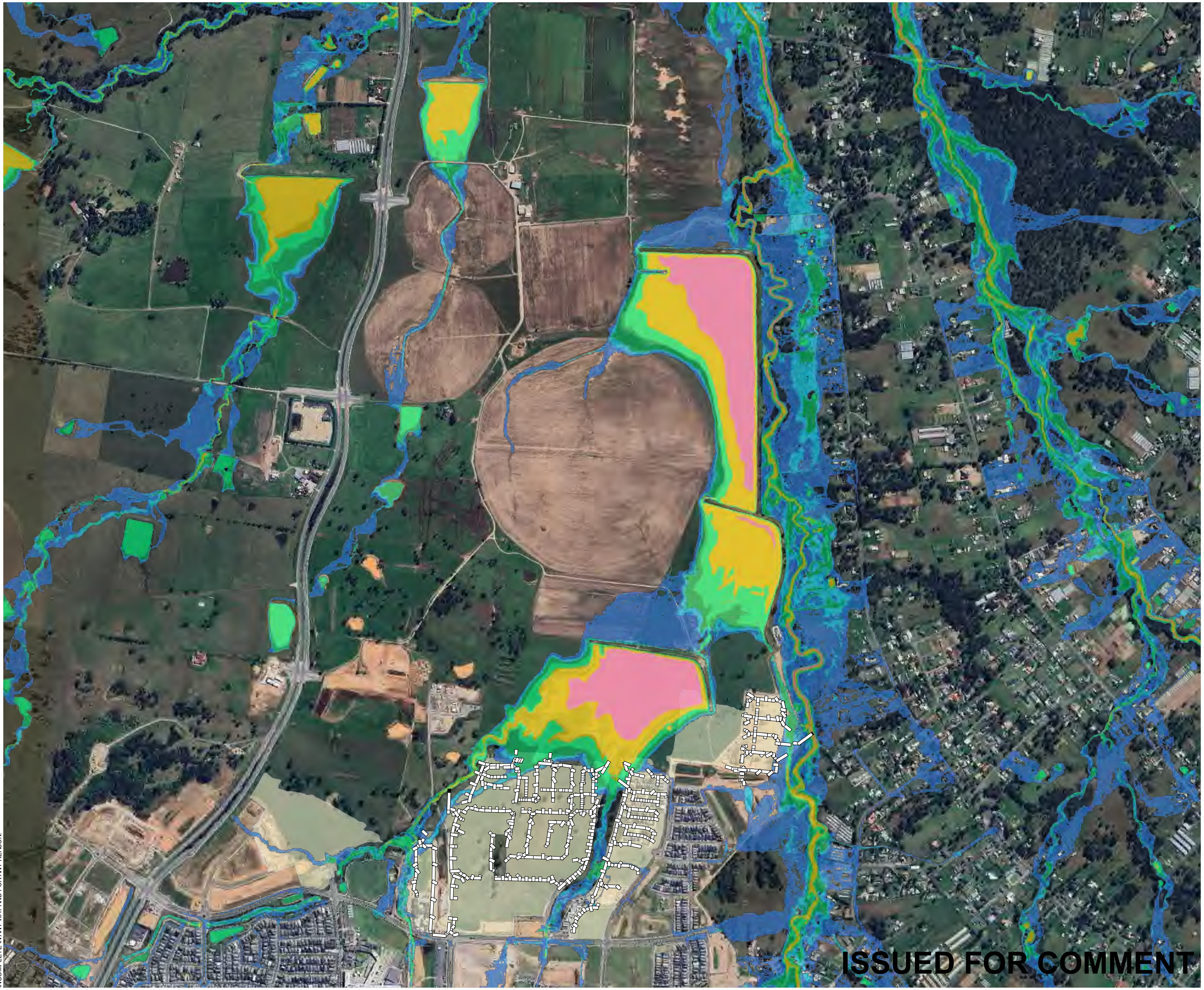

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
2% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-050-D-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
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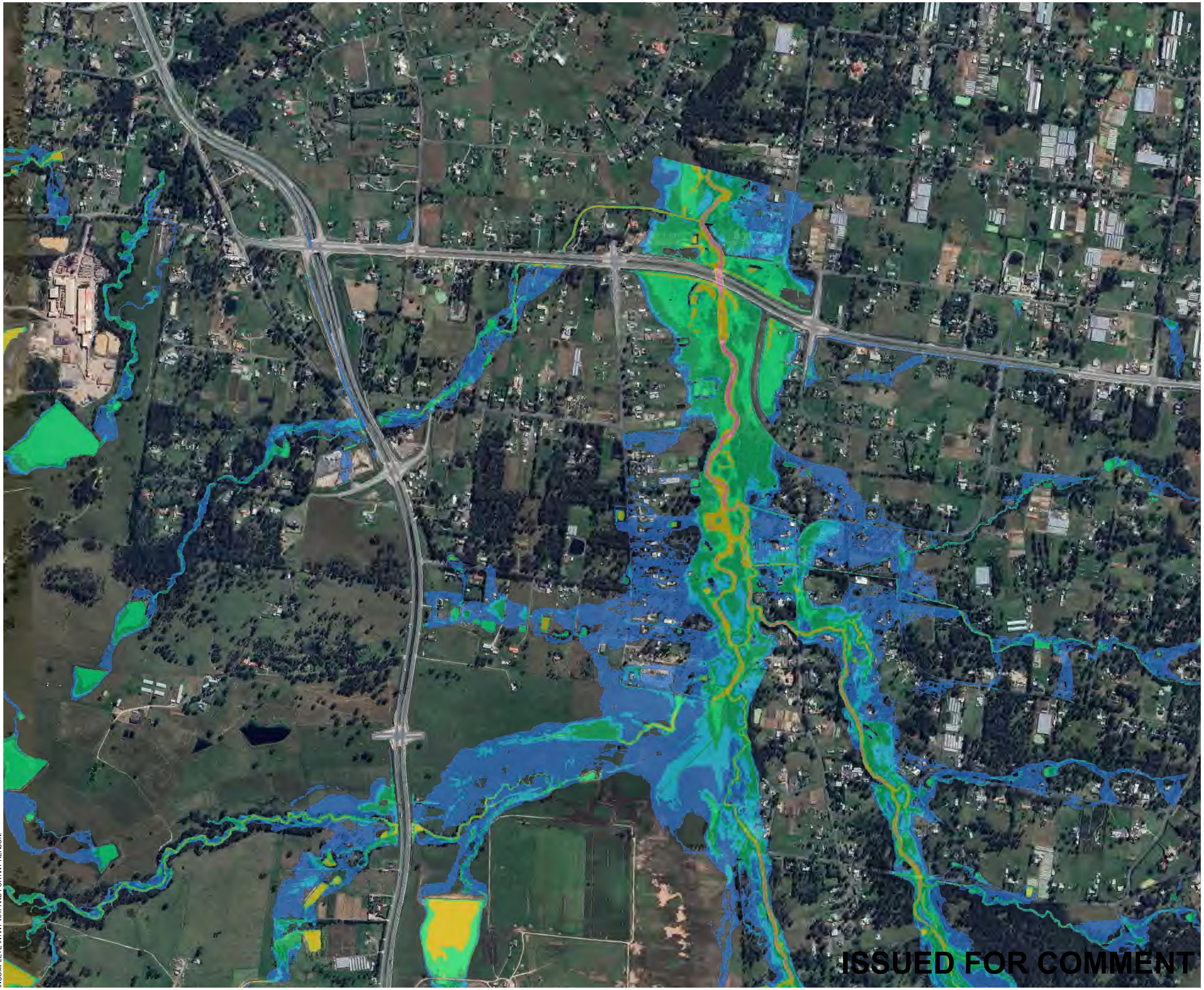

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
2% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-050-D-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
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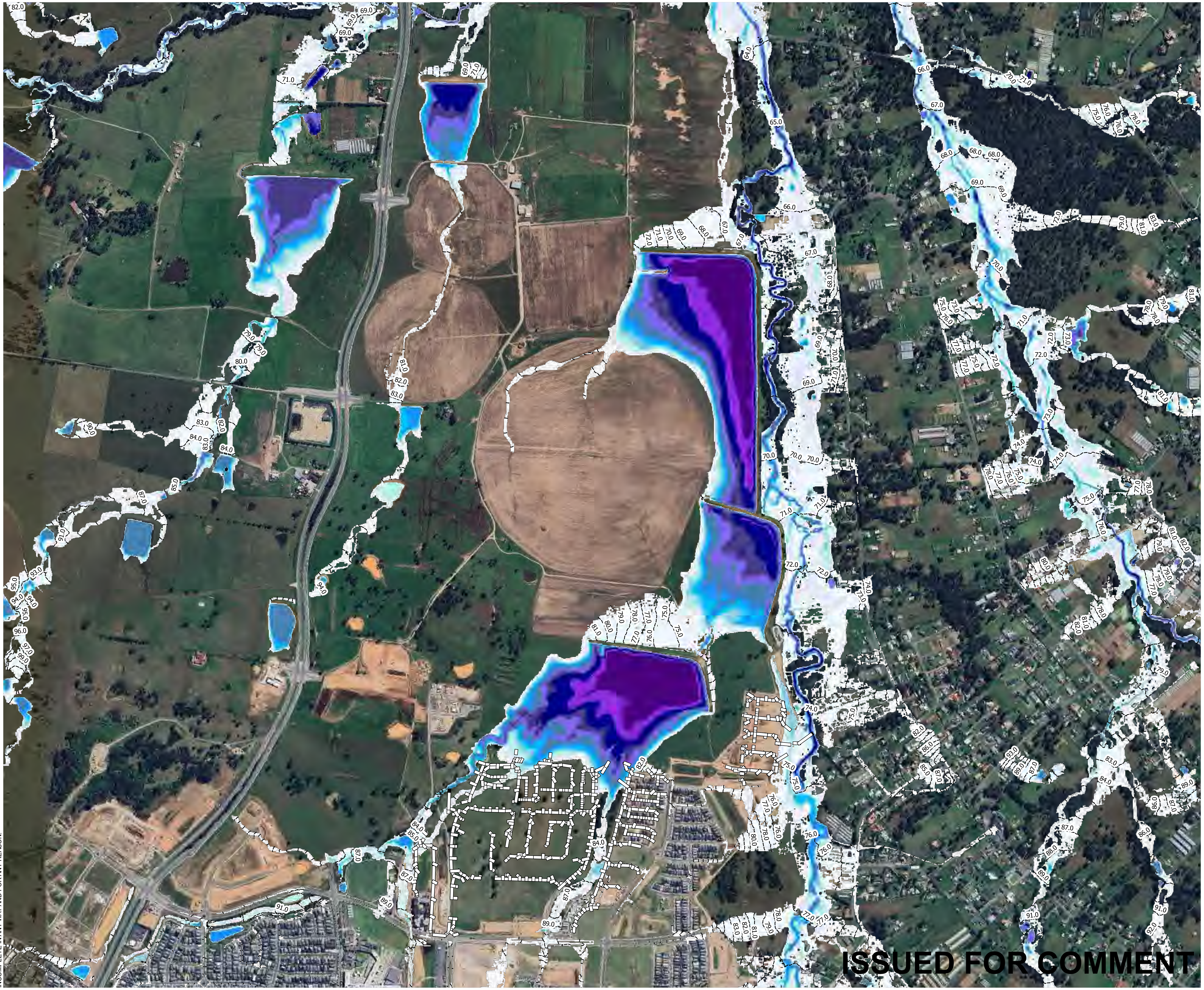

ISSUED FOR COMMENT

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

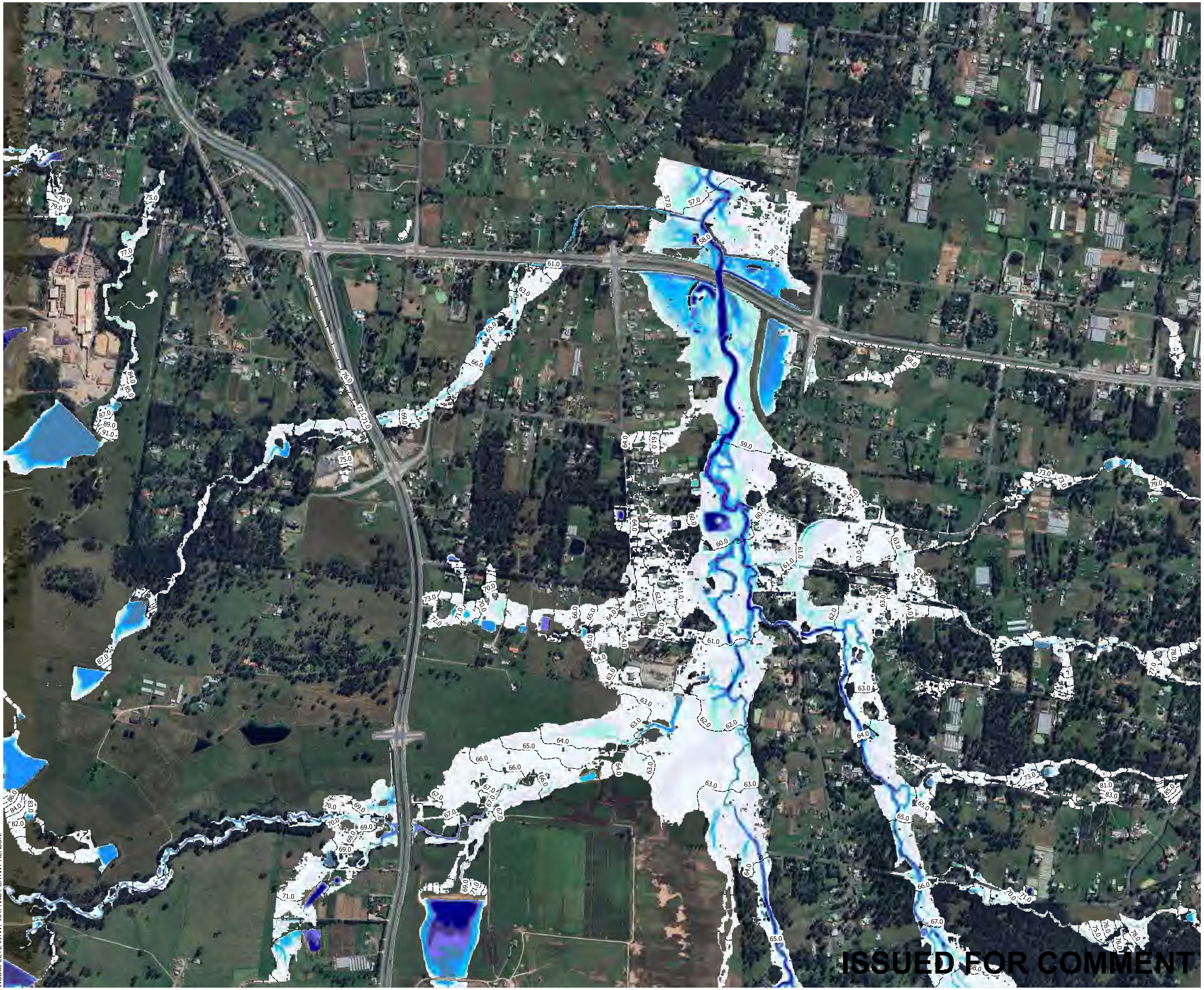
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
5% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-020-A-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

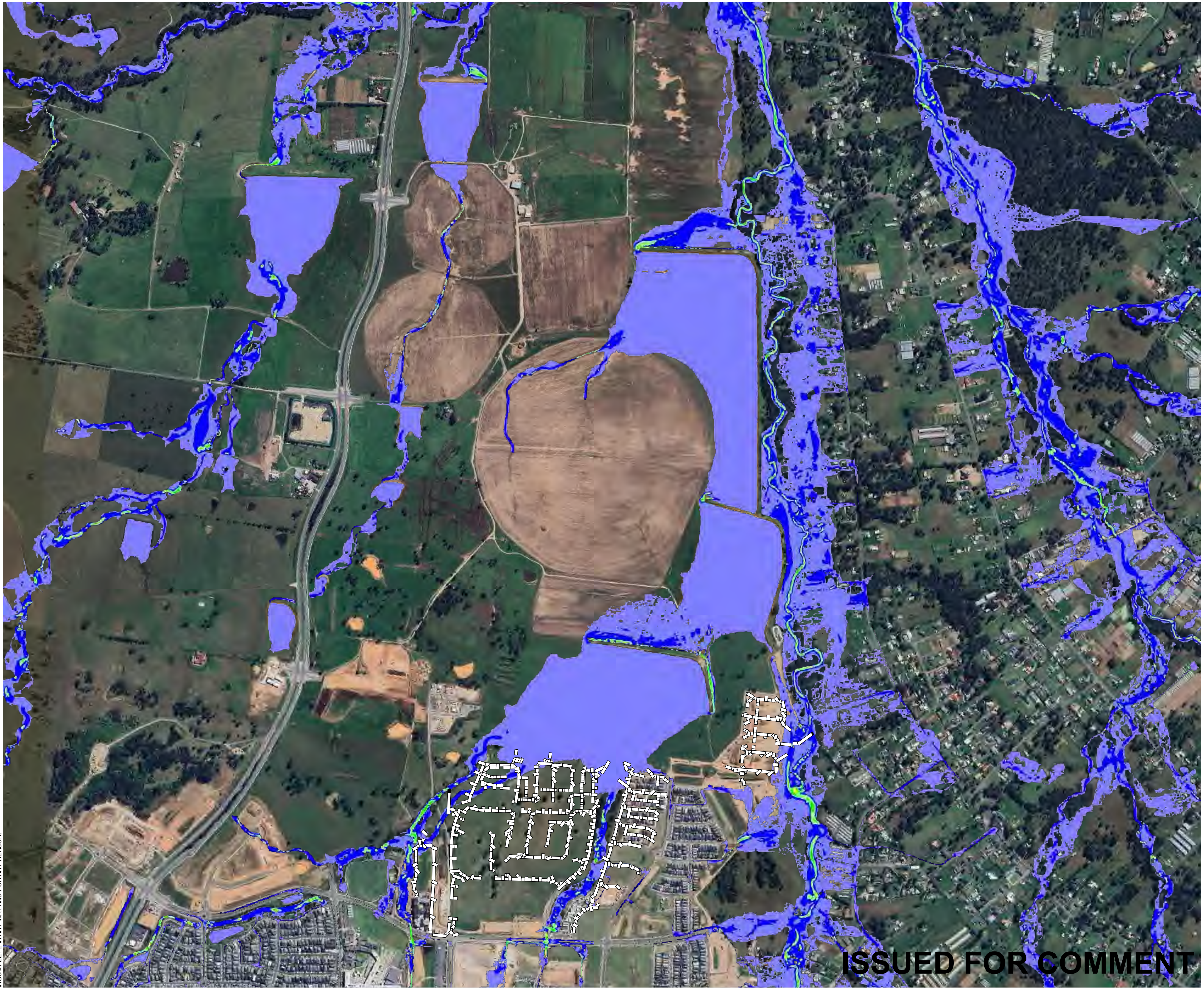
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
5% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-020-A-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
5% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-E-020-B-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

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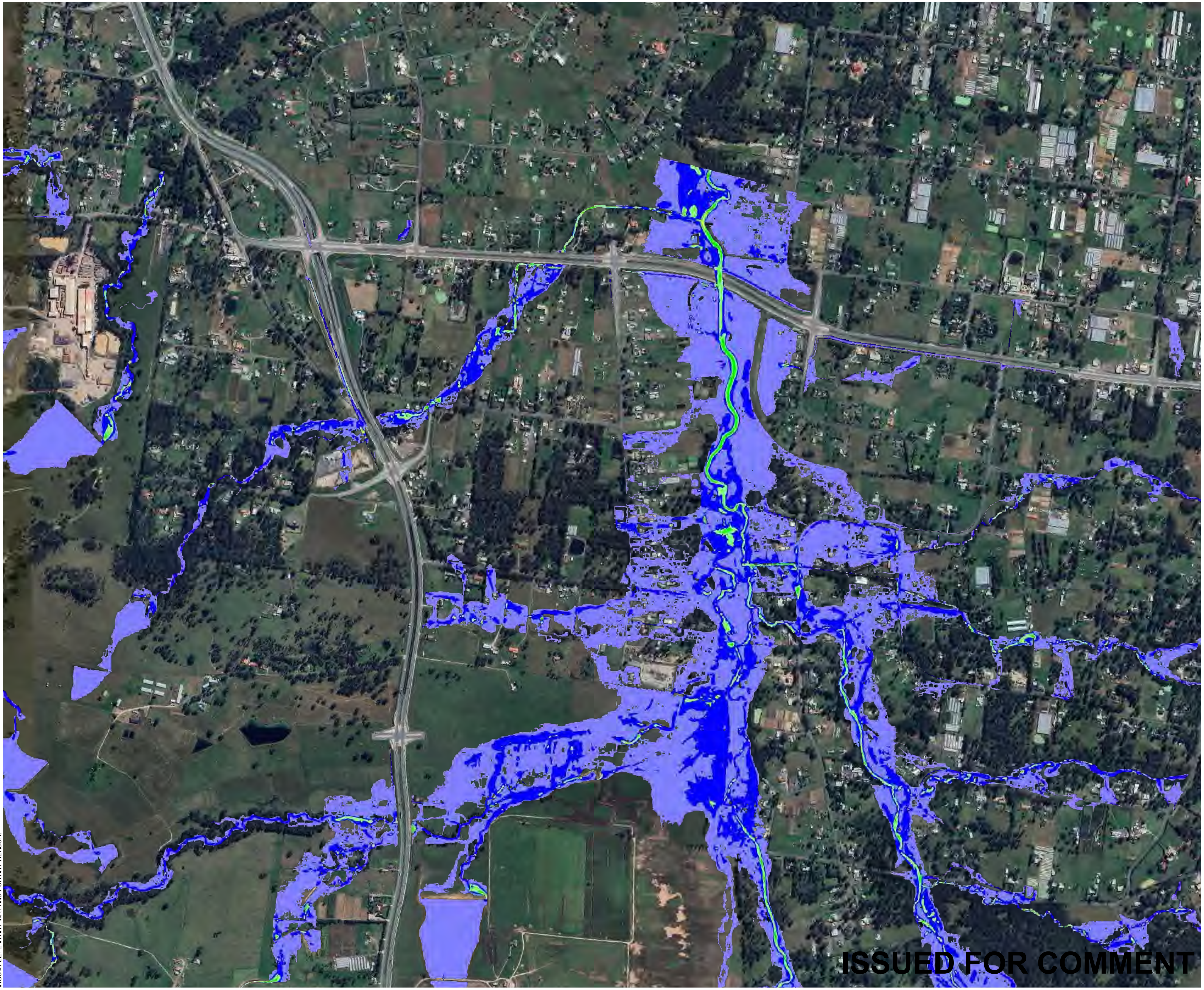
COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
5% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-E-020-B-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

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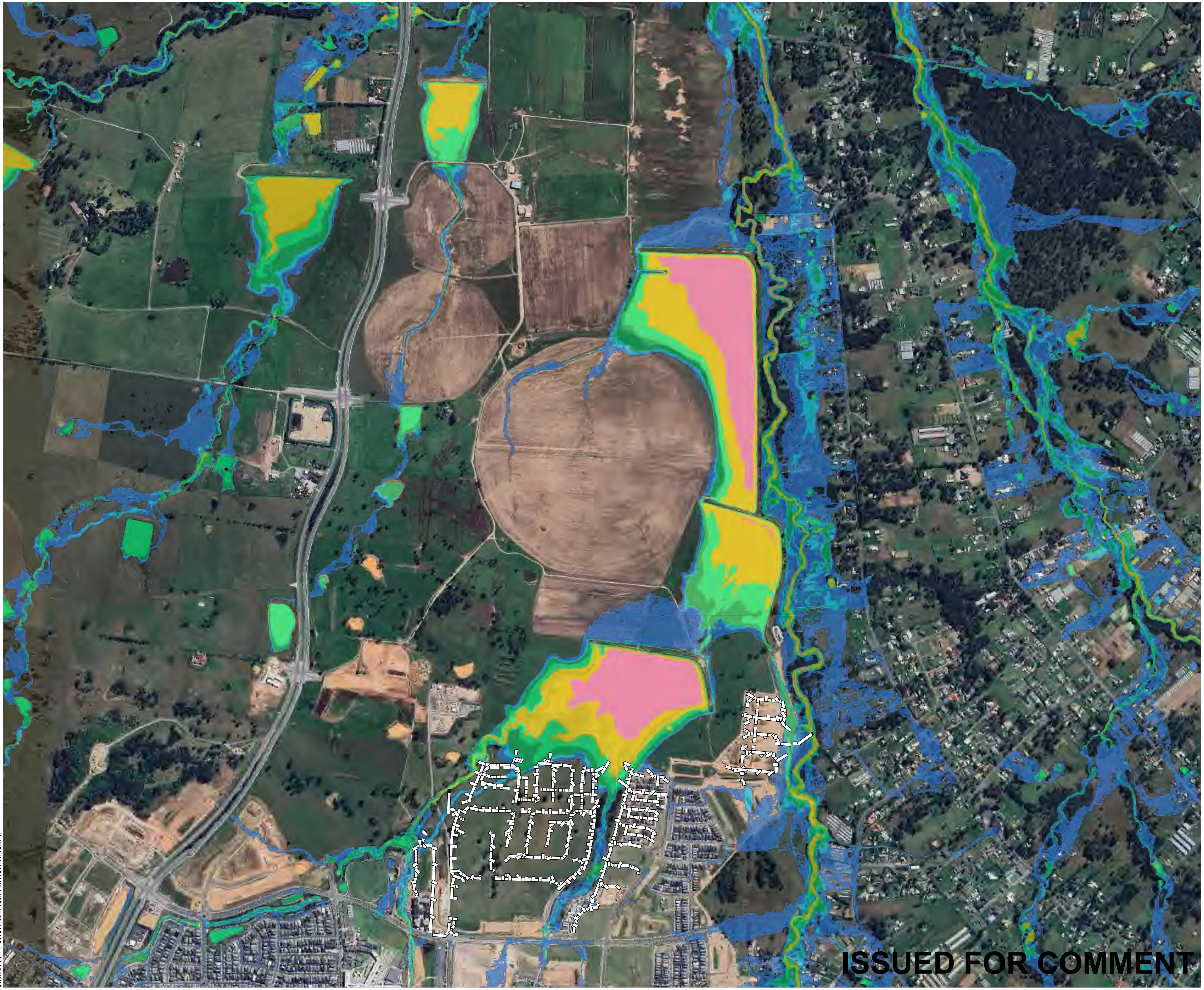

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
5% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-020-D-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
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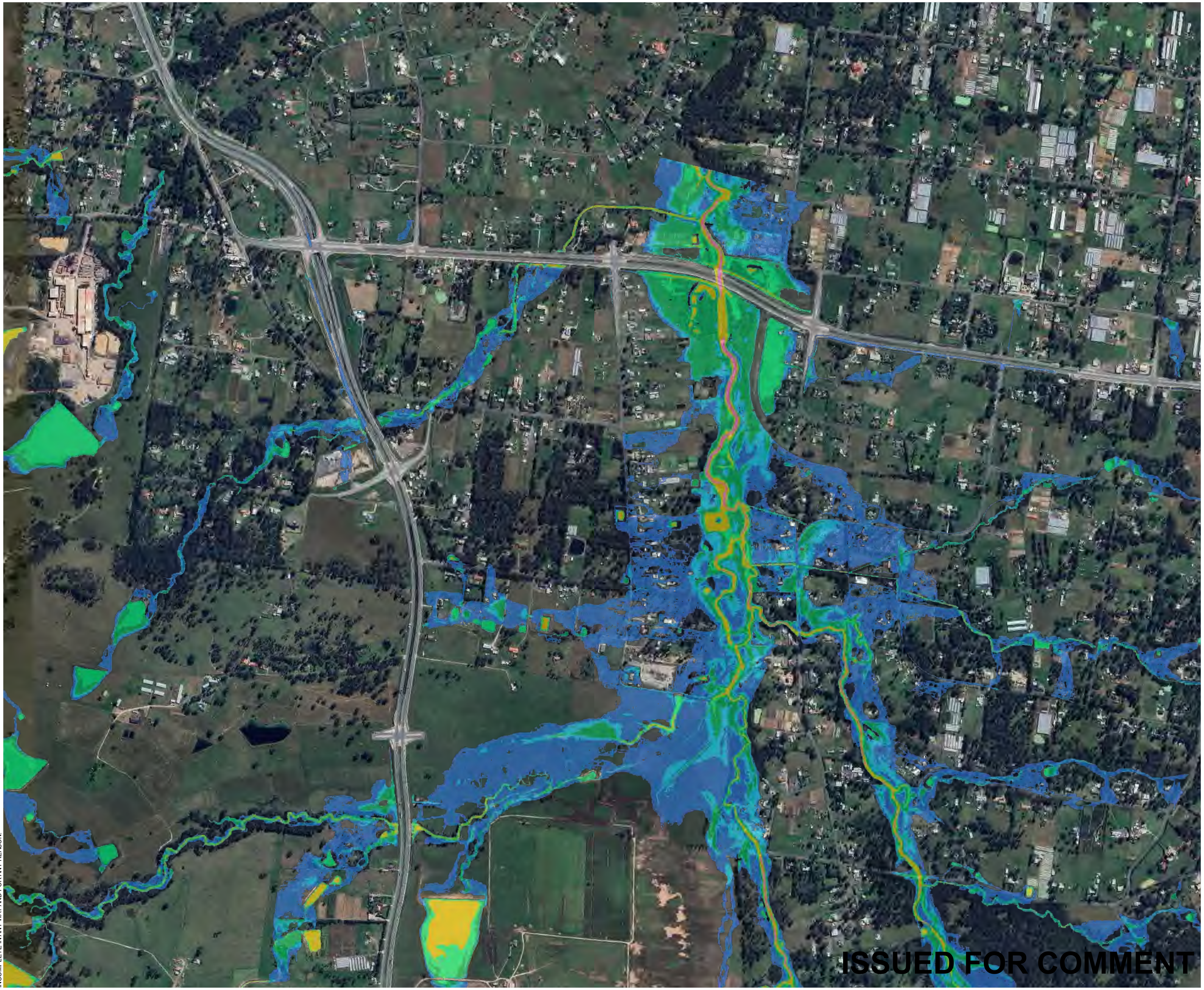

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

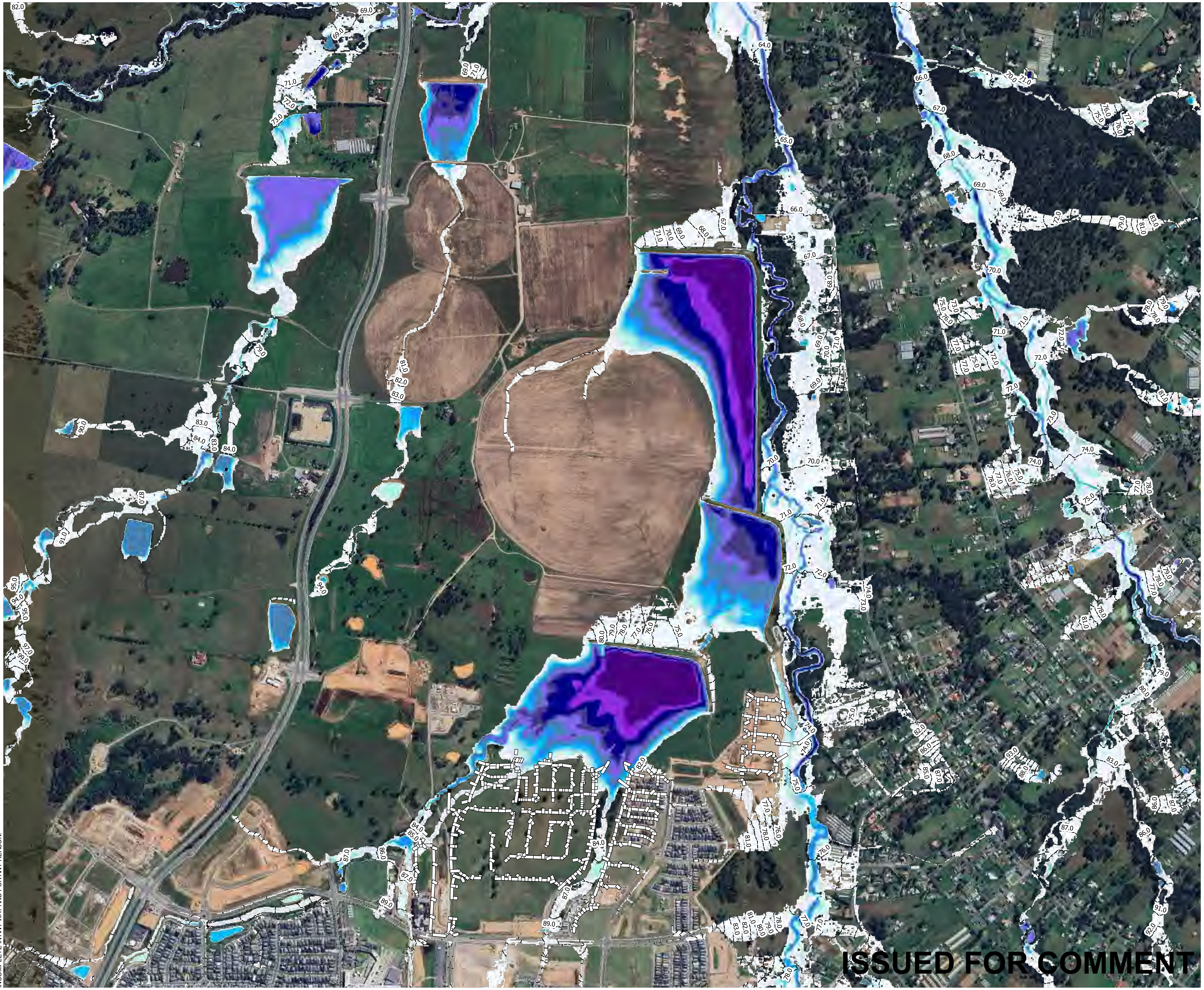
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
5% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-020-D-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

- EX MODEL 1D ELEMENTS
- FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
10% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-010-A-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
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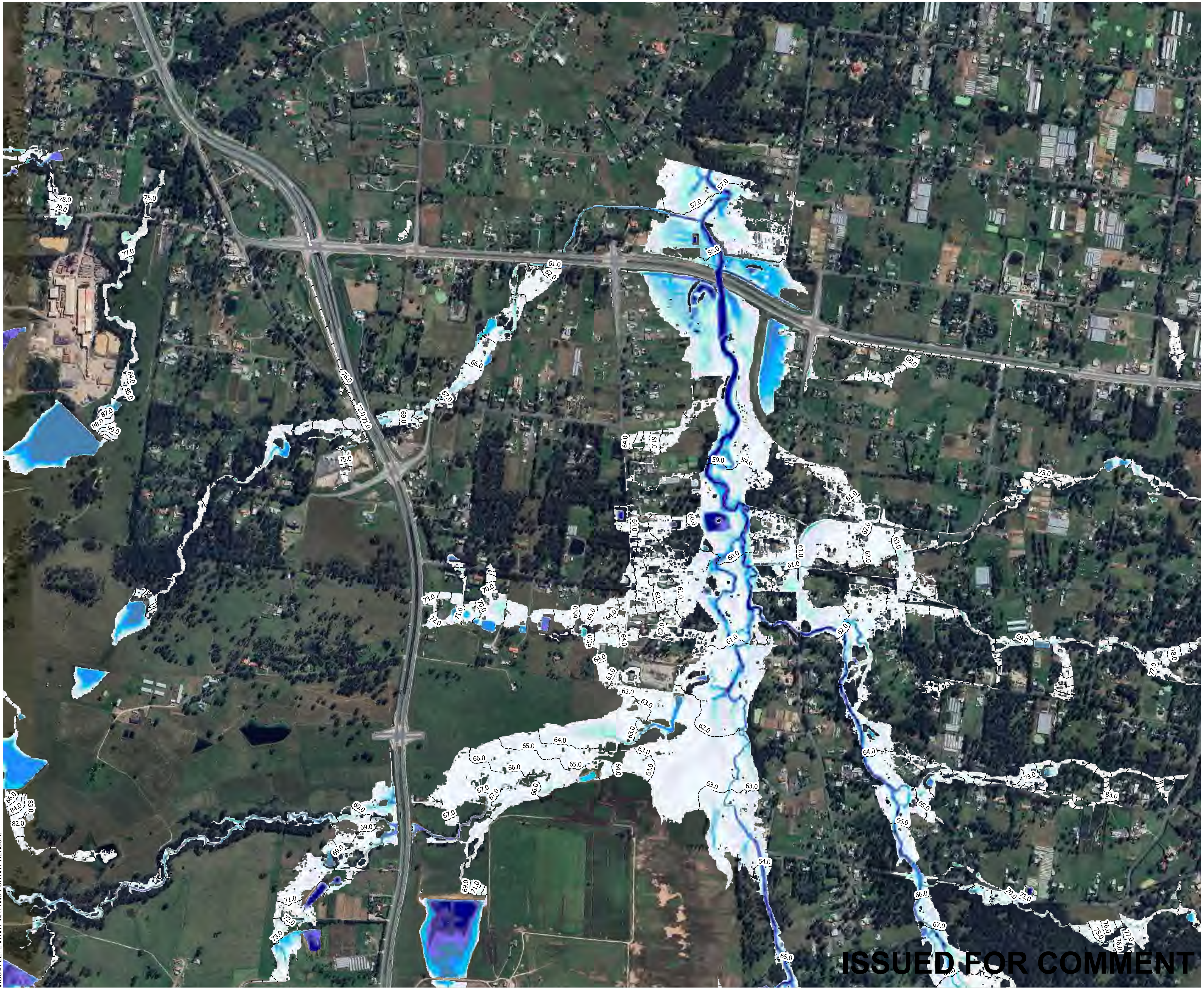
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

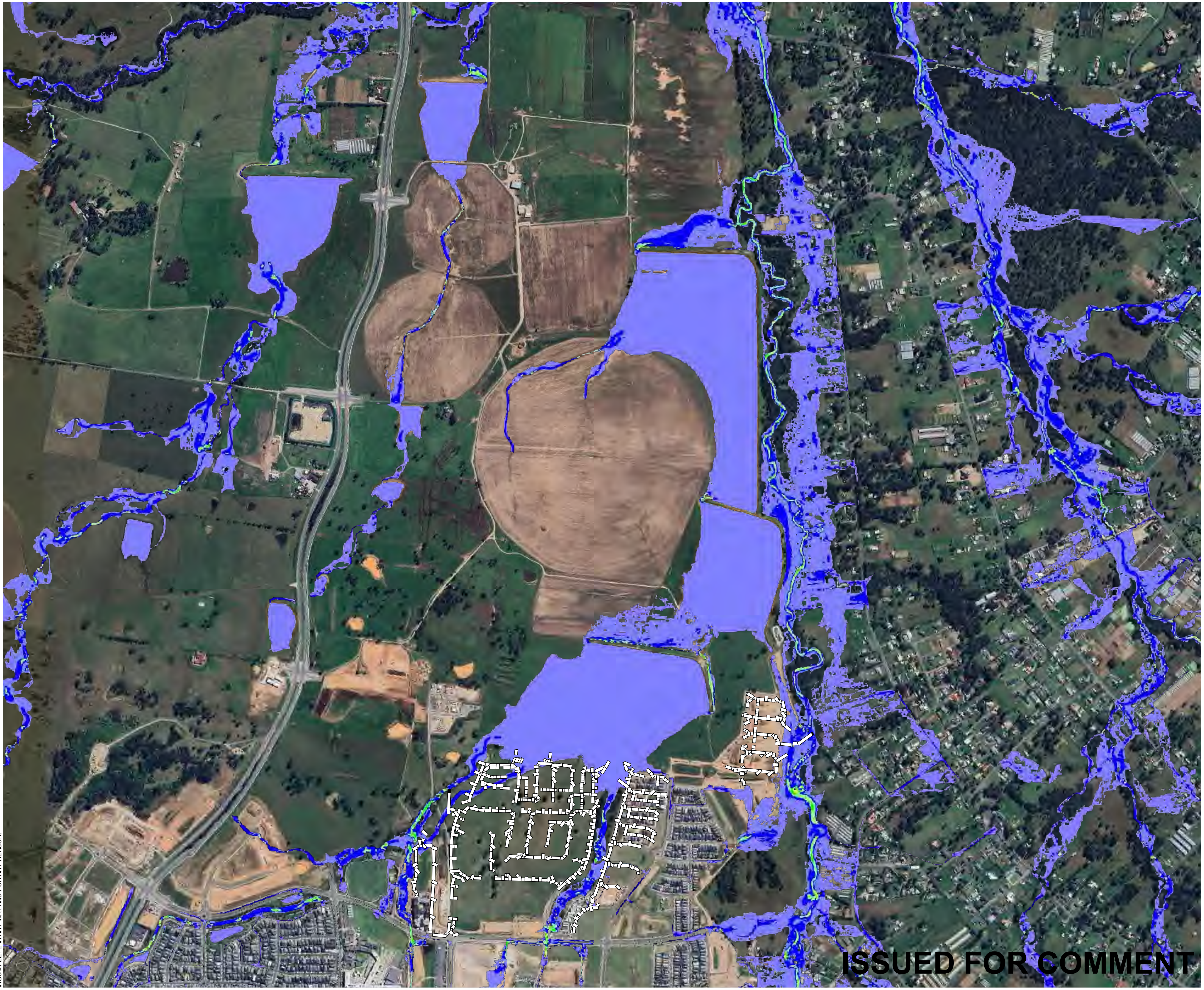
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
10% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-010-A-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



calibre
CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.
2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m
1:15,000 (A3)
N

PROJECT:
Pondicherry Precinct

CLIENT:
-

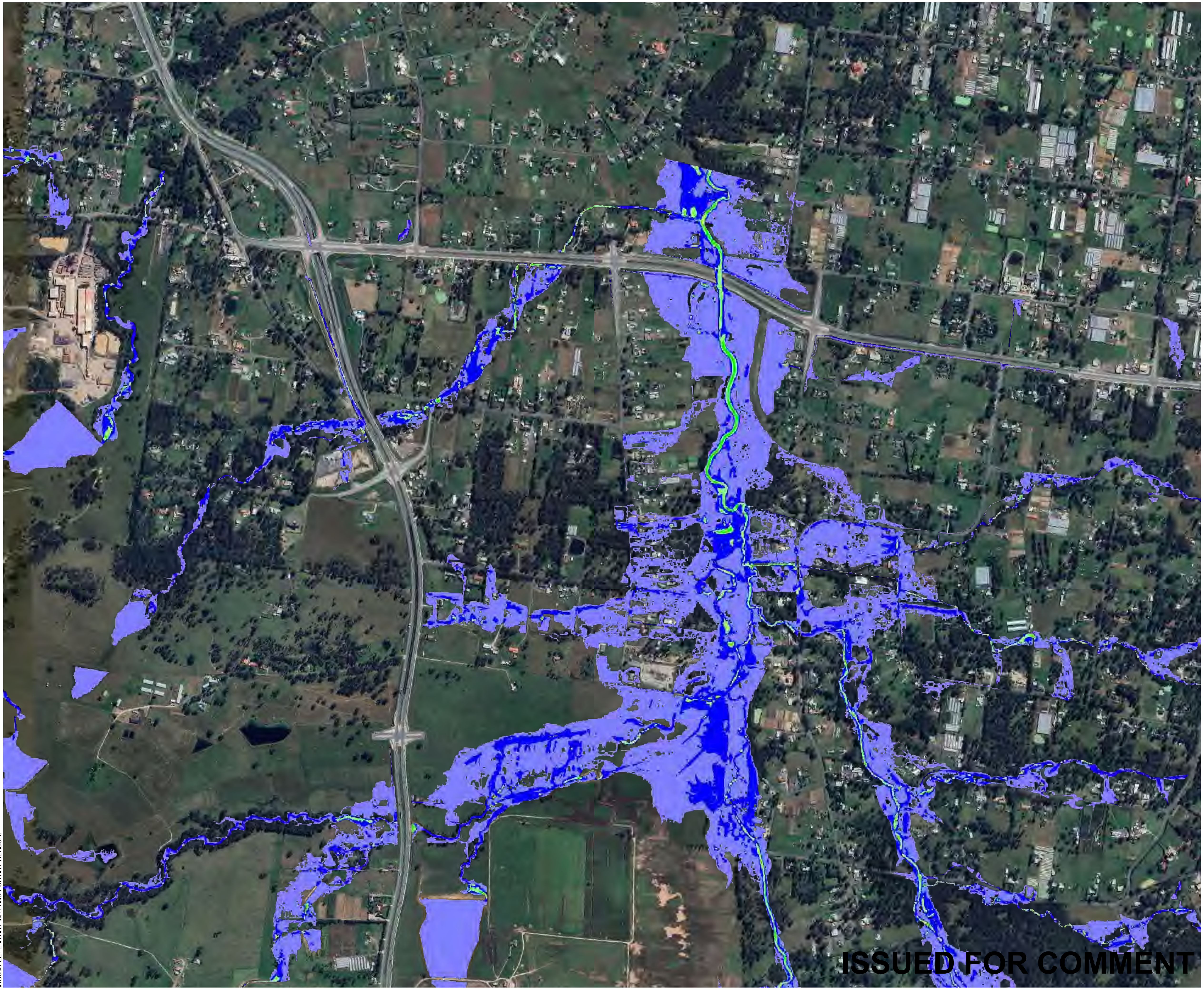
DRAWING TITLE:
COUNCIL MODEL
10% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-E-010-B-1**
ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

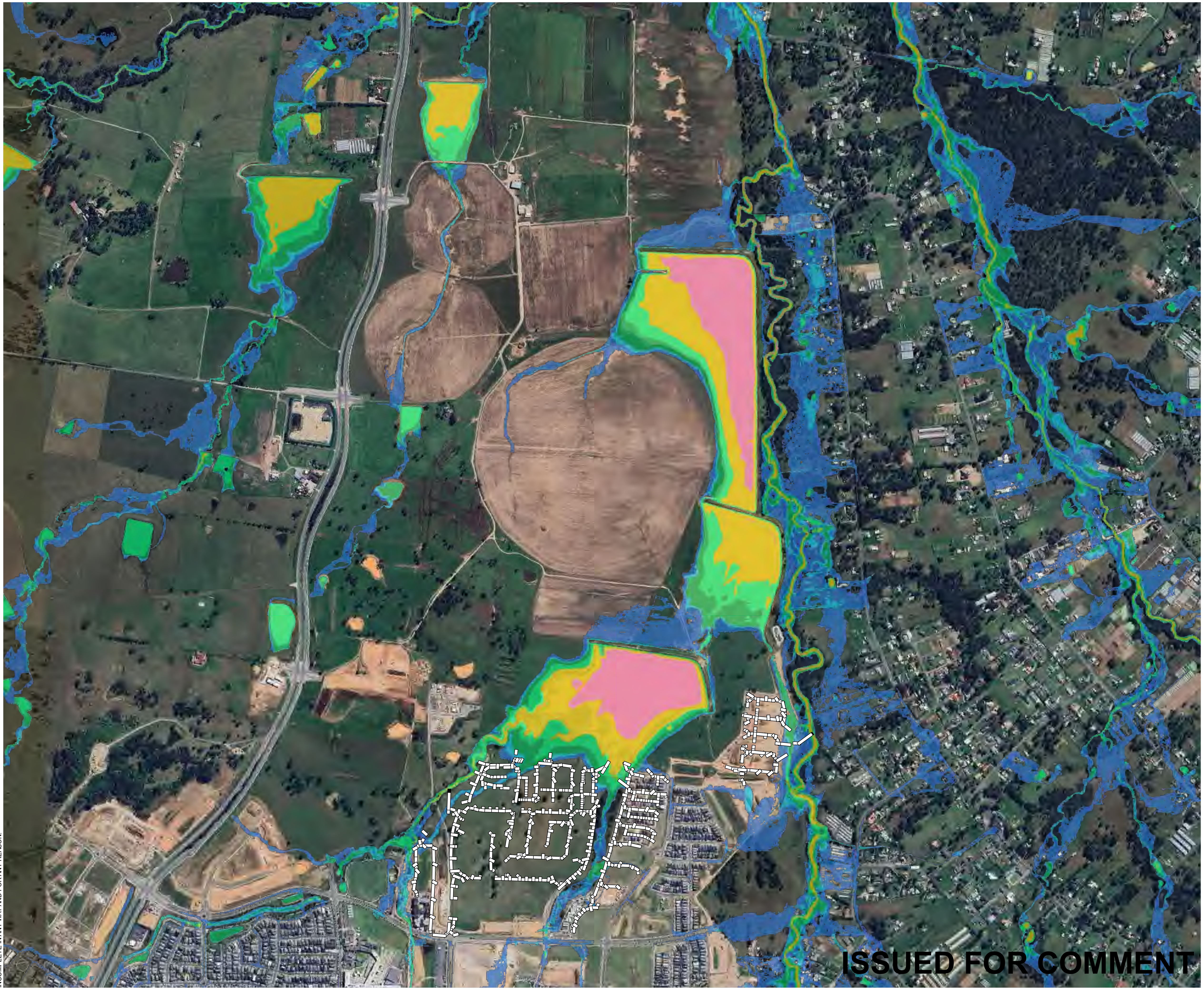
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
10% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-E-010-B-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

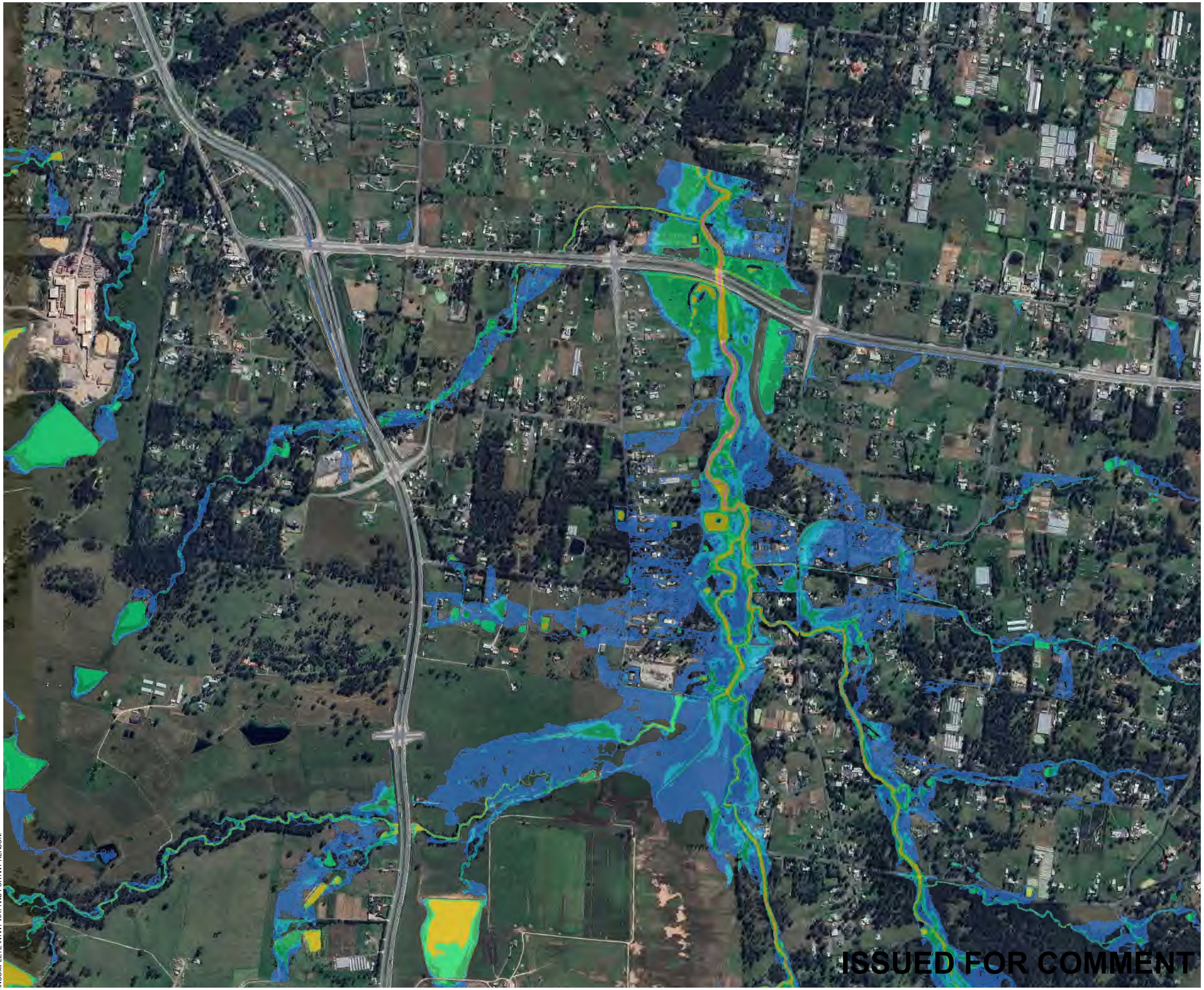
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
10% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-010-D-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
10% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-010-D-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
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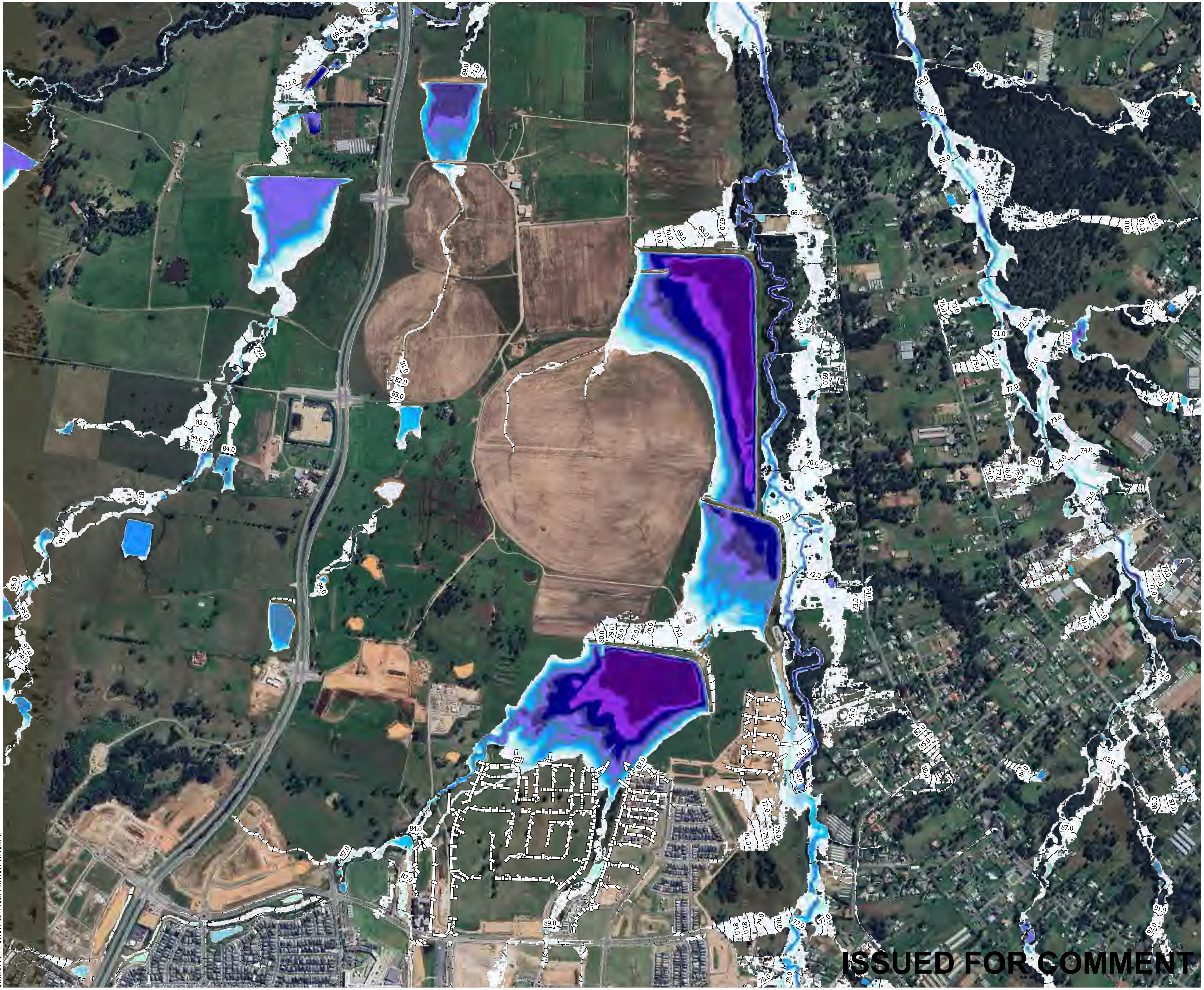
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

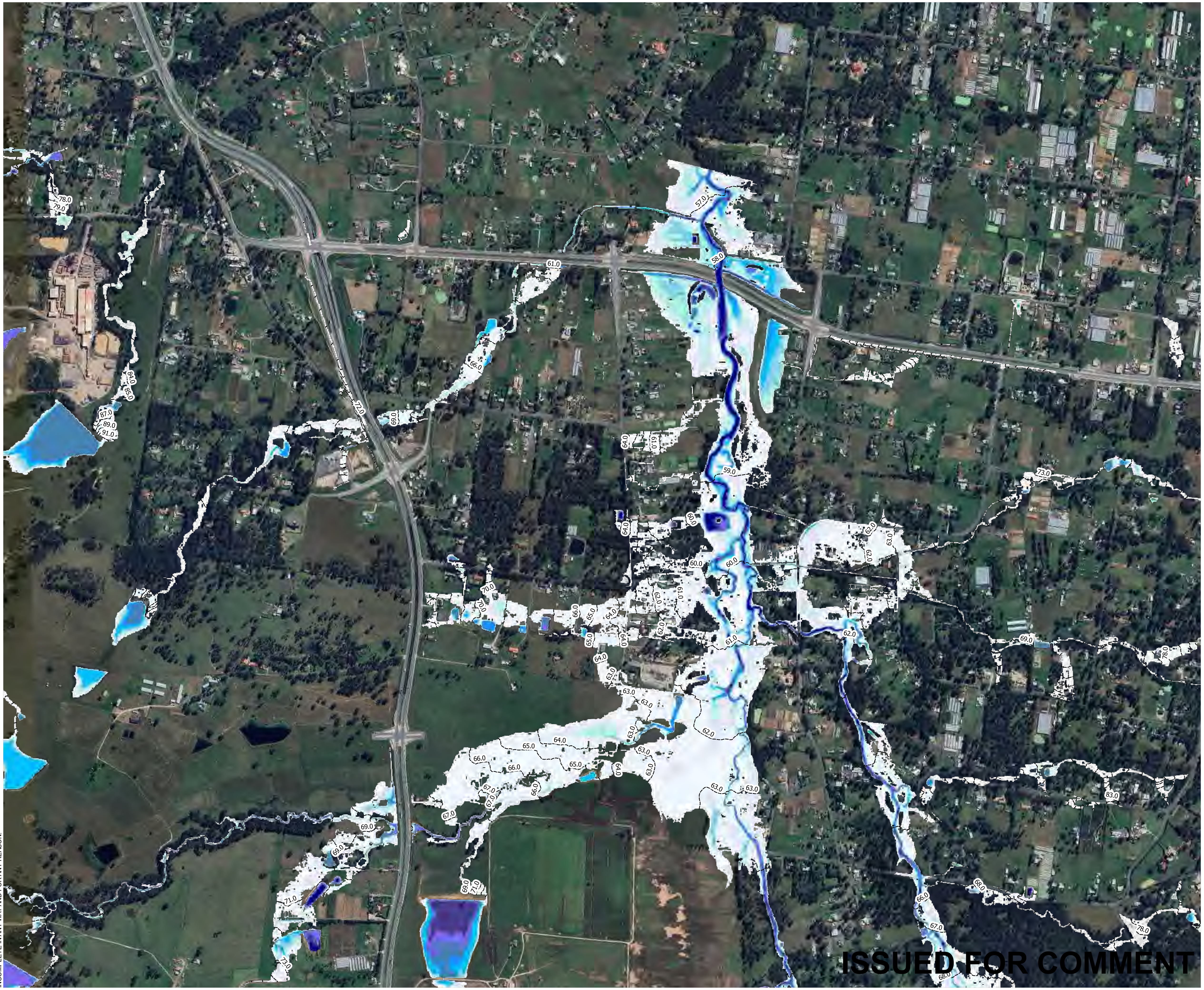
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
18% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-005-A-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

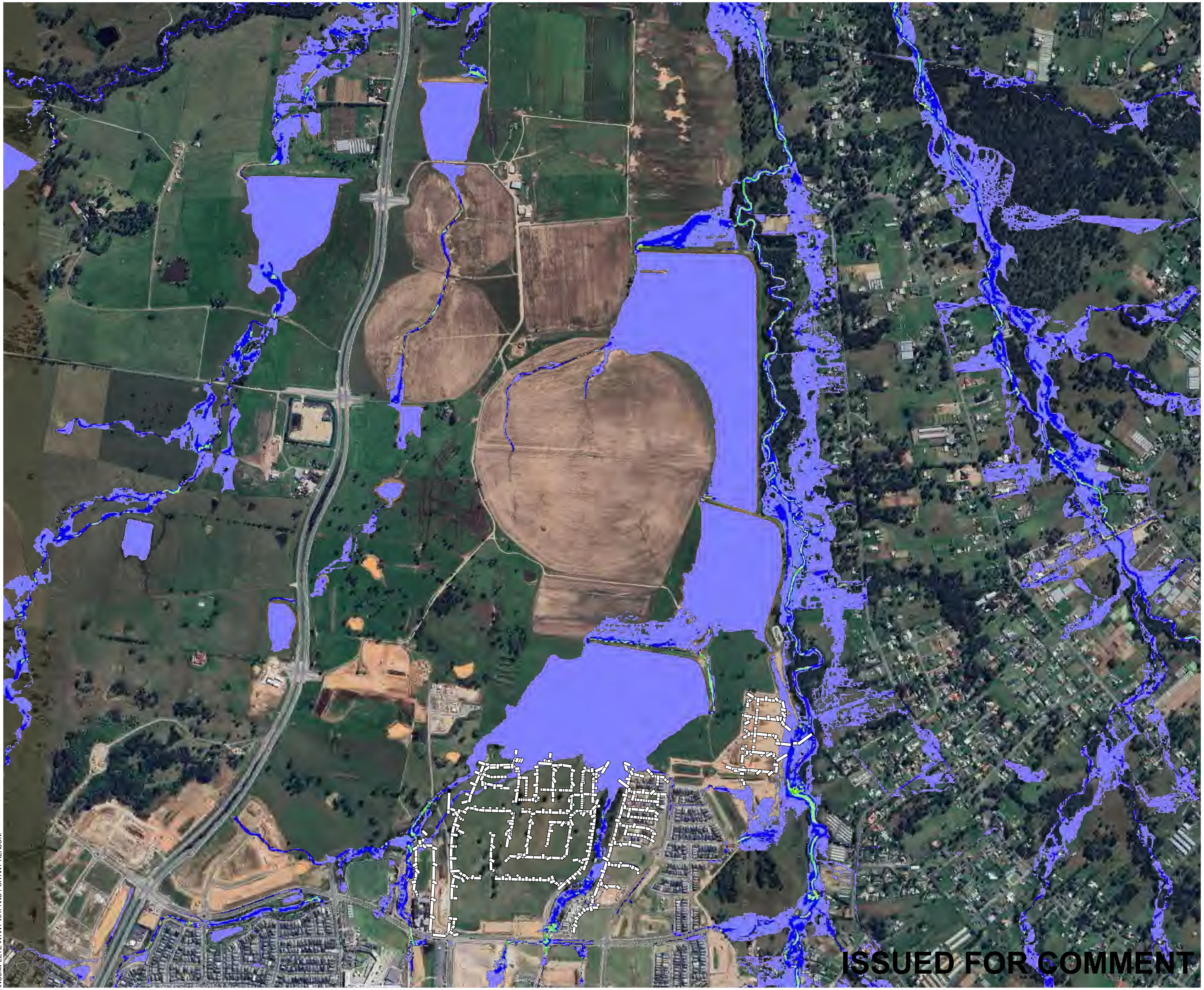
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
18% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-005-A-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

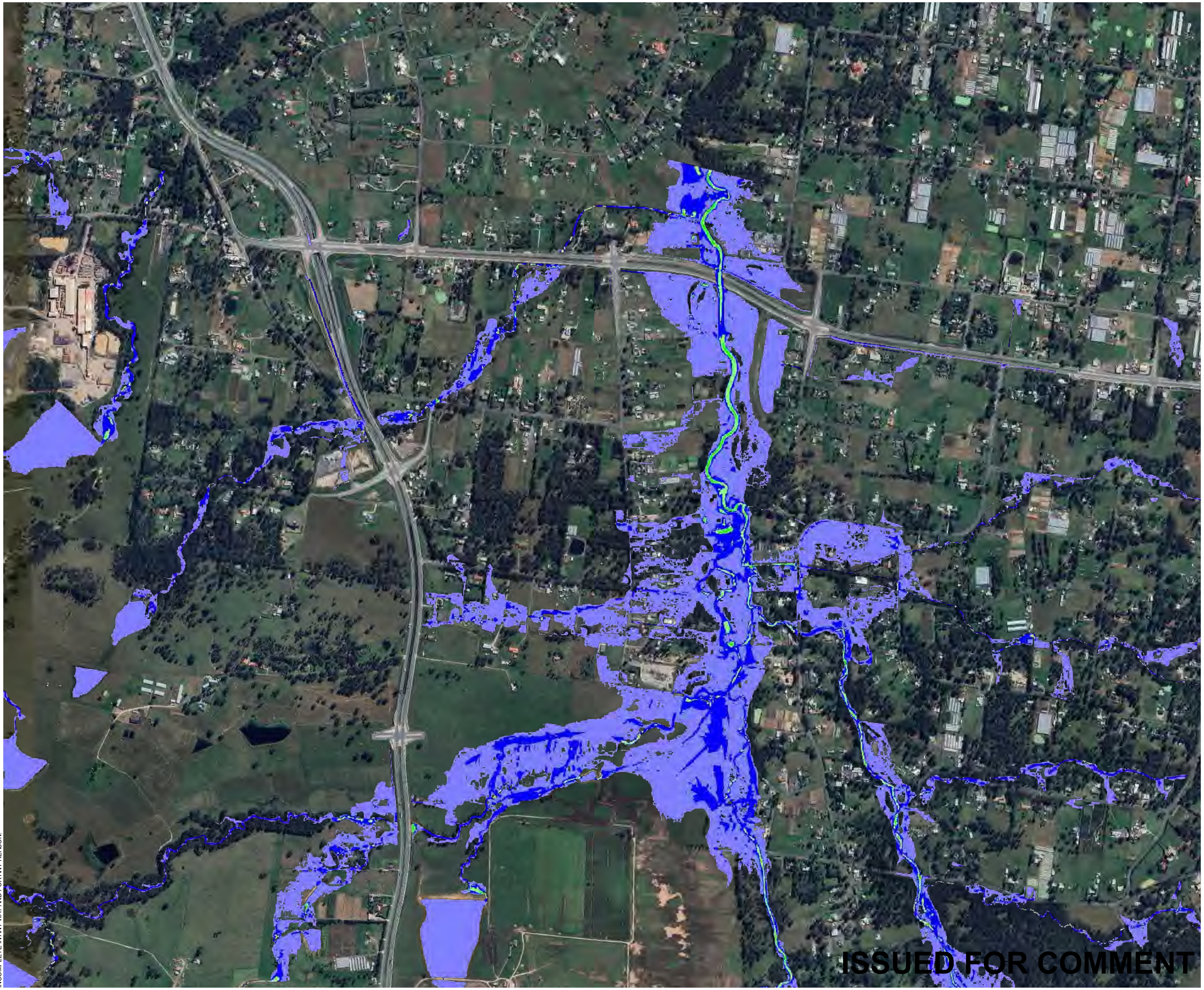
DRAWING TITLE:
COUNCIL MODEL
18% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-E-005-B-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

WHILE EVERY CARE IS TAKEN TO ENSURE THE ACCURACY OF DATA SOURCED THROUGH THIRD PARTIES, CALIBRE PROFESSIONAL SERVICES PTY LTD MAKES NO REPRESENTATIONS OR WARRANTIES ABOUT ITS ACCURACY, RELIABILITY, COMPLETENESS OR SUITABILITY FOR ANY PARTICULAR PURPOSE AND DISCLAIMS ALL RESPONSIBILITY AND ALL LIABILITY (INCLUDING WITHOUT LIMITATION LIABILITY IN NEGLIGENCE) FOR ALL EXPENSES, LOSSES, DAMAGES (INCLUDING INDIRECT OR CONSEQUENTIAL DAMAGE) AND COSTS WHICH MIGHT BE INCURRED AS A RESULT OF THE DATA BEING INACCURATE OR INCOMPLETE IN ANY WAY AND FOR ANY REASON.



ISSUED FOR COMMENT

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

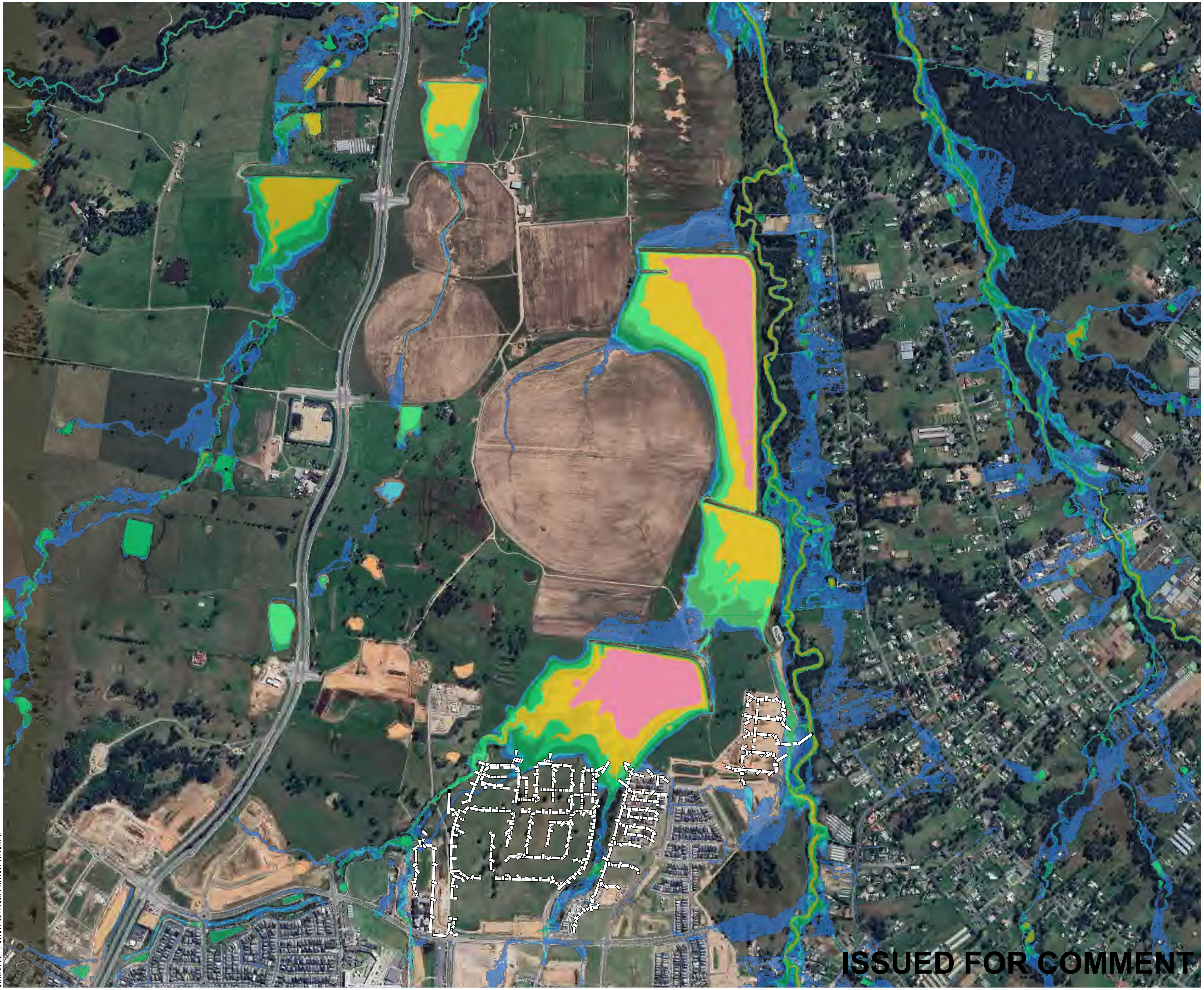
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
18% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-E-005-B-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

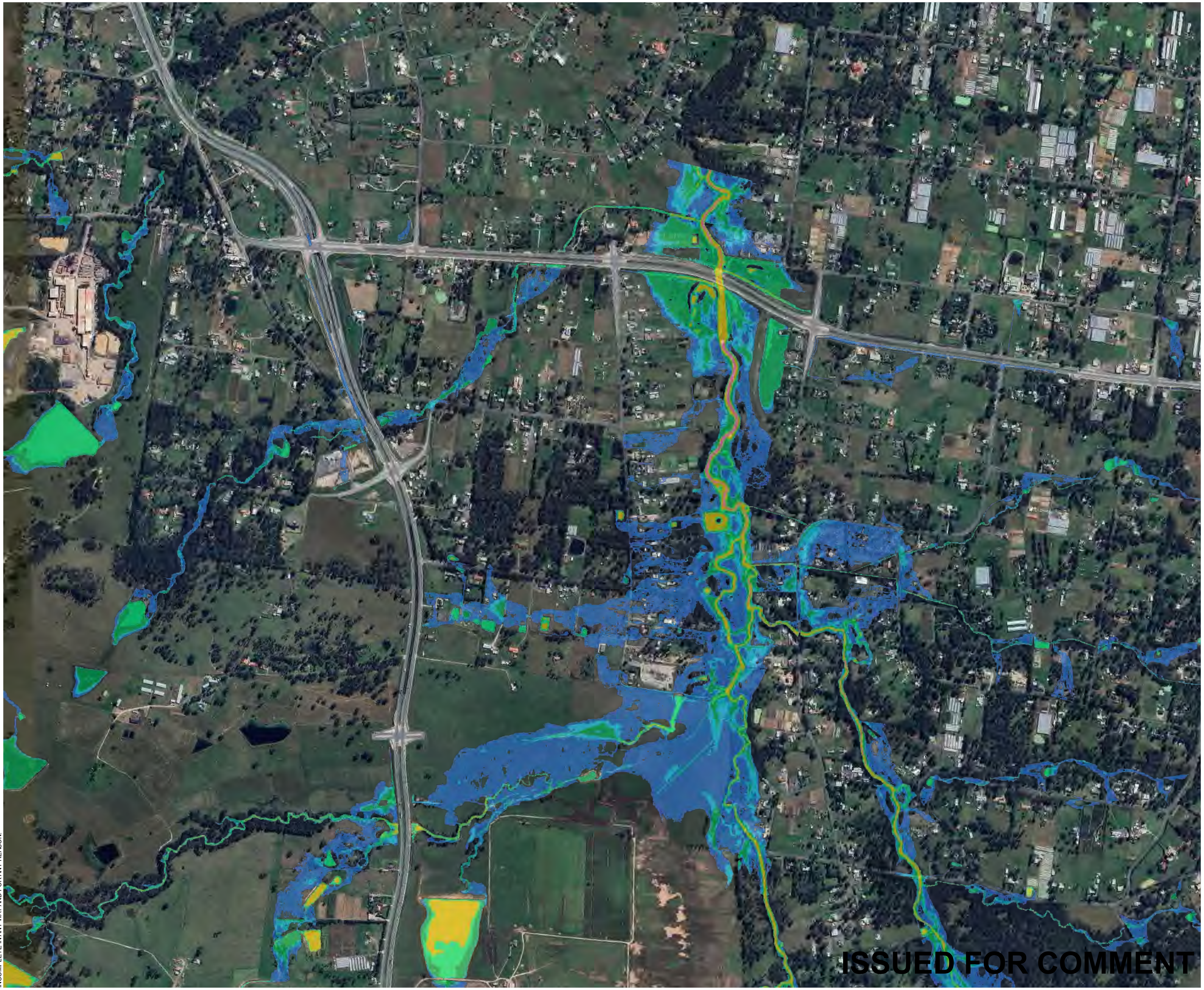
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
18% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-005-D-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

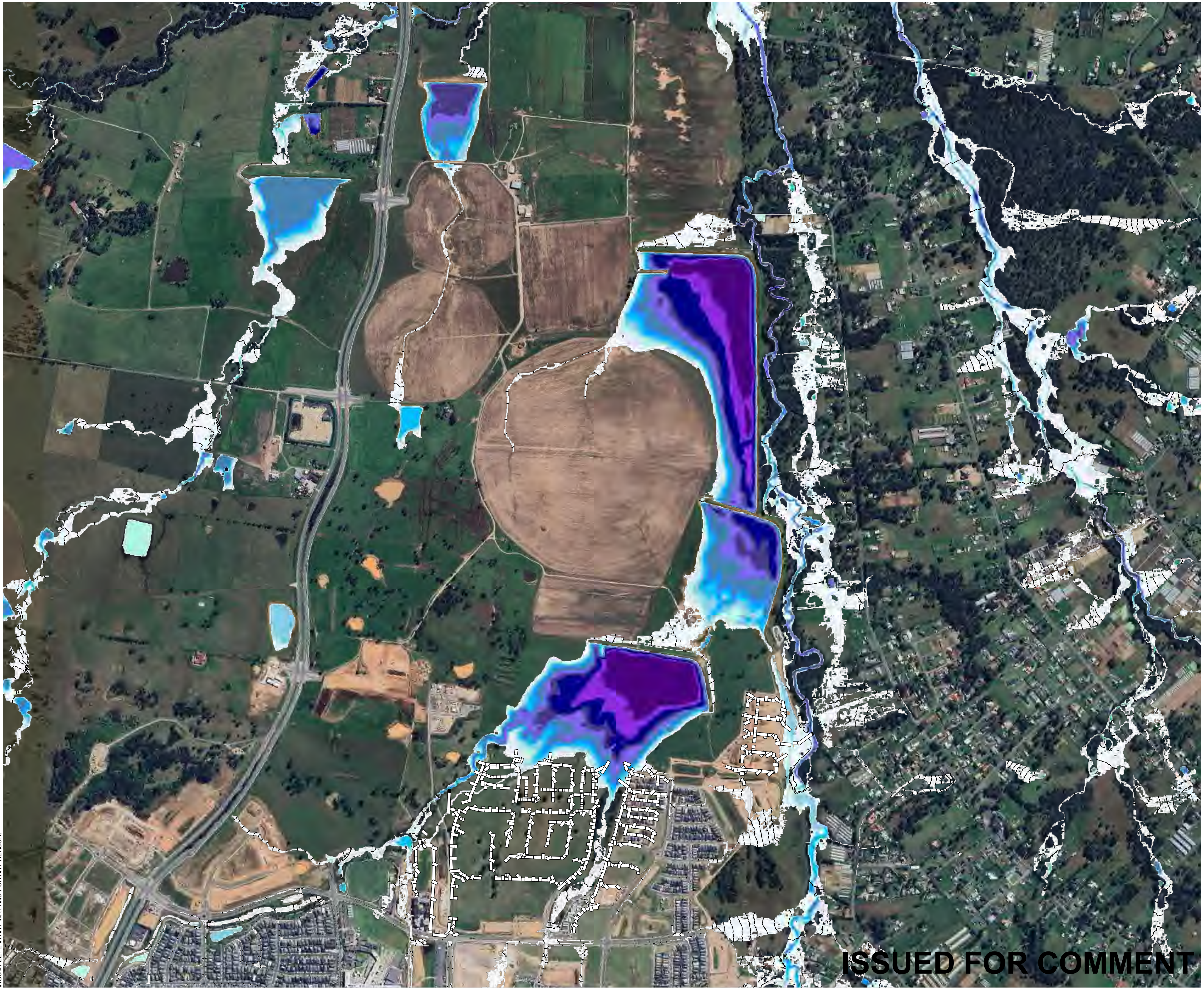
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
18% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-005-D-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

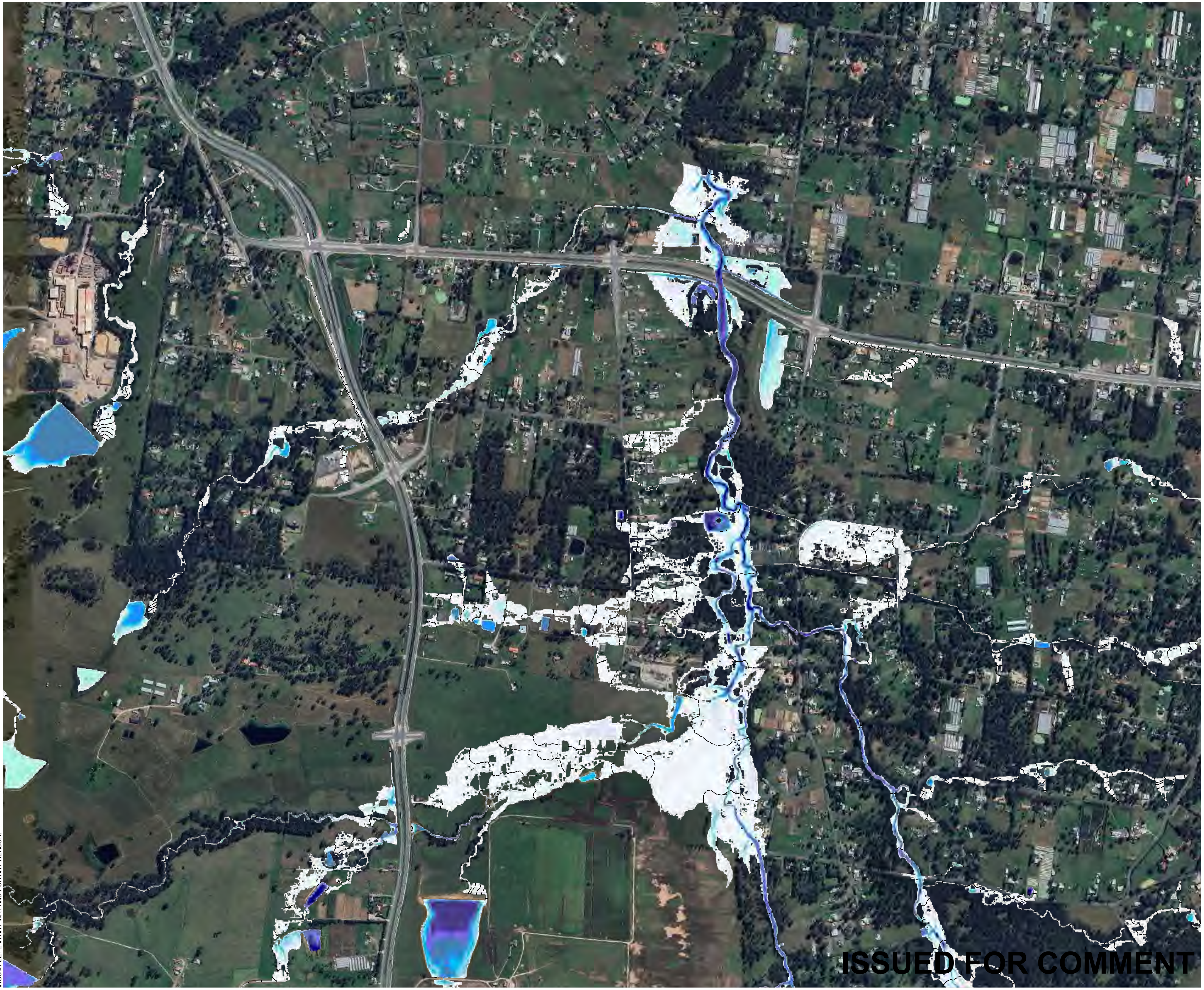
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
39% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-002-A-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
39% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-E-002-A-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
39% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-E-002-B-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
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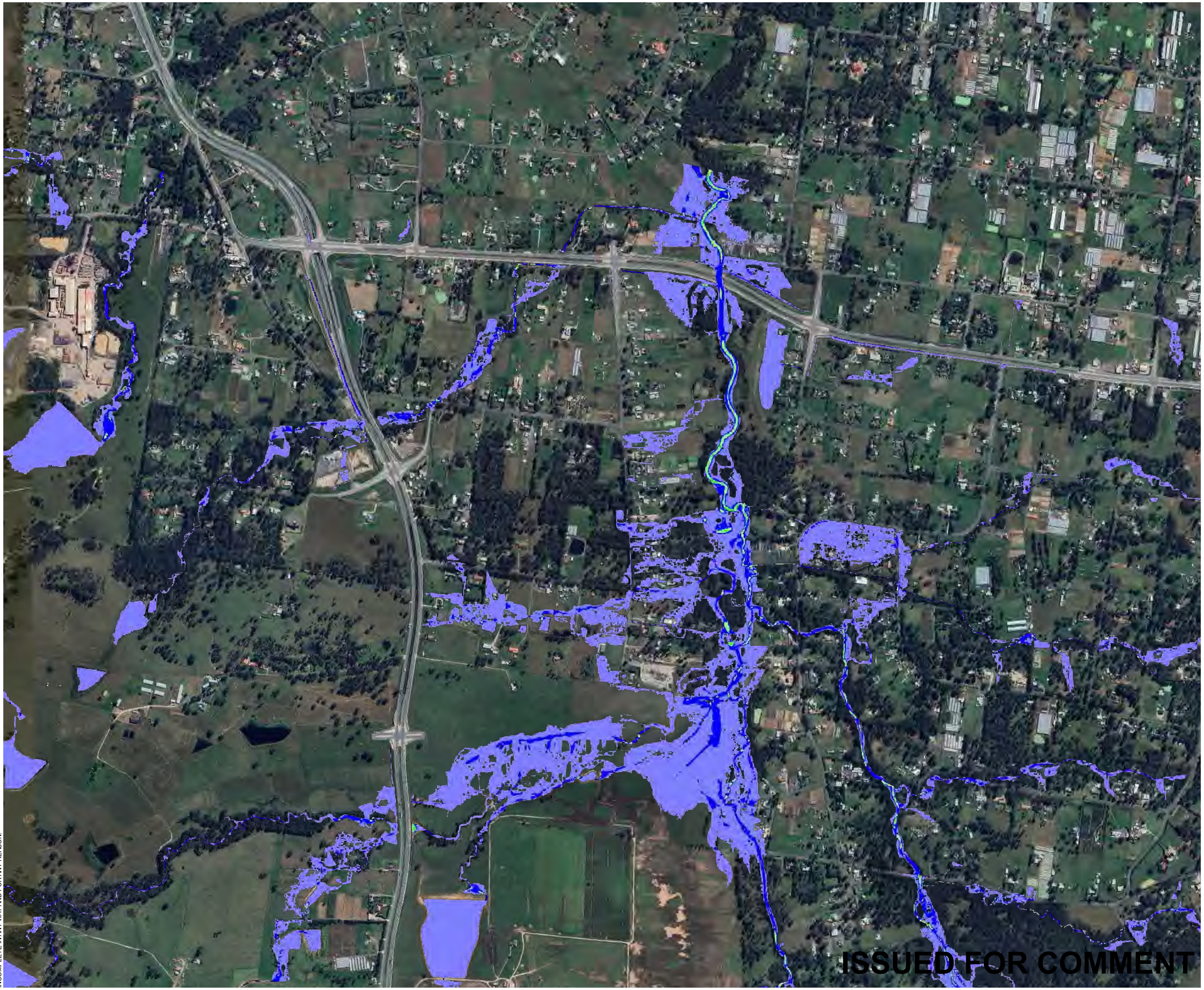
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

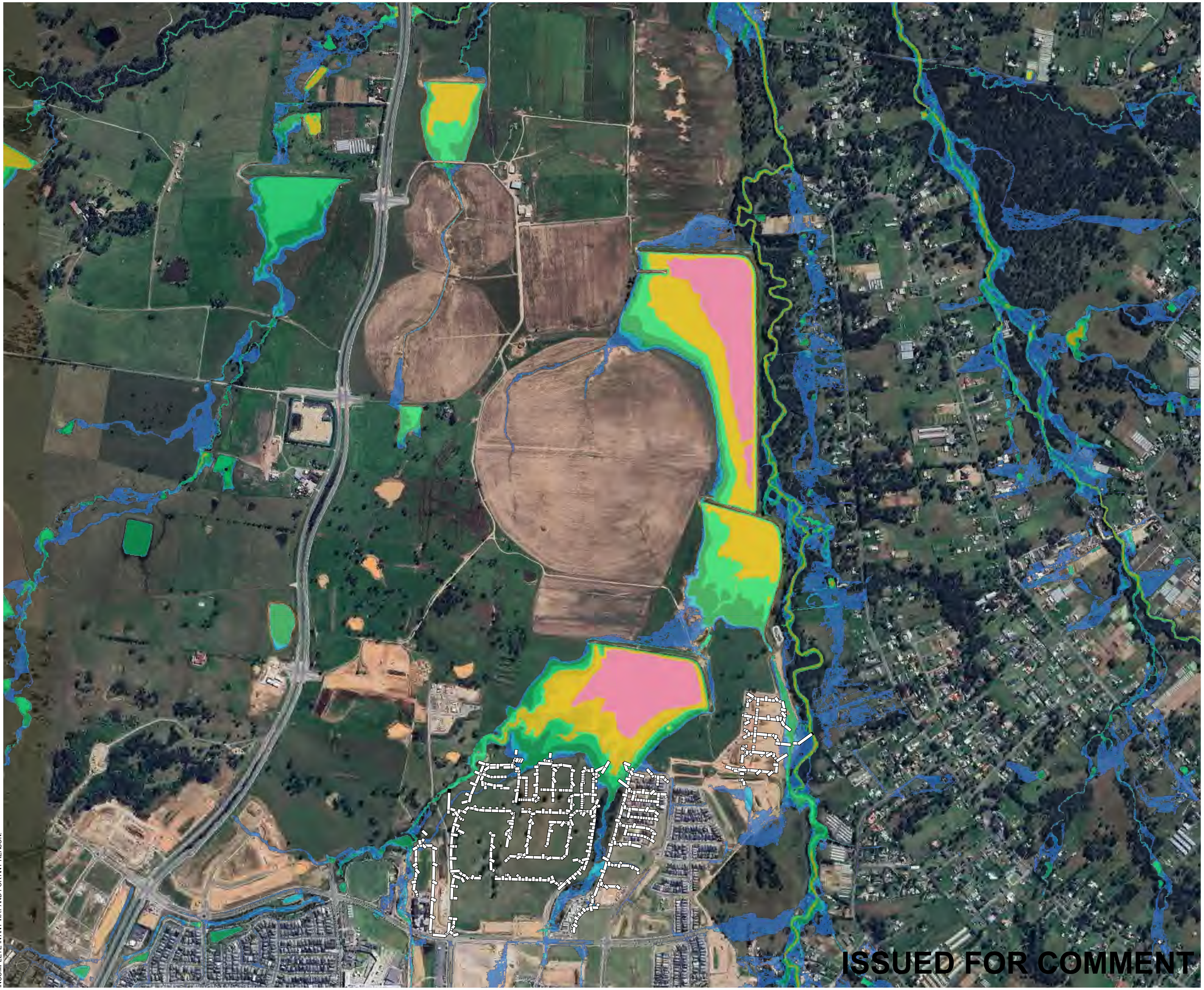
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
39% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-E-002-B-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

EX MODEL 1D ELEMENTS

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

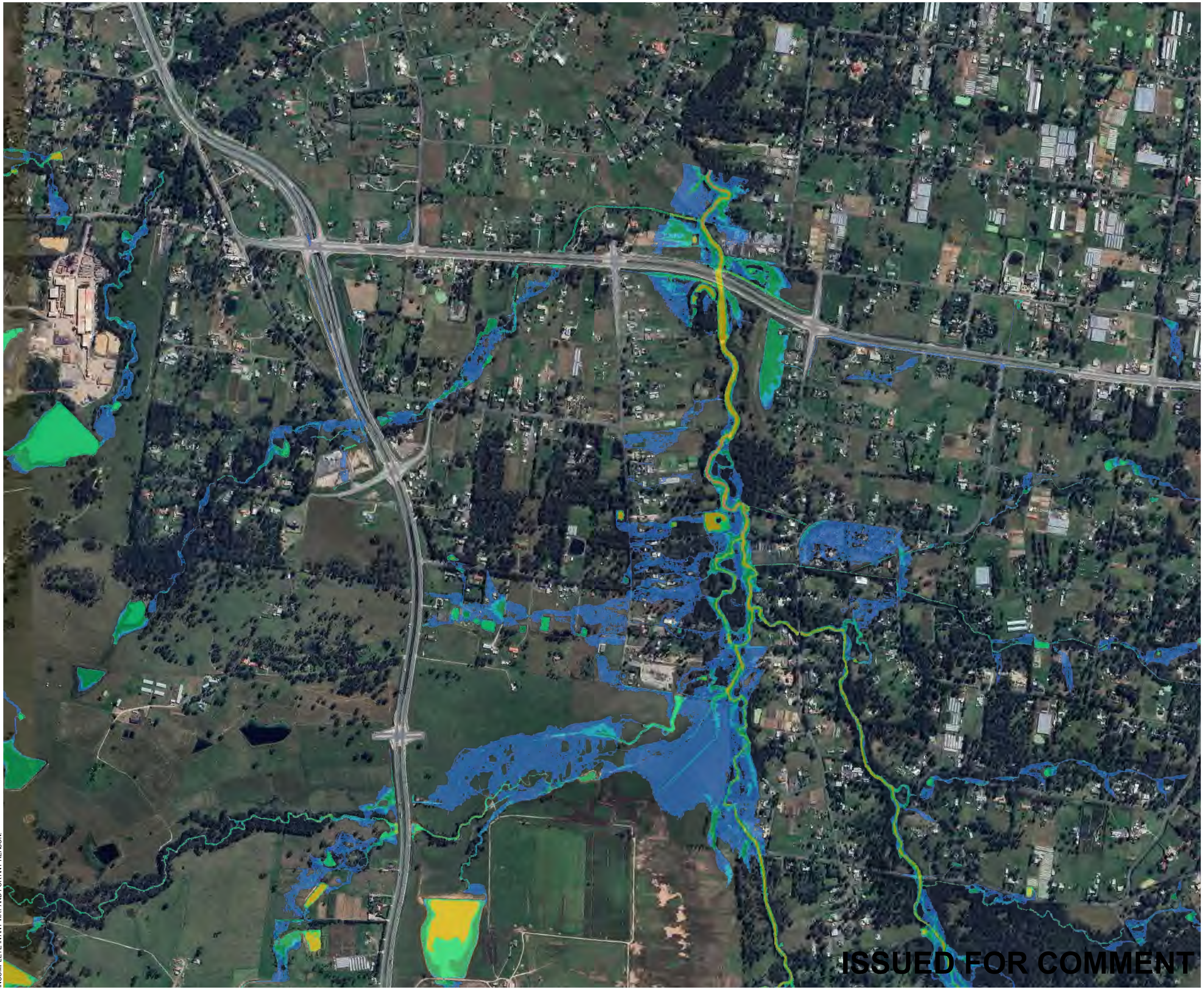
CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
39% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-002-D-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



calibre CONSULTING

LEGEND

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
COUNCIL MODEL
39% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-E-002-D-2**

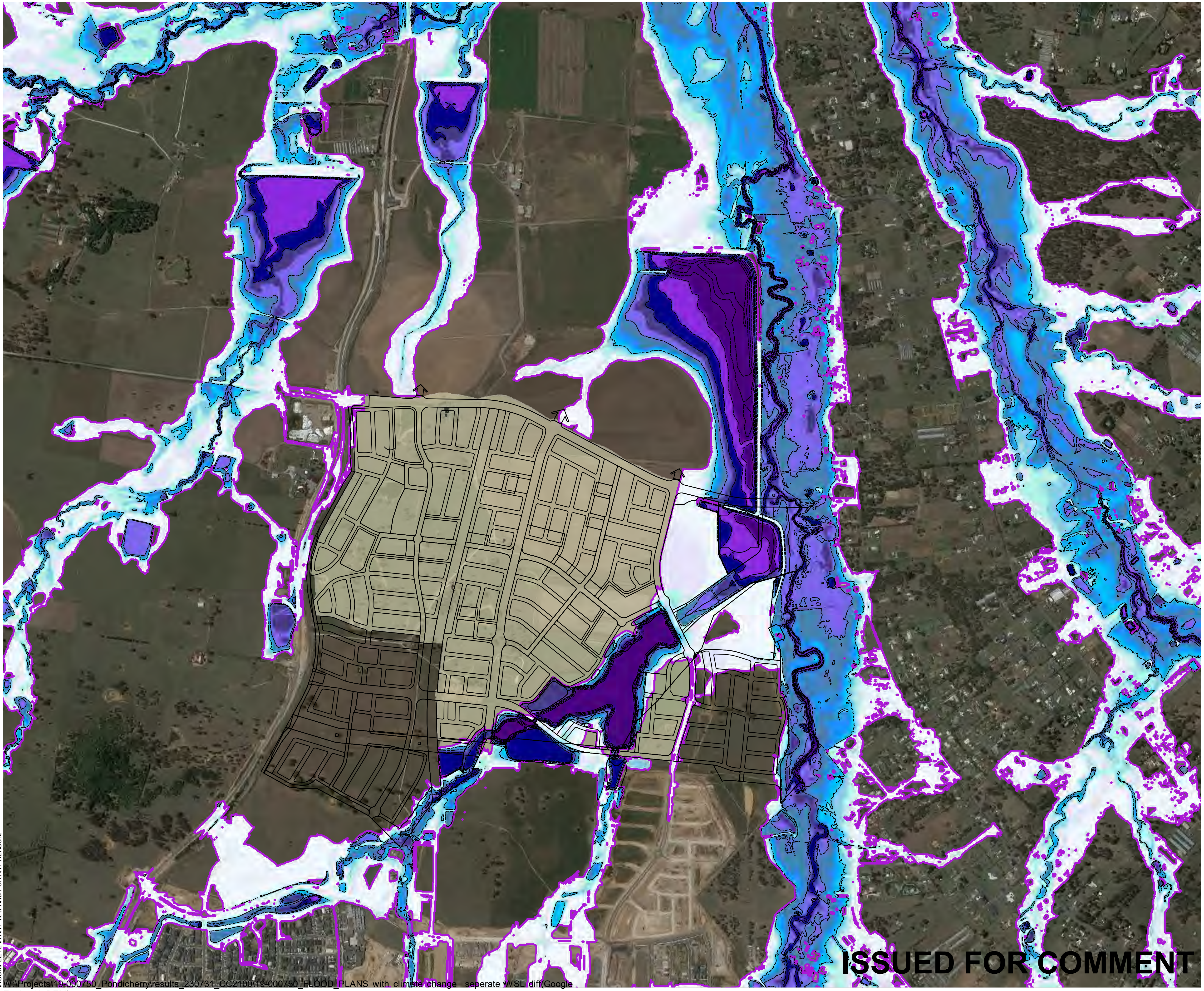
ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

Attachment B – Climate Change Assessment



W:\Projects\19-000750_Pondicherry\results_230731_CC2100\19-000750_FLOOD_PLANS_with_climate_change - seperate WSL_diff(Google Earth with DEM).qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED DEVELOPMENT LAYOUT

SENSITIVITY A

PMF

FLOOD HEIGHT CONTOURS (mAHD)

FLOOD EXTENT

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

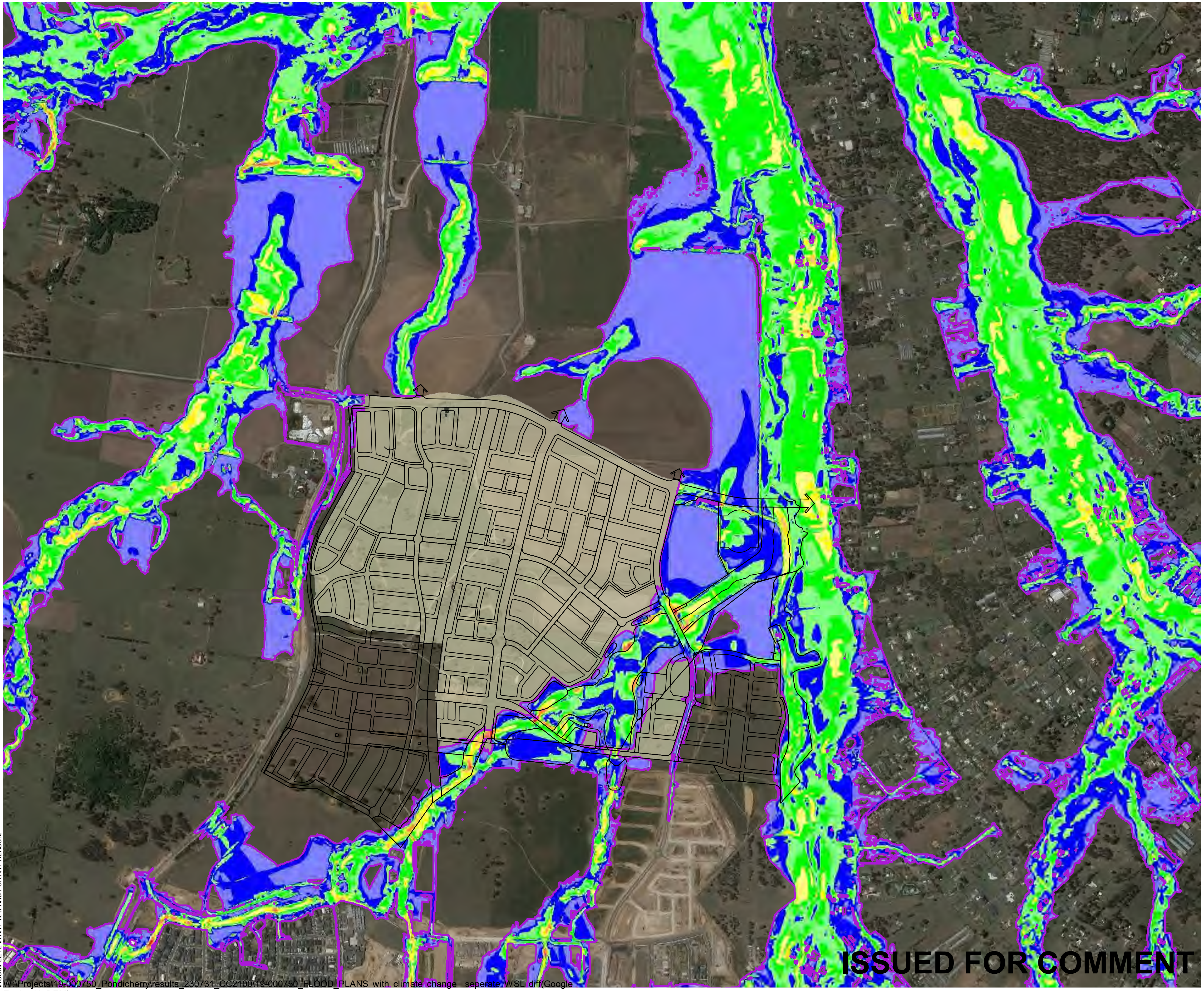
CLIENT:
-

DRAWING TITLE:
Climate Change Year 2100 SCENARIO
PMF STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-S_A-PMF-A**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	07.08.23	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_230731_CC2100\19-000750_FLOOD_PLANS with climate change - seperate WSL diff(Google Earth with DEM).qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED DEVELOPMENT LAYOUT

SENSITIVITY A

PMF

FLOOD EXTENT

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

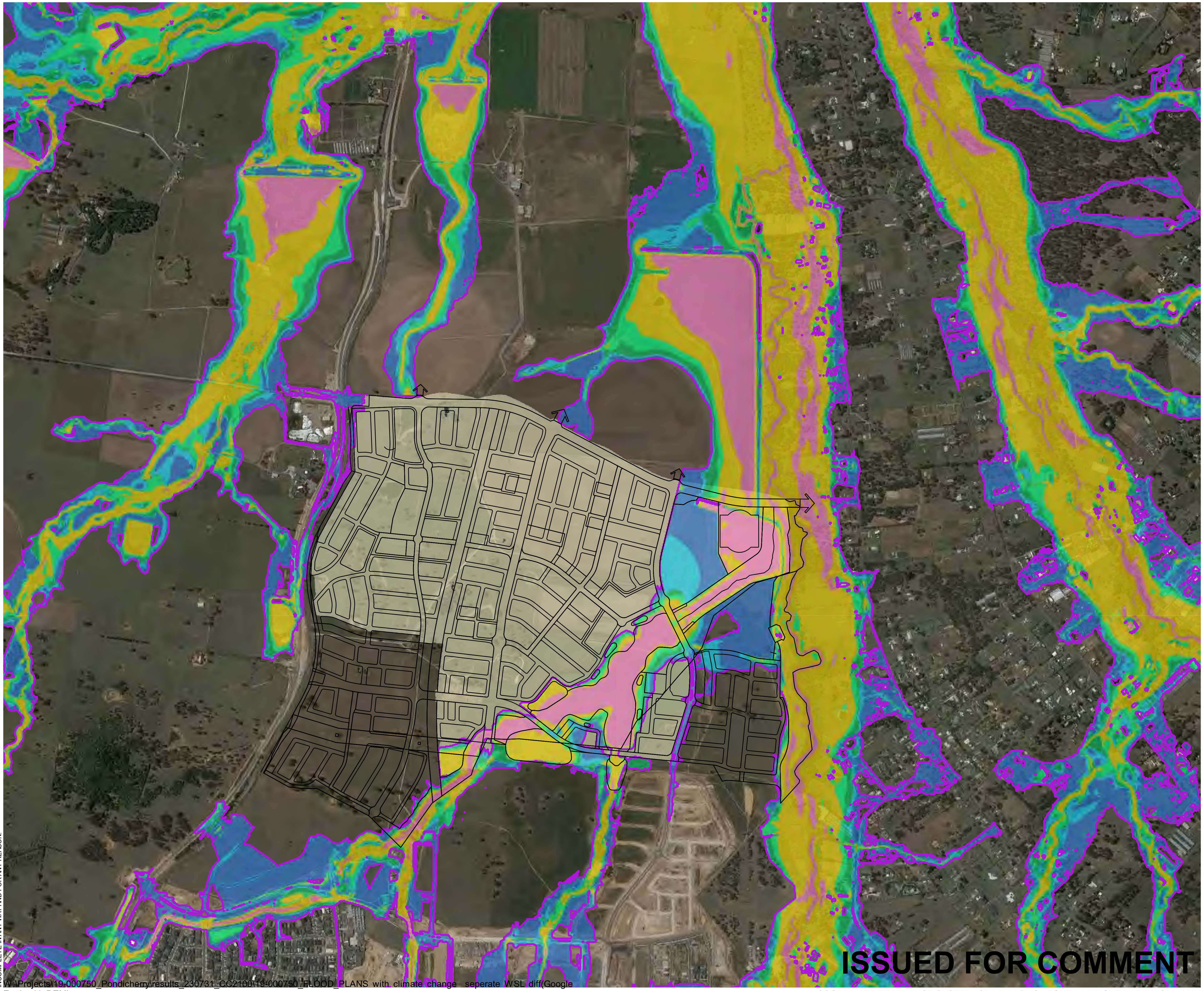
CLIENT:
-

DRAWING TITLE:
Climate Change Year 2100 SCENARIO
PMF STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-S_A-PMF-B**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	07.08.23	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_230731_CC2100\19-000750_FLOOD_PLANS with climate change - seperate WSL diff(Google Earth with DEM).qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED DEVELOPMENT LAYOUT

SENSITIVITY A

PMF

FLOOD EXTENT

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

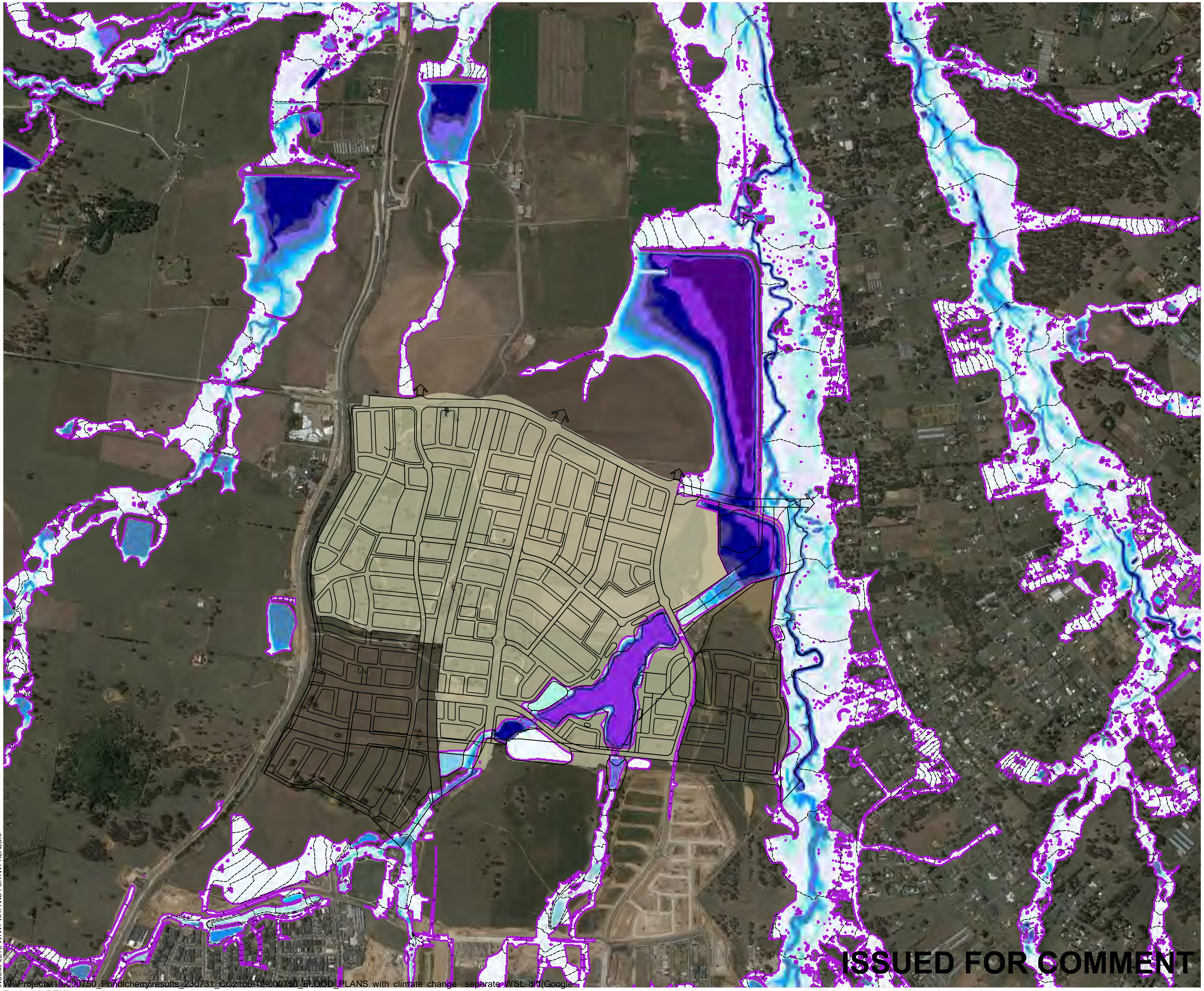
CLIENT:
-

DRAWING TITLE:
Climate Change Year 2100 SCENARIO
PMF STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-S_A-PMF-D**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	07.08.23	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_230731_CC2100\19-000750_FLOOD_PLANS with climate change - separate WSL diff(Google Earth with DEM).qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

——— PROPOSED DEVELOPMENT LAYOUT

SENSITIVITY A

1%

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD EXTENT

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

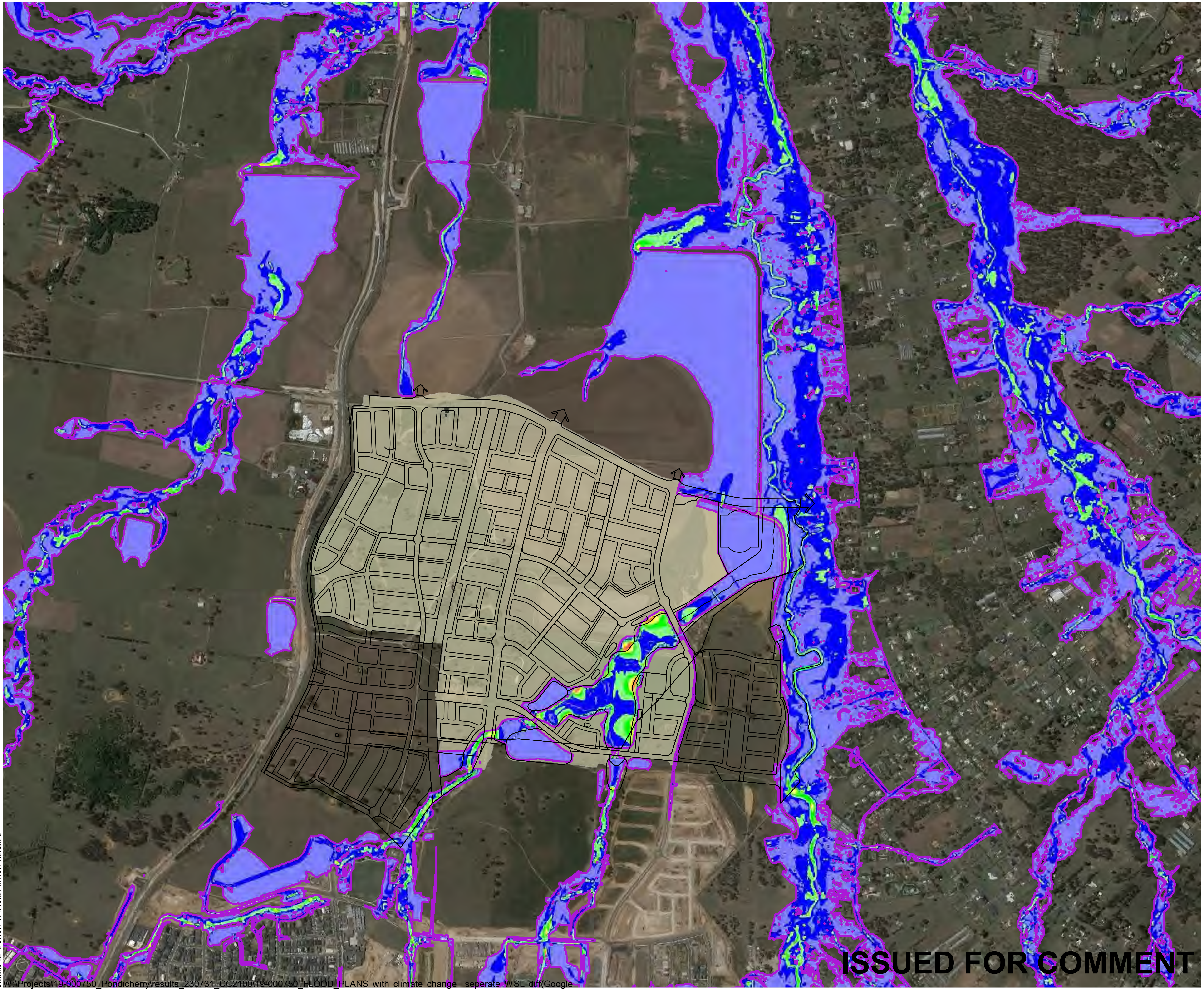
CLIENT:
-

DRAWING TITLE:
Climate Change Year 2100 SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-S_A-100-A**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	07.08.23	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_230731_CC2100\19-000750_FLOOD_PLANS with climate change - seperate WSL diff(Google Earth with DEM).qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

—— PROPOSED DEVELOPMENT LAYOUT

SENSITIVITY A

1%

FLOOD EXTENT

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

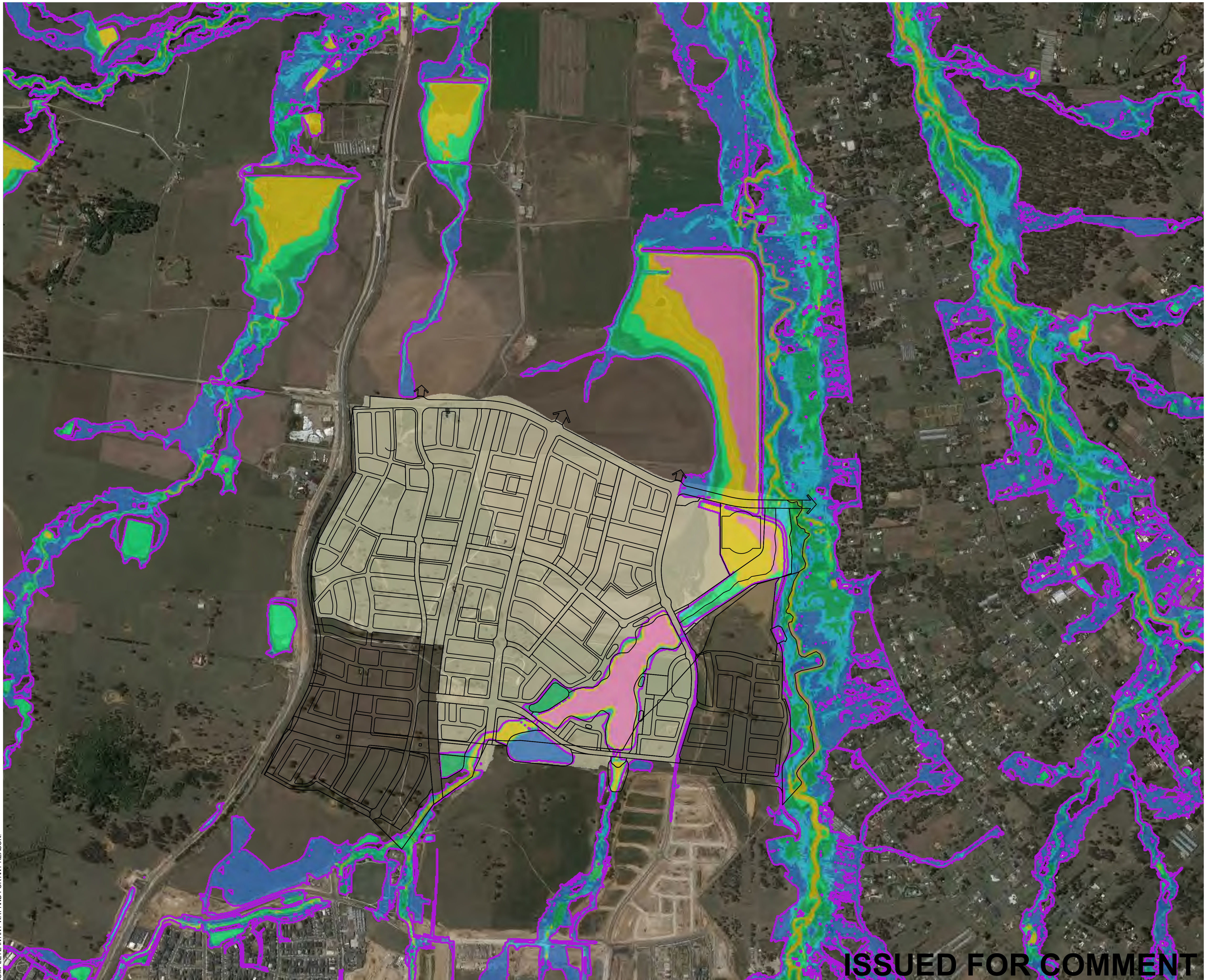
CLIENT:
-

DRAWING TITLE:
Climate Change Year 2100 SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-S_A-100-B**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	07.08.23	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

—— PROPOSED DEVELOPMENT LAYOUT

SENSITIVITY A

1%

FLOOD EXTENT

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

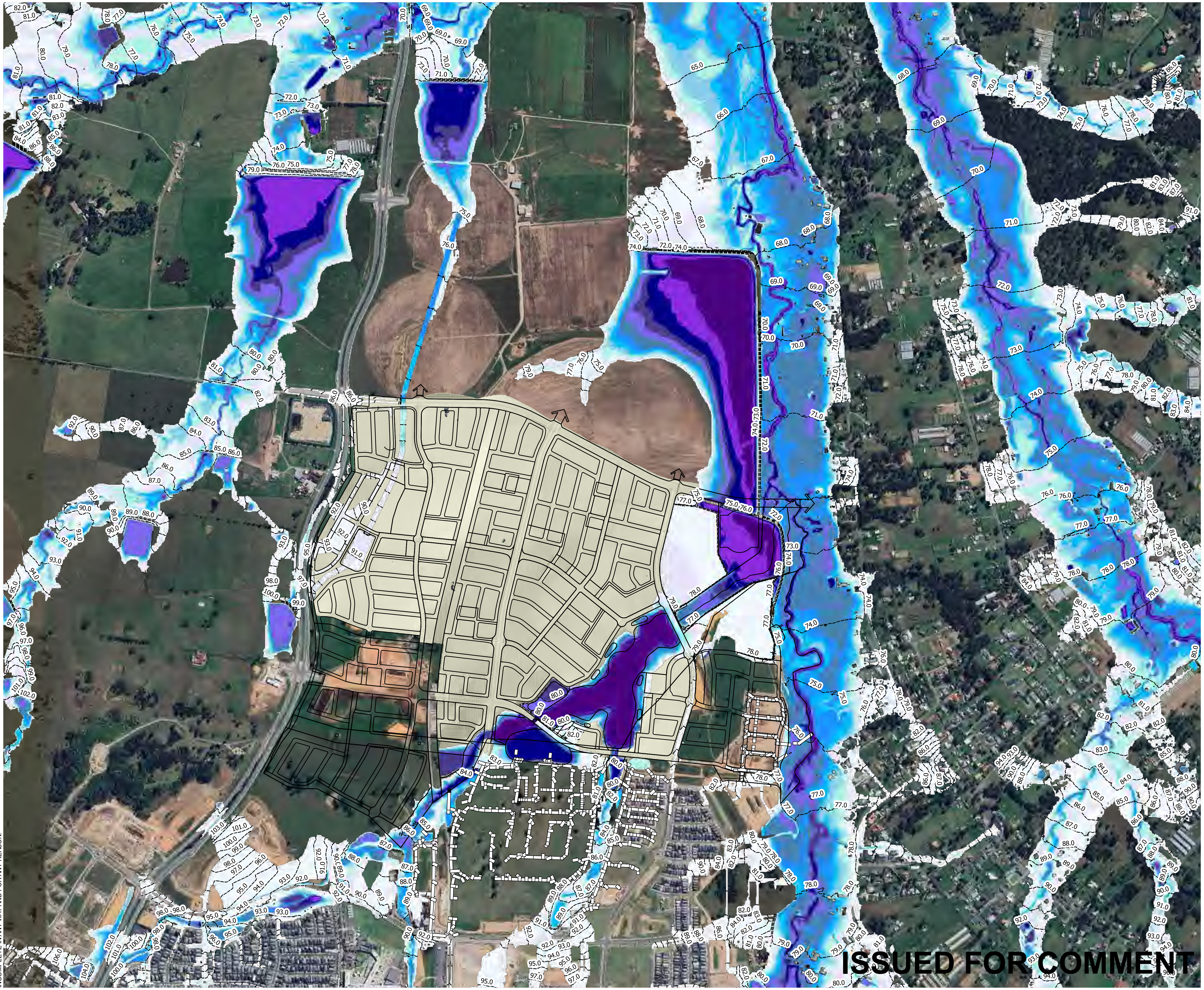
CLIENT:
-

DRAWING TITLE:
Climate Change Year 2100 SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-S_A-100-D**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	07.08.23	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

- PROPOSED_INTERUM_LAYOUT
- EX MODEL 1D ELEMENTS
- FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

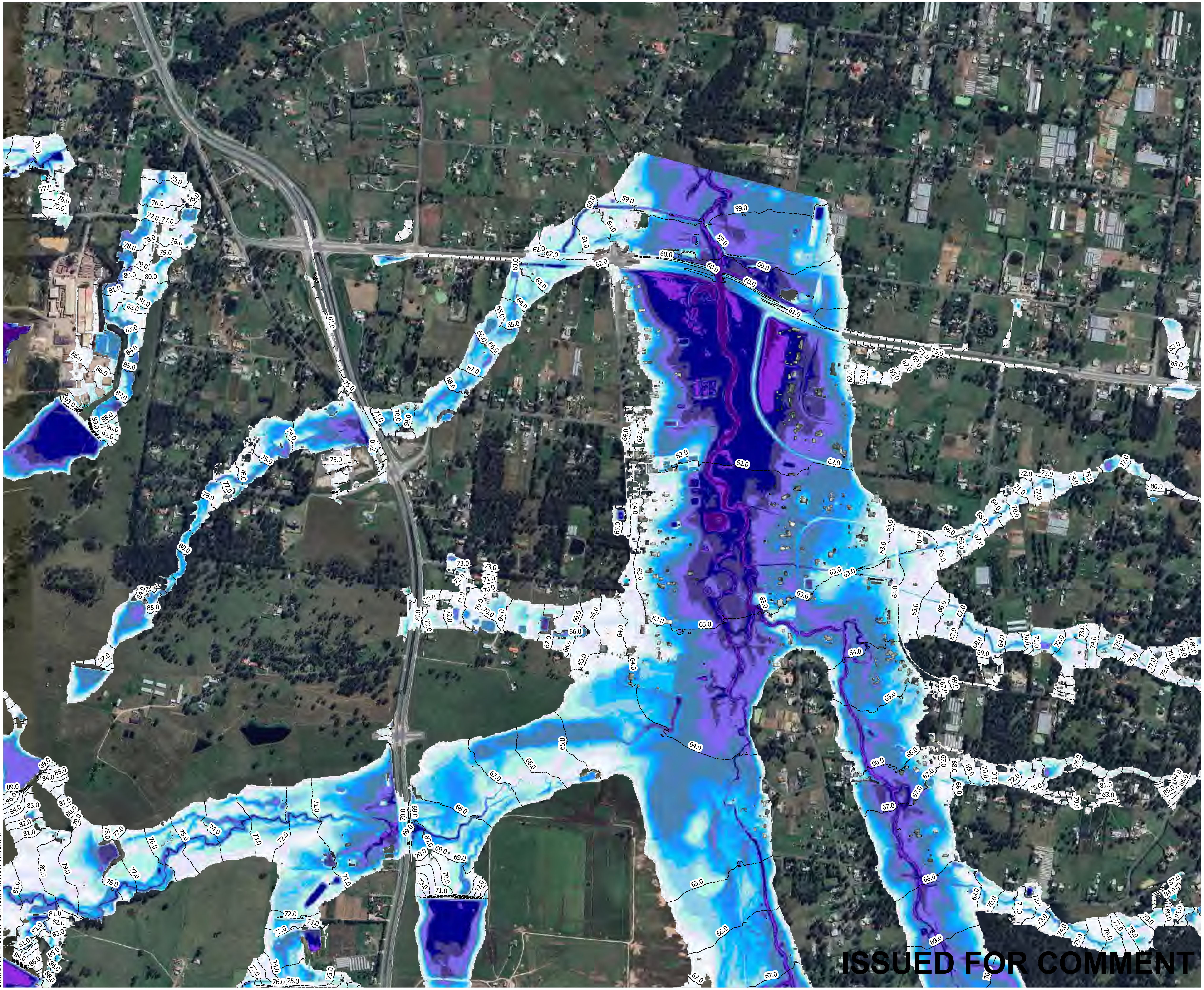
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
PMF STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-I-PMF-A-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

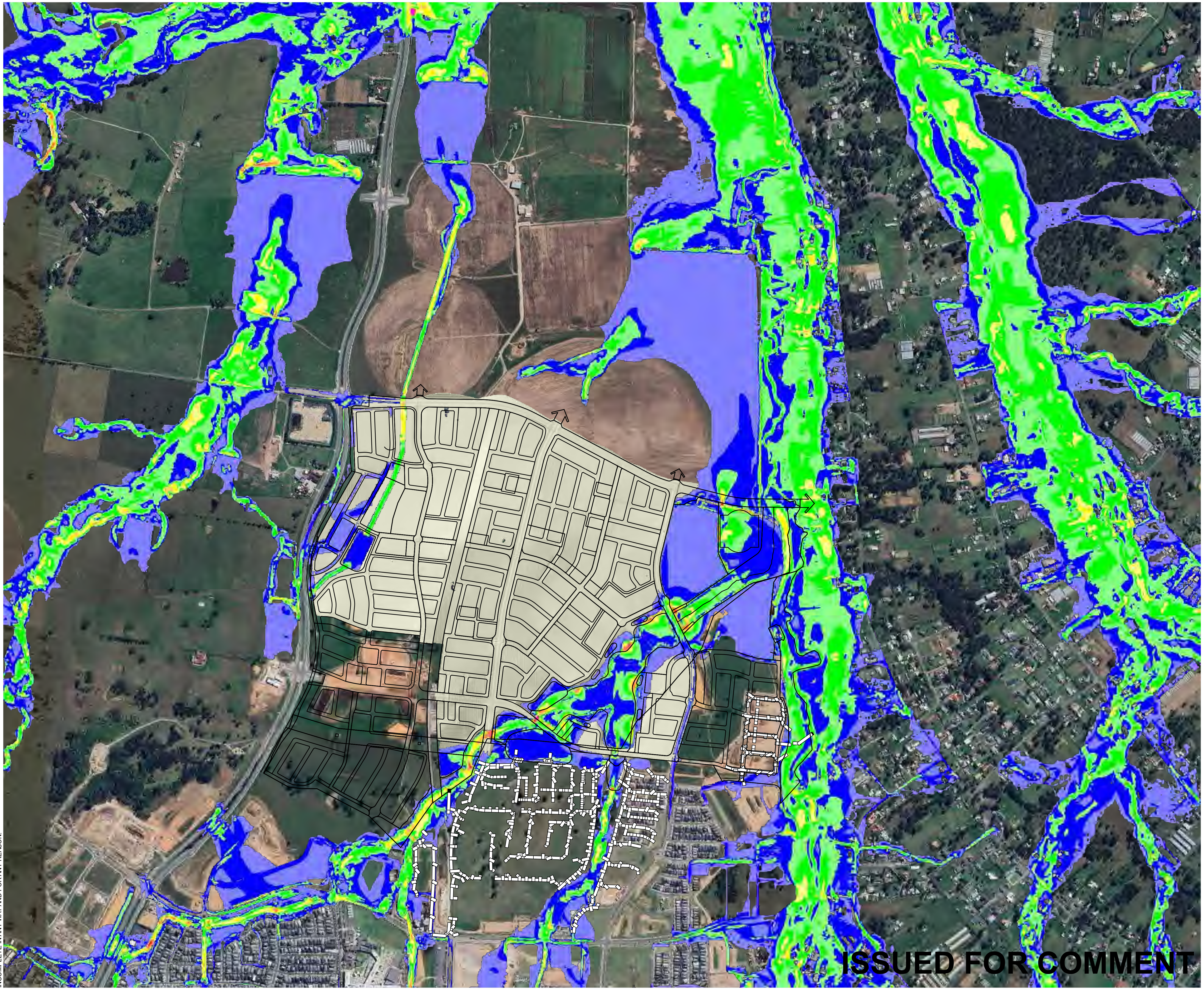
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
PMF STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-I-PMF-A-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

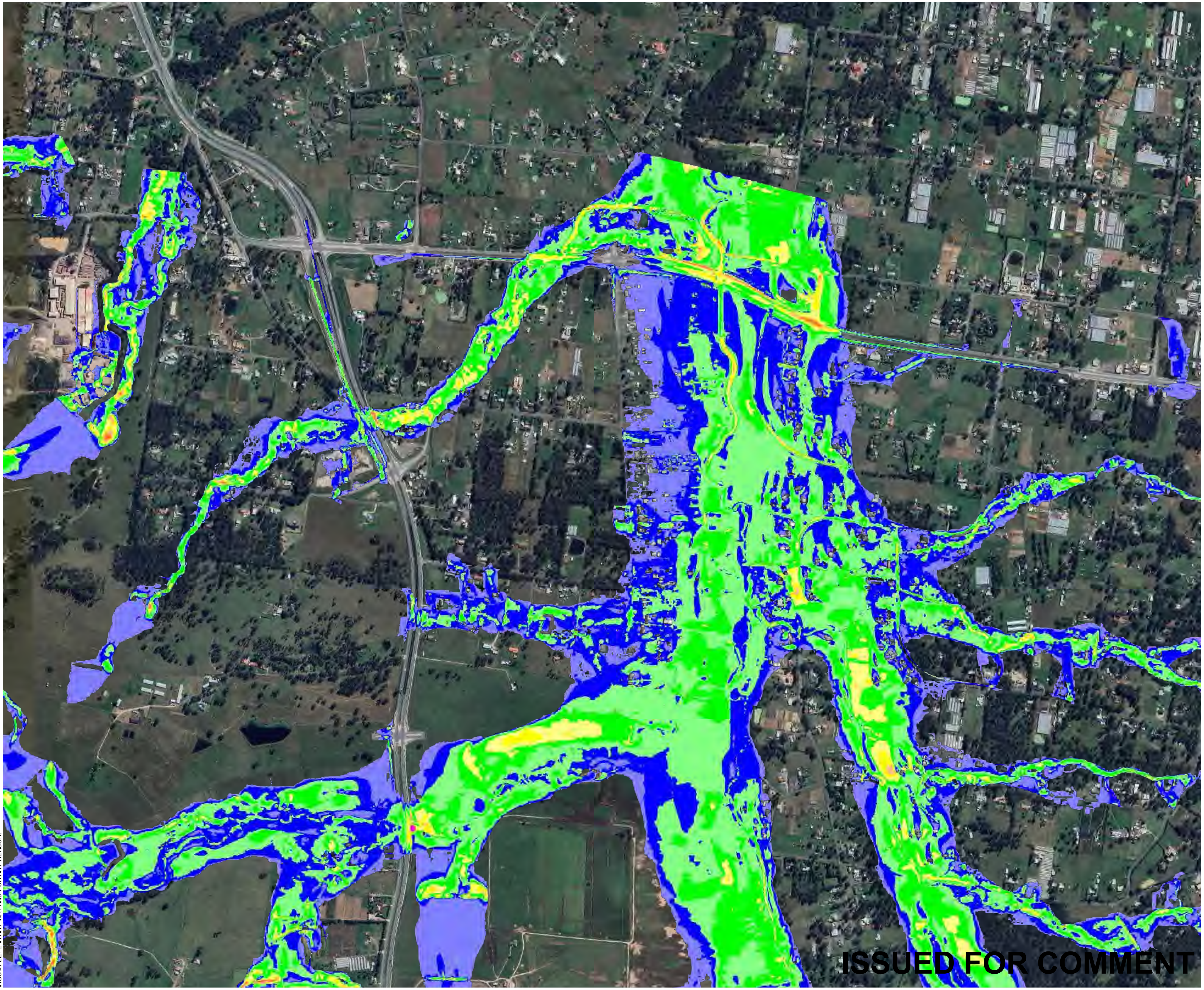
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
PMF STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-I-PMF-B-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

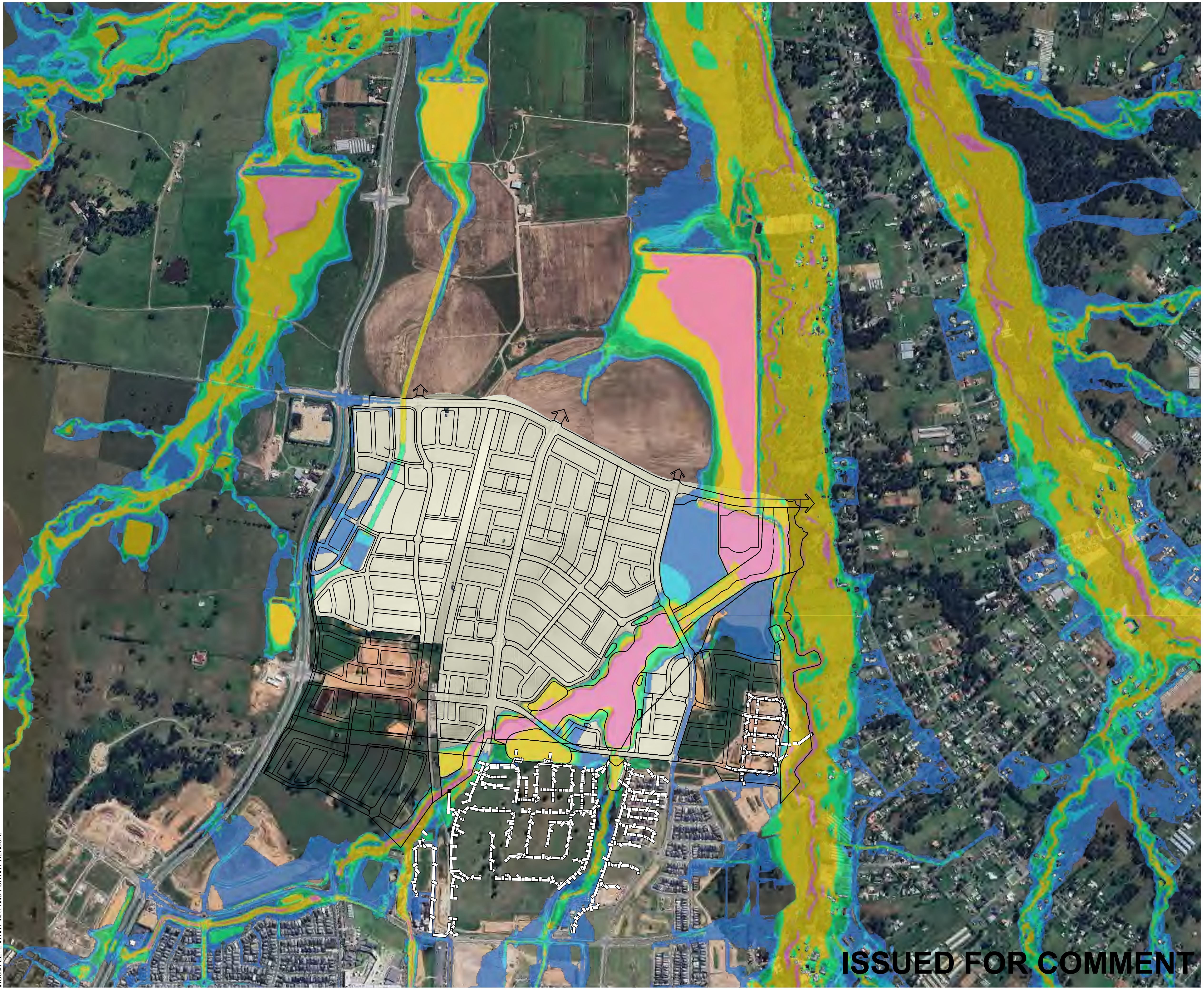
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
PMF STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-I-PMF-B-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

PMF

INT

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

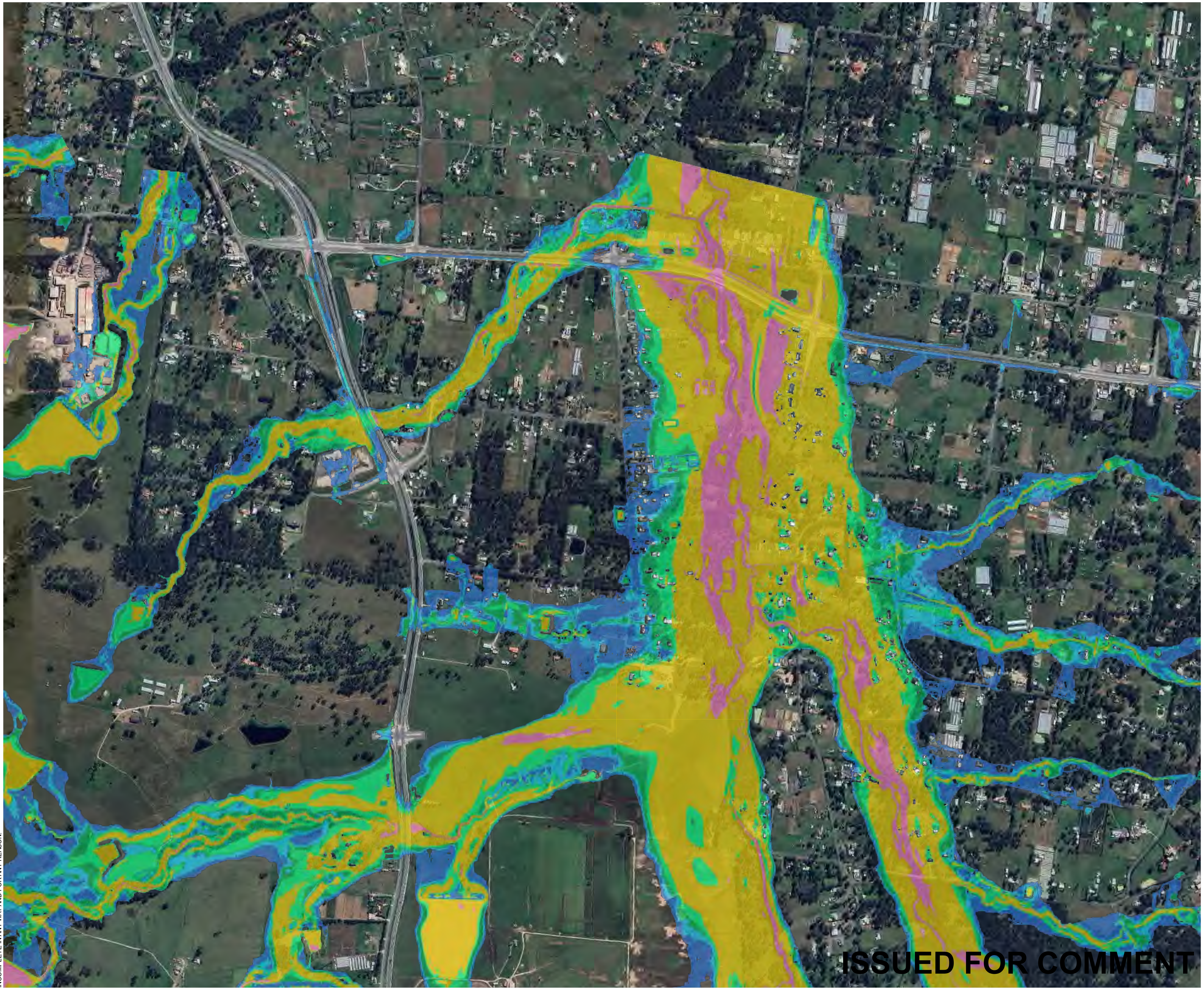
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
PMF STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-I-PMF-D-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

PMF

INT

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

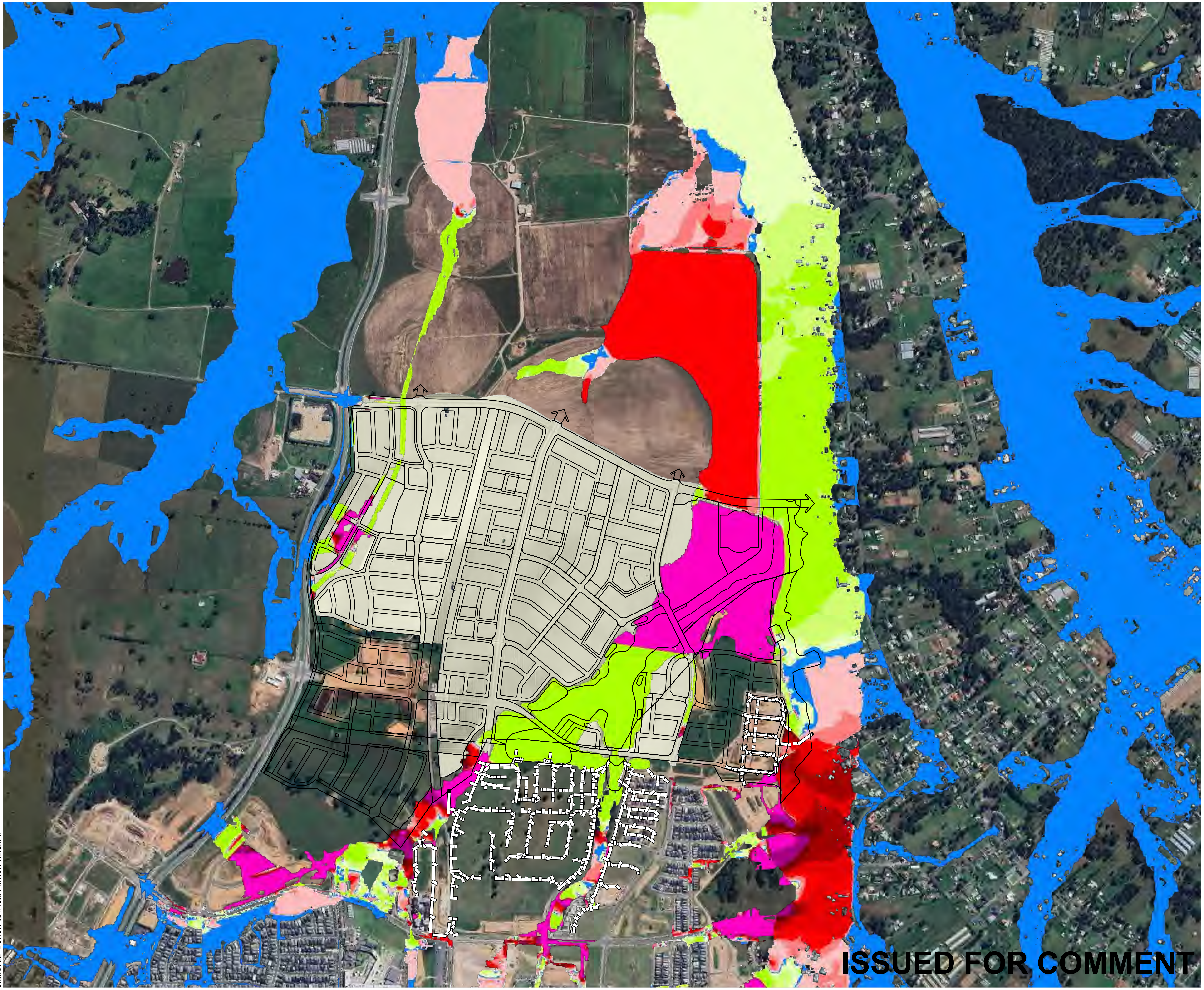
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
PMF STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-I-PMF-D-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

- PROPOSED_INTERUM_LAYOUT
- EX MODEL 1D ELEMENTS

PMF

INT

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

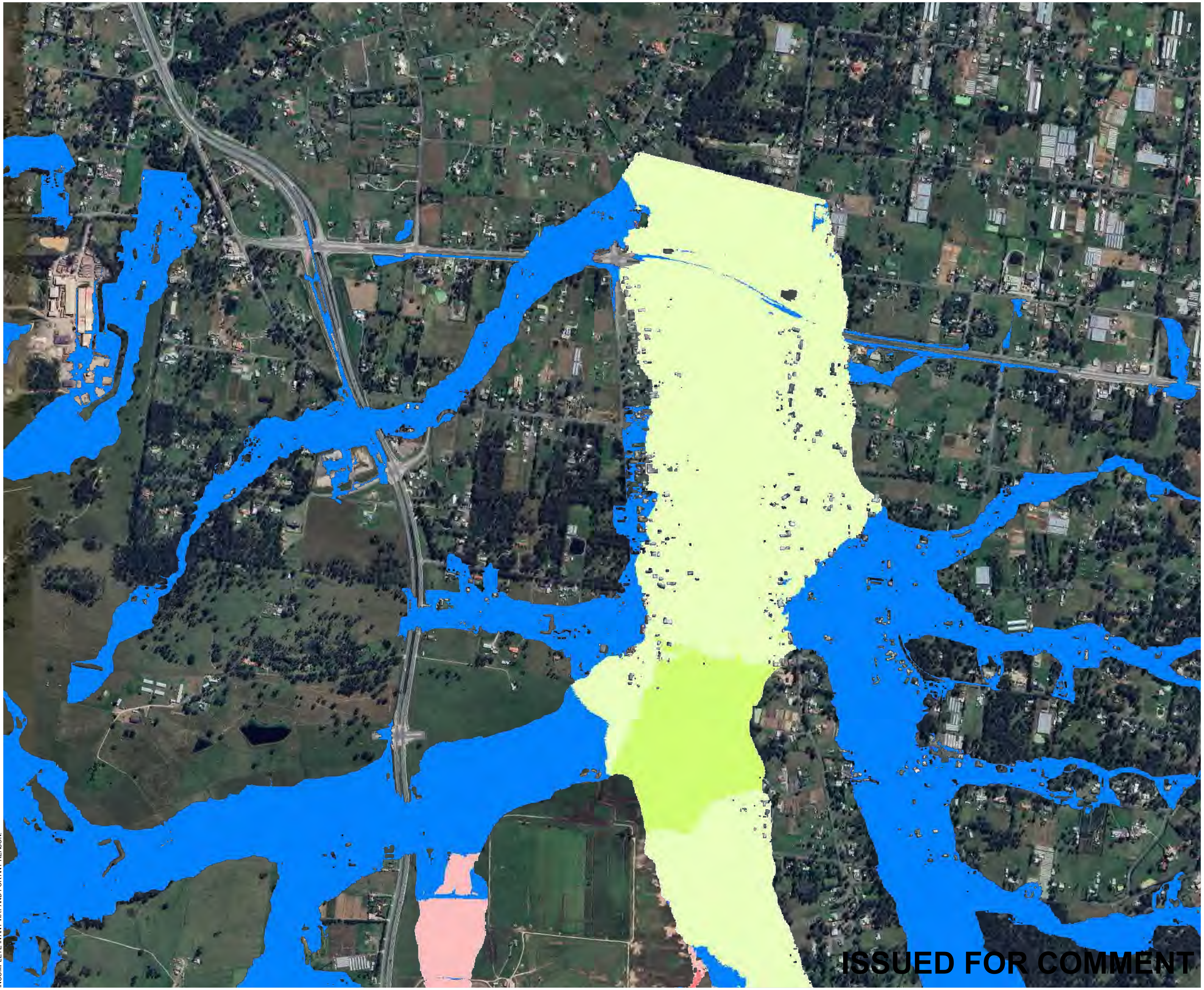
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
PMF STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-I-PMF-E-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



LEGEND

PMF

INT

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.
2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
PMF STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

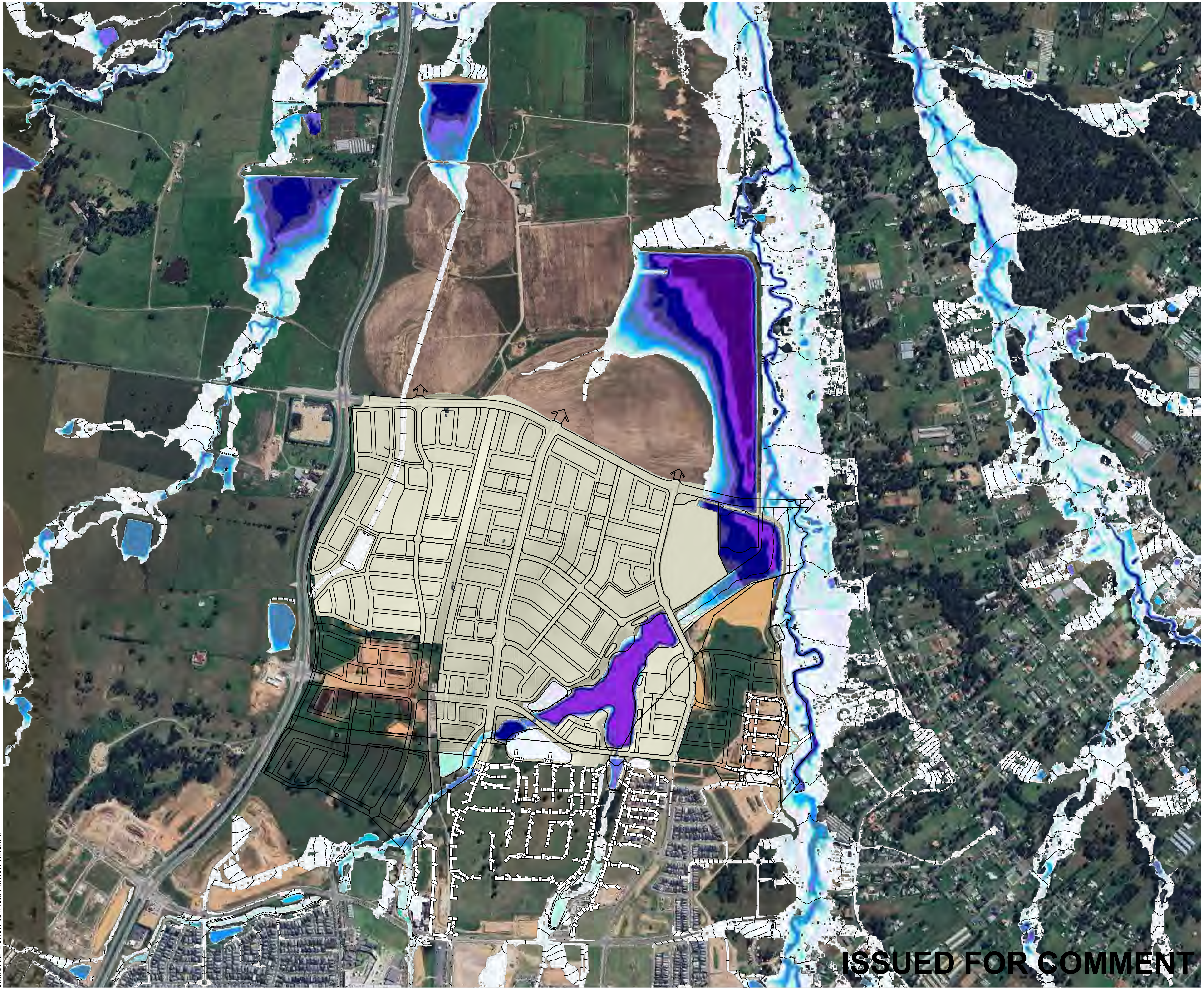
DRAWING NO: **19-000750-I-PMF-E-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

1% AEP

INT

FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

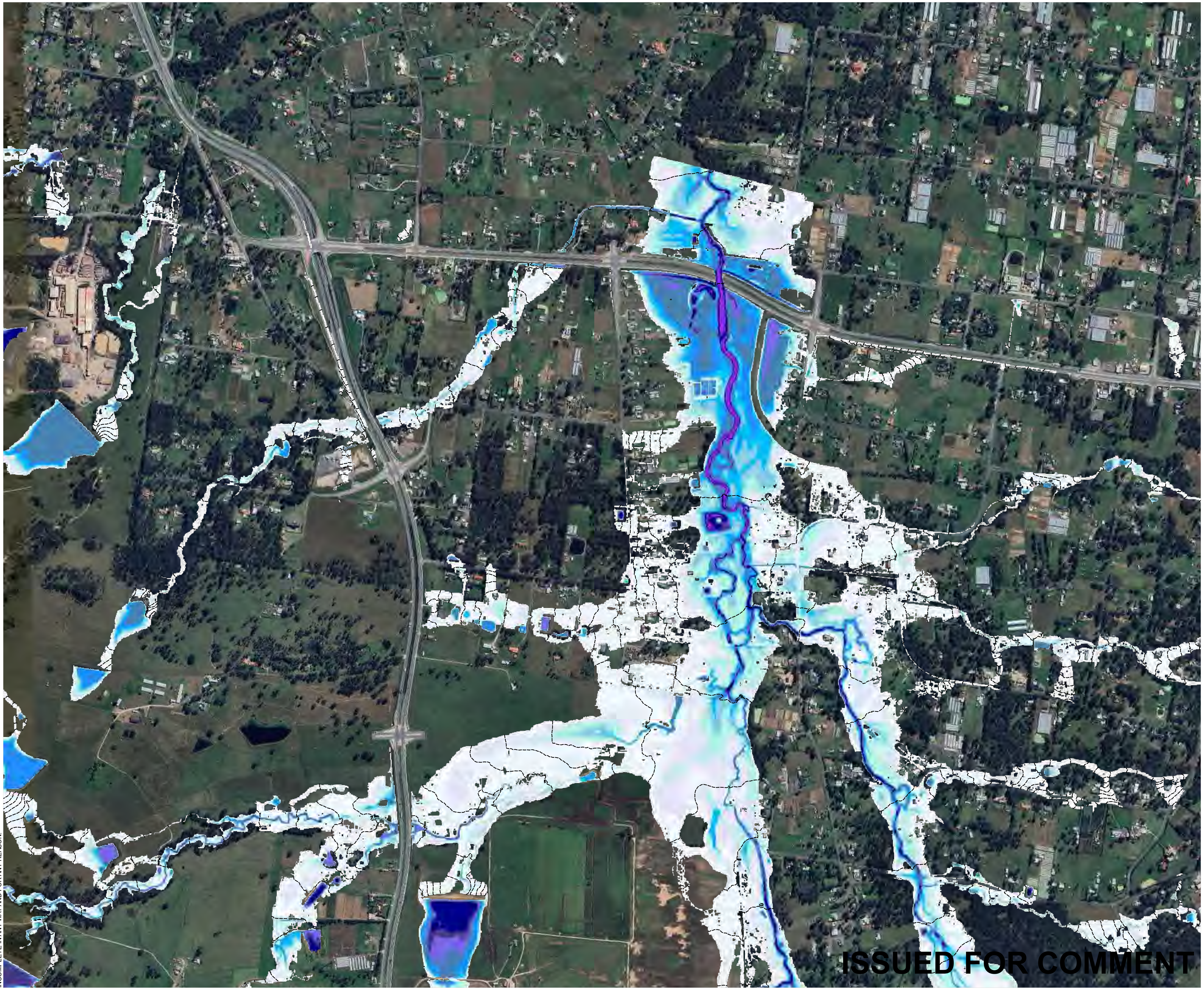
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-I-100-A-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



calibre CONSULTING

LEGEND

1% AEP

INT

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

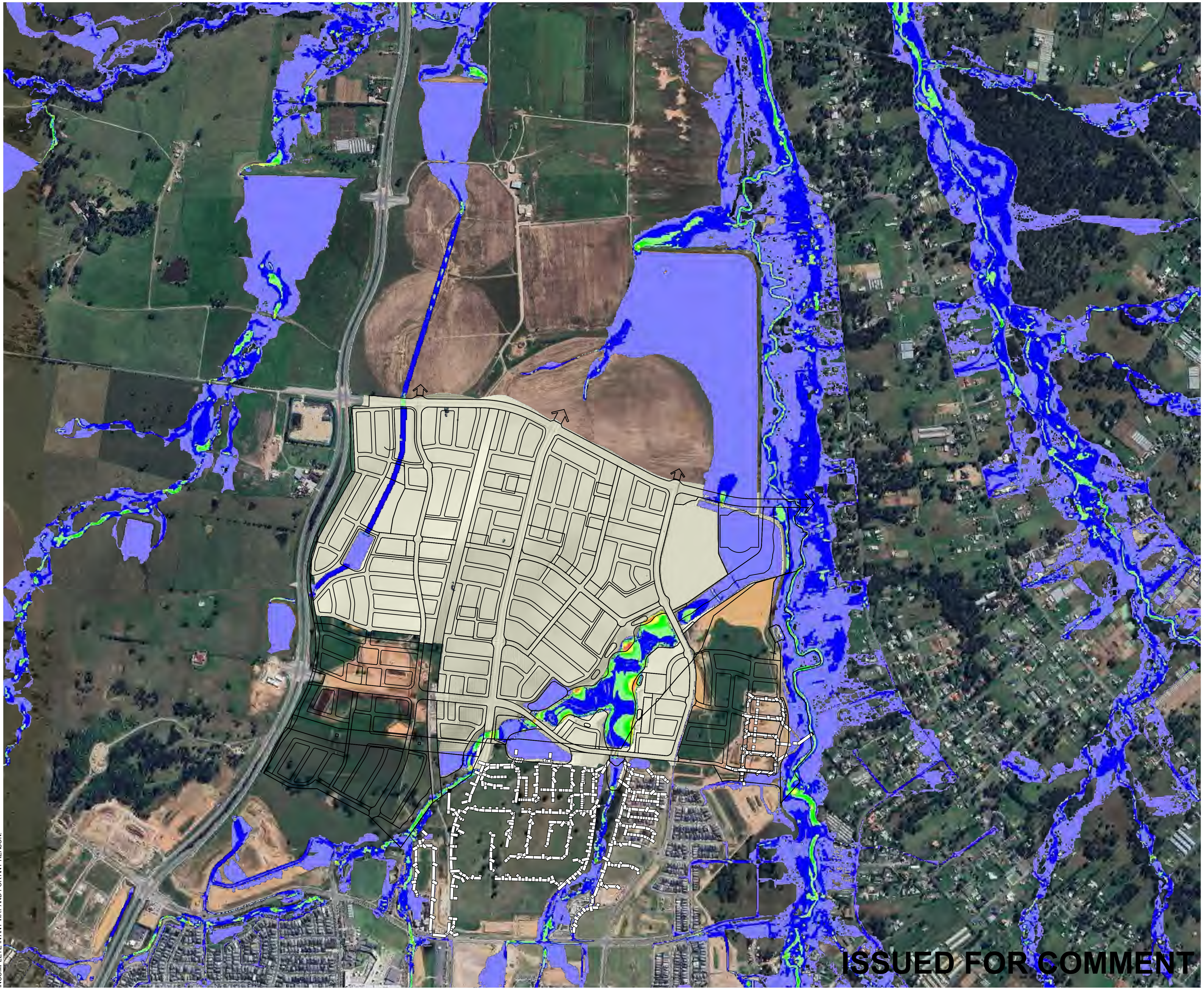
DRAWING NO: **19-000750-I-100-A-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

1% AEP

INT

FLOOD VELOCITY (m/s)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

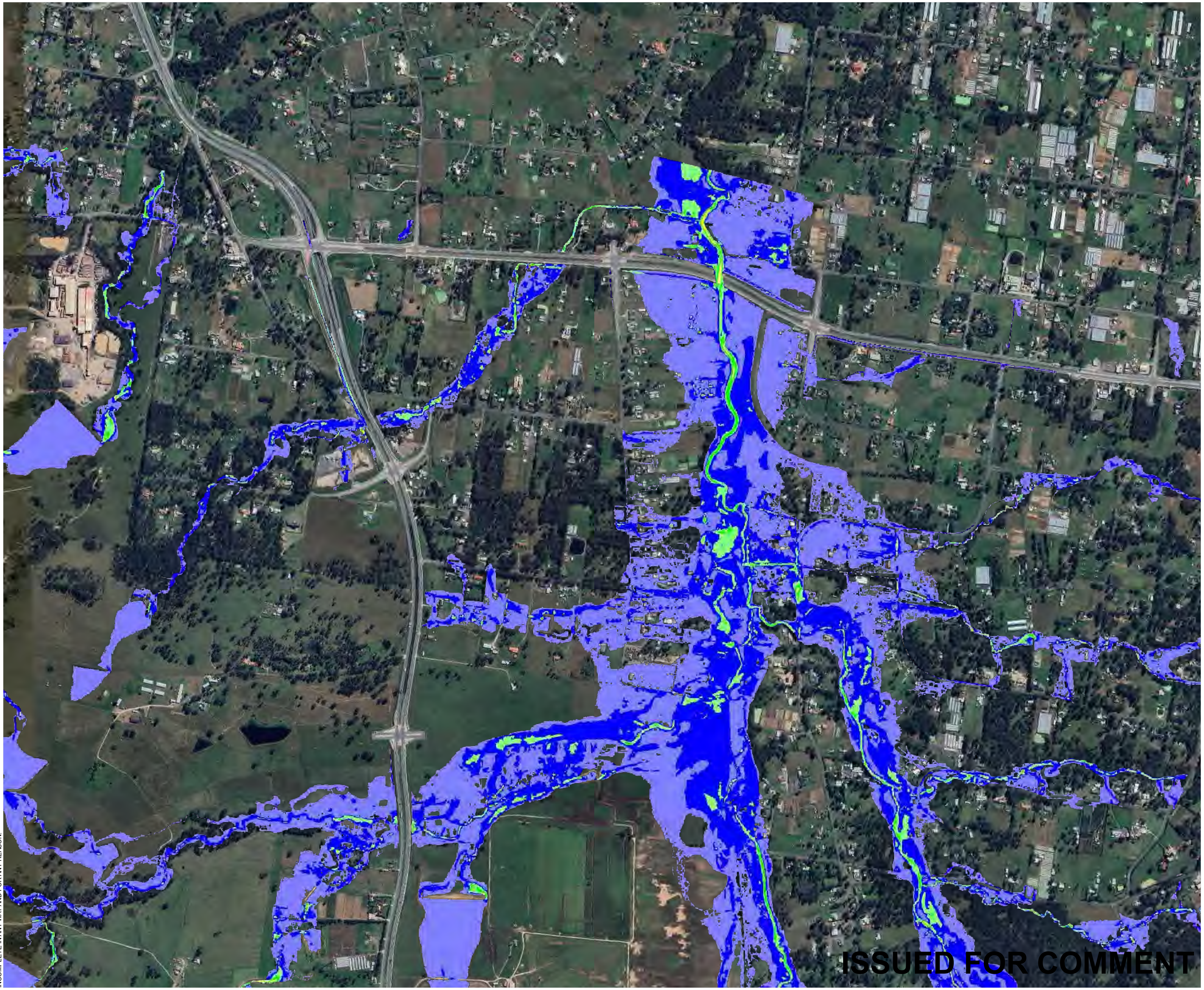
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-I-100-B-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

1% AEP

INT

FLOOD VELOCITY (m/s)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

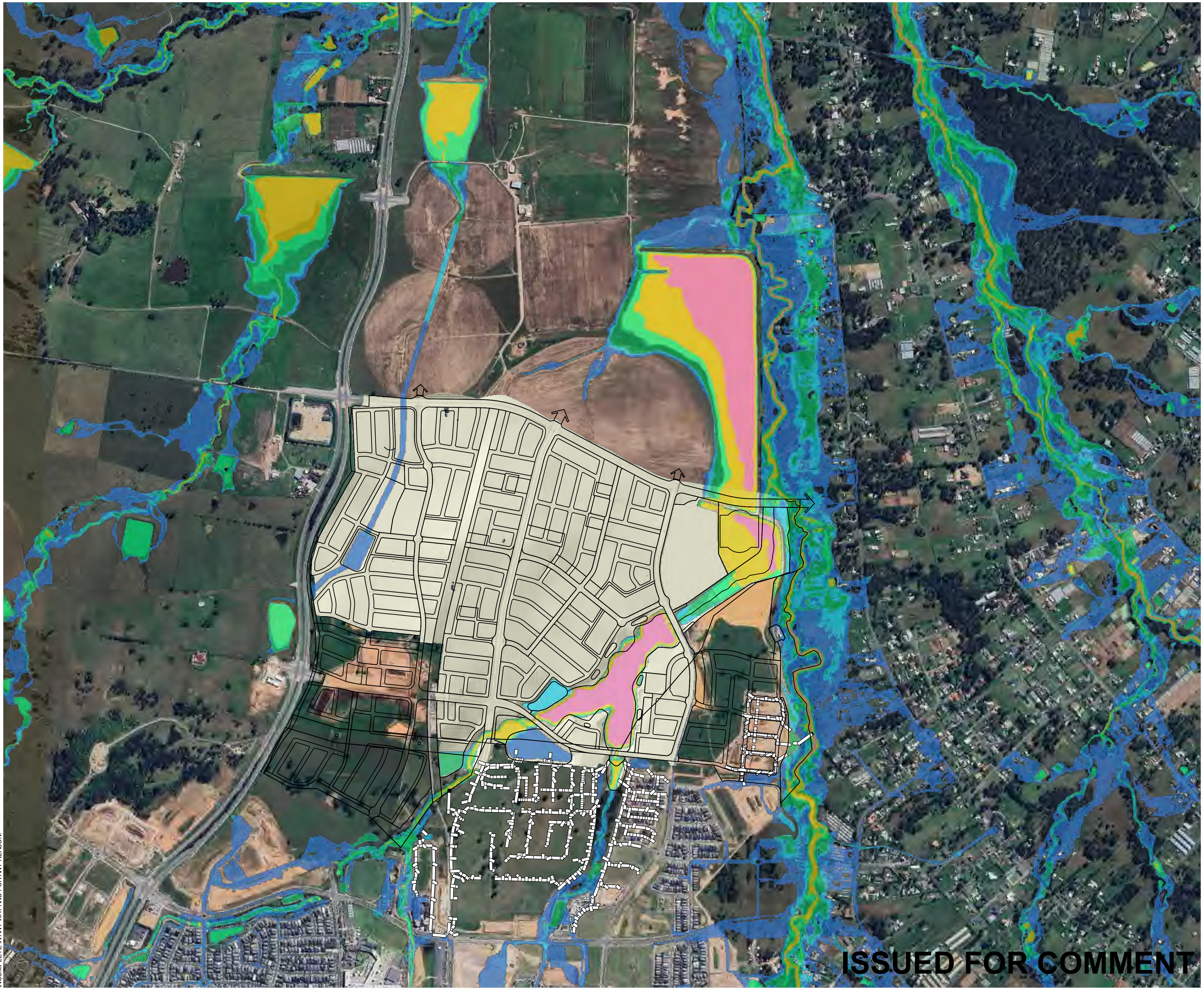
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-I-100-B-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

1% AEP

INT

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

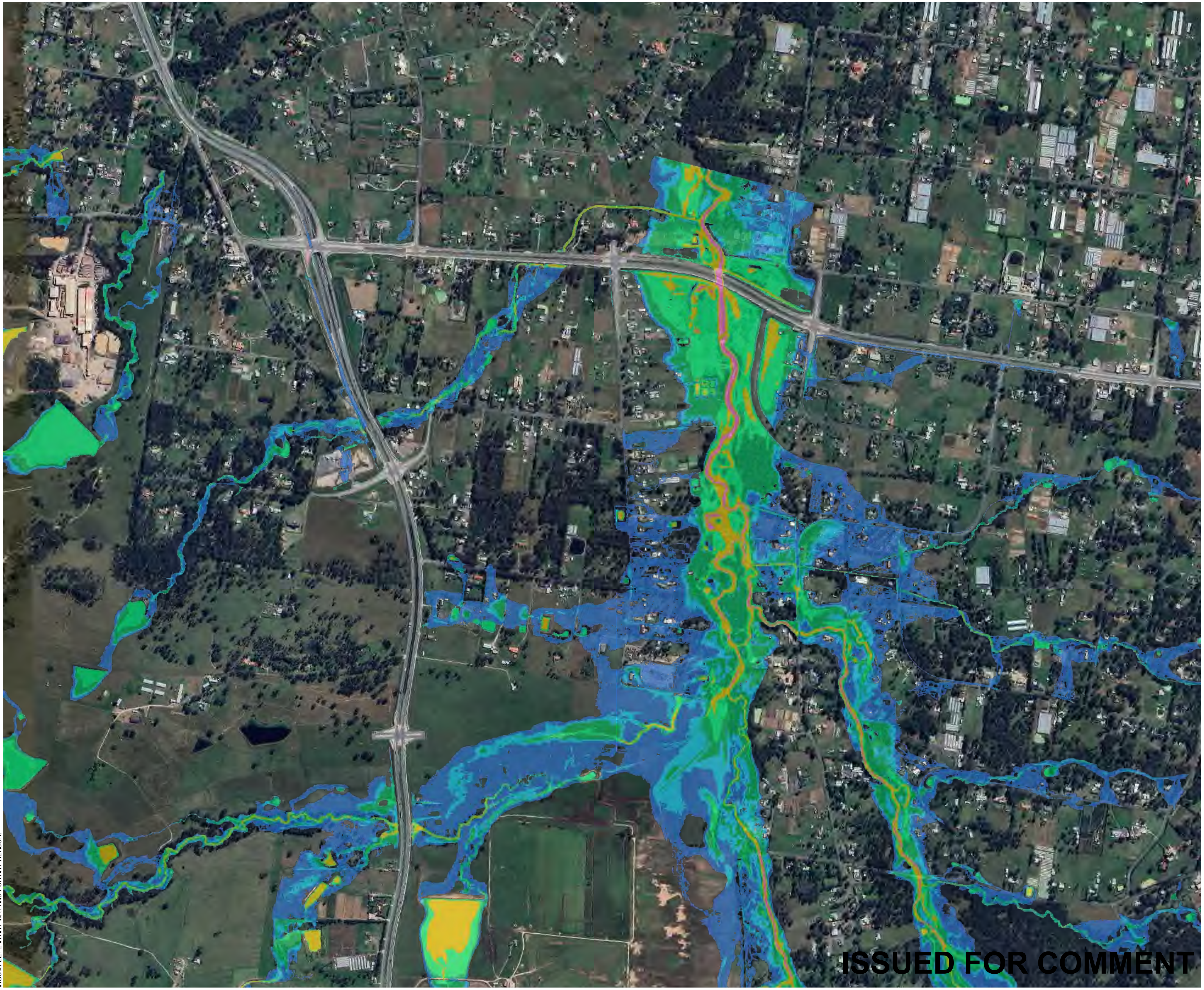
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-I-100-D-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



calibre CONSULTING

LEGEND

1% AEP

INT

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

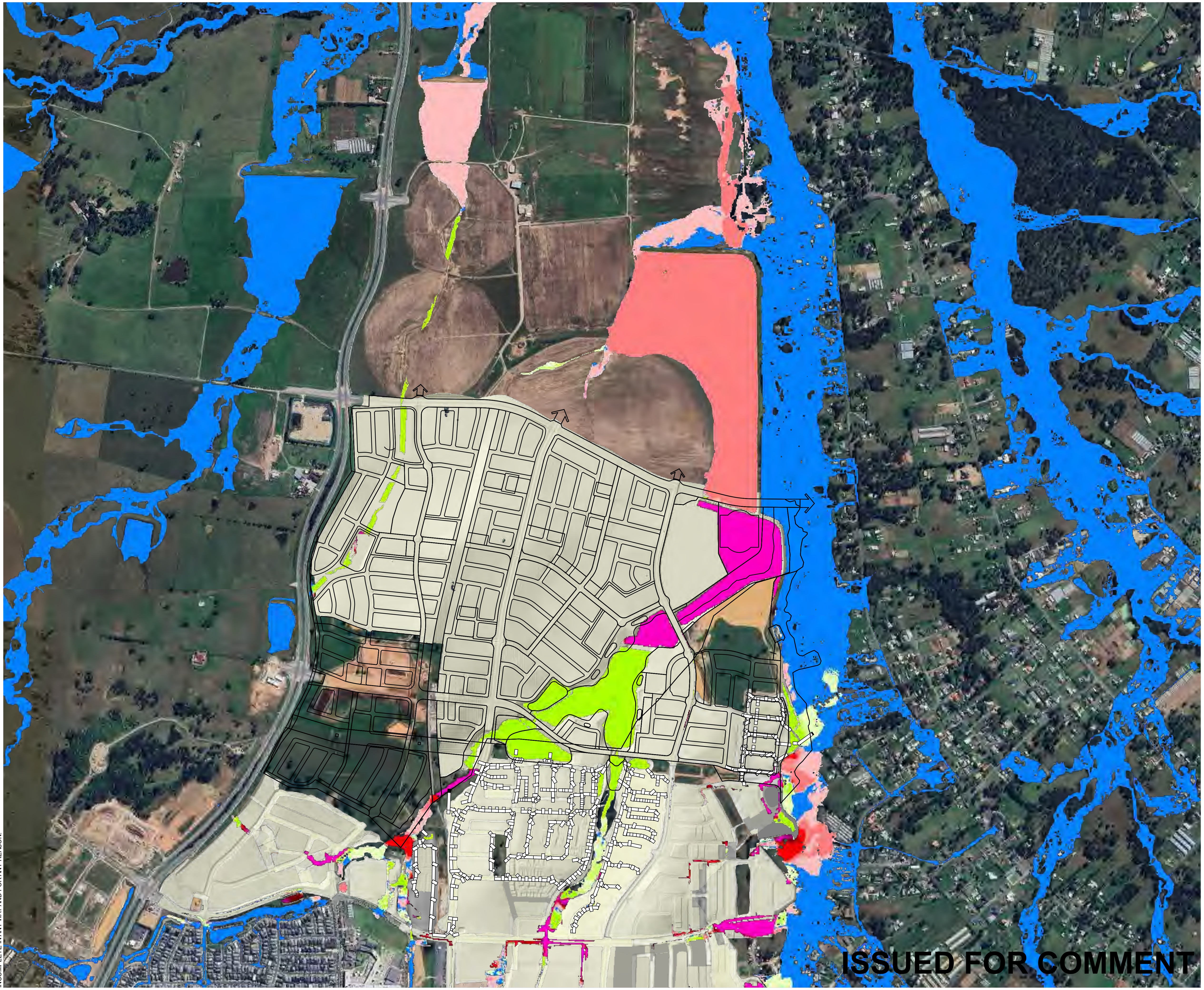
DRAWING NO: **19-000750-I-100-D-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

1% AEP

INT

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

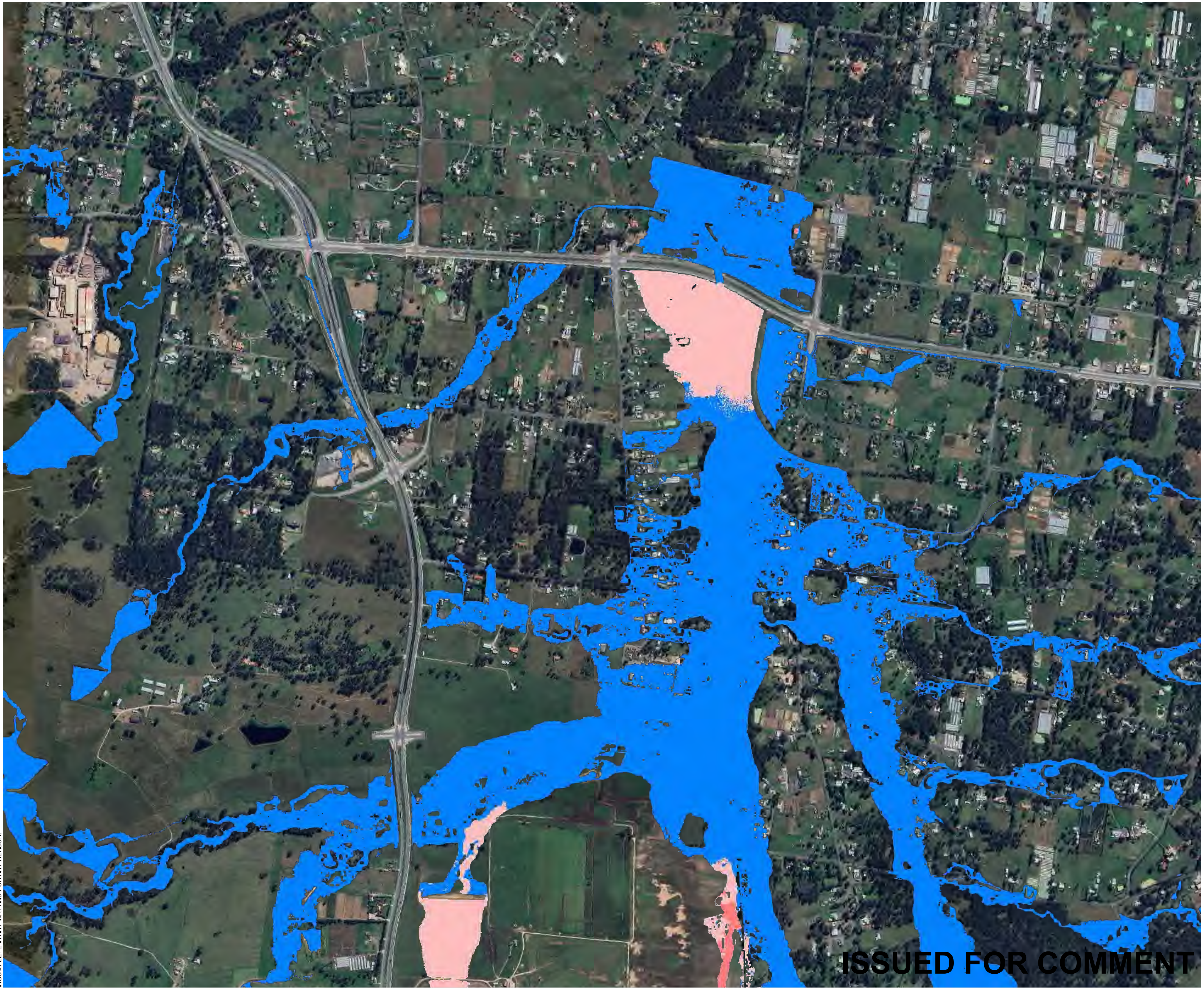
PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-I-100-E-1**
ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

1% AEP

INT

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

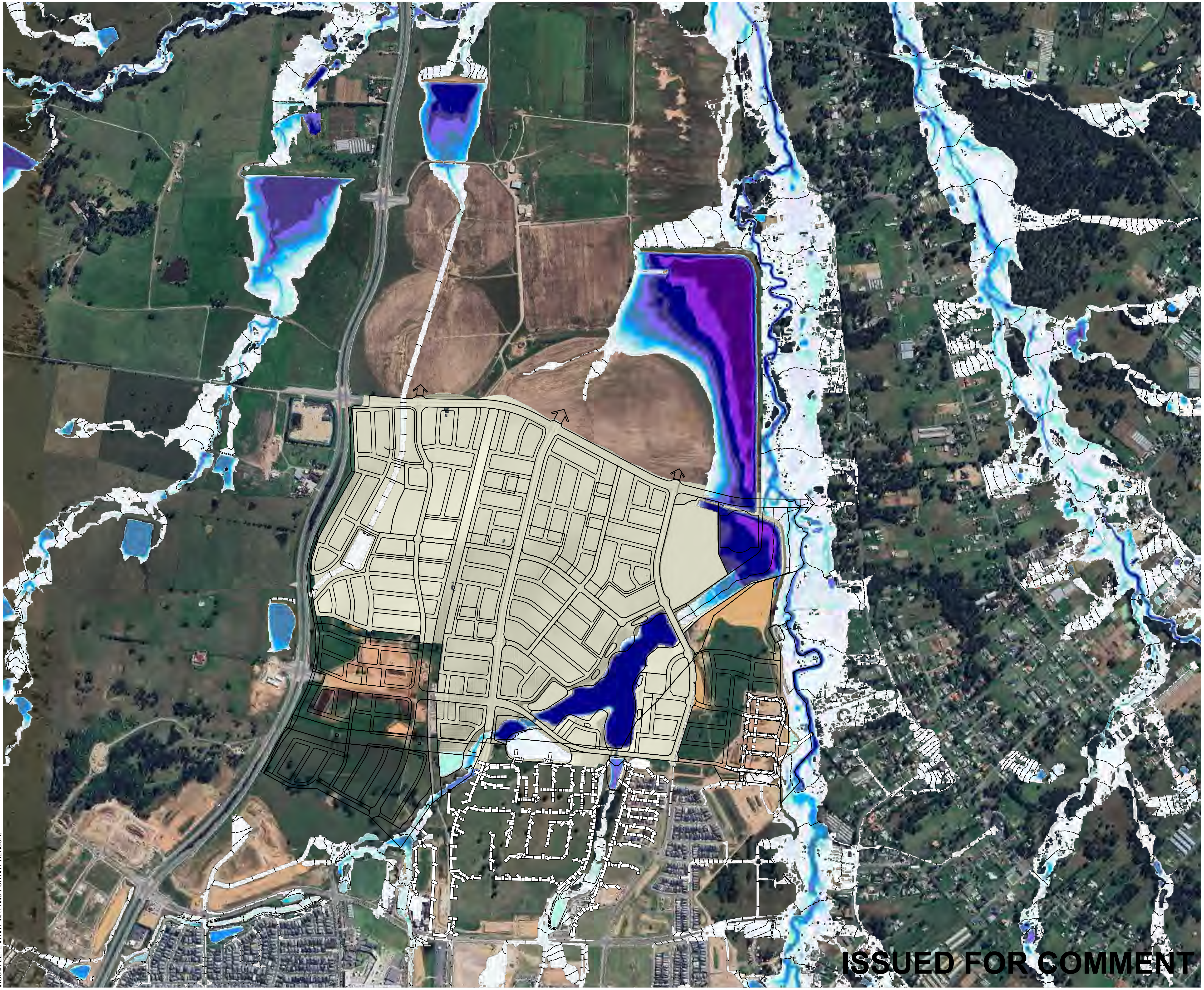
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-I-100-E-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

2% AEP

INT

FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

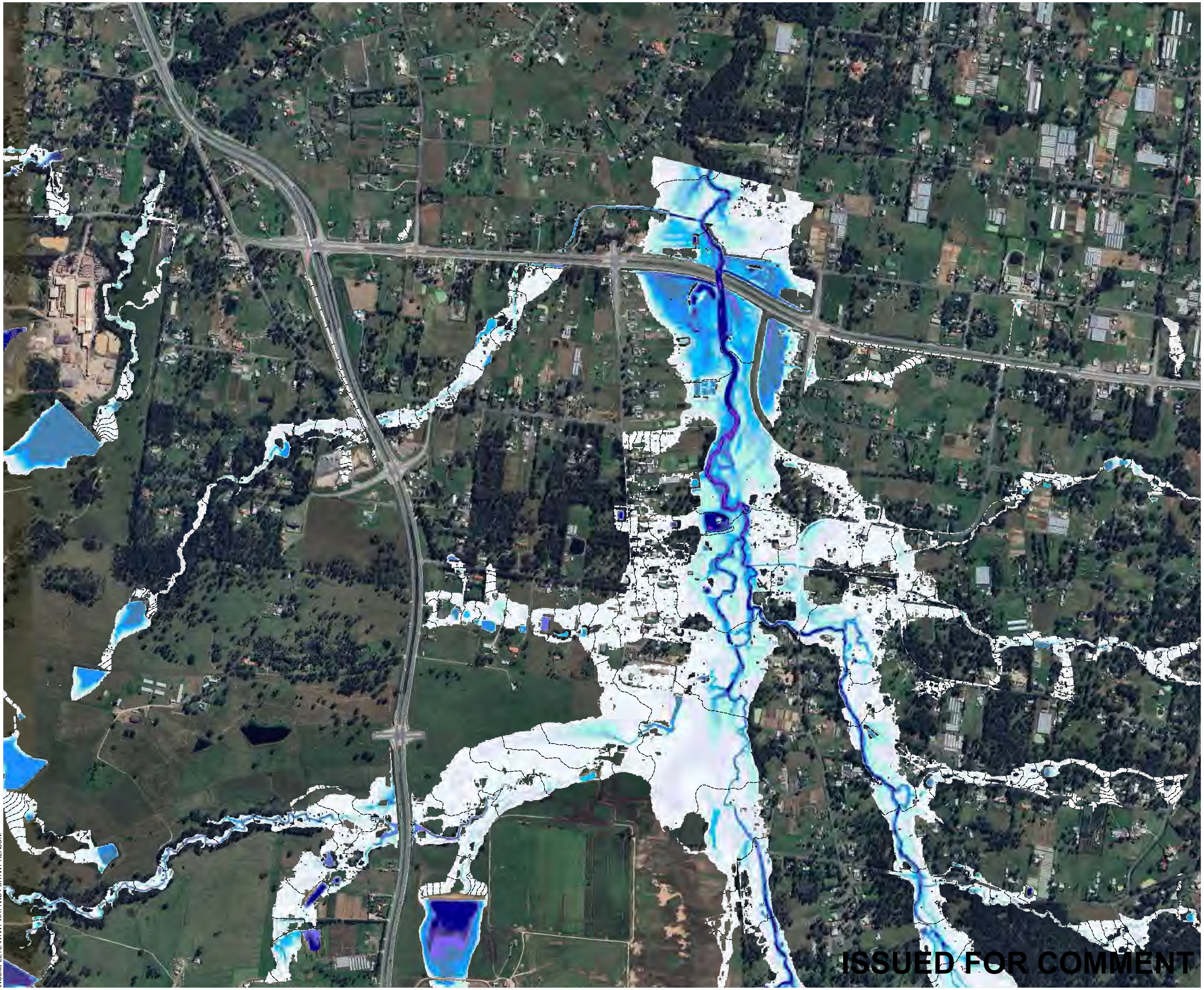
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
2% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-I-050-A-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



calibre CONSULTING

LEGEND

2% AEP

INT

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
2% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

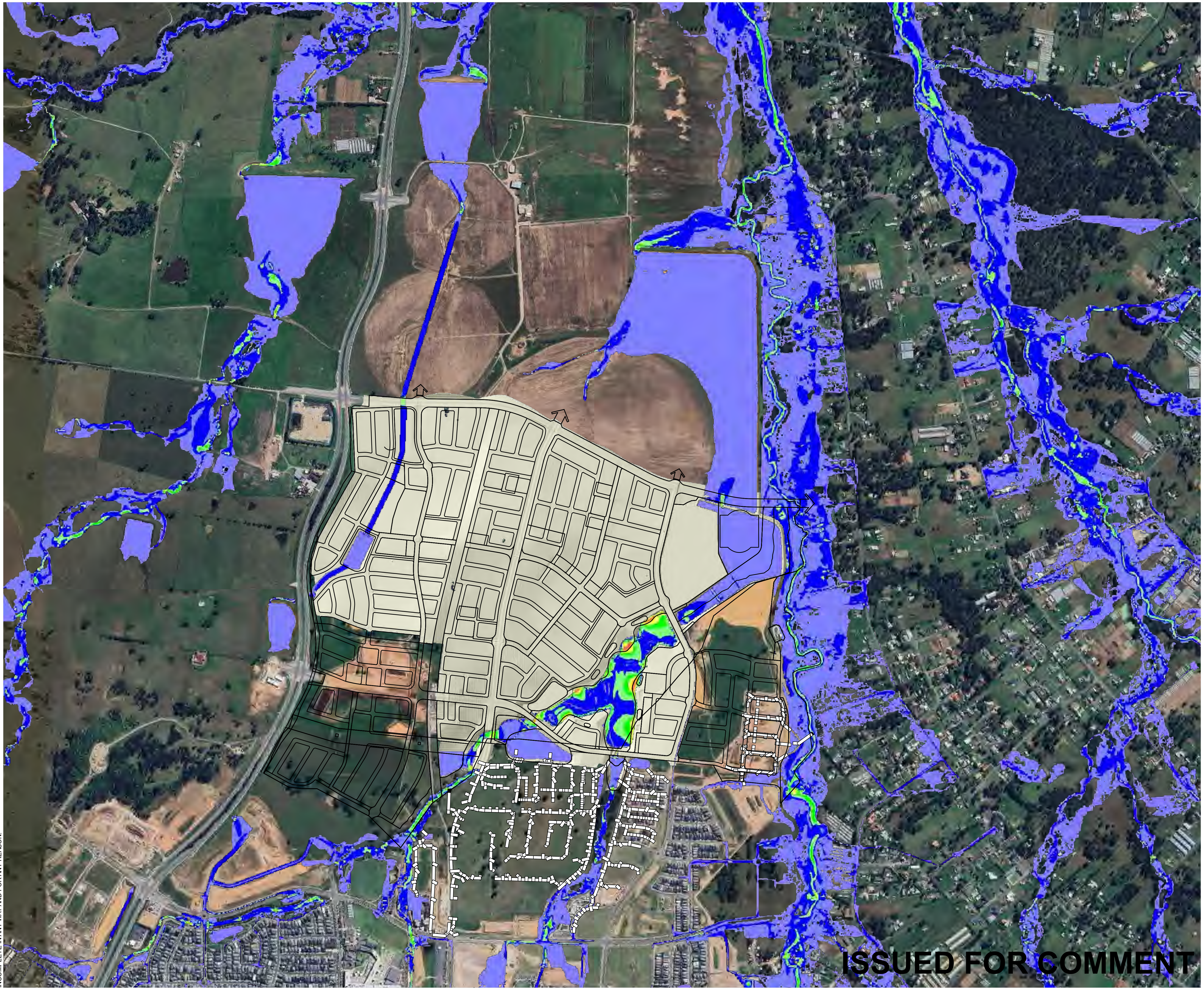
DRAWING NO: **19-000750-I-050-A-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre
CONSULTING

LEGEND

Project

- PROPOSED_INTERUM_LAYOUT
- EX MODEL 1D ELEMENTS

2% AEP

INT

FLOOD VELOCITY (m/s)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

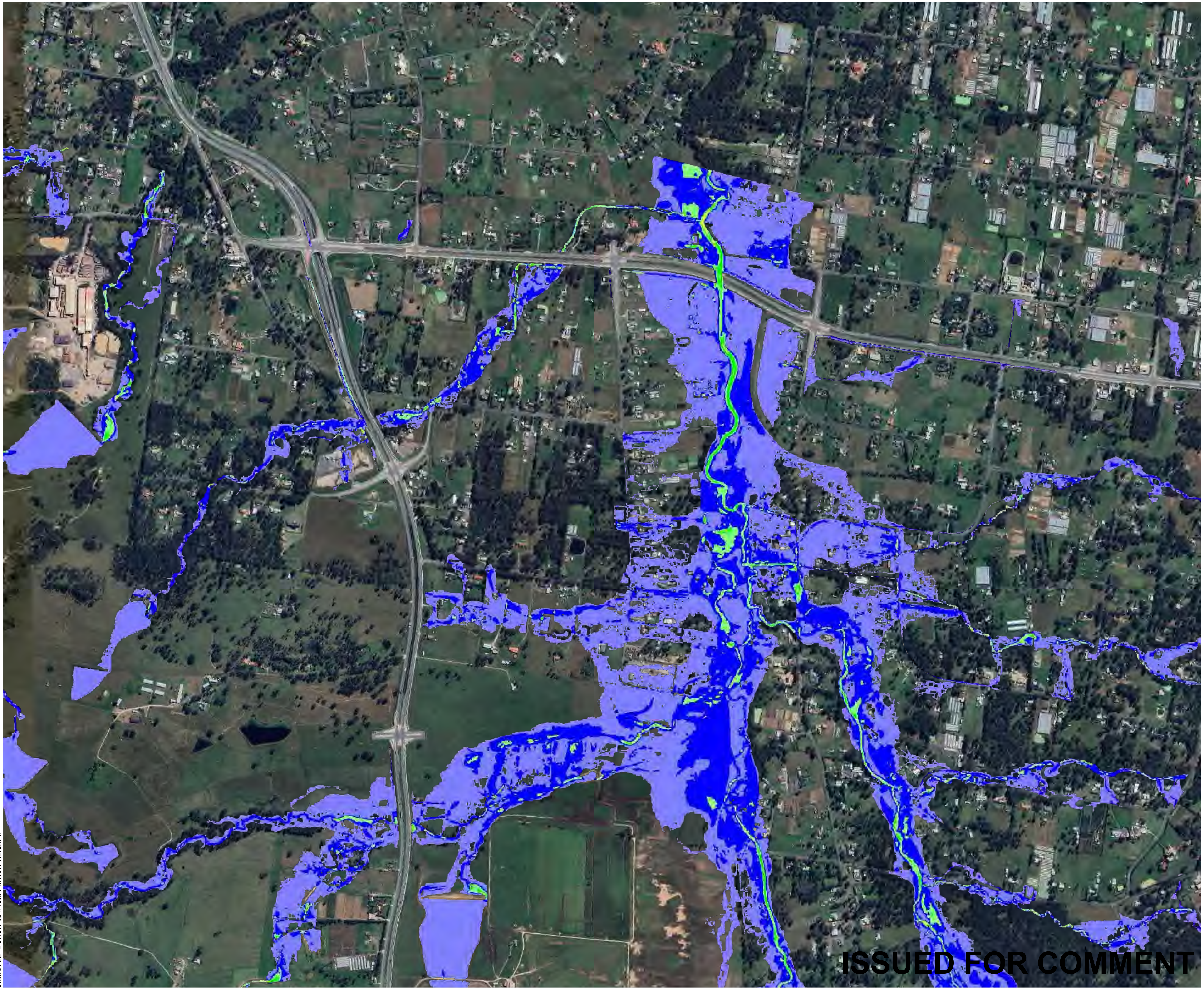
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
2% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-I-050-B-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



calibre CONSULTING

LEGEND

2% AEP

INT

FLOOD VELOCITY (m/s)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
2% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

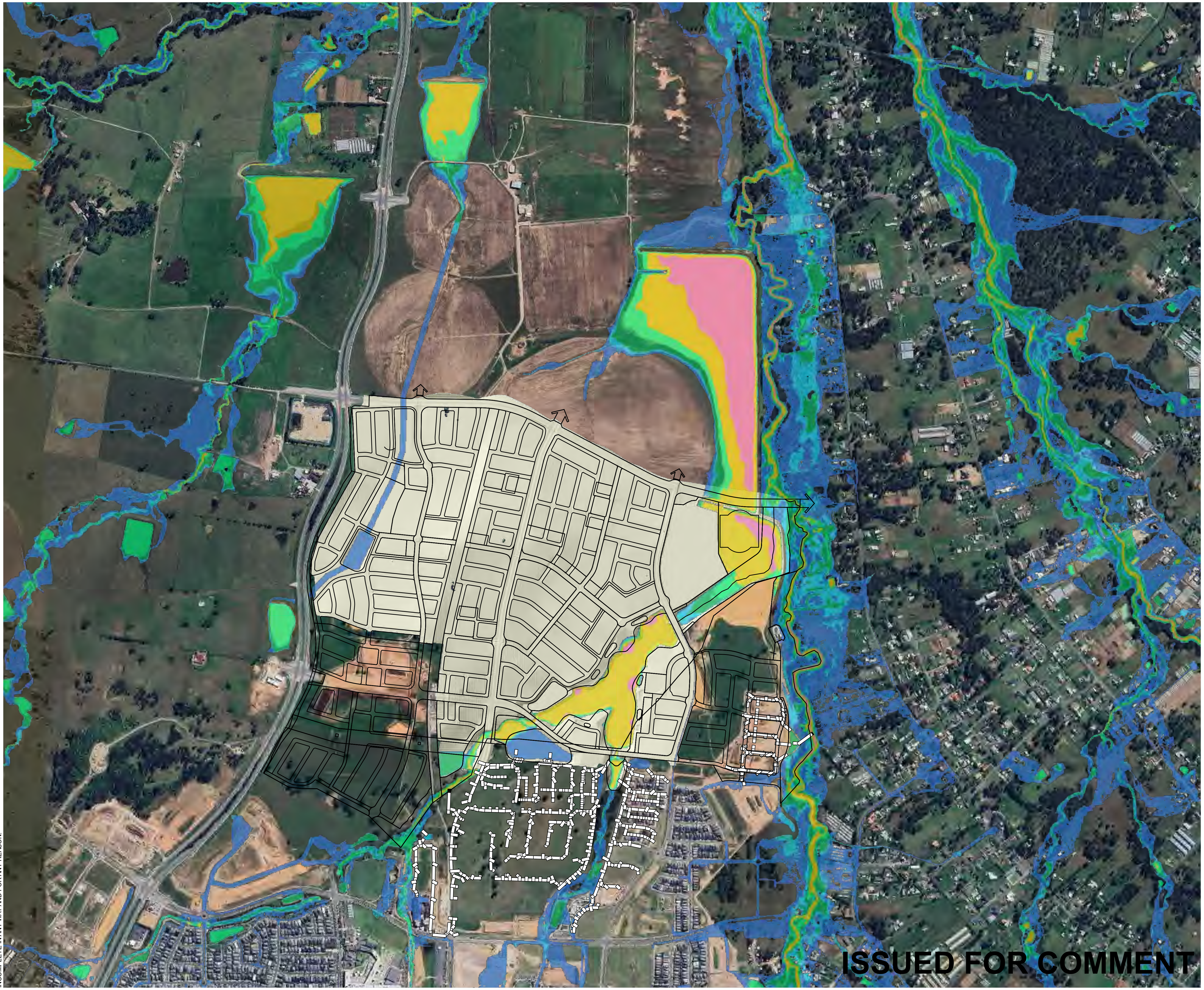
DRAWING NO: **19-000750-I-050-B-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

2% AEP

INT

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

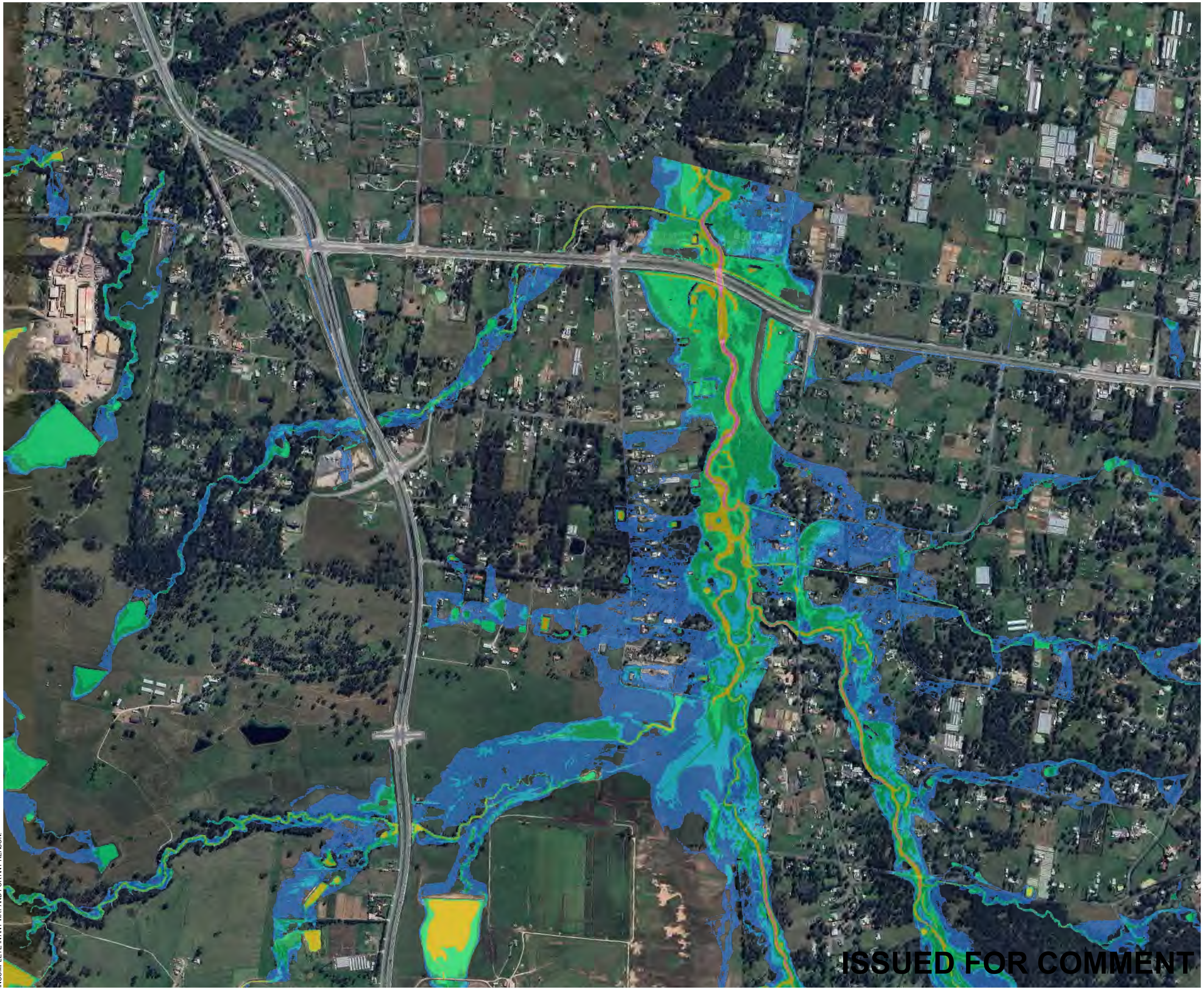
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
2% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-I-050-D-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

2% AEP

INT

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

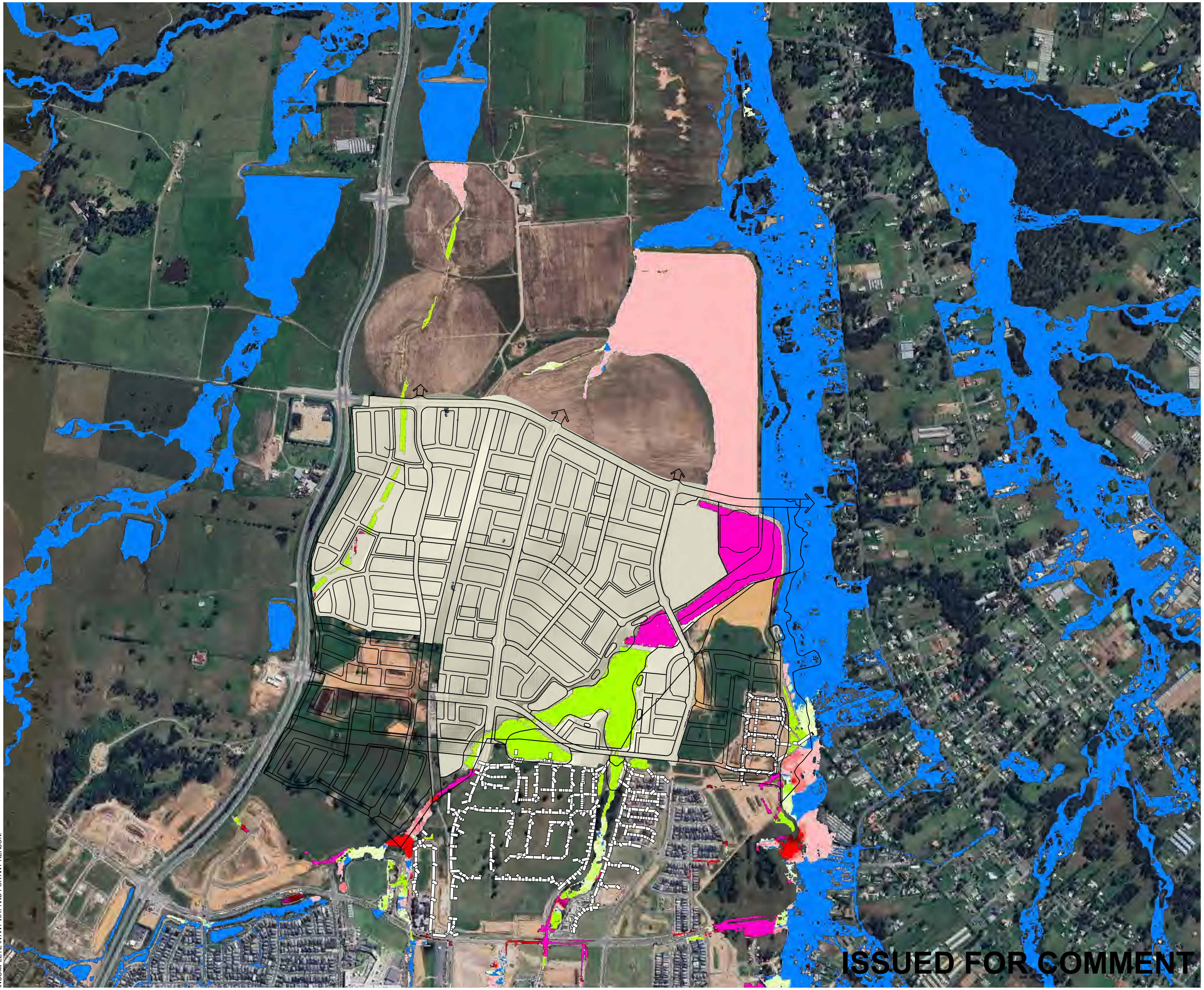
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
2% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-I-050-D-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

2% AEP

INT

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
2% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

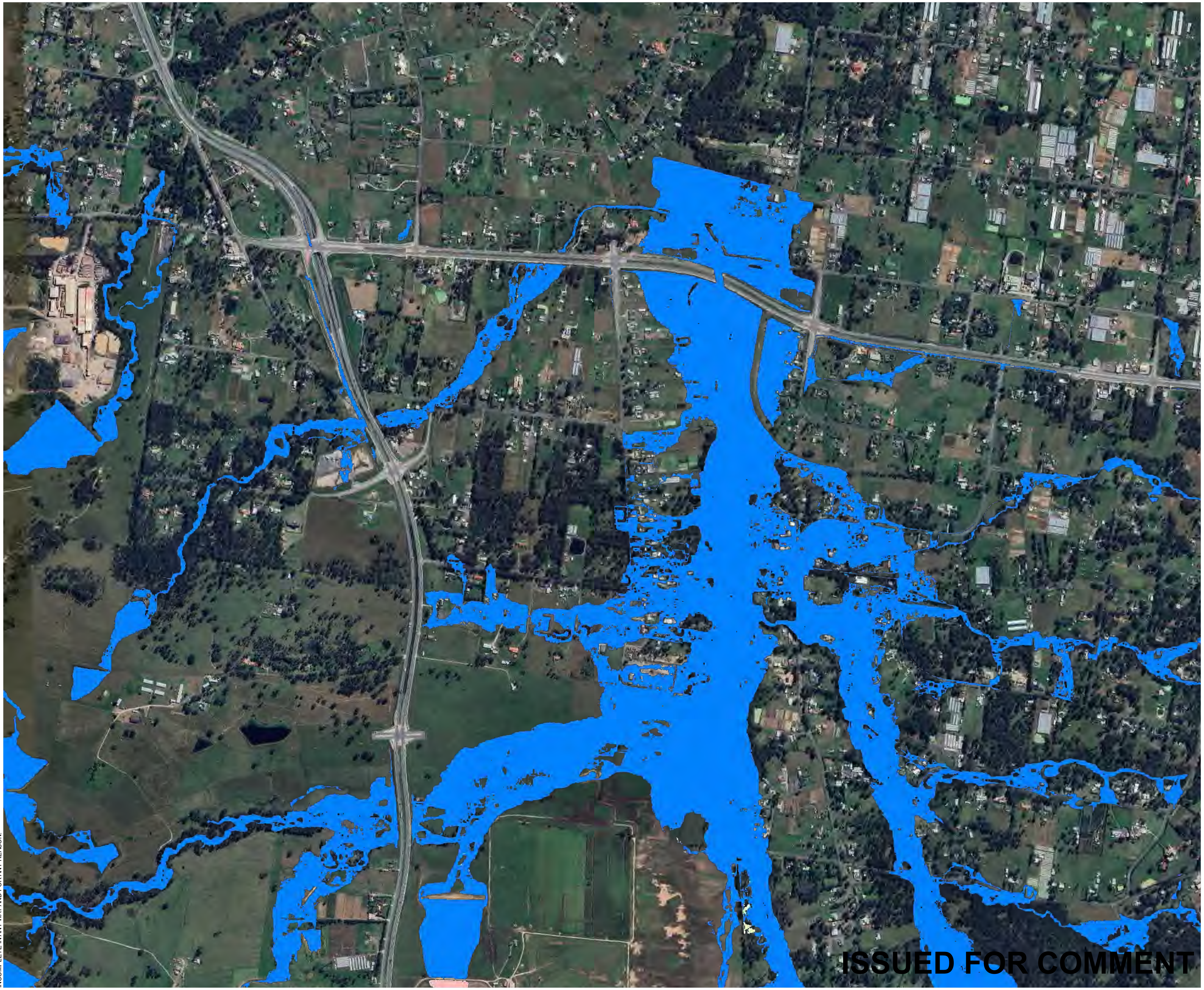
DRAWING NO: **19-000750-I-050-E-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

2% AEP

INT

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

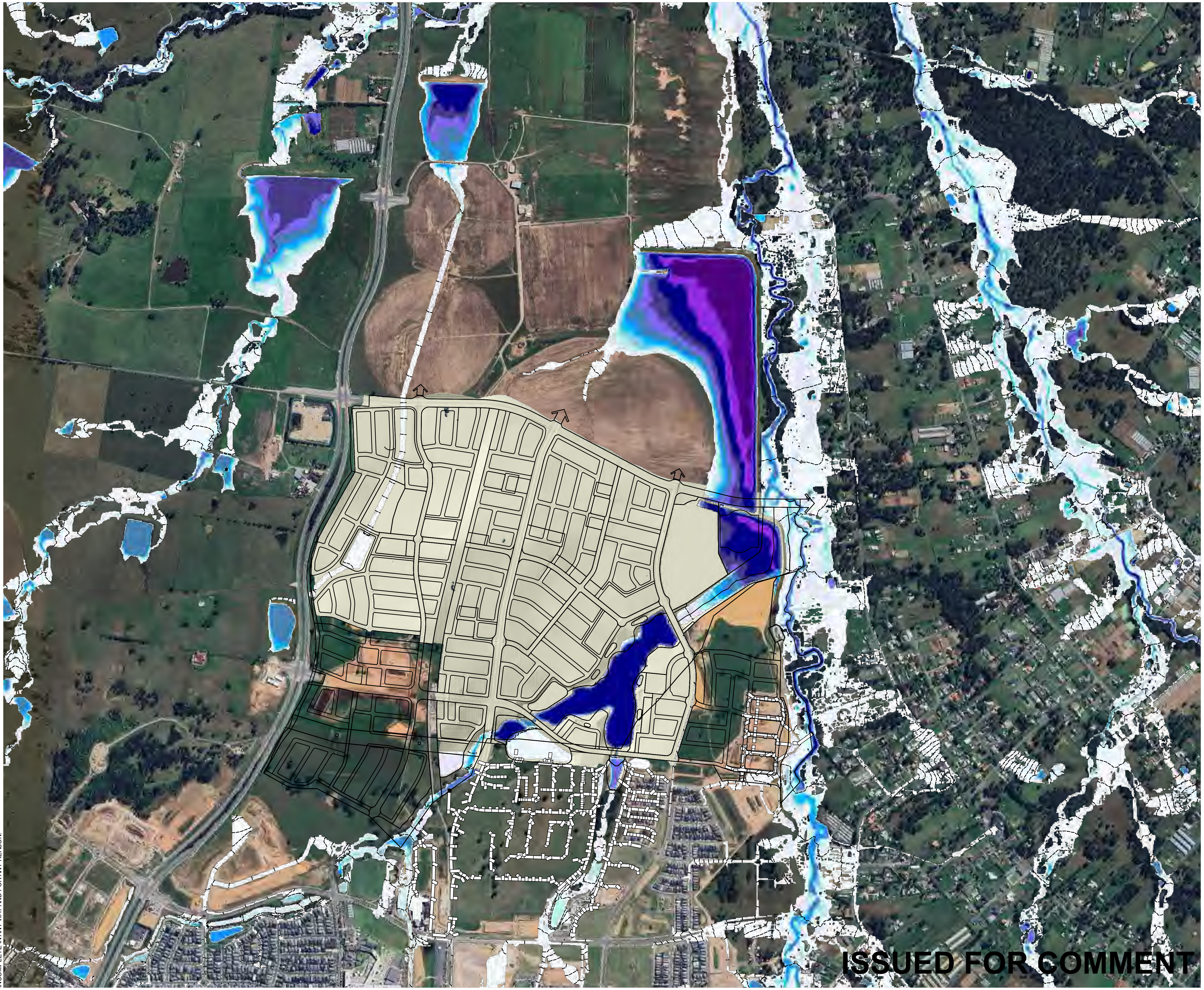
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
2% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-I-050-E-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

5% AEP

INT

FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
5% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

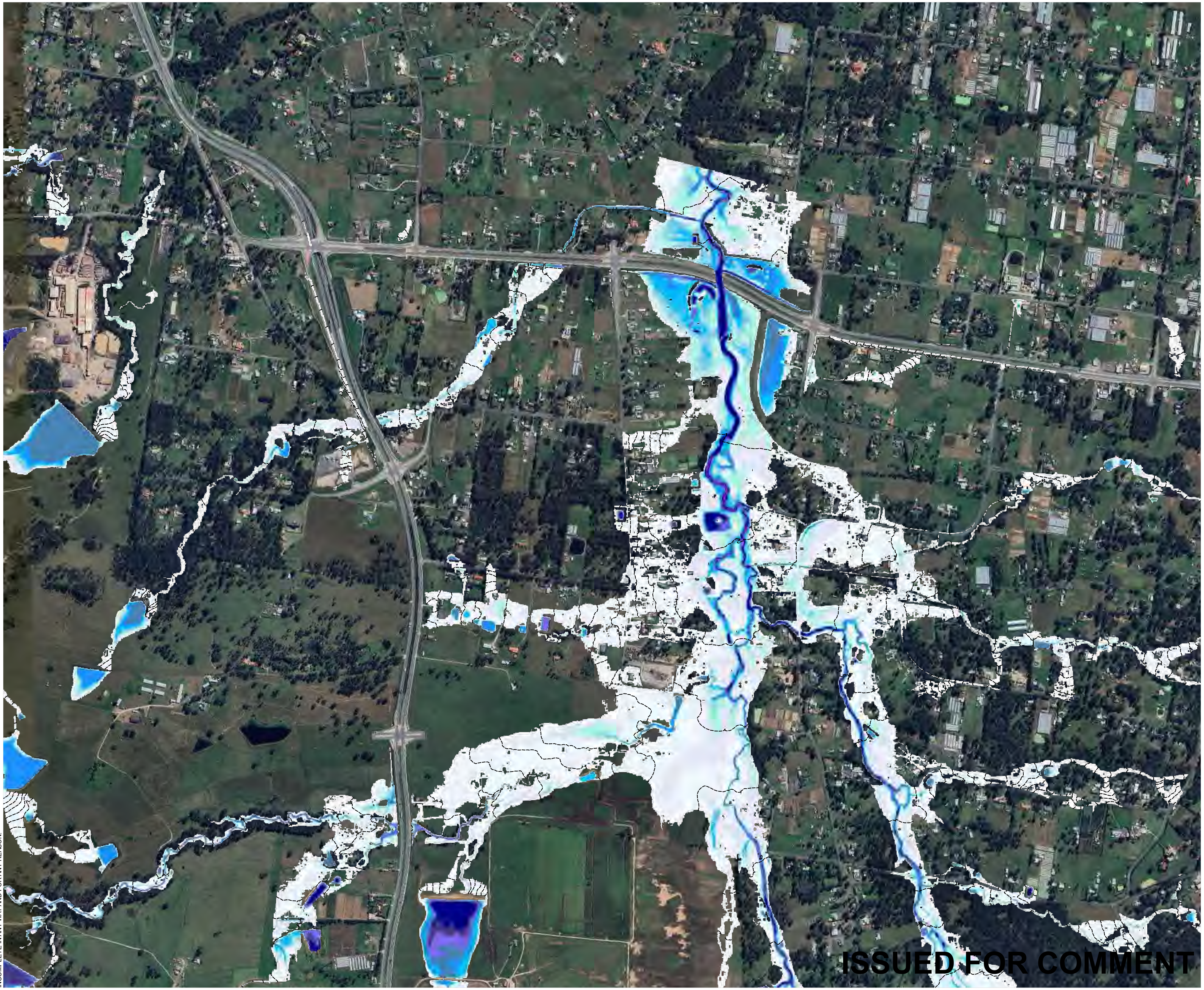
DRAWING NO: **19-000750-I-020-A-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



calibre CONSULTING

LEGEND

5% AEP

INT

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
5% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

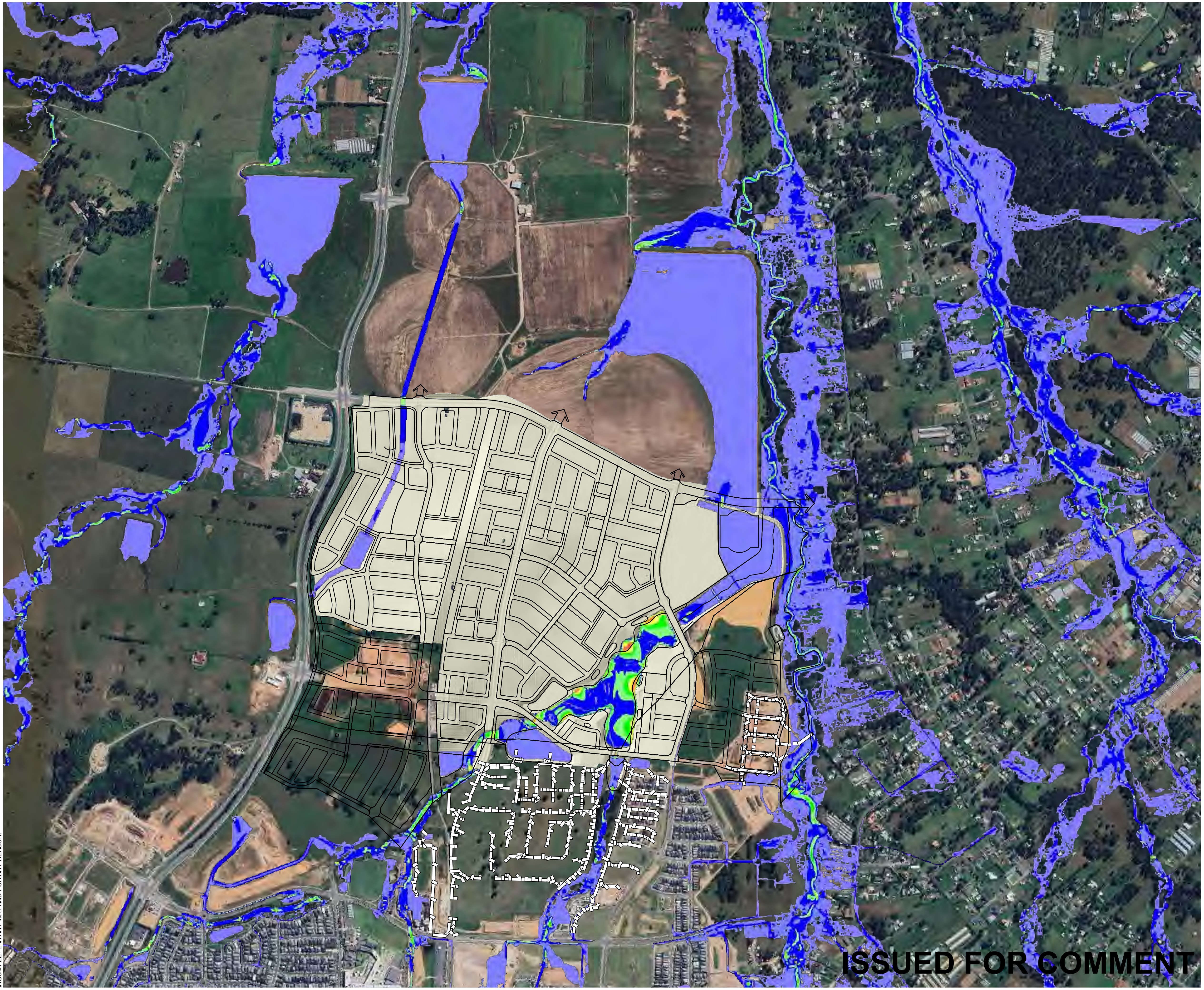
DRAWING NO: **19-000750-I-020-A-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

5% AEP

INT

FLOOD VELOCITY (m/s)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

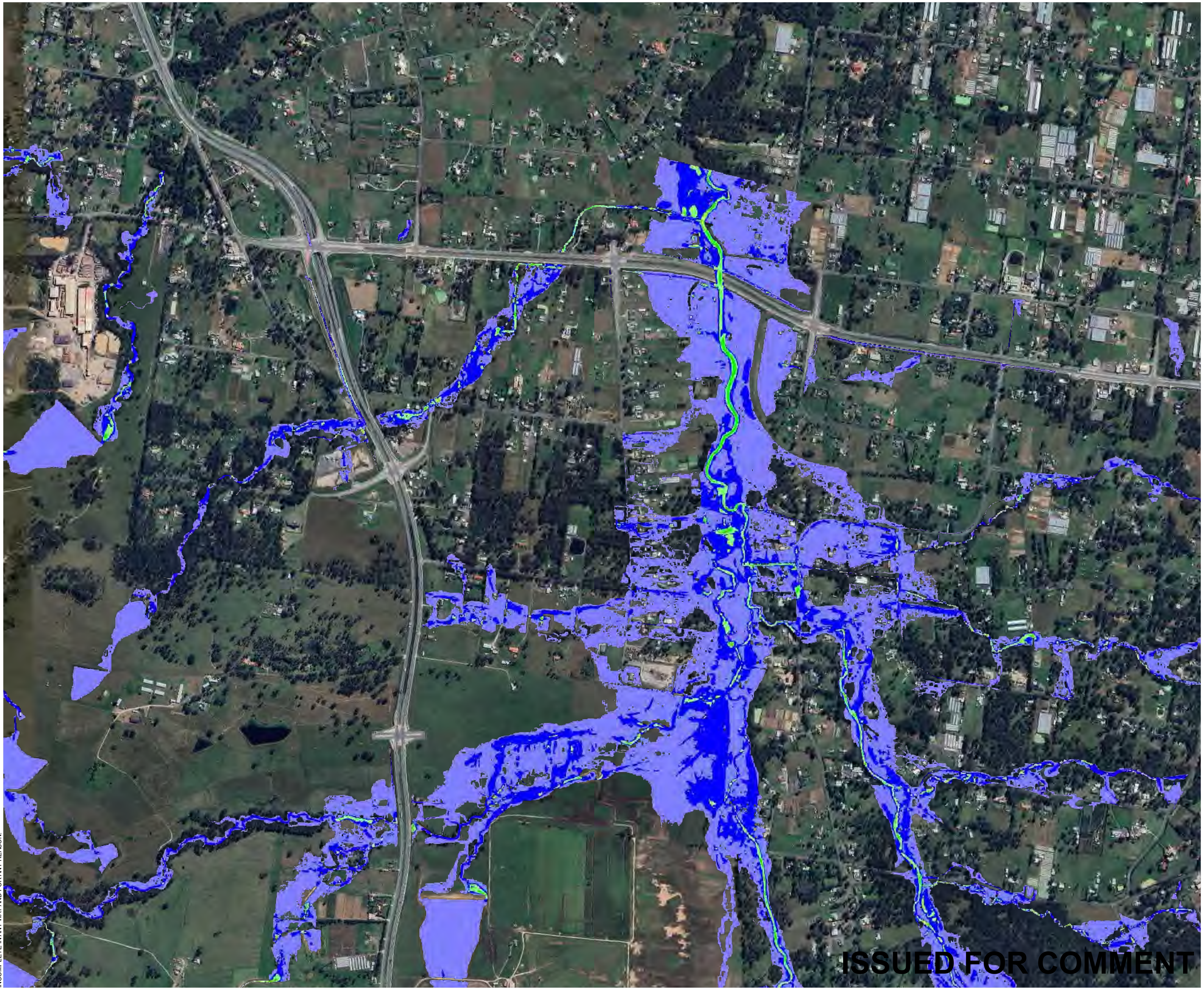
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
5% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-I-020-B-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

5% AEP

INT

FLOOD VELOCITY (m/s)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

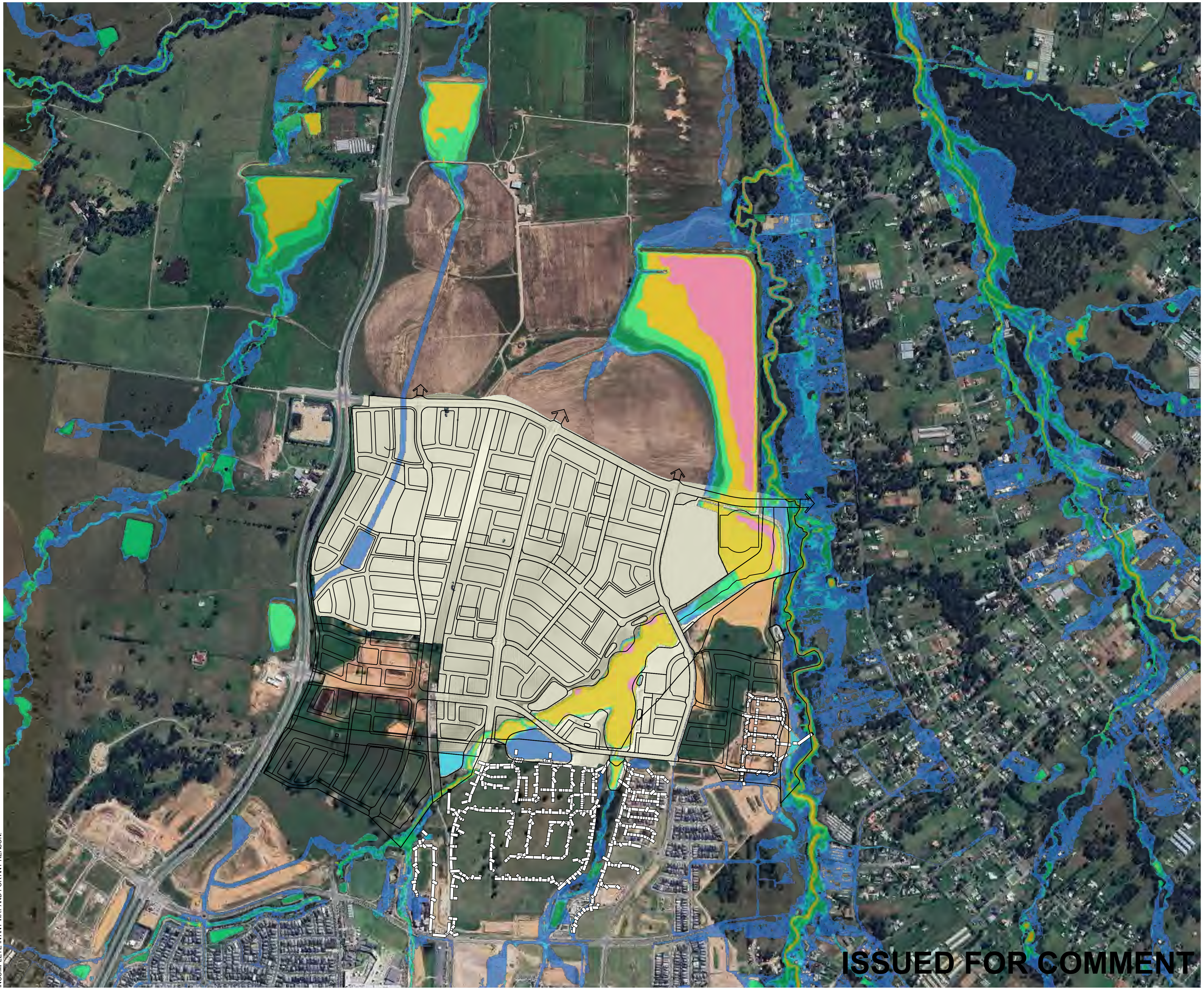
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
5% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-I-020-B-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

5% AEP

INT

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
5% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-I-020-D-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
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C				
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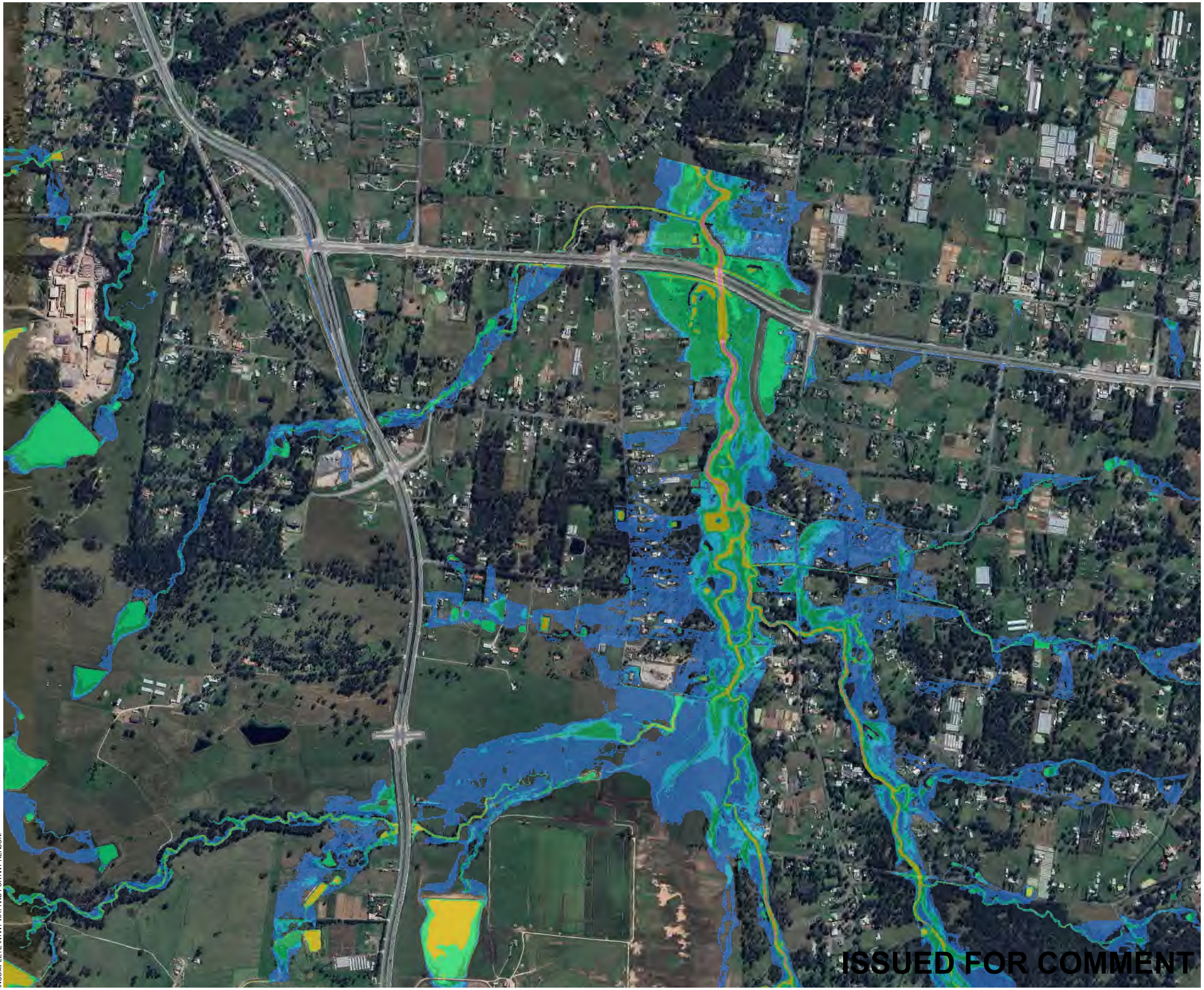
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

5% AEP

INT

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

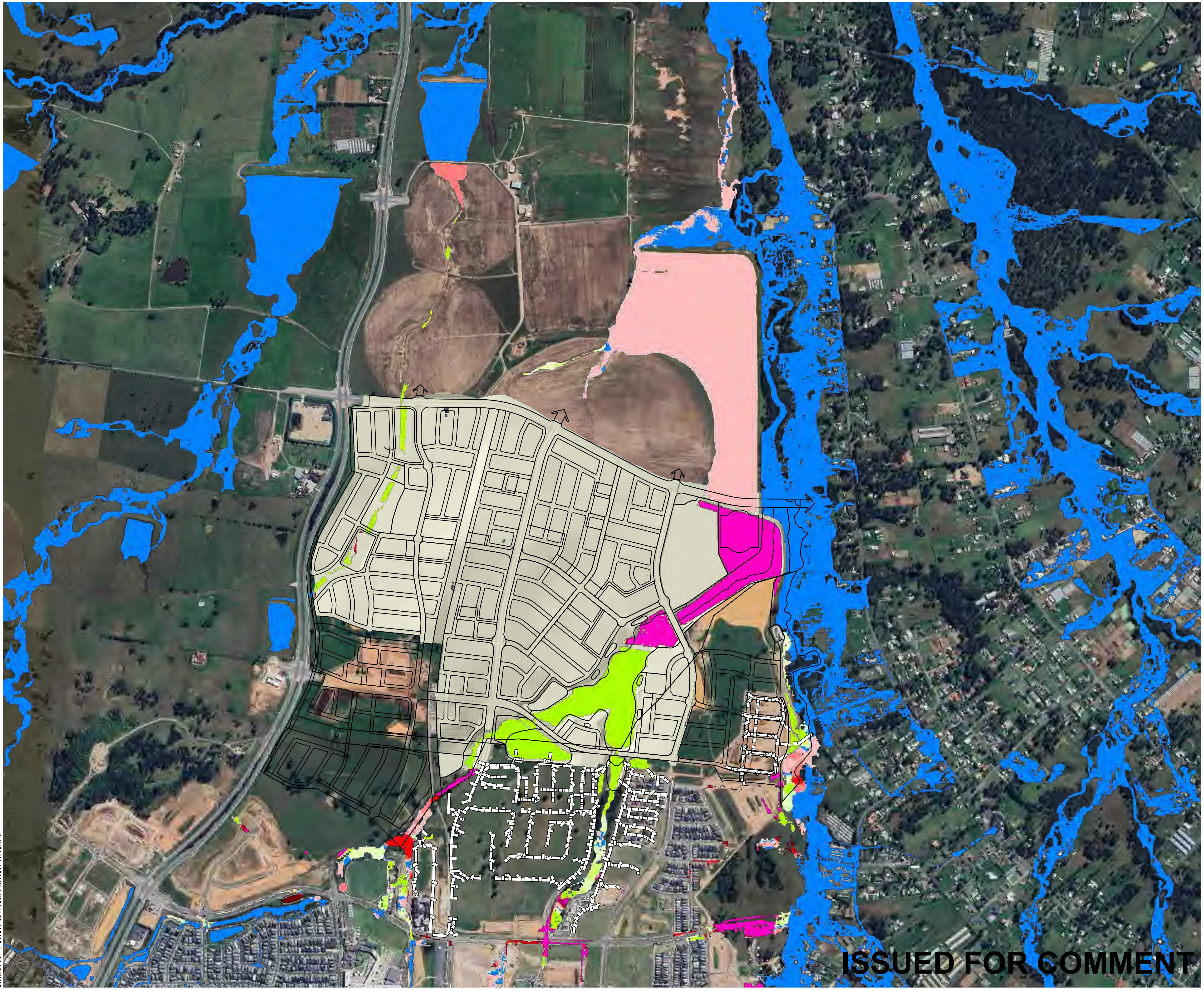
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
5% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-I-020-D-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

5% AEP

INT

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

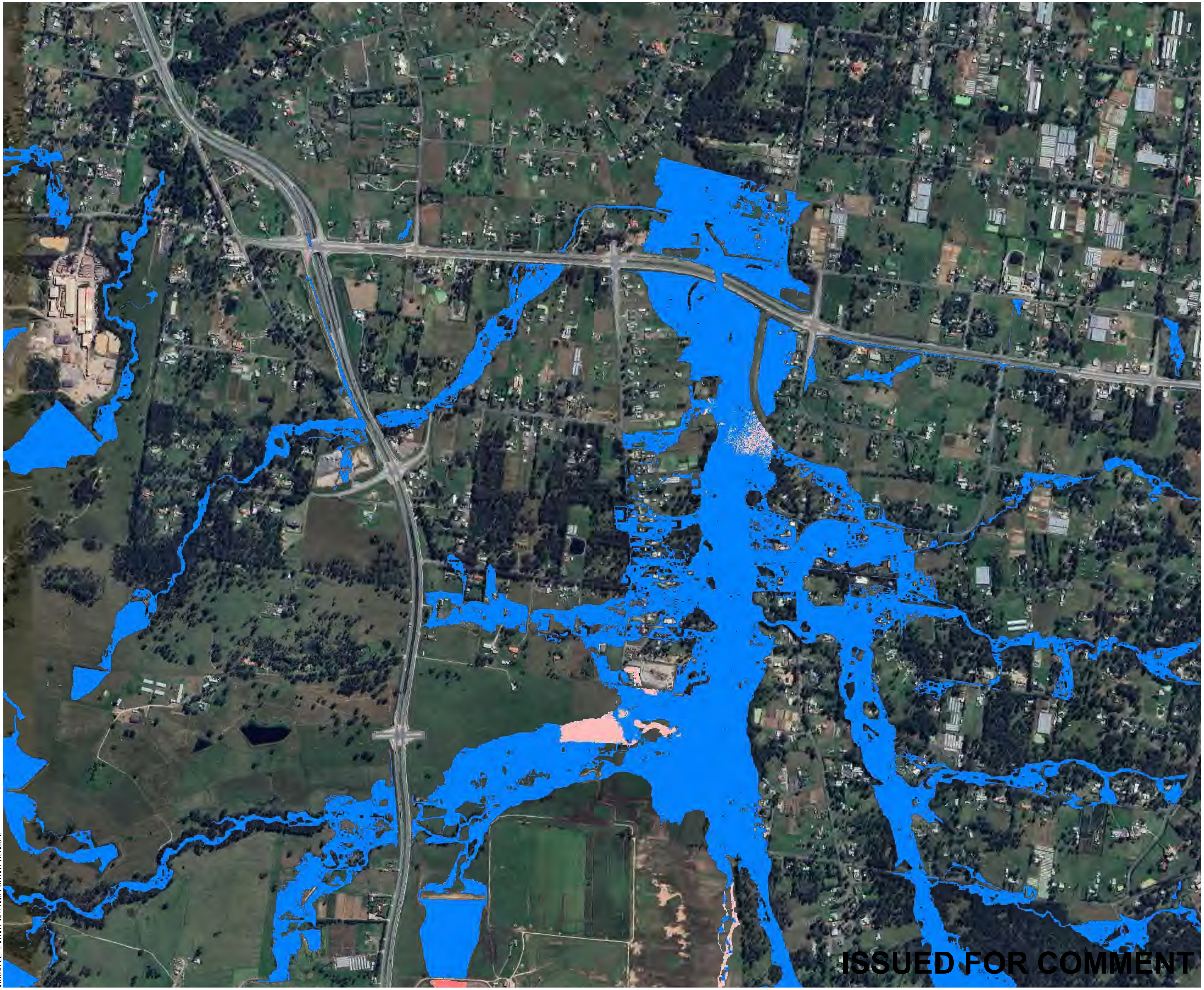
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
5% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-I-020-E-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

5% AEP

INT

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

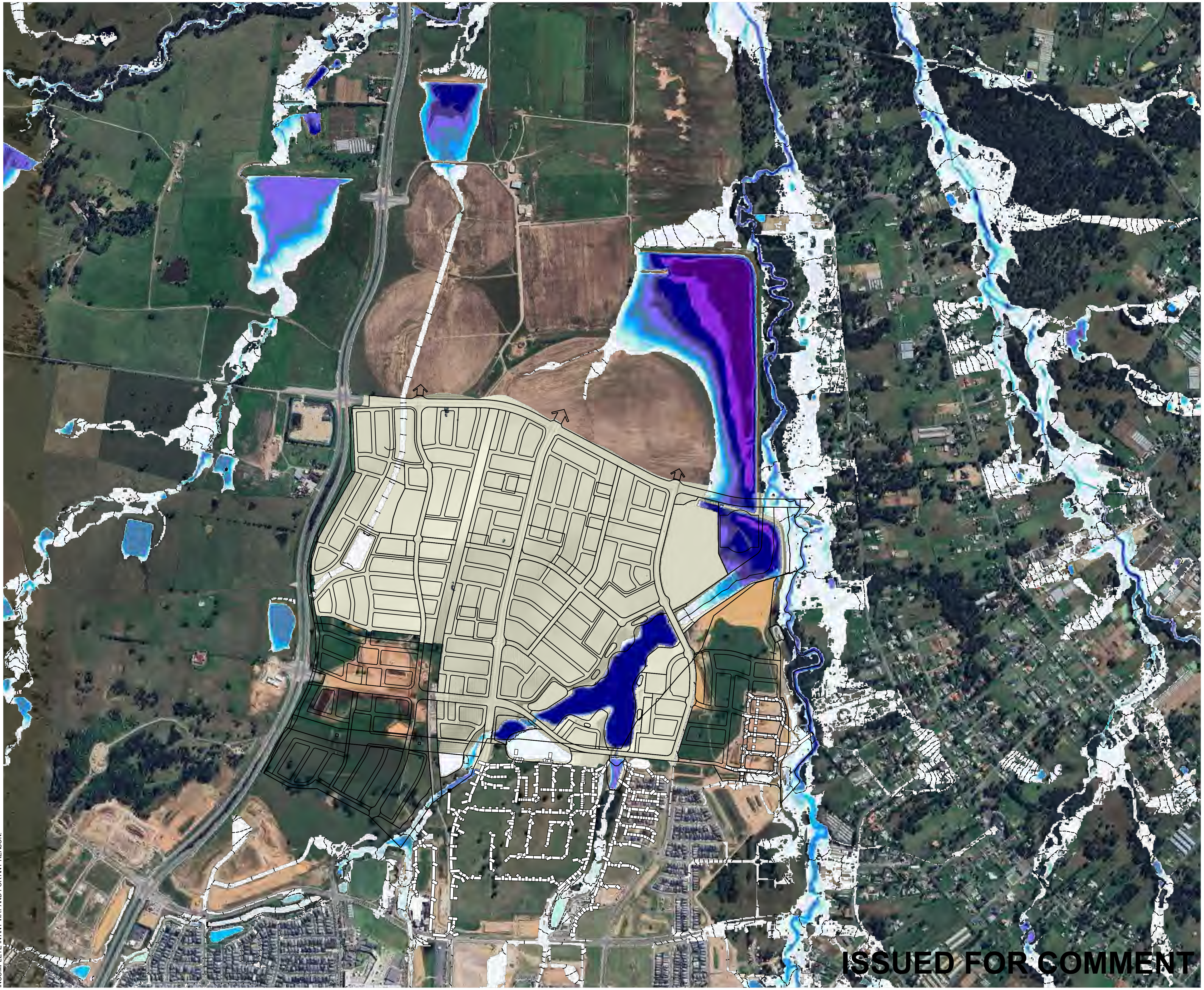
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
5% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-I-020-E-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

10% AEP

INT

FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

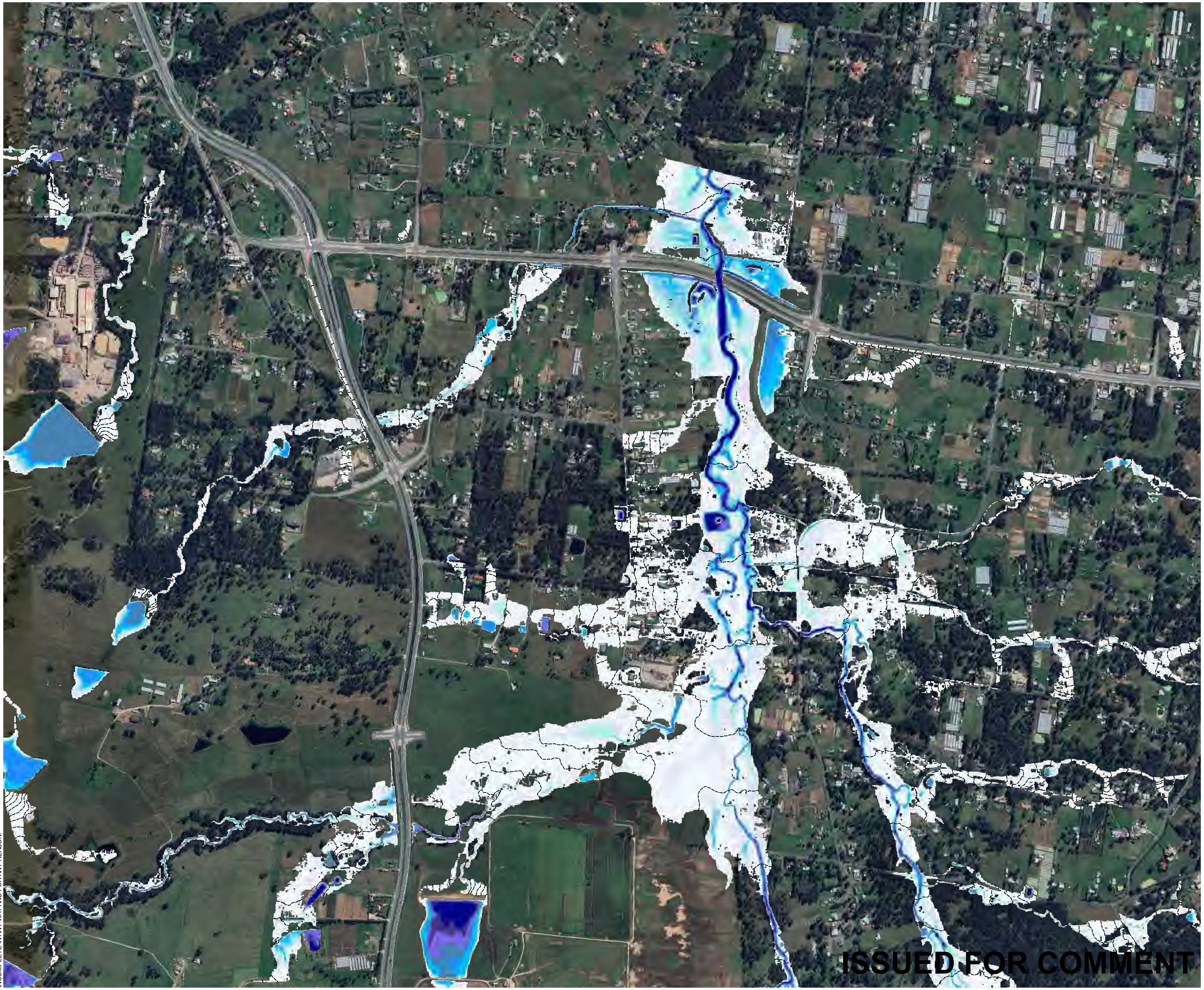
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
10% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-I-010-A-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

10% AEP

INT

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

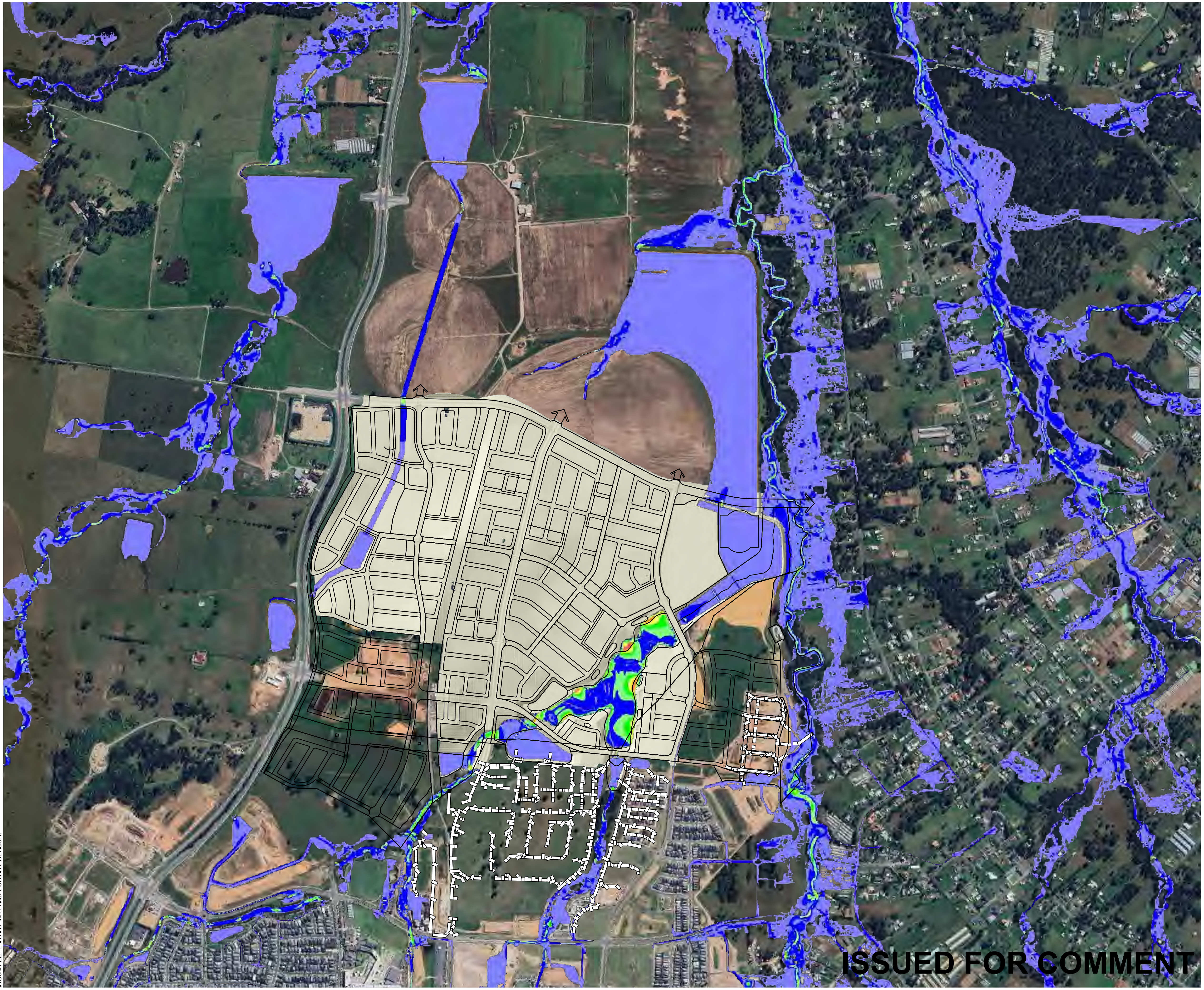
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
10% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-I-010-A-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

10% AEP

INT

FLOOD VELOCITY (m/s)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

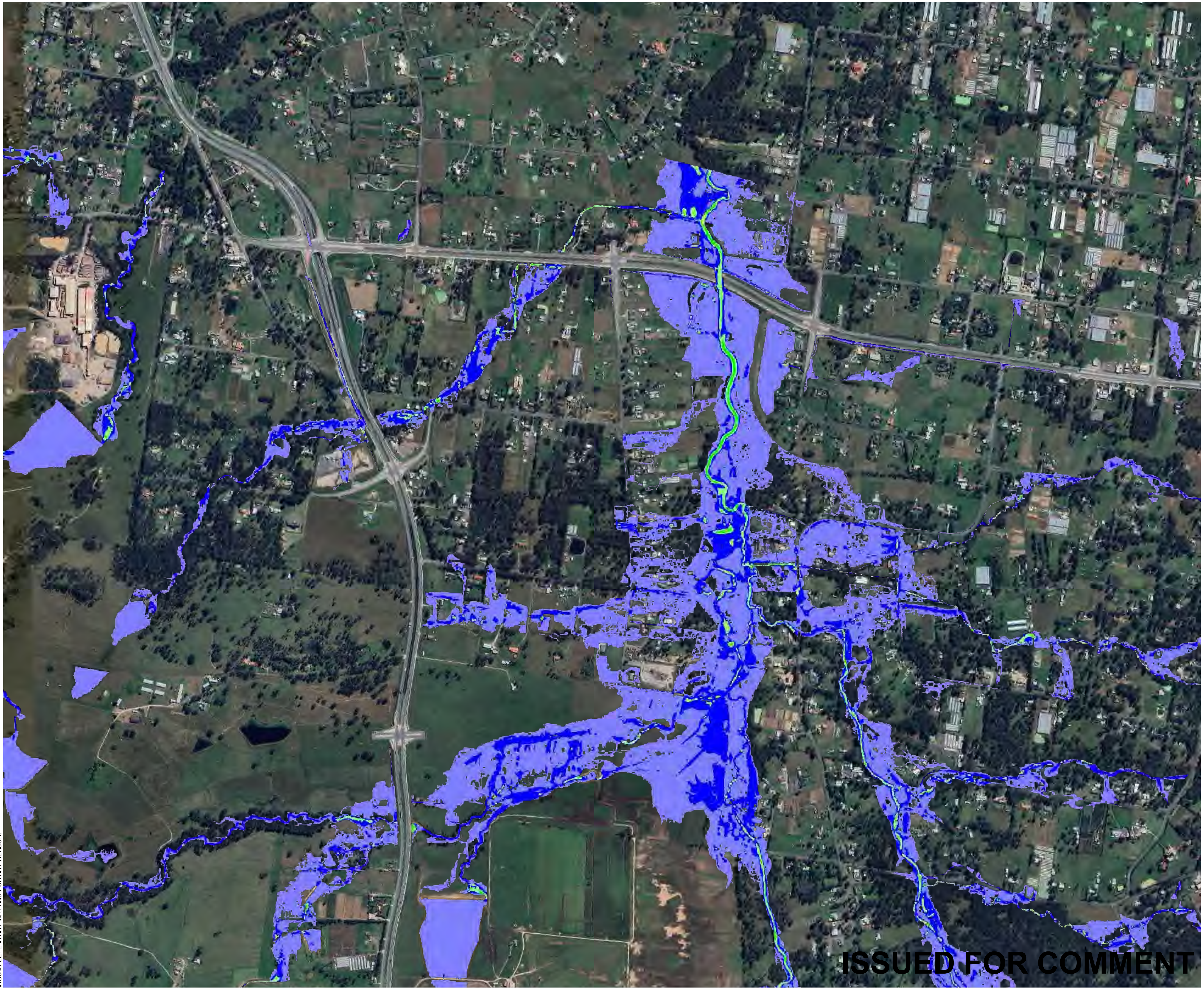
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
10% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-I-010-B-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

10% AEP

INT

FLOOD VELOCITY (m/s)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
10% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-I-010-B-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
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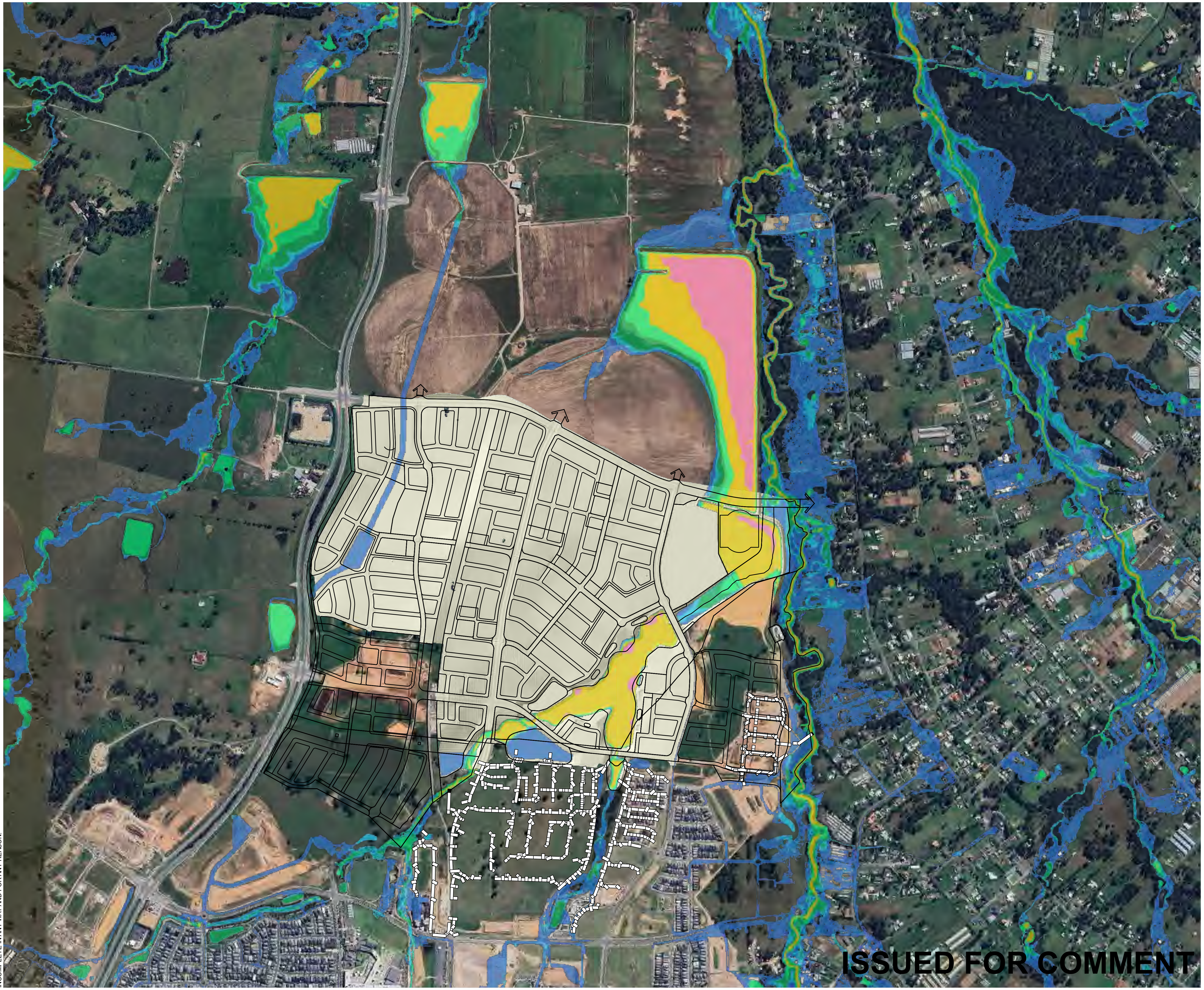
C				
D				
E				



calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

10% AEP

INT

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.
2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
10% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-I-010-D-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

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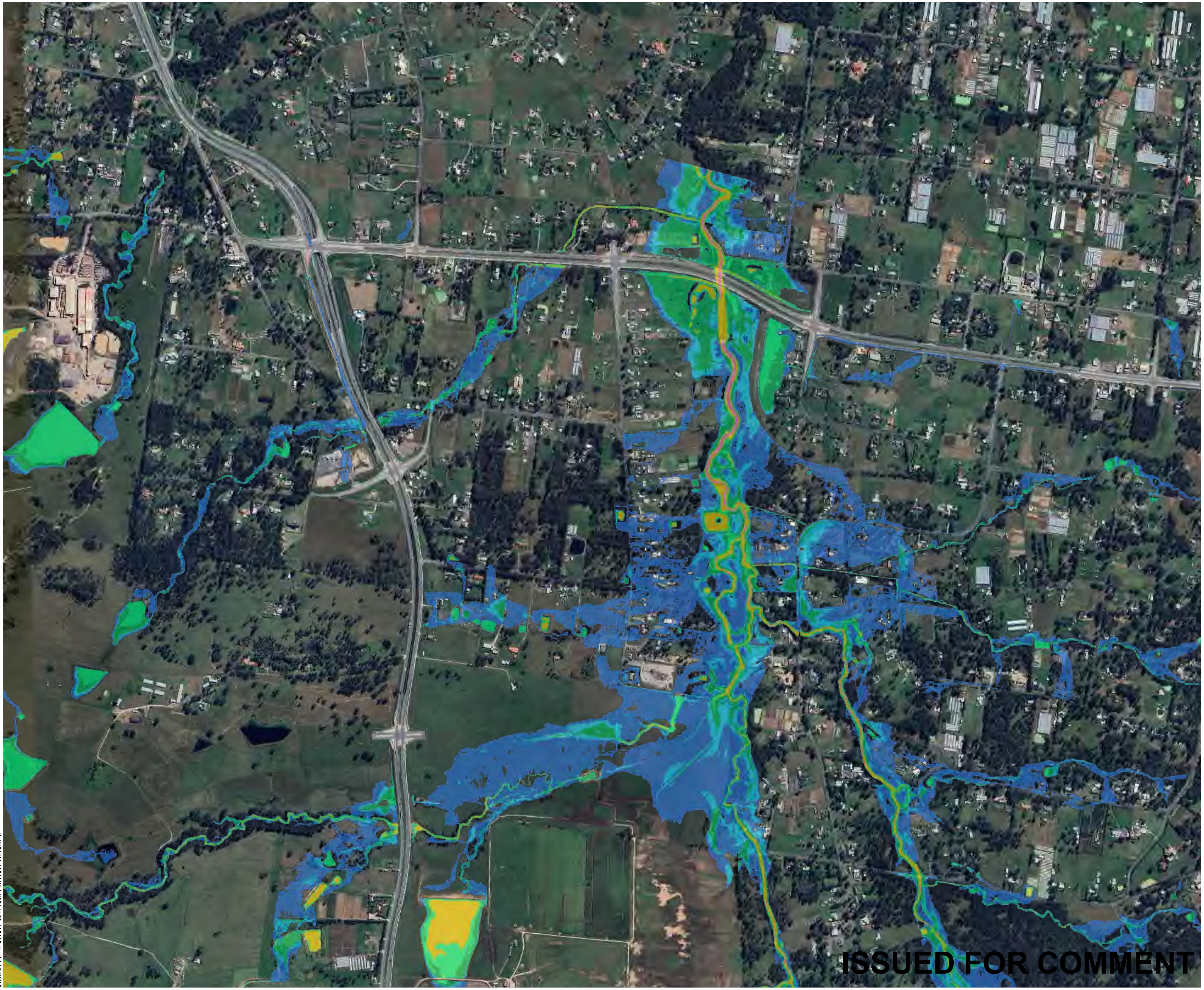
COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

10% AEP

INT

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
10% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-I-010-D-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
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B				
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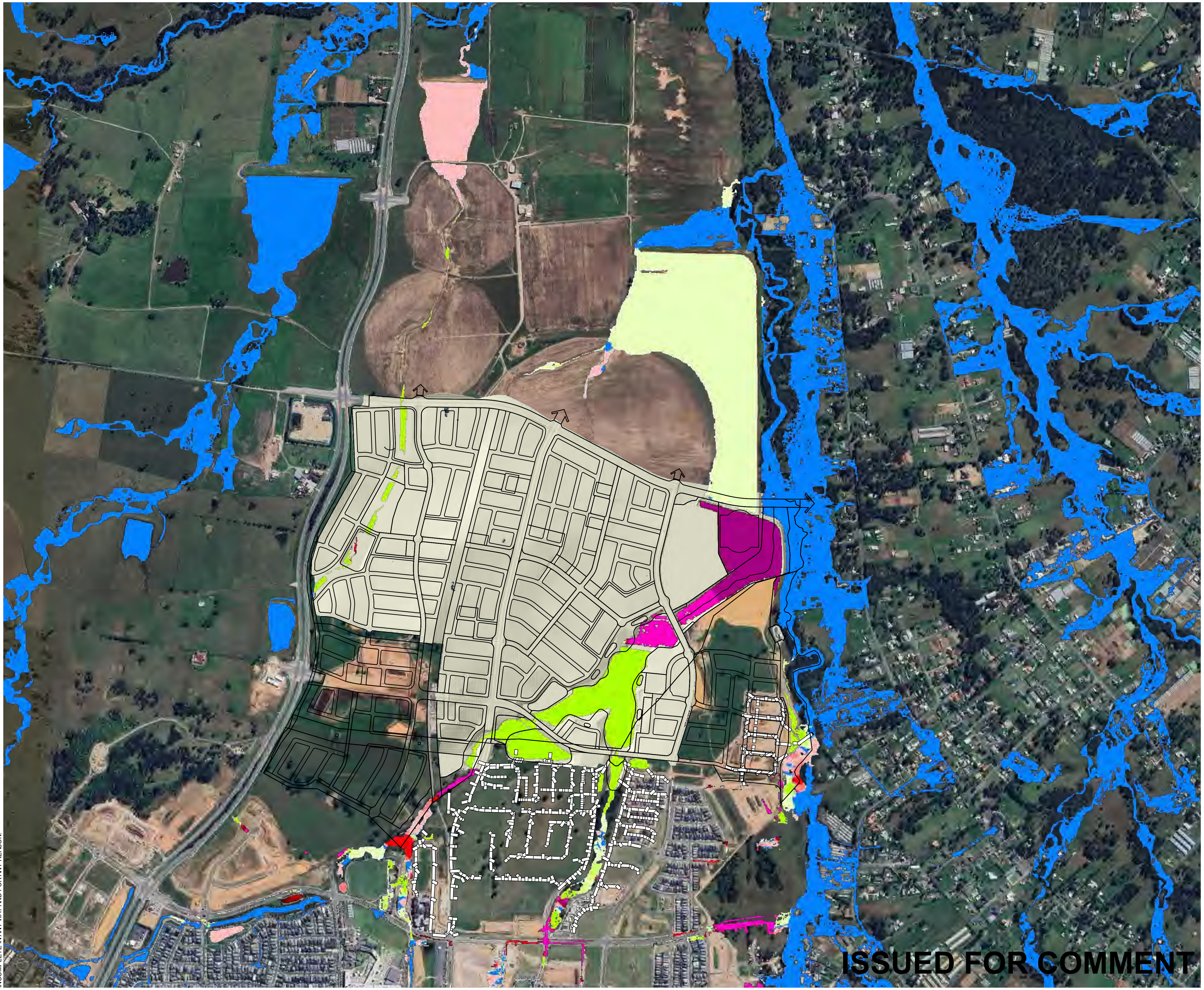
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

10% AEP

INT

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

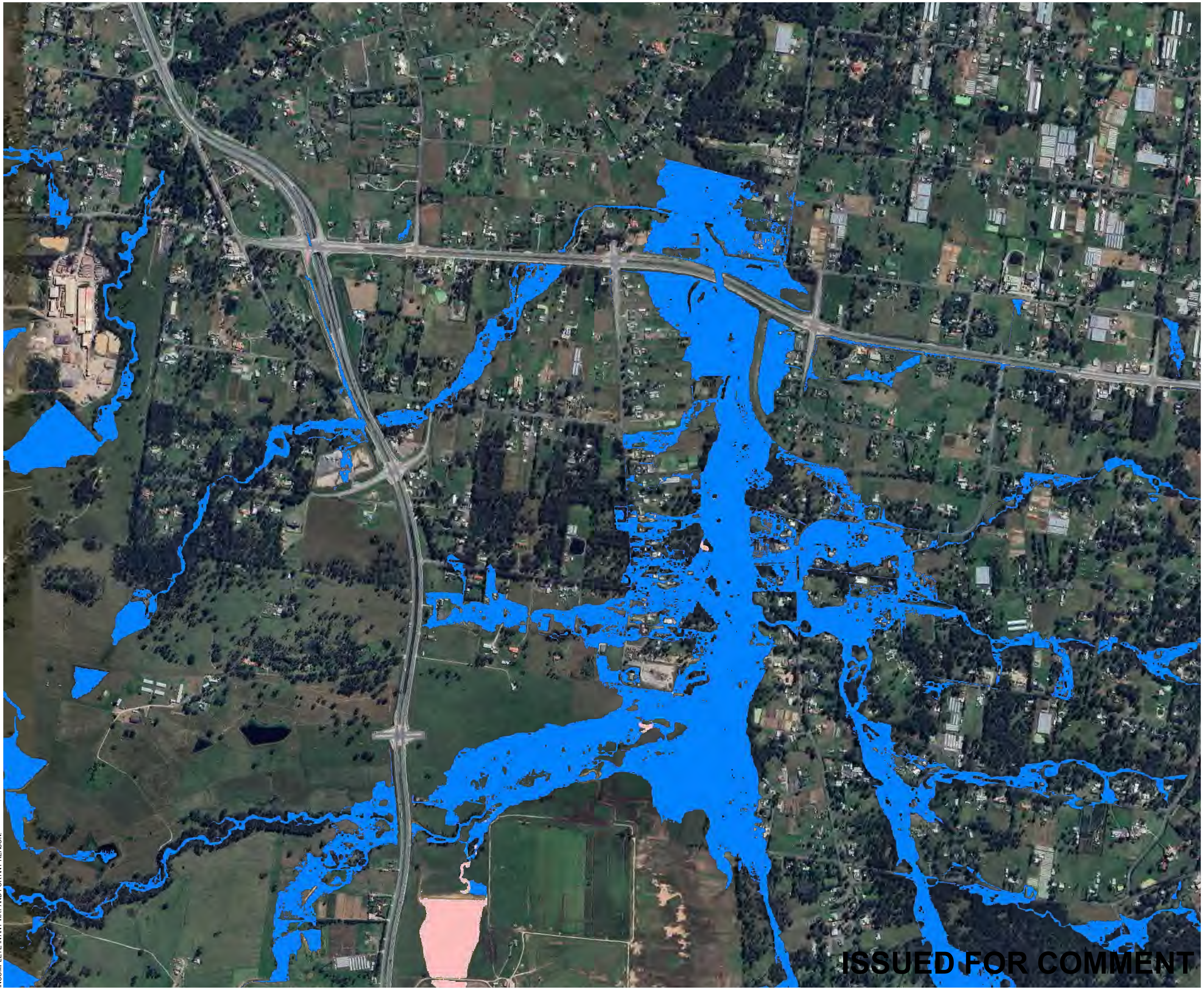
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
10% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-I-010-E-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

10% AEP

INT

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

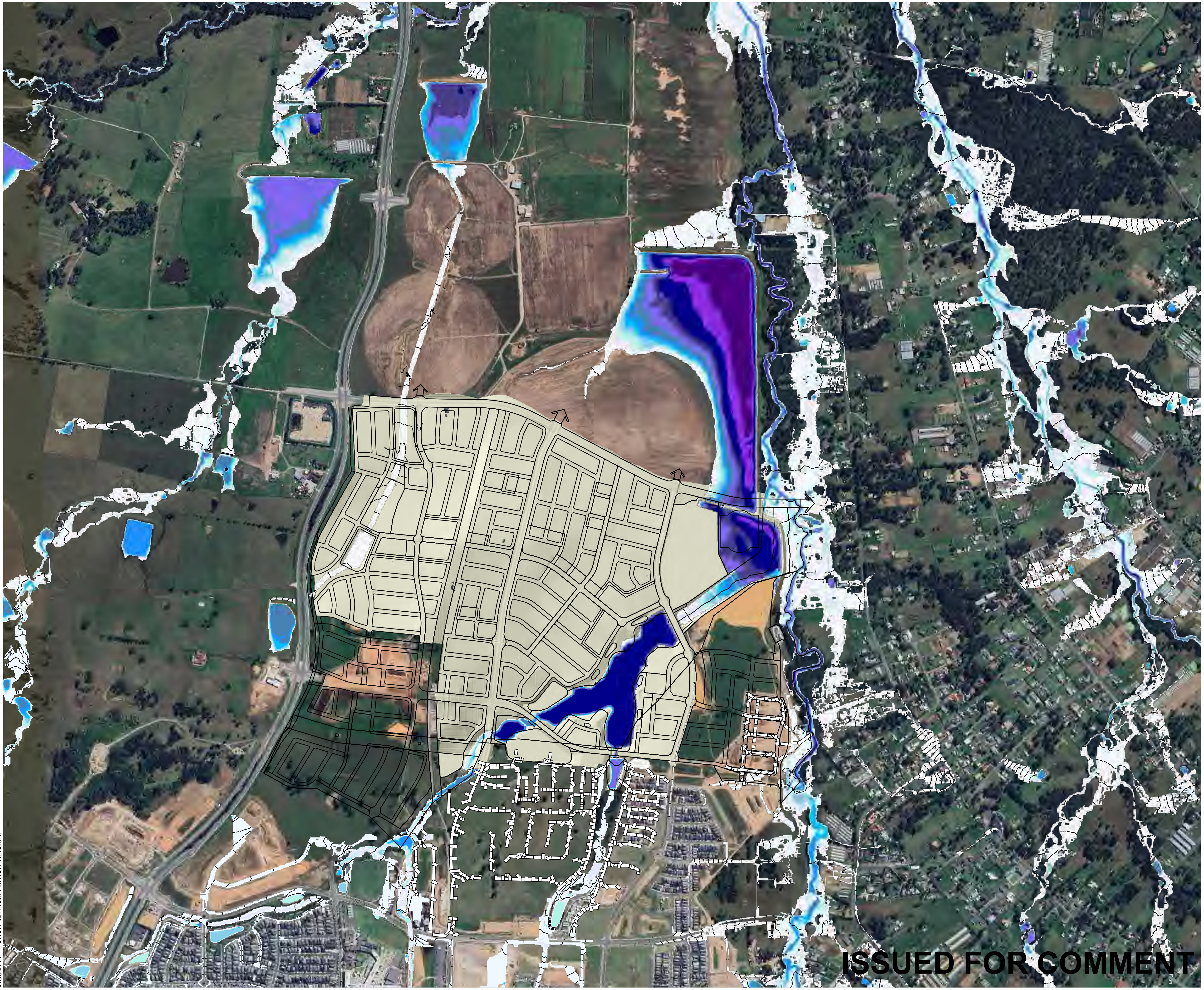
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
10% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-I-010-E-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

- PROPOSED_INTERUM_LAYOUT
- EX MODEL 1D ELEMENTS
- FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

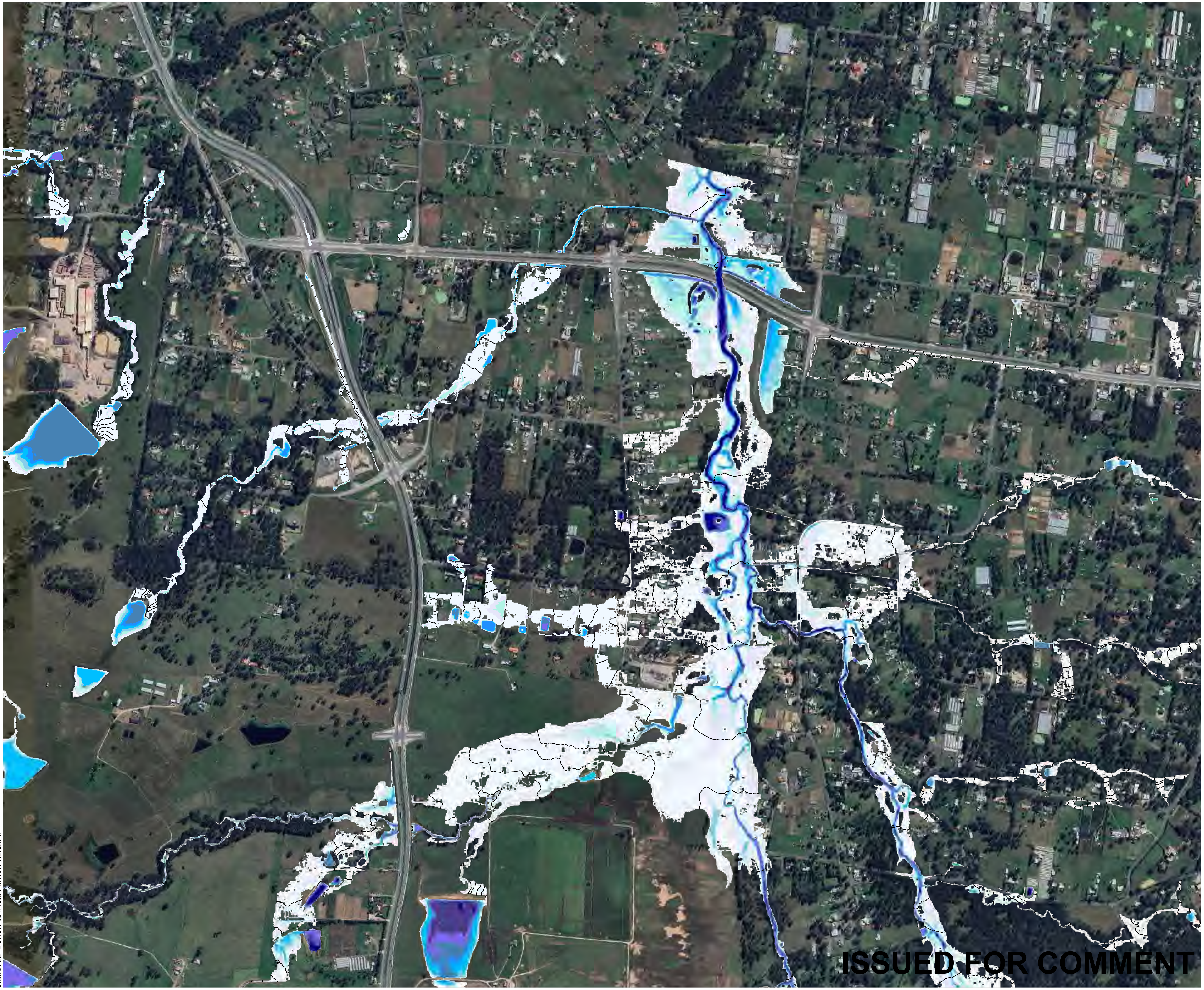
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
18% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-I-005-A-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



ISSUED FOR COMMENT

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

Band 1 (Gray)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

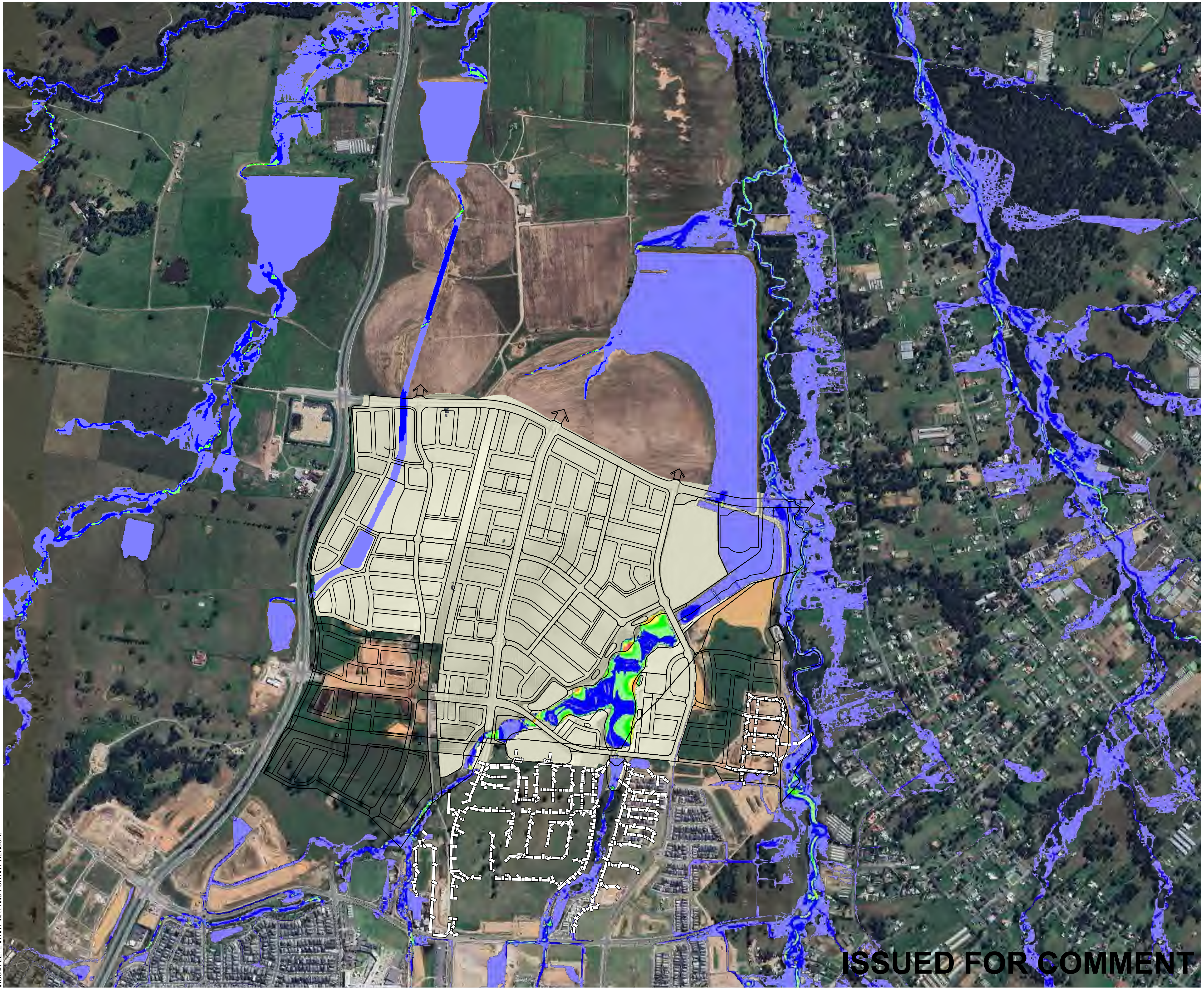
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
18% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-I-005-A-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

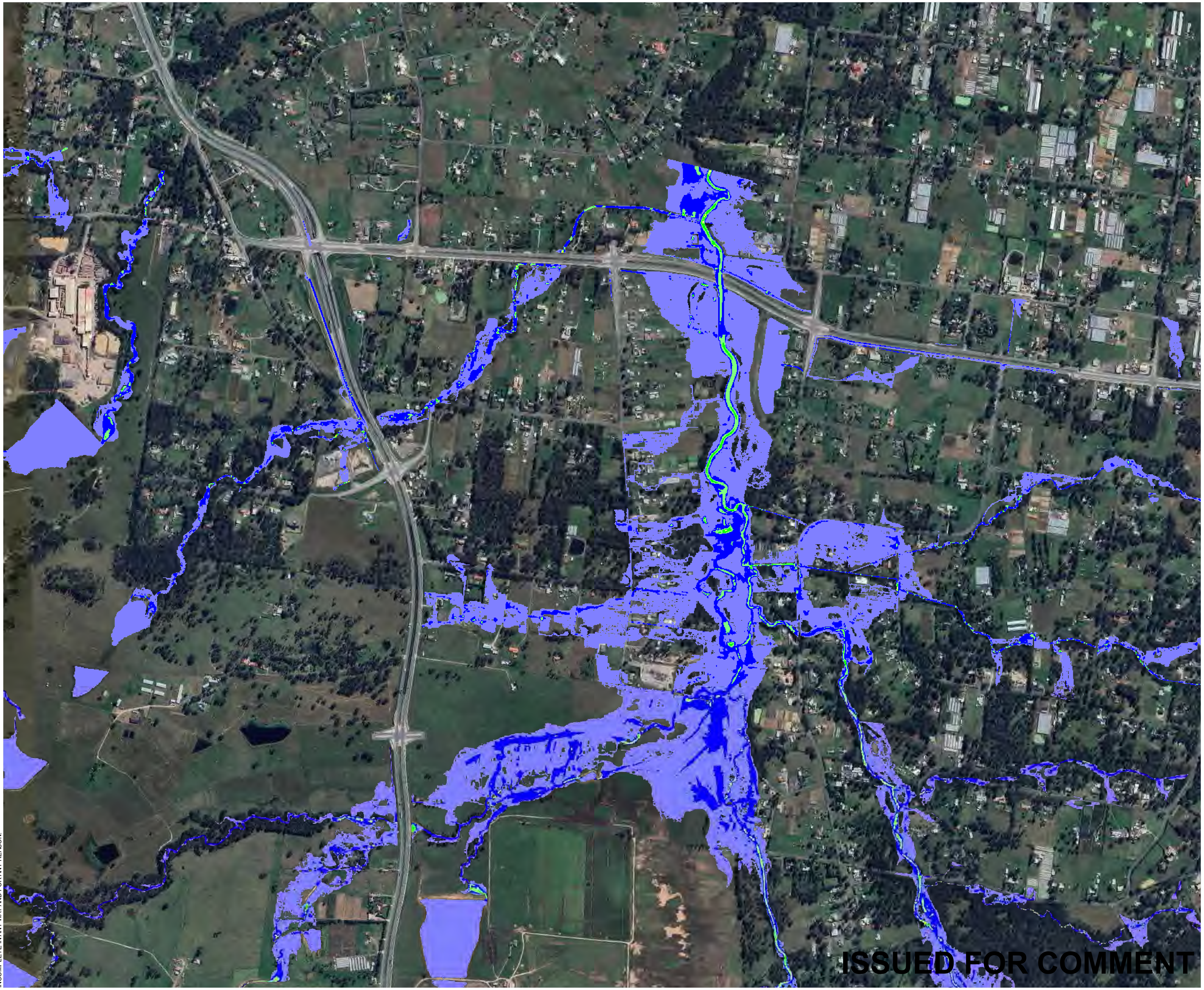
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
18% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-I-005-B-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

FLOOD VELOCITY (m/s)

Band 1 (Gray)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

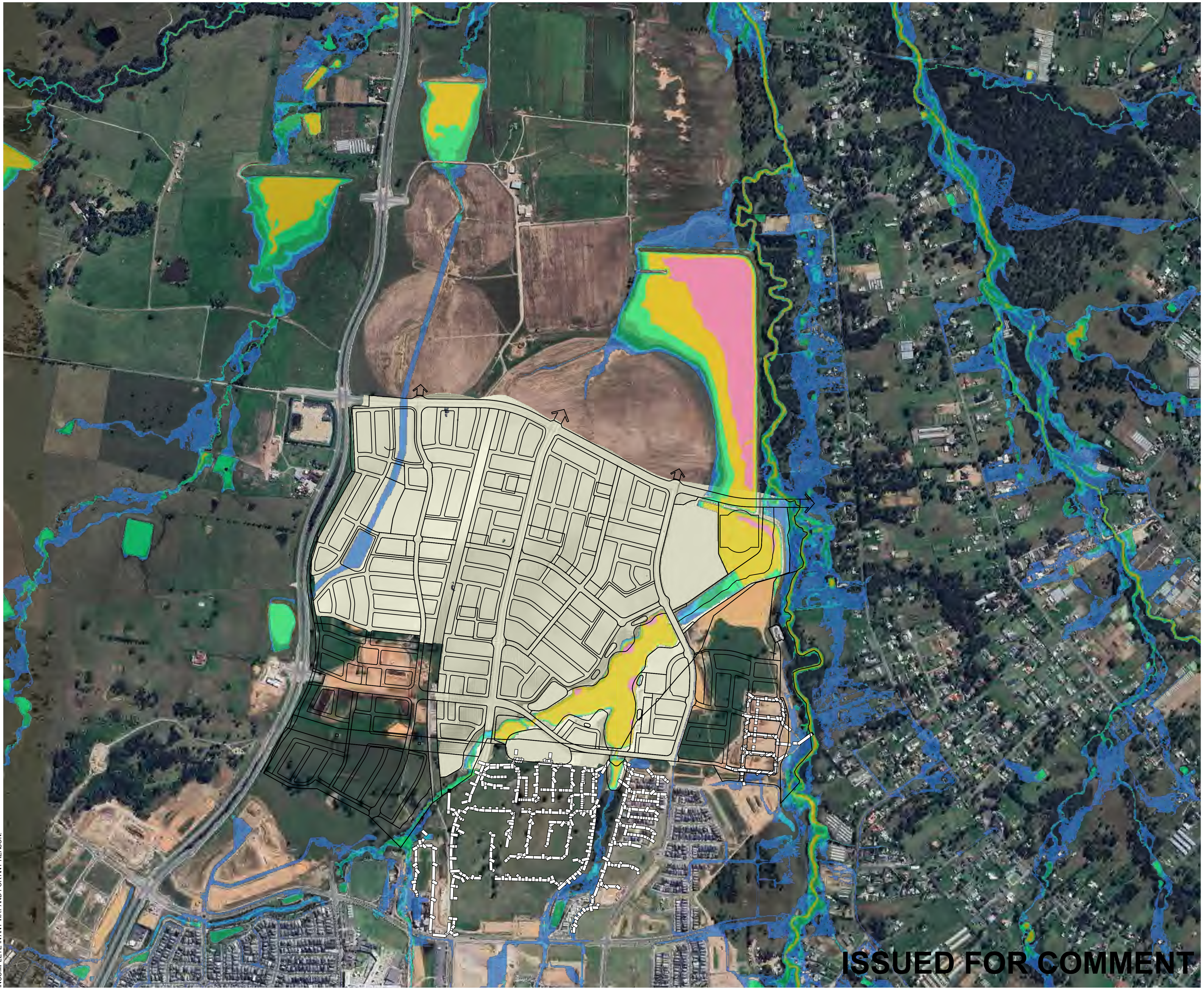
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
18% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-I-005-B-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

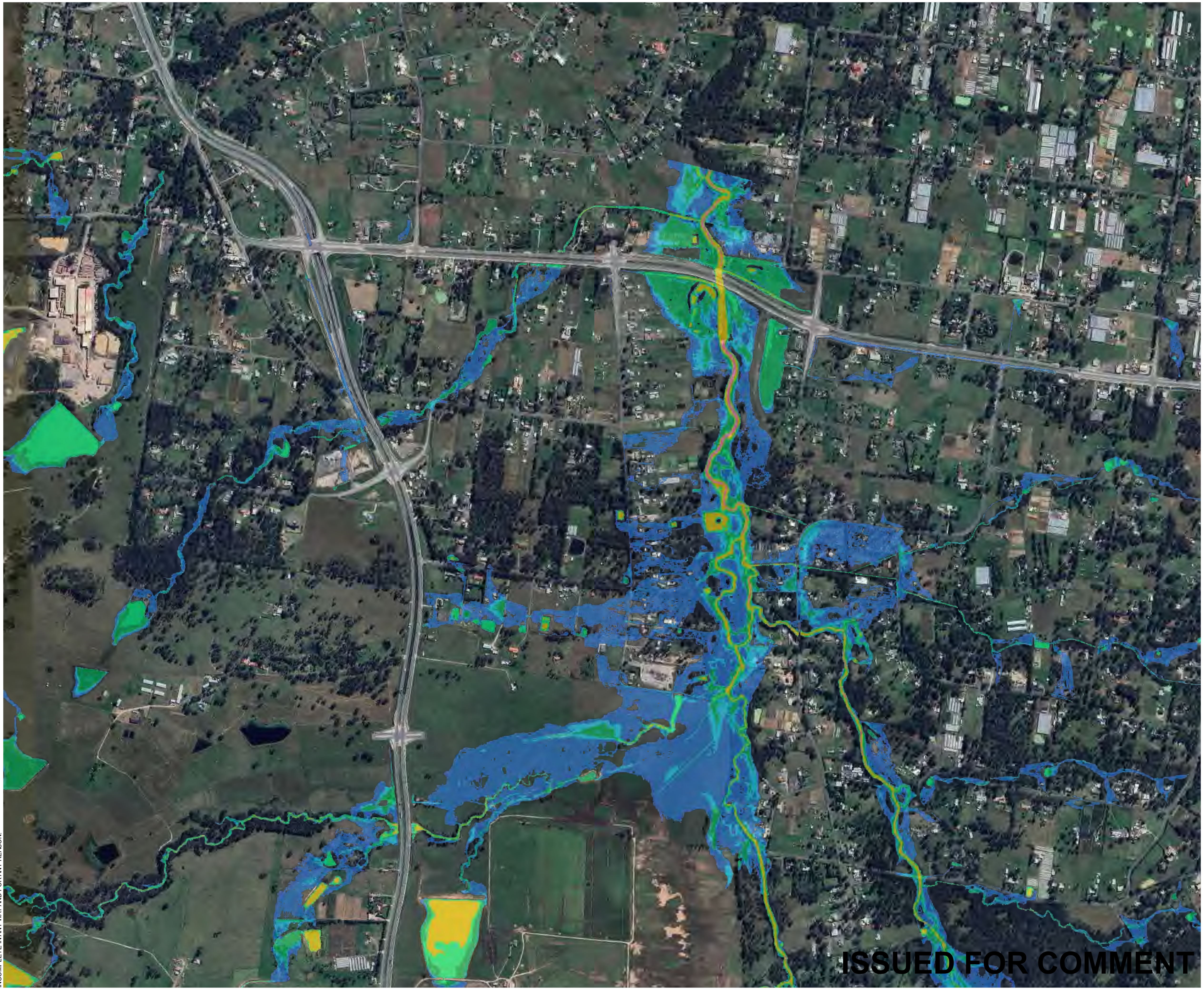
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
18% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-I-005-D-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



LEGEND

FLOOD HAZARD

Band 1 (Gray)

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
18% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-I-005-D-2**

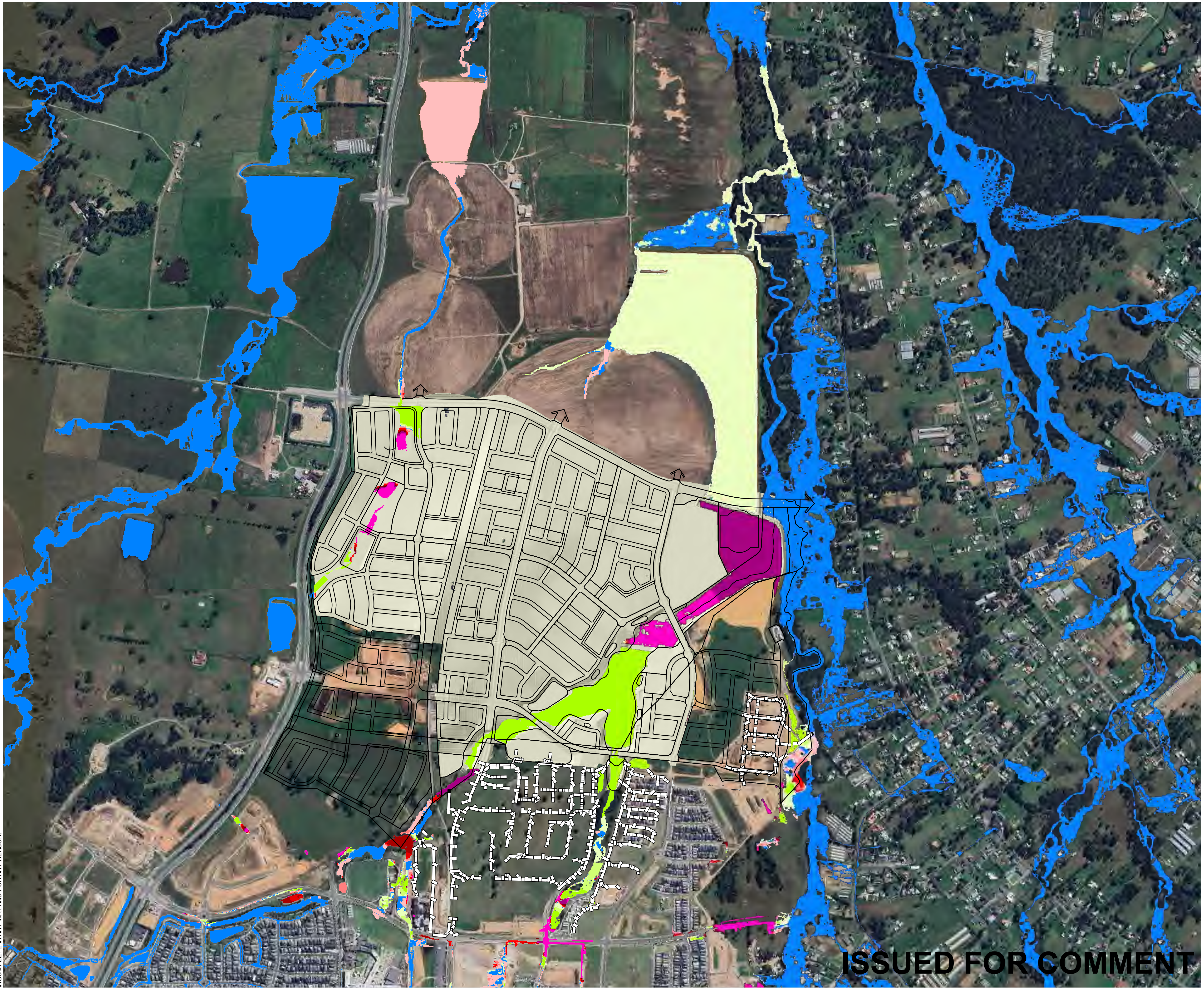
ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

ISSUED FOR COMMENT

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

WSL DIFFERENCE (m)

Band 1 (Gray)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

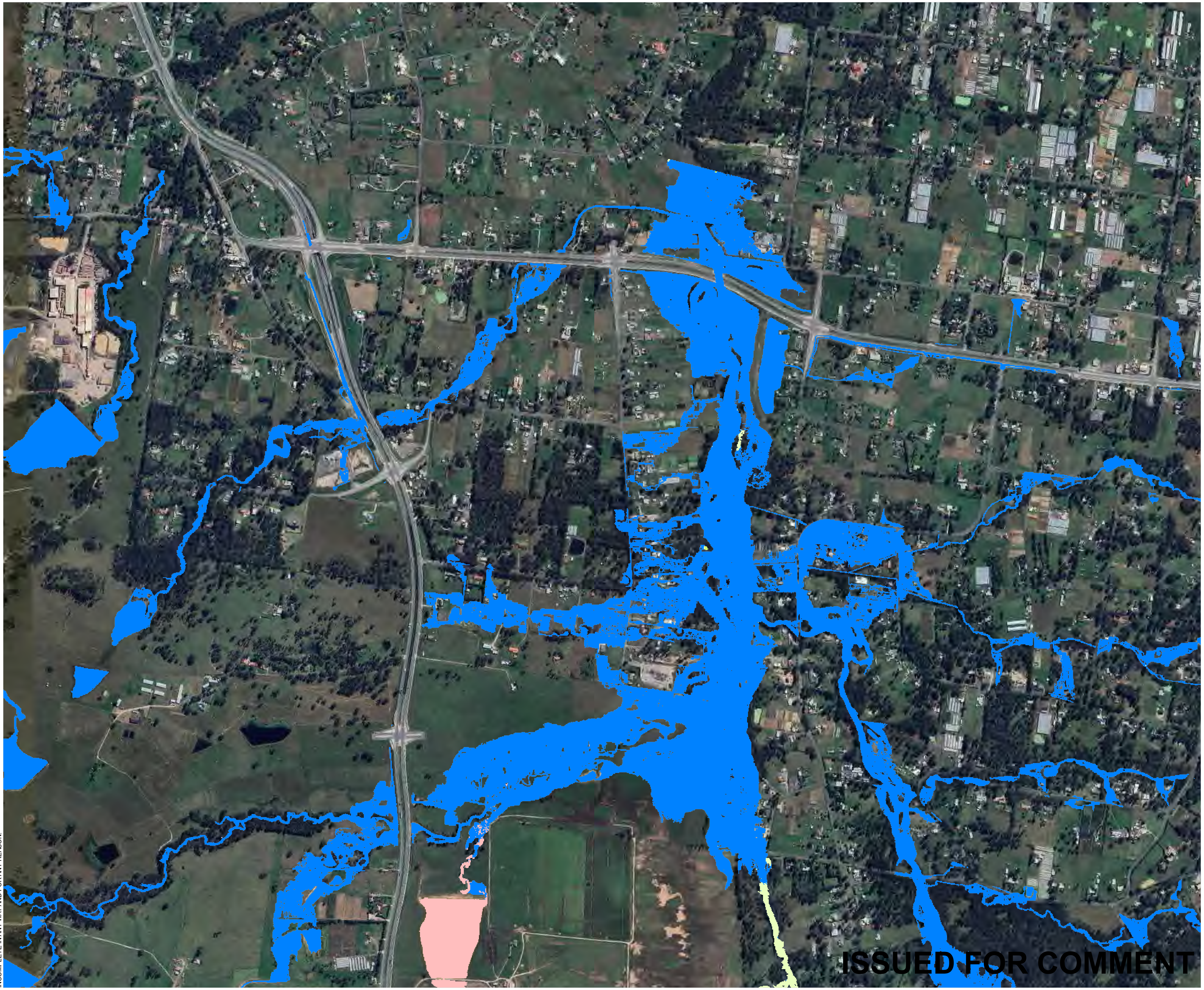
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
18% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-I-005-E-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



calibre CONSULTING

LEGEND

WSL DIFFERENCE (m)

Band 1 (Gray)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15,000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
18% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

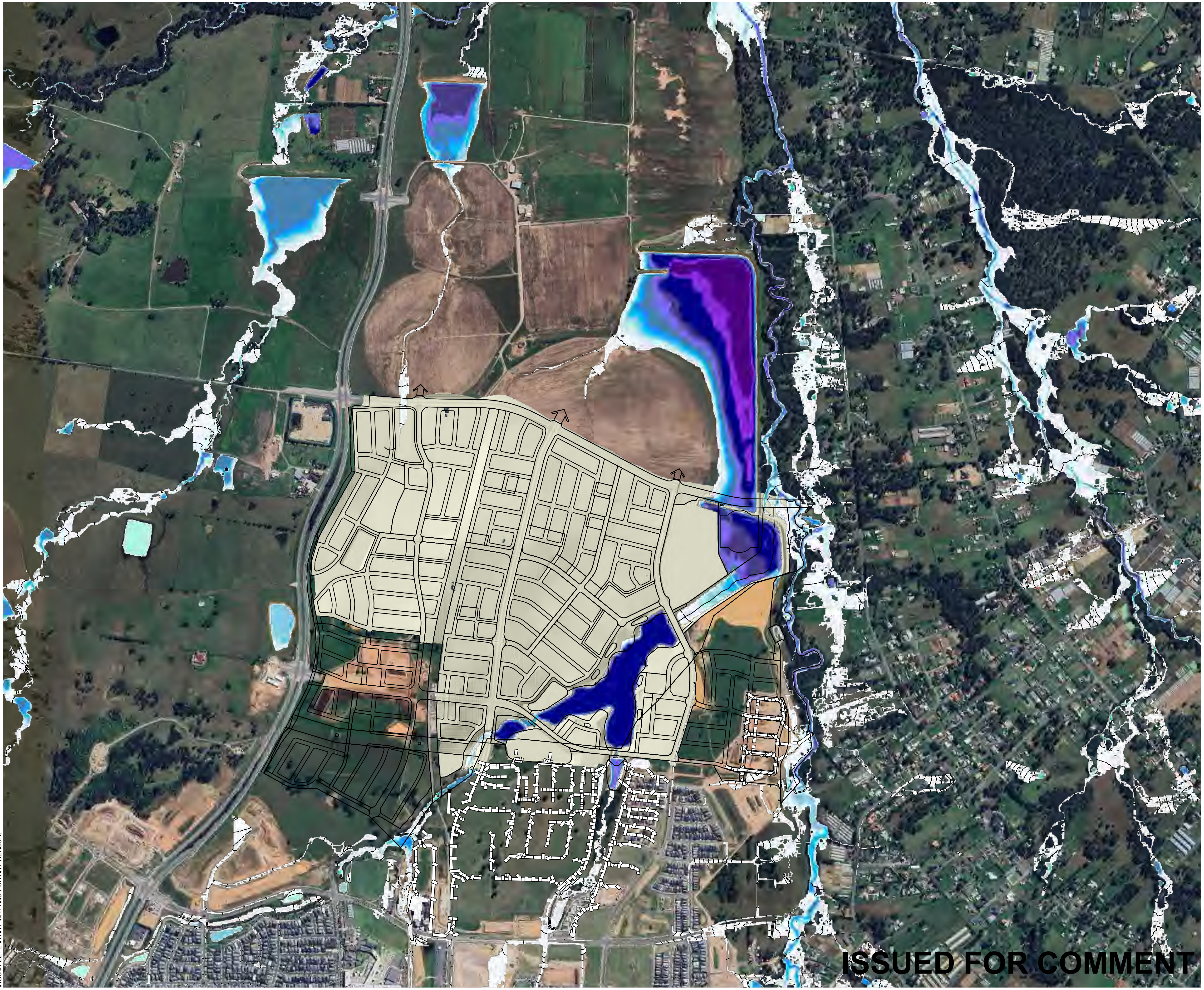
DRAWING NO: **19-000750-I-005-E-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

39% AEP

INT

FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
39% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

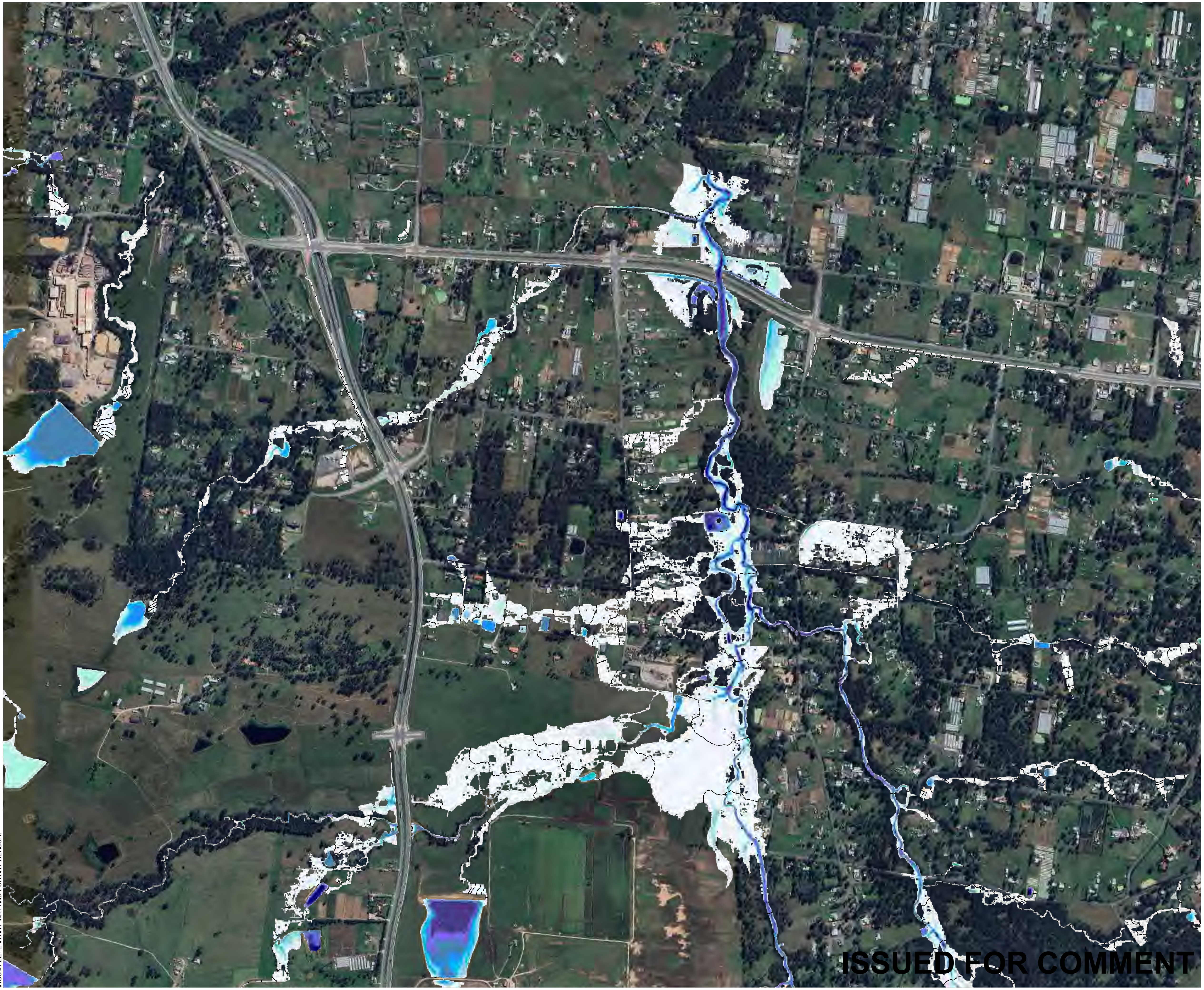
DRAWING NO:
19-000750-I-002-A-1

ISSUE:
A

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



calibre CONSULTING

LEGEND

39% AEP

INT

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
39% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

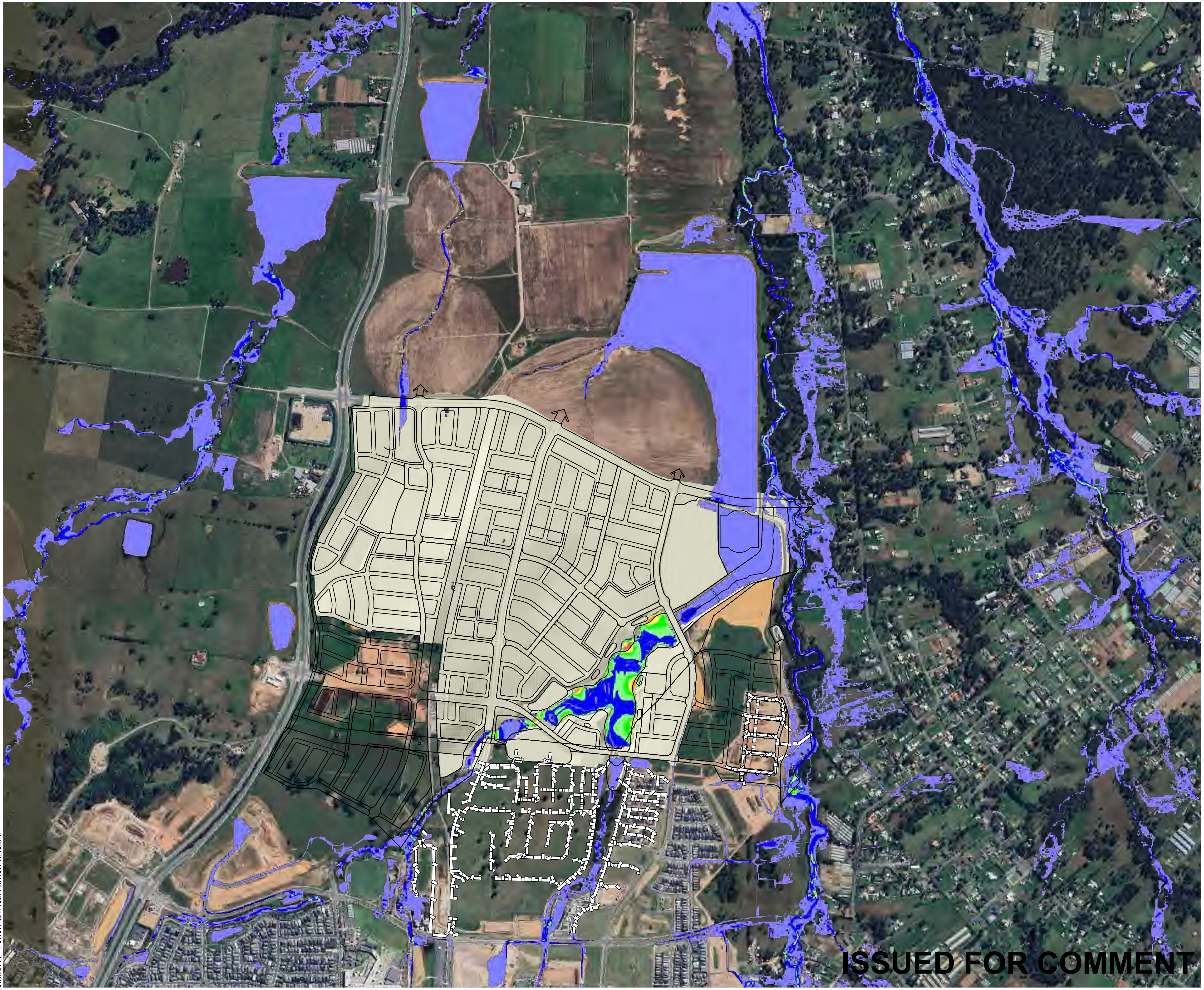
DRAWING NO: **19-000750-I-002-A-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

39% AEP

INT

FLOOD VELOCITY (m/s)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

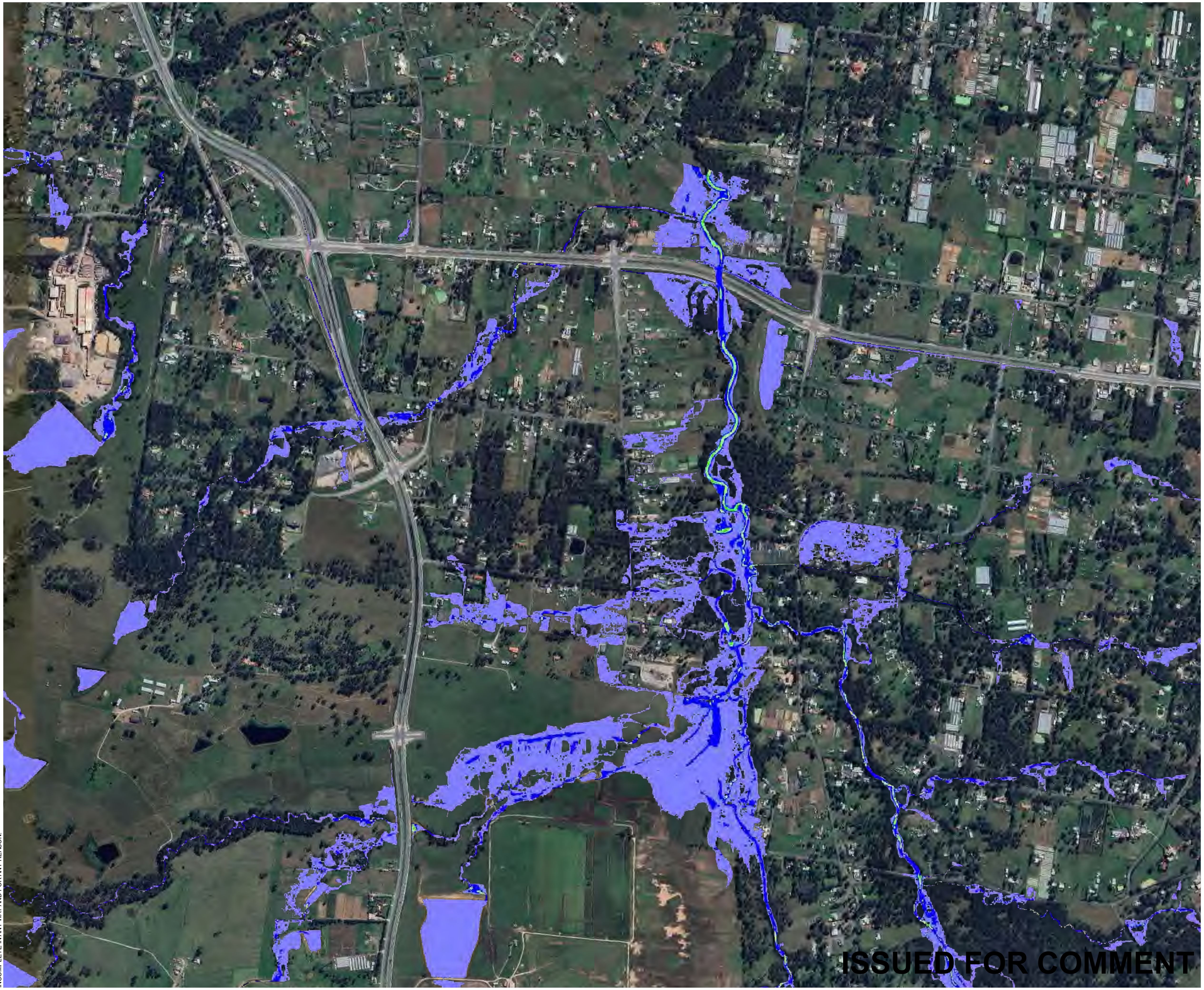
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
39% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-I-002-B-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

39% AEP

INT

FLOOD VELOCITY (m/s)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- 3.5 - 4.0
- 4.0 - 4.5
- 4.5 - 5.0
- 5.0 - 5.5
- 5.5 - 6.0
- > 6.0

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

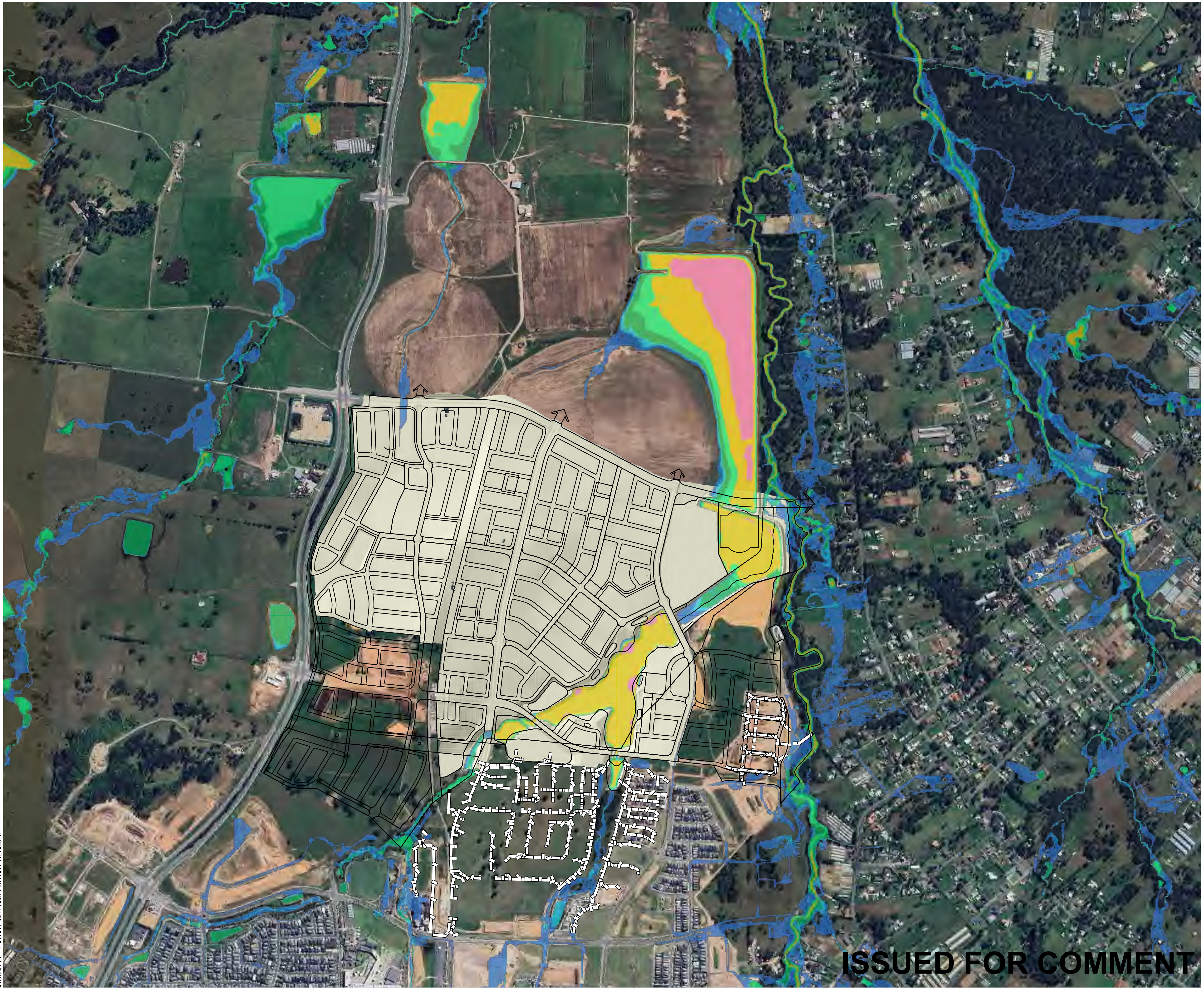
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
39% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-I-002-B-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

39% AEP

INT

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

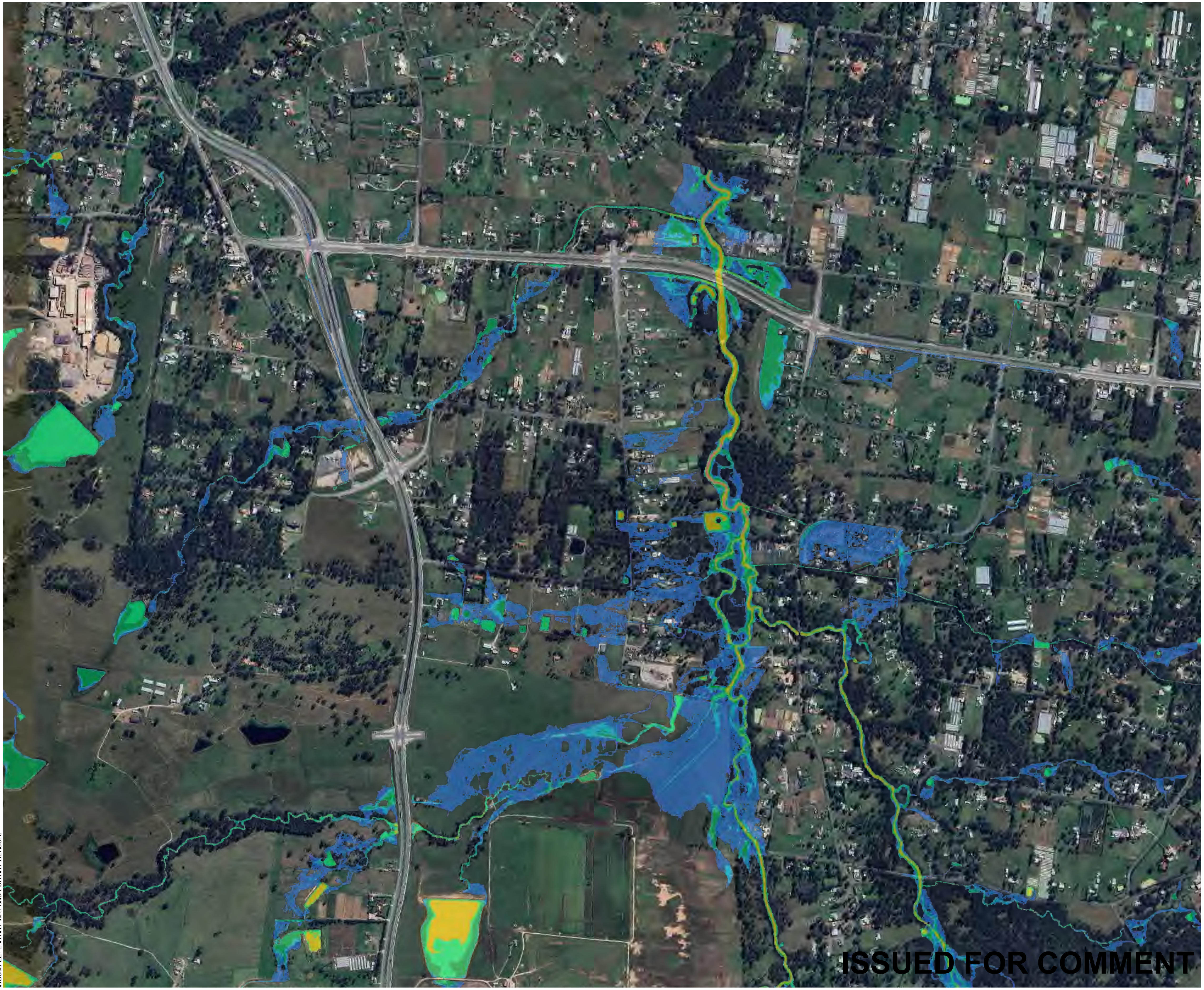
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
39% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-I-002-D-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



calibre CONSULTING

LEGEND

39% AEP

INT

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.
2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
39% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-I-002-D-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

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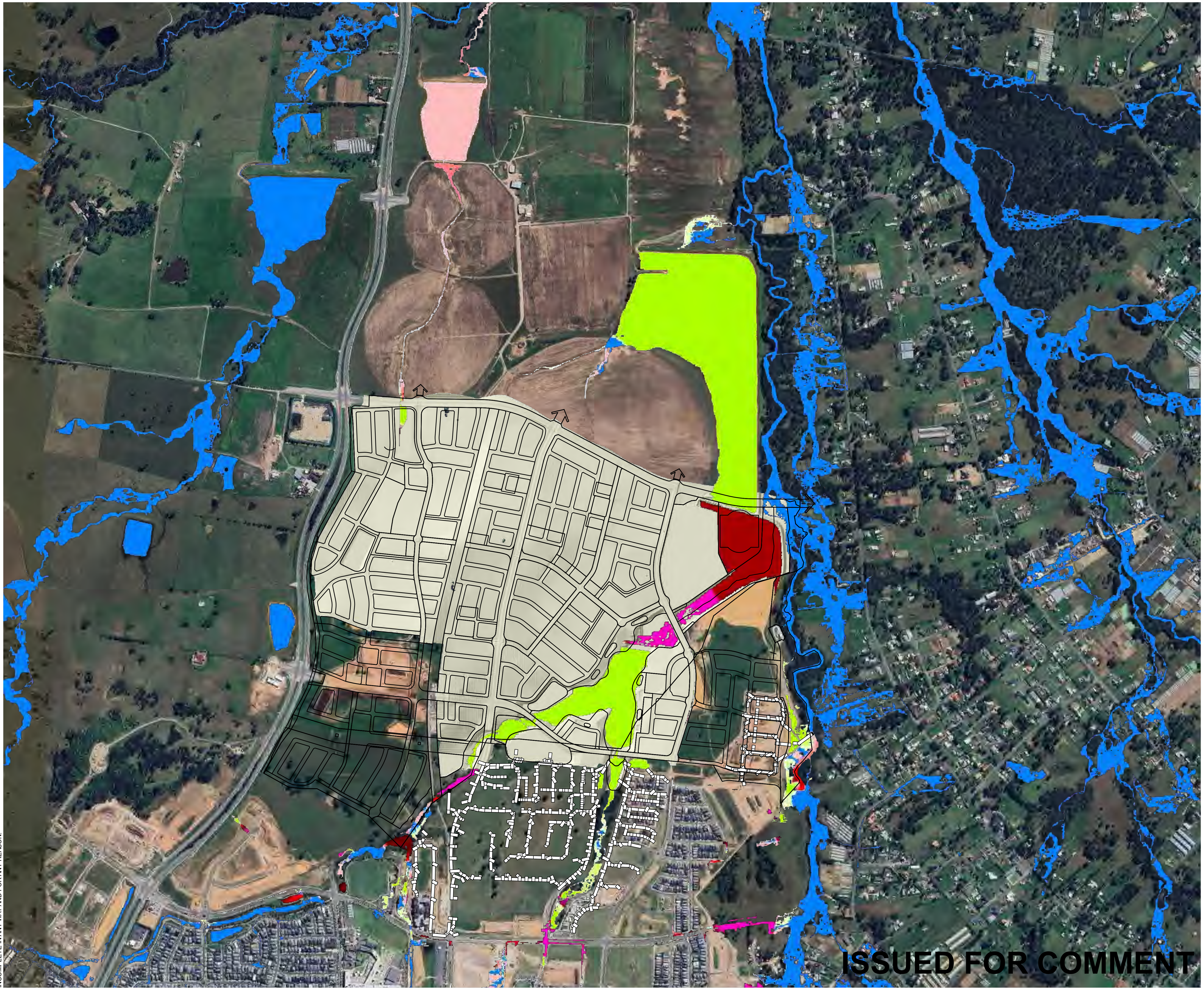
COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED_INTERUM_LAYOUT

EX MODEL 1D ELEMENTS

39% AEP

INT

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

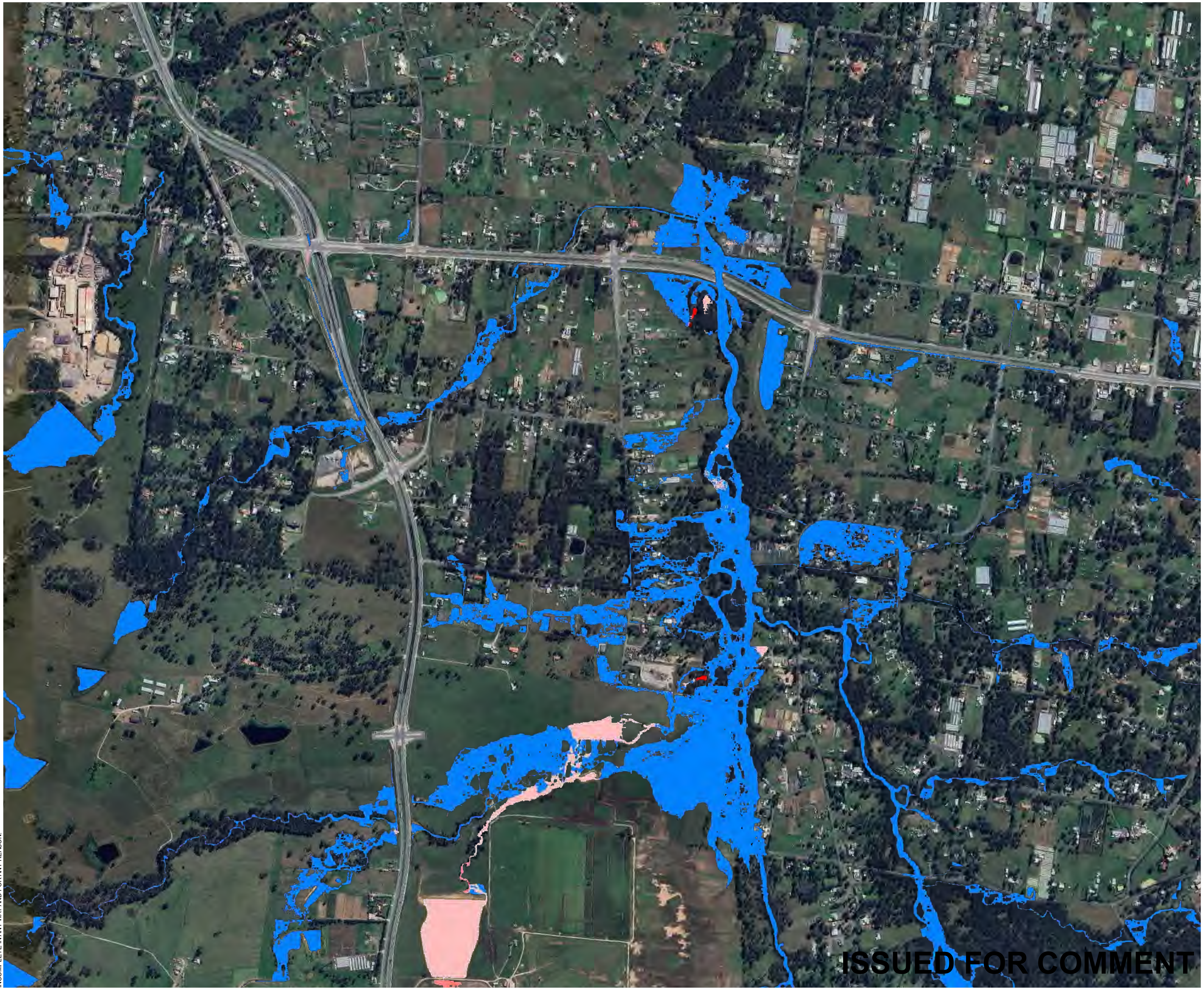
CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
39% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-I-002-E-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



calibre CONSULTING

LEGEND

39% AEP

INT

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
INTERIM SCENARIO
39% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

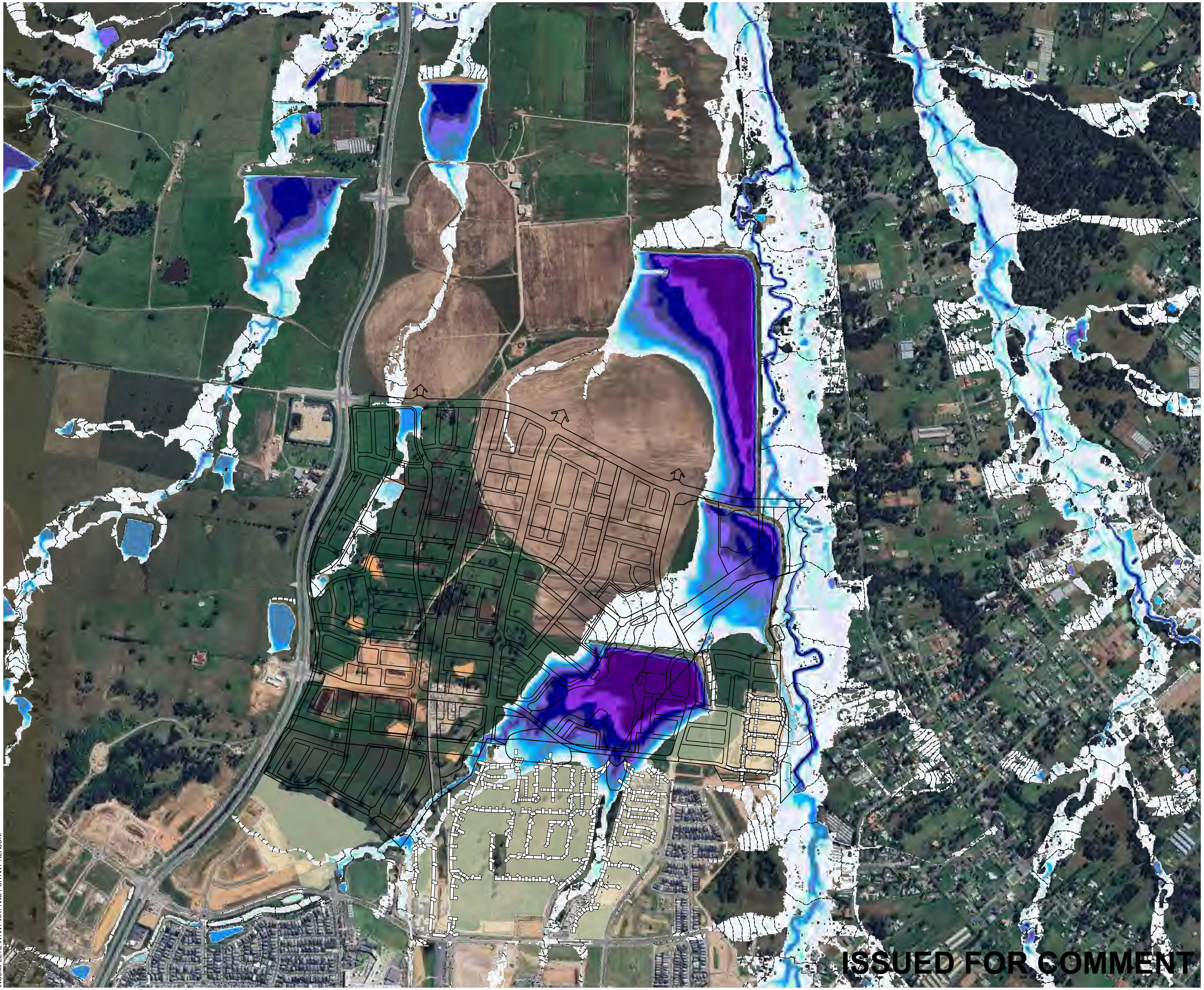
DRAWING NO: **19-000750-I-002-E-2**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				

W:\Projects\19-000750_Pondicherry\results_240115\19-000750_FLOOD_PLANS 240115.qgz

COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED DEVELOPMENT LAYOUT

EX MODEL 1D ELEMENTS

SENSITIVITY A

1%

FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

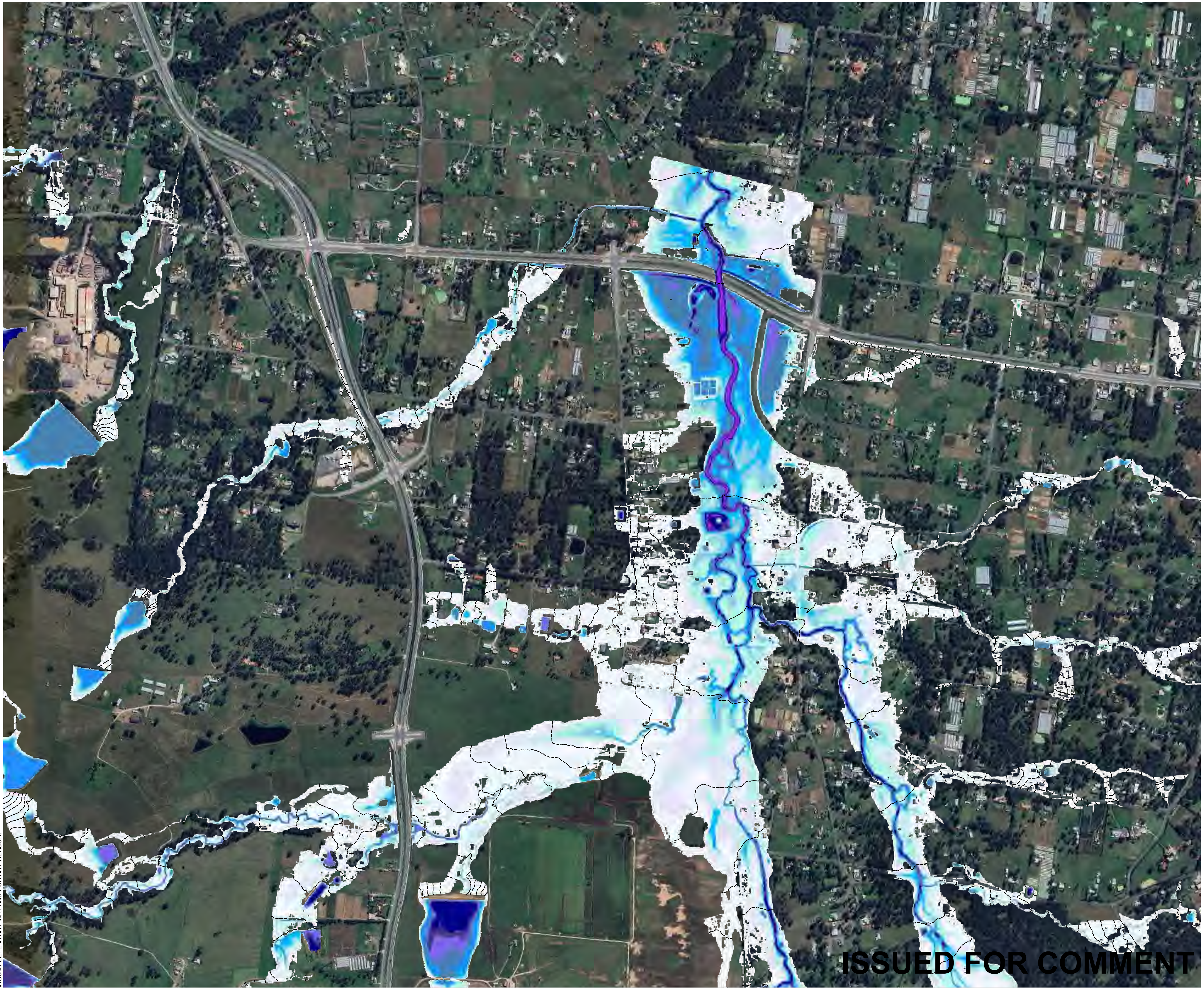
CLIENT:
-

DRAWING TITLE:
PRE-EXISTING TO COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-S_A-100-A-1**

ISSUE: **A**

ISS	BY	CHK	DATE	DETAILS
A	DKH	-	25.01.24	FOR COMMENT
B				
C				
D				
E				



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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

SENSITIVITY A

1%

------ FLOOD HEIGHT CONTOURS (mAHD)

FLOOD DEPTH (m)

- 0.00 - 0.15
- 0.15 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 4.00
- 4.00 - 5.00
- > 5.00

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
PRE-EXISTING TO COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **19-000750-S_A-100-A-2**

ISSUE: **A**

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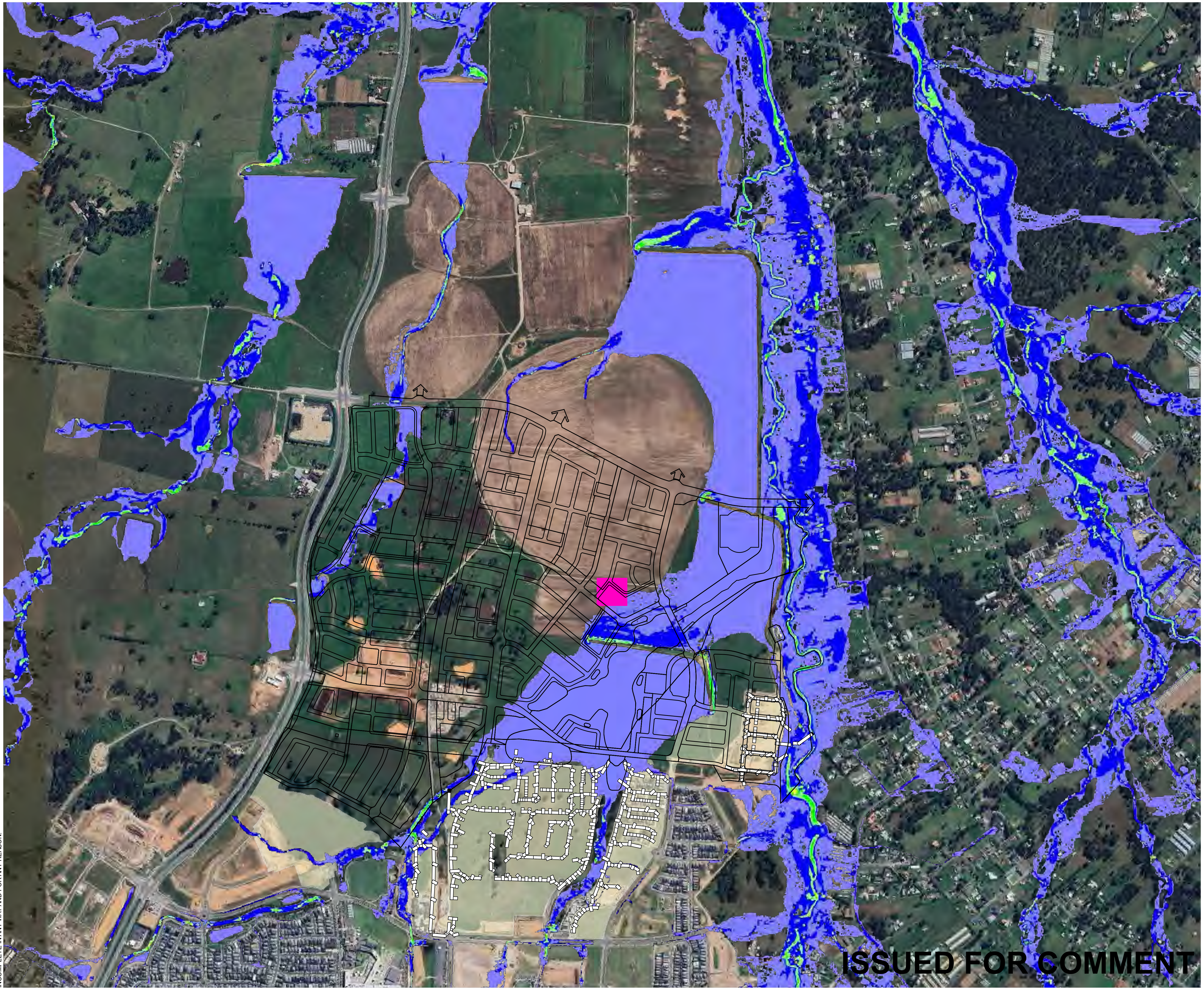

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED DEVELOPMENT LAYOUT

EX MODEL 1D ELEMENTS

10% AEP

DEV

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

SENSITIVITY A

1%

FLOOD VELOCITY (m/s)

NOTES:
1. REFER TO CALIBRE REPORT.

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140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
PRE-EXISTING TO COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-S_A-100-B-1**

ISSUE: **A**

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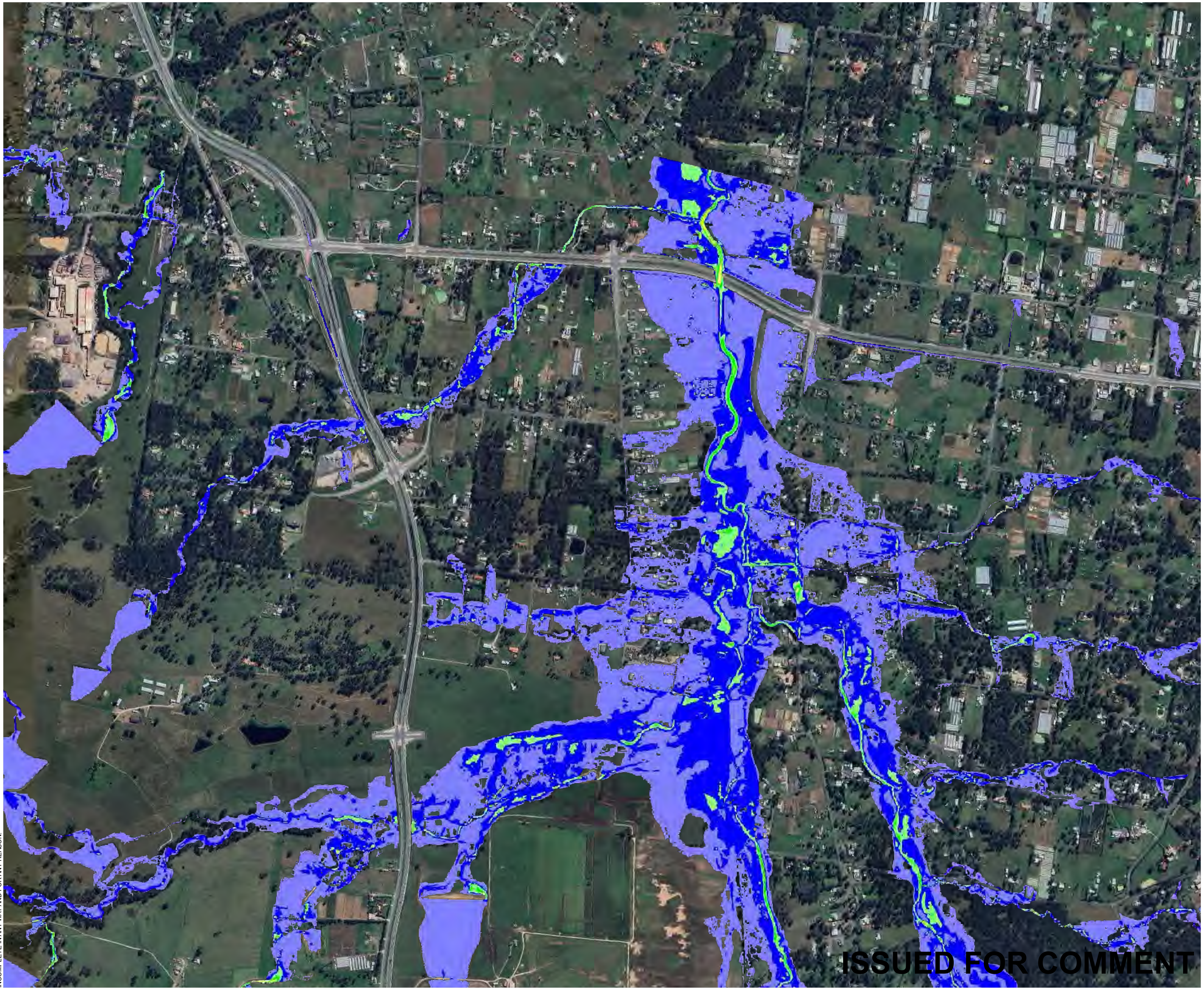

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LEGEND

10% AEP

DEV

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

SENSITIVITY A

1%

FLOOD VELOCITY (m/s)

- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
PRE-EXISTING TO COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **19-000750-S_A-100-B-2**

ISSUE: **A**

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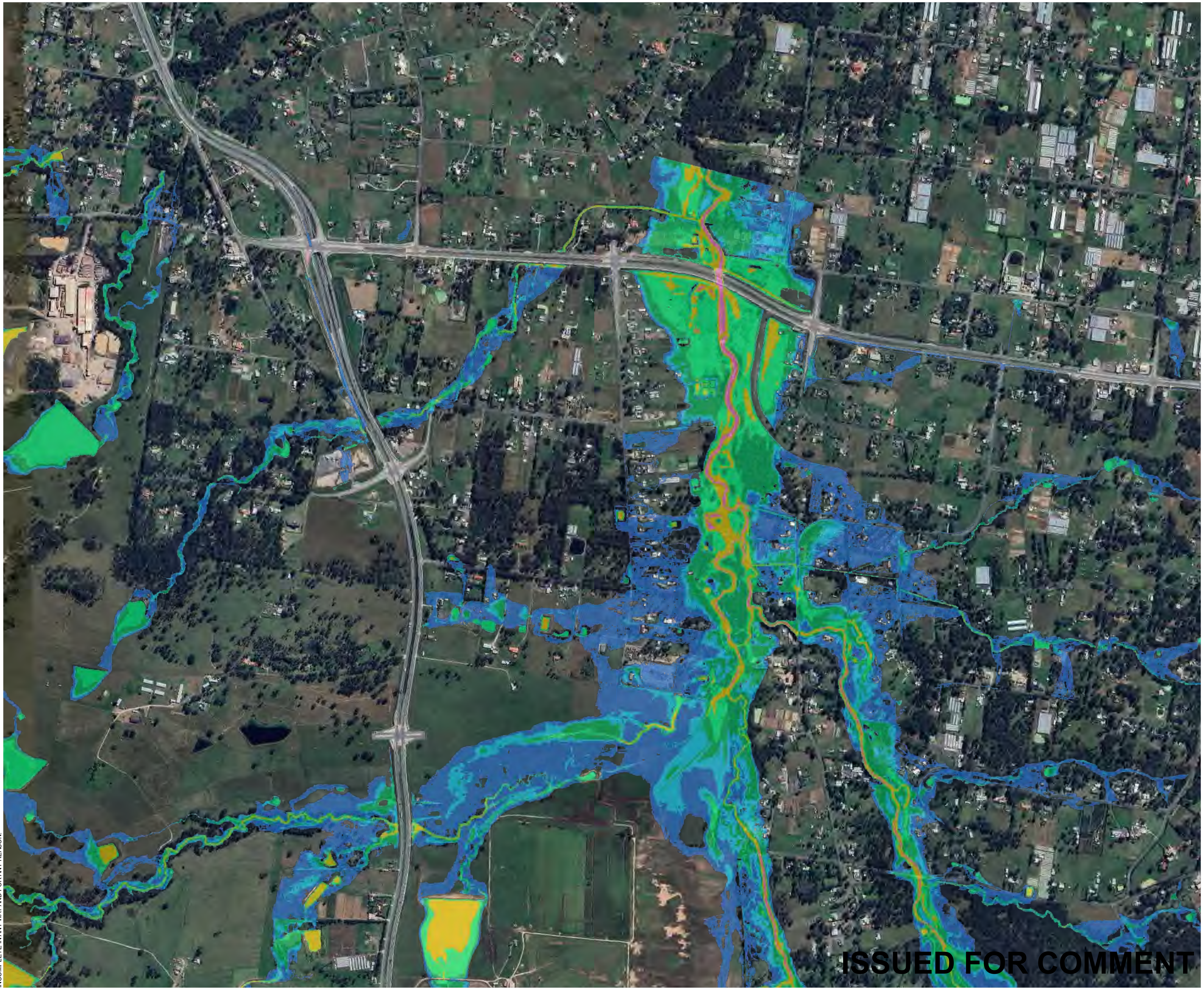

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

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LEGEND

SENSITIVITY A

1%

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.

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PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
PRE-EXISTING TO COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-S_A-100-D-2**

ISSUE: **A**

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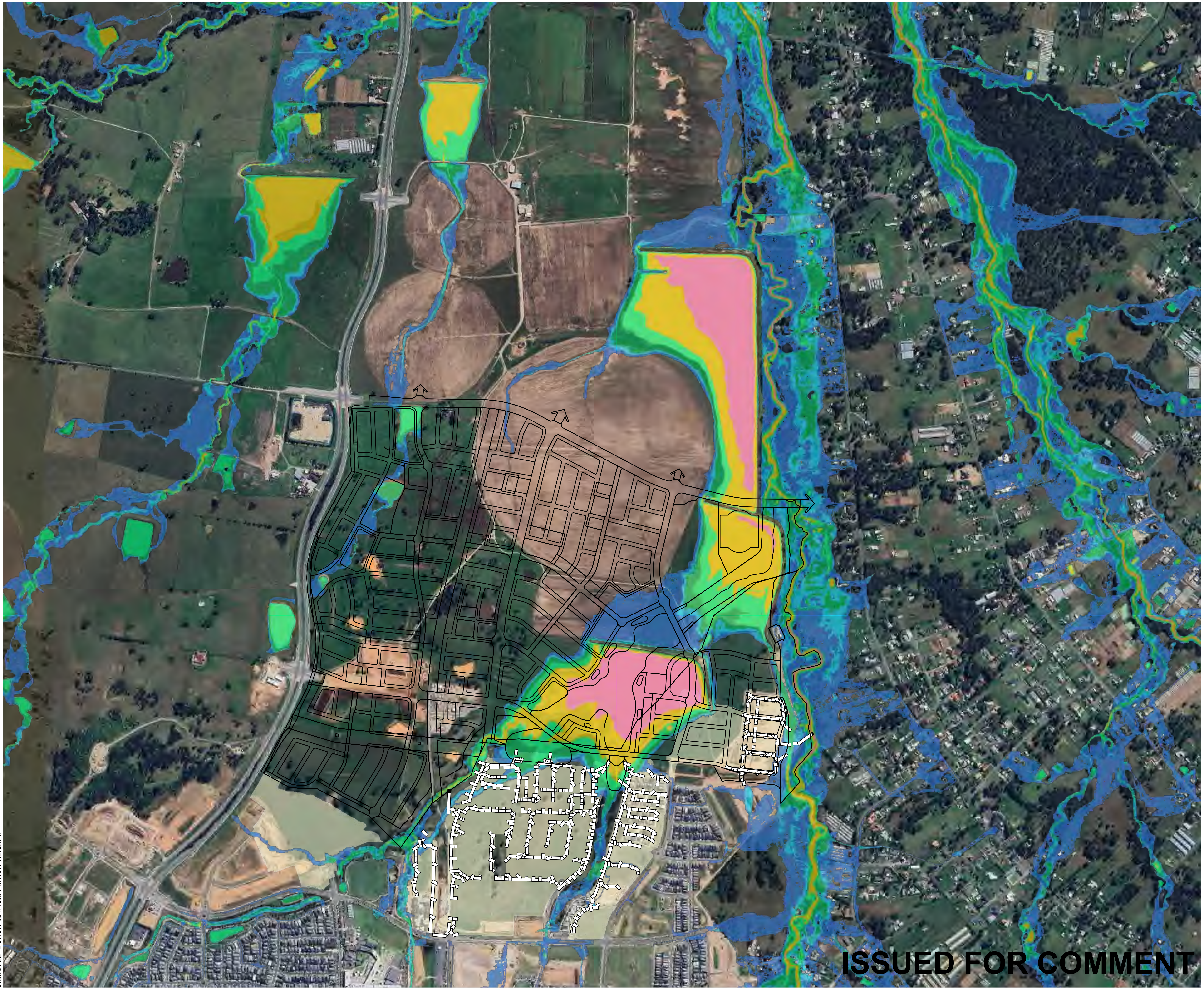

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LEGEND

Project

PROPOSED DEVELOPMENT LAYOUT

EX MODEL 1D ELEMENTS

SENSITIVITY A

1%

FLOOD HAZARD

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

NOTES:
1. REFER TO CALIBRE REPORT.

2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

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PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
PRE-EXISTING TO COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **19-000750-S_A-100-D-1**

ISSUE: **A**

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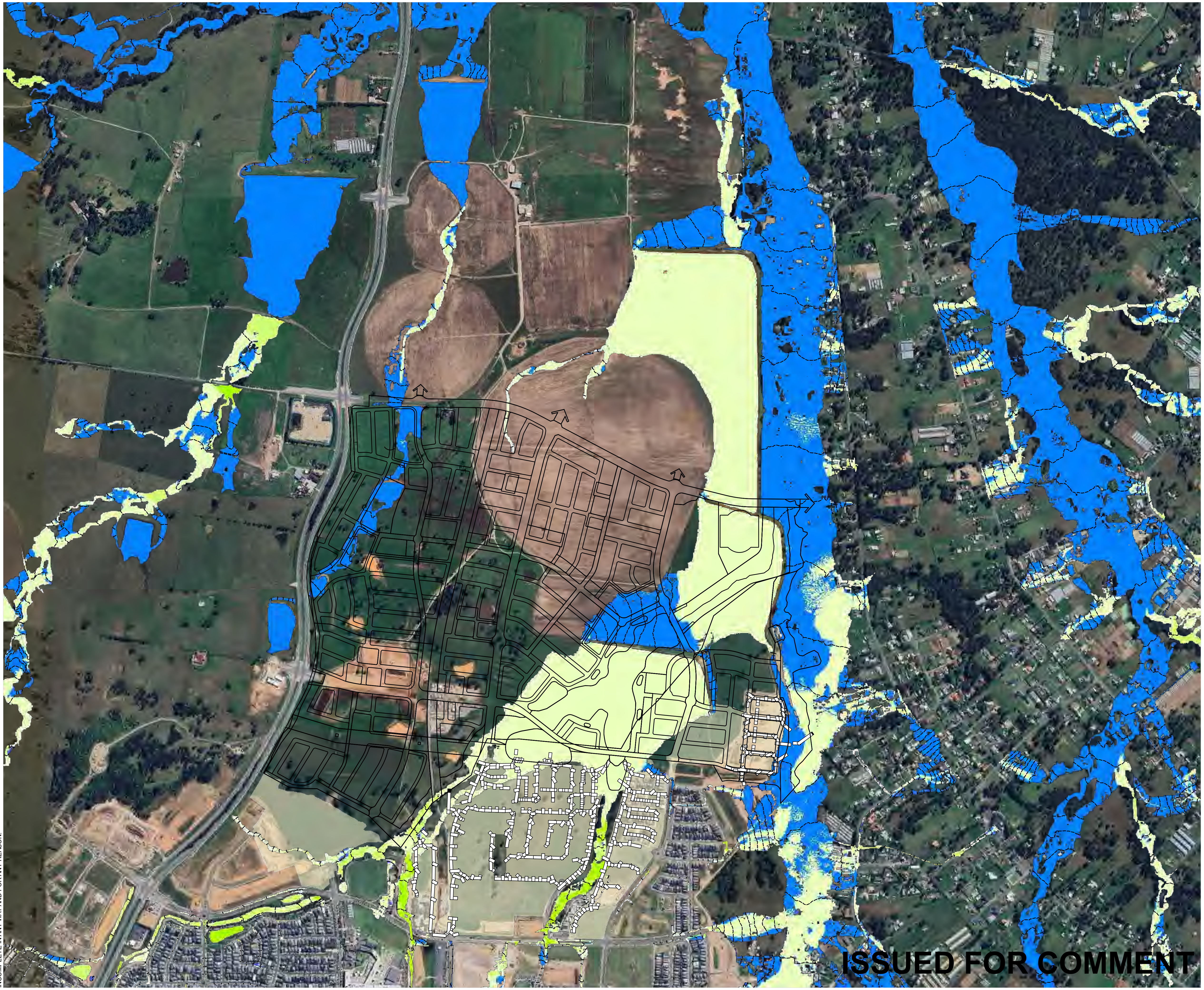

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

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LEGEND

Project

- PROPOSED DEVELOPMENT LAYOUT
- EX MODEL 1D ELEMENTS

SENSITIVITY A

1%

- FLOOD HEIGHT CONTOURS (mAHD)

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
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2. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
PRE-EXISTING TO COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-S_A-100-E-1**

ISSUE: **A**

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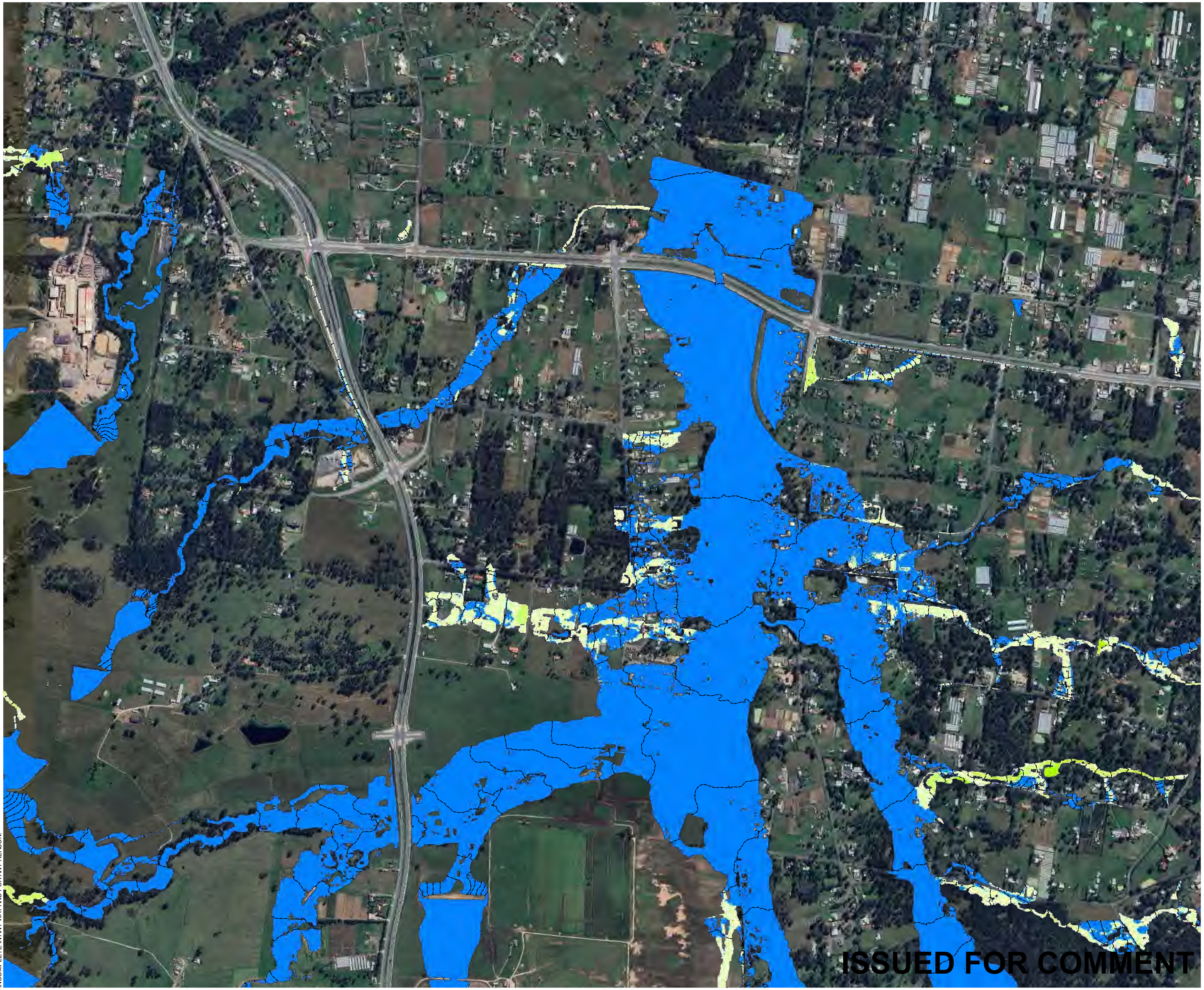

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

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LEGEND

SENSITIVITY A

1%

------ FLOOD HEIGHT CONTOURS (mAHD)

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
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140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
PRE-EXISTING TO COUNCIL MODEL
1% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-S_A-100-E-2**

ISSUE: **A**

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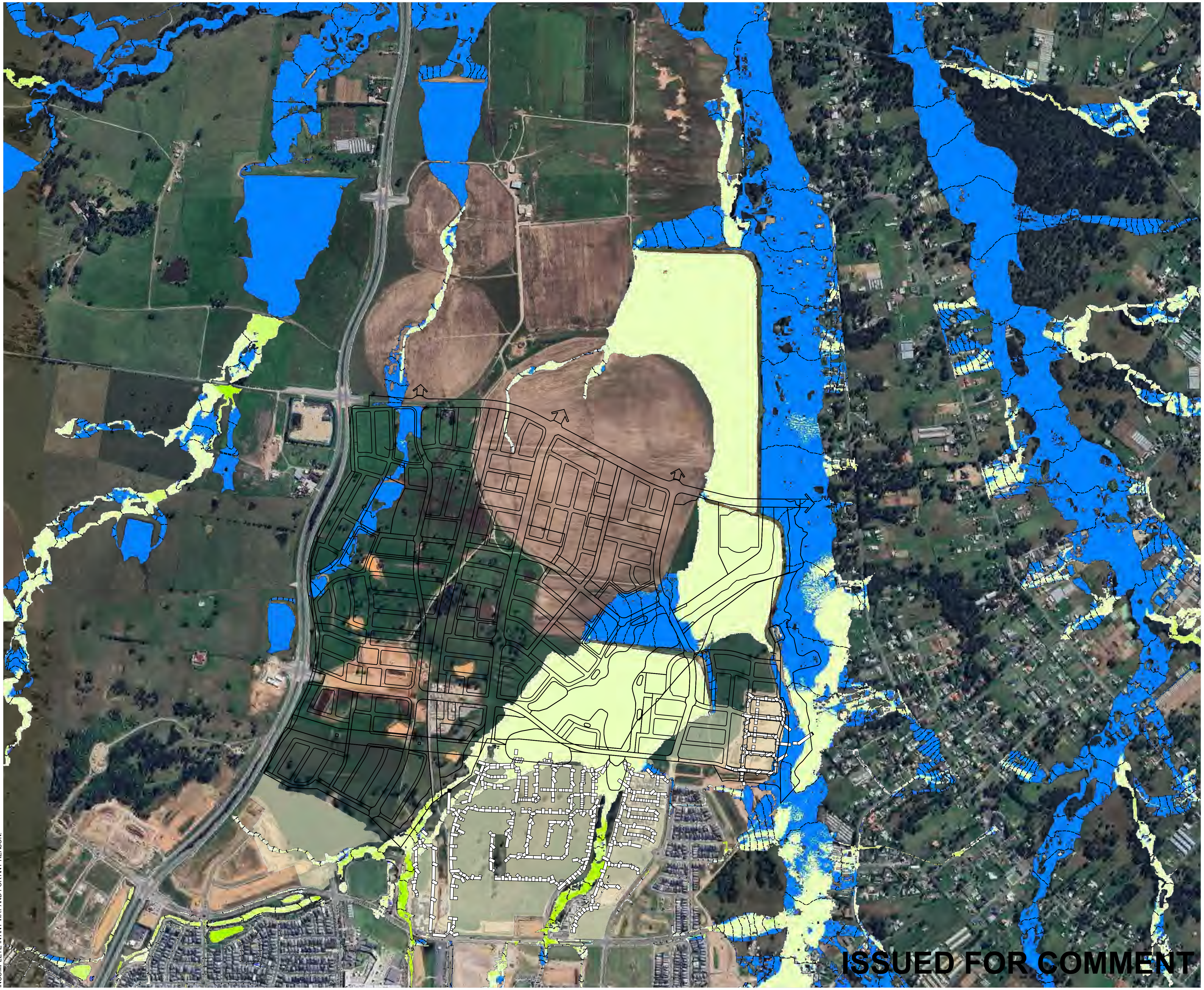

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

Project

PROPOSED DEVELOPMENT LAYOUT

EX MODEL 1D ELEMENTS

SENSITIVITY A

1%

FLOOD HEIGHT CONTOURS (mAHD)

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.05
- 0.05 - 0.1
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- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

NOTES:
1. REFER TO CALIBRE REPORT.

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140 0 140 280 420 m

1:15000 (A3)

N

PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
DEVELOPED TO PRE-EXISTING 1% AEP STORM EVENT MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-S_B-100-E-1**

ISSUE: **A**

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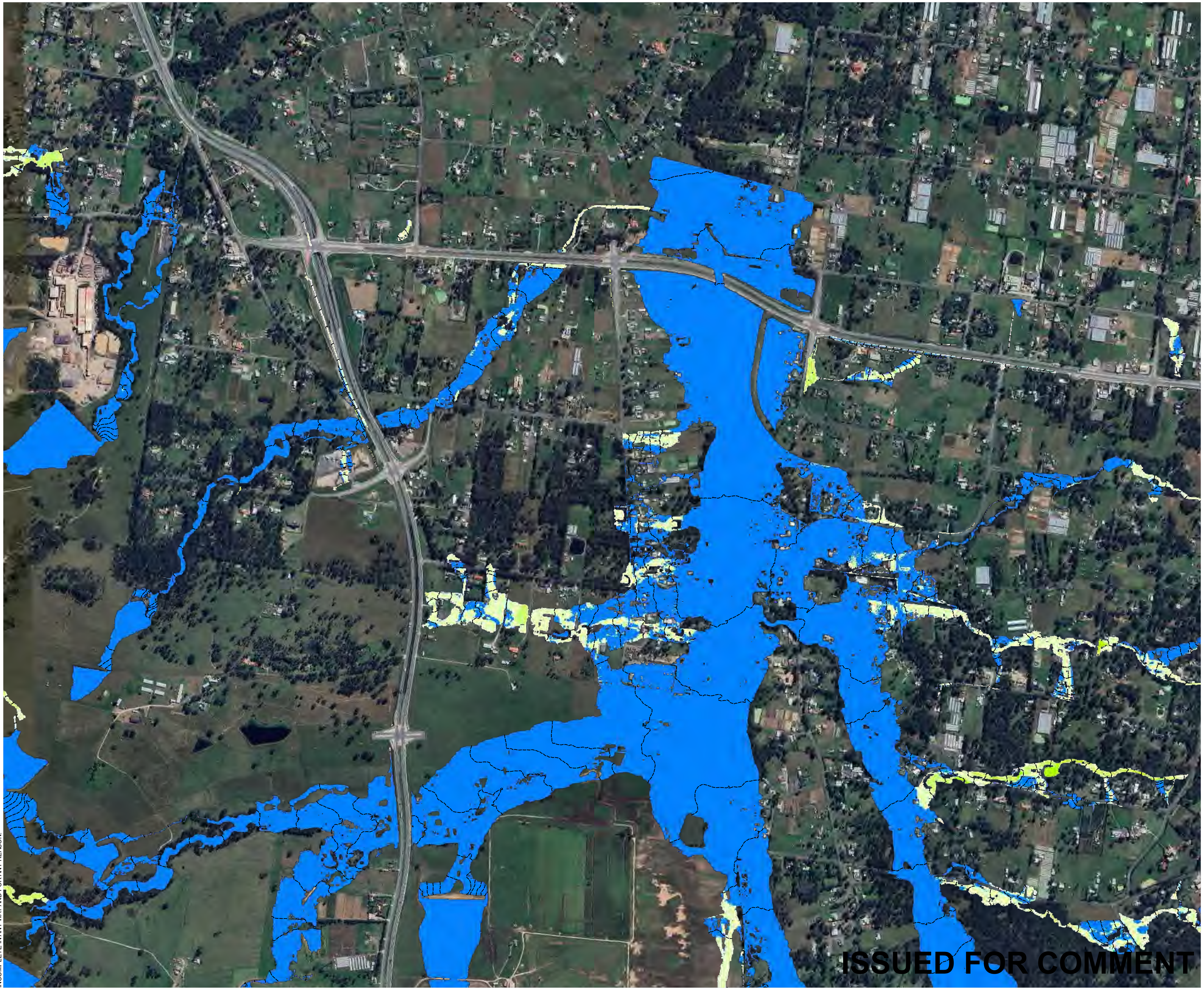

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COORDINATE REFERENCE SYSTEM: GDA1994 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre CONSULTING

LEGEND

SENSITIVITY A

1%

------ FLOOD HEIGHT CONTOURS (mAHD)

WSL DIFFERENCE (m)

- < -0.1
- -0.1 - -0.05
- -0.05 - 0.01
- -0.01 - 0.00
- 0.00 - 0.01
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- 0.1 - 0.15
- 0.15 - 0.2
- 0.2 - 0.25
- 0.25 - 0.3
- 0.3 - 0.4
- > 0.4

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140 0 140 280 420 m

1:15000 (A3)

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PROJECT:
Pondicherry Precinct

CLIENT:
-

DRAWING TITLE:
DEVELOPED TO PRE-EXISTING
1% AEP STORM EVENT
MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **19-000750-S_B-100-E-2**

ISSUE: **A**

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Attachment C – Calibre Memorandum 16 September 2020

Memorandum

Date:	Wednesday, 16 September 2020	**Pages:**	13
To:	Department of Planning	**Copy:**	
From:	Troy Eyles	**Ref:**	19-000750

Subject: **Pondicherry Flood Model**

1.1 Introduction

Calibre has prepared flood modelling for the future lakes within the Pondicherry Precinct.

1.1.1 Site Description

The site locality of Pondicherry is shown in Figure 1.

The Pondicherry Precinct is located approximately 5 km downstream of the uppermost headwaters of South Creek, and 3.7 km downstream of Camden Valley Way. South Creek forms the southern boundary of the precinct. The catchment area of South Creek upstream of the Pondicherry/Oran Park Precinct is approximately 871 ha.

Oran Park Precinct (upstream of Pondicherry) includes two major tributaries that discharge to South Creek via the existing dams in Pondicherry, with a combined 458 ha area that drain east of Northern Road to South Creek. The largest of the two tributaries is approximately 377 ha in size and drains to an existing large dam. A smaller tributary of approximately 81.3 ha also drains to this dam.

The catchment area is predominantly cleared grazed land on ridges. While some of the creek lines contain remnant vegetation, most are predominantly cleared. Average catchment slopes range between 1% and 4%.

Figure 1: Pondicherry Locality Plan

Pondicherry drains to South Creek which also forms the Eastern boundary to the site.

1.1.2 Background

The Oran Park Precinct Masterplan Stormwater Quantity Management and Flooding (2013) was prepared for the Growth Centres Commission and identified the stormwater management for the Oran Park Precinct (draining into Pondicherry). The stormwater management took the form of small detention storage associated with water quality improvement features, and larger detention basins to manage major flows up to the 100 year average recurrence interval (ARI). The smaller storages located through the site will be used to attenuate bank-full flows (up to the 2 year ARI) to mitigate erosion and ensure ecologically sustainable creeks through the site. The larger detention storages will be used to ensure that flooding in South Creek is not heightened as a result of the development in the Oran Park Precinct. In addition to detention basins, the commercial land use of town centre is proposed to incorporate lot based onsite detention (for the 2 year ARI) to protect the creeks immediately downstream. This would form an OSD component of their rainwater storage.

The precinct strategy did not account for the existing farm dam capacity, as they were considered to be for irrigation purpose and not for flood mitigation. The strategy identified the basin/lakes as discharging directly to South Creek.

The modelling for the Pondicherry Precinct has been updated to adopt Camden Councils Upper South Creek Flood model. The existing scenario was analysed, and it was identified that active flood storage was occurring as a result of the farm dam embankments being incorporated in the terrain surface. Figure 2 identifies the active storage volumes occurring in the Council flood model during the 100 year ARI storm event.

Figure 2. Existing flood storage within farm dams

Memorandum

As part of the Pondicherry Precinct the strategy is to return waterway discharging into South Creek to the original alignment prior to the construction of the farm dams.

The intention of the farm dam was not for flood mitigation and does not form part of a regional strategy to reduce flood levels, however the figure shows the flood storage that is occurring within the flood model as a result of the inclusion of the embankments within the terrain model. The construction of the farm dam embankments has also resulting in modification of the pre developed flow regime, the waterways no not enter directly to South Creek, the flows have been modified to have each dam cascade into the lower dam prior to entering South Creek.

1.2 Pondicherry Lakes

1.2.1 Lakes System Option

The stormwater strategy involves converting the existing dams into a formalised lakes system. The online existing dam currently provides a large permanent water level, the option will maintain the concept of permanent water and allow the water body to have multi purposed uses.

The detention volume required will be above the permanent water level of the proposed lakes, the outflow will be controlled through weirs and culverts to ensure that the existing flow rate is achieved. The permanent water level has a number of advantages including reducing the footprint required for detention volumes. The permanent water provides a flat level surface, allowing the detention volume to be applied over the whole lakes area. By allowing a depth of up to 1m deep, the lakes option will allow the detention storage to reduce the detention footprint to approximately 20 ha. The total footprint can be made up of 13 -14ha within open water bodies,

The detention within the lakes discharge around the playing fields to South Creek. The strategy returns the discharge point to South Creek to the natural (pre farm dam) location.

Memorandum

Figure 3. Lake strategy (Design and Planning)

Memorandum

The developed lakes strategy was run in the Camden Councils Upper South Creek Flood model.

The flood afflux (difference map of post developed vs pre-developed) is presented in figure 4. The existing scenario flood model has incorporated flood storage within the farm dam, each dam cascades into the downstream dam prior to discharging into South Creek. As the developed scenario looks to align the discharge with the natural location, the flow enters South Creek upstream of the existing flood model, as a result the flood difference mapping shows an increase in flood levels within South Creek in the order of 200-250mm (dark red).

Figure 4 100 yr Flood Afflux

Memorandum

A sanity check was run to test the effect of the reliance on the flood mitigation within the farm dams, the existing scenario model was modified to remove the active storage. The flood difference map presented in figure 5 shows that there is flood level improvements from the developed scenario when the active storage in the farm dams is not included.

Figure 5: 100 yr Flood Afflux (no existing farm dam flood storage)

Various flood studies have ben undertaken along South Creek, both with and without flood storage within the farm dams. Figure 6 presents the flood extents of the flood studies. The analysis shows that any flood level increase as a result of removal of the active flood storage within the farm dams has minimal impact on the flood extents.

Figure 6: flood extent comparison

Memorandum

1.3 Greenways

The flood level alterations as a result to returning the Pondicherry discharge to the natural location can be manage within Greenways precinct to the North.

There is opportunities to open up the flood plain within the riparian corridor once Greenways has been constructed. The development footprint for the Greenways Precinct can be located at the western side of the existing dam embankment as shown in Figure 2. This provides for a wider floodplain that has a greater conveyance than under the existing conditions.

Figure 7. Greenways development Area

The wider floodplain and the stormwater mitigation measure that will be incorporated into the Greenways Precinct plan to manage the flooding within South Creek. Any flood level difference are considered temporary until such time as Greenways has been developed.

The ultimate development including the future Greenway Precinct has demonstrated that the existing flood levels will be maintained. It is anticipated that the Pondicherry and Greenway Precincts will be constructed prior to the release of the Catherine Fields Precinct to the east.

1.4 Temporary

The flood modelling has demonstrated that the existing flood model is reliant on the farm dams providing a role in flood mitigation. Excluding active flood storage in the existing scenario (pre farm dams) shows the development scenario has flood level improvements within South Creek.

The development of Greenway will provide additional flood level improvements and manage any potential flood level increases.

However, if the development scenario needs to match the flood regime modelled in the Upper South Creek model (with active storage in farm dams) then an alternate solution was investigated. For the option to maintain the flood regime as modelled in the Council existing flood model, the lower dam within Pondicherry Precinct will need to remain, and the discharge directly to South creek will occur once Greenways precinct is developed.

The preservation of the existing farm dam embankment (temporarily) will result in delays in delivering some of the active playing fields. Figure 8 shows the flood extents when maintaining the existing farm dam embankment (temporary) until such time as Greenways Precinct is online. The scenario allows filling of a portion of the playing fields, however not all the regional playing fields can be delivered until the farm dam embankment is removed and the discharge is directed to South Creek

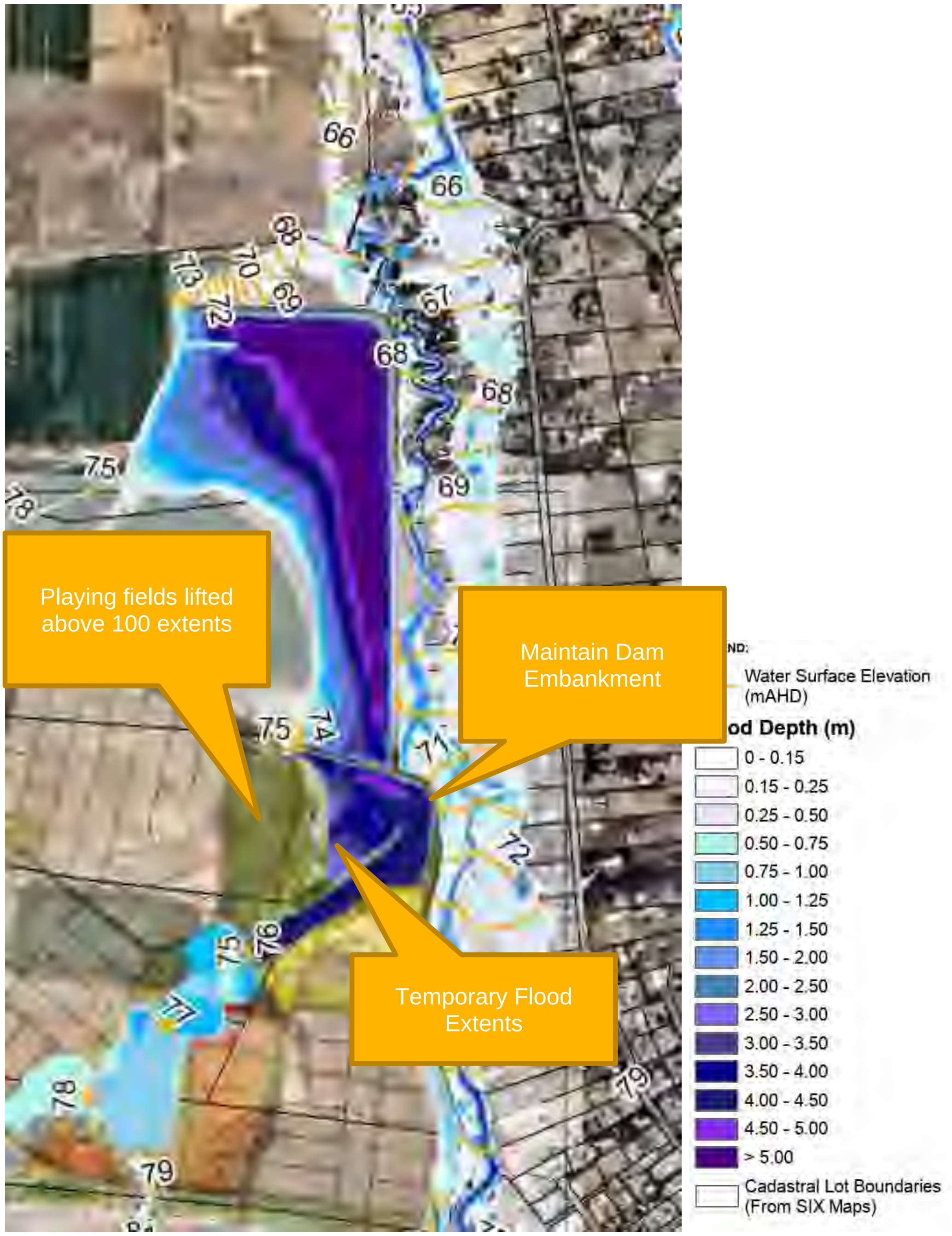


Figure 8: option for temporarily maintain dam embankment.

Preserving the lower dam embankment allows the flow to discharge into the northern dam and not to South Creek. This results to no flood level increase when compared to the existing flood model (with active storage in farm dams).

Figure 10: Flood afflux with temporary farm dam

1.5 Flood Evacuation

Generally, the existing proposed lakes will control flooding, but the majority of the Pondicherry is not considered flood prone, and therefore the issue of flood evacuation does not have to significantly influence urban design as areas except for along South Creek within the flood fringe (PMF) are proposed to be filled. A flood evacuation plan will be required as part of the future development application process. Given that flood free ground is close by, evacuation should be considered an acceptable solution to manage flood risk.

As recommended by Camden Council and Australian Rainfall and Runoff, a 'minor' and 'major' drainage system approach is proposed to manage local runoff. This typical requirement allows safe passage of flood flows along the road once the drainage pipe capacity is exceeded. Flows are also accommodated in the drainage corridors where riparian buffers are located.

Proposed lot and habitable floor levels would at a minimum conform to the Growth Centres DCP, with the habitable floor levels being a minimum of 500 mm above the 100 year ARI flood levels throughout the site. The relevance of this planning control is restricted to lots fronting riparian corridors and South Creek.

1.6 Conclusion

The proposed water cycle management for Pondicherry Precincts proposes a lake system that incorporates detention to manage the flows from the Oran Park town and Pondicherry precinct. The proposal looks to re-establish the natural discharge point to South Creek.

The flood levels within South Creek can ultimately be managed with the development of Pondicherry and Greenways.

The ultimate stormwater management strategy can be delivered, alternatively a temporary scenario (maintaining lower dam) could be adopted. The pros and cons of each option are presented below.

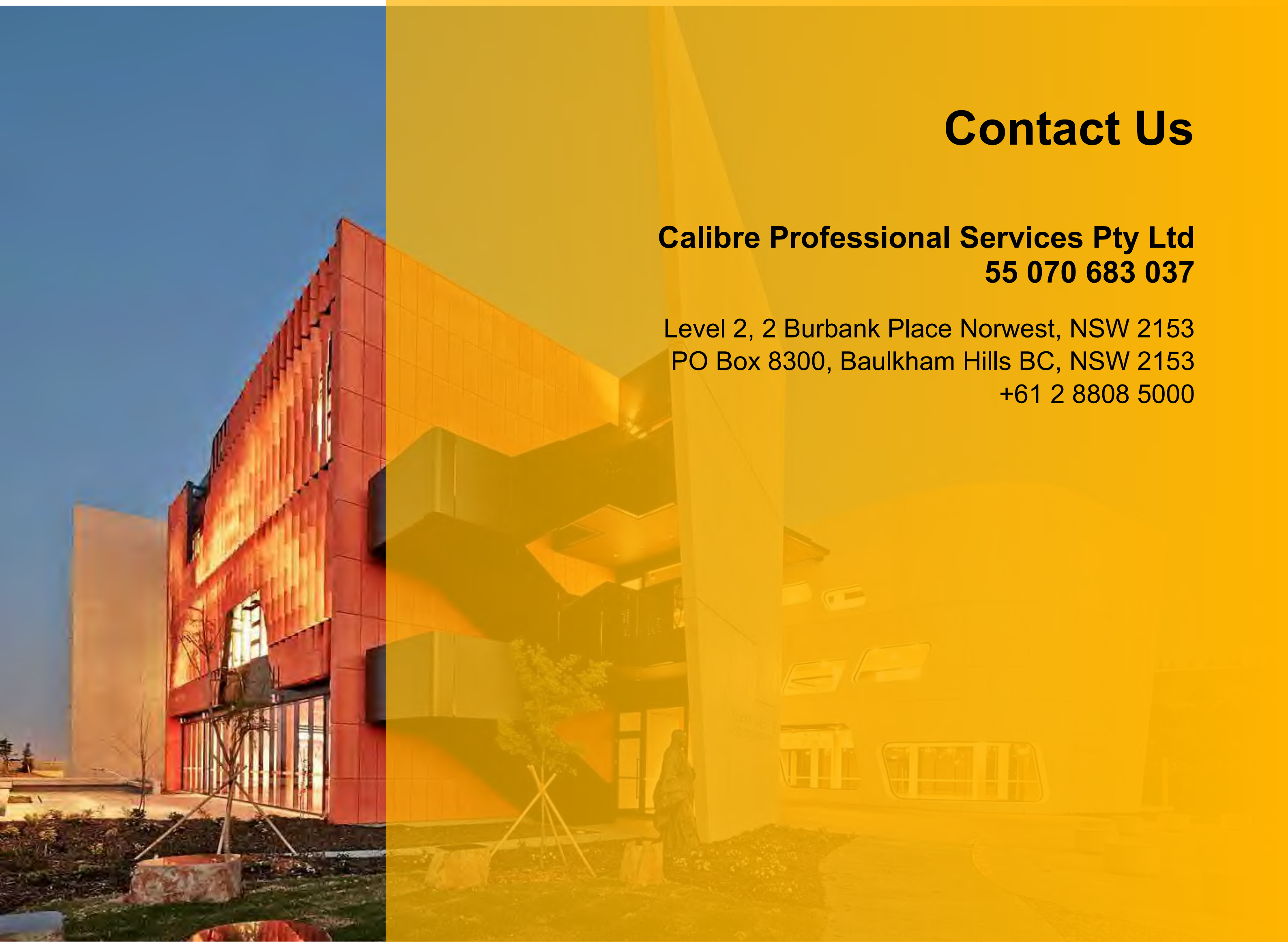
ULTIMATE STORMWATER STRATEGY

BENEFIT	DISBENEFIT
The full complement of recreation facilities within the Pondicherry active open space area can be delivered	Temporary increase in flood levels within South Creek until such time as Greenways is developed (due to removal of active storage inadvertently modelled within the Council Flood Study)
Re-establishes the connection of the stream through Pondicherry with South Creek at the original location (prior to construction of the farm dams in Pondicherry) The natural water discharge and environmental flows to South Creek restored	Council may need to fund through the relevant Contribution Plans the provision of the district active open space, and any shortfall, earlier than the full funds being available.
Final development outcome can be delivered upfront, no need to return to rectifying works at a later stage	
Pondicherry release area manages its own drainage and does not rely on drainage on other land outside the precinct.	
The provision of active open space to fulfill the Pondicherry requirements and the District obligations under the relevant Council Contribution Plans can be achieved simultaneously	
The structural integrity of the existing dam is overcome and any potential issues with Dam Safety Committee avoided	
No change to the ILP for Pondicherry	

The same landowner for both Pondicherry and Greenways and therefore commitment to the ultimate outcome can be achieved	

TEMPORARY STORMWATER STRATEGY

BENEFIT	DISBENEFIT
Maintains flood levels in South Creek by mimicking the active storage in farm dams from the Council flood model	The provision of the district active open space component (i.e. one multi-purpose field) in Pondicherry is temporarily delayed until the strategy for the south eastern portion of Greenways is implemented
The portion of the active playing fields that can be delivered equals the provision requirements for the Pondicherry Release Area	The natural water discharge and environmental flows to South Creek in the original stream location does not occur until the south eastern portion of Greenways is developed, at which time the flood impact on South Creek is improved
The District playing field component can be delivered once Greenways is developed and the full funds can be captured by Council from the various contribution plans	
Maintains flows into northern farm dam	
The remainder of the ILP for Pondicherry can be delivered with confidence	
The delivery of the district playing field component of the active open space in Pondicherry can occur simultaneously with the removal of the dam in Greenways.	
Better coordination of the overall Pondicherry and Greenways (south east portion) stormwater strategy	
The same landowner for both Pondicherry and Greenways and therefore commitment to the ultimate outcome can be achieved	



Contact Us

Calibre Professional Services Pty Ltd
55 070 683 037

Level 2, 2 Burbank Place Norwest, NSW 2153
PO Box 8300, Baulkham Hills BC, NSW 2153
+61 2 8808 5000

calibregroup.com

Attachment D – Flood Modelling Brief

Memorandum

Date:	Friday, 4 June 2021	**Pages:**	3
To:	Trent Kelly	**Copy:**	
From:	Troy Eyles	**Ref:**	20-000800

Subject: **Tranche 41 and Pondicherry Flood Modelling Brief**

Precinct Planning Flood Modelling Brief

The Precinct Planning is being undertaken on Tranche 41 and the Pondicherry Precinct. Currently flood modelling has been undertaken for the 1% AEP, as the 1% AEP has been used to set the basin areas and flood extents for the major storm event, with the intention that the outlets will be designed to mitigate the minor storm events as part of the design process. A pre submission meeting was undertaken on the 11 May 2020 to discuss the flood modelling requirements including additional requirements for 2-d modelling of the basins at the precinct planning.

At our meeting held on the 11thMay 2021, it was agreed that Greenfield Development Company (GDC) would provide a proposed outline of undertaking flood modelling for both Tranche 41 and Pondicherry. This memorandum outlines the proposed flood modelling for Council consideration, the comparison tables are shown on pages 4 – 6 of this document.

Typically, the water cycle management strategy is adopted as part of the Precinct Planning to prepare an Indicative Layout Plan (ILP). As ILP is indicative, generally detailed grading or terrain modelling isn't undertaken until later stages. Preliminary catchments are delineated and are refined as part of the design process with detailed road grading and final surface. All 2-dimensional flood modelling utilises a Digital Terrain Model (DTM) as the finished surface. The DTM is created from the proposed 3-dimensional terrain of the site including road grading and any basins. Traditionally the terrain modelling is not undertaken as part of the preparation of the ILP but prepared as part of the DA and bulk earthworks process. A broad terrain can be constructed for the development and the basin/lake for use in the flood model, however detailed terrain modelling would not be available until all constraints are re assessed and design undertaken as part of DA design. At that stage the flood modelling would need to be reassess with the basin stage vs storage and outlets being modified to suit.

The Upper South Creek Regional Model Framework – Draft memorandum prepared for Camden Council by WMAwater (April 2020) provides a user guide for the use of the Upper South Creek Regional flood model. The draft TUFLOW user guide provides recommendations on the storm events and durations to be modelled. As the precinct planning for Tranche 41 and Pondicherry has commenced, it was agreed that Council would consider an approach for Tranche 41 that recognises precinct planning was completed before Council's implementation of new flood modelling assessment. For Pondicherry it was agreed that GDC would respond with an approach that sets out practical modelling for each stage that allows Council to be confident that flood risk, evacuation and flood plains have been adequately considered and that there is nothing that will contravene flood risk. Also, that sizing of basins was sufficient to protect downstream properties or did not result in poor outcomes. This memo outlines the proposed flood modelling strategy for the Precinct Planning phase for both Tranche 41 and Pondicherry. Assumptions will need to be made in regard to the terrain and basins to prepare the proposed modelling at this stage and will require an update with more detailed terrain modelling.

Tranche 41

Tranche 41 includes a detention and water quality basin discharging into Anthony Creek. The basin has been sized in XPRAFTs to ensure no aggravating of flows for all storm events. Until such time as the construction of the future Pondicherry Lakes, Tranche 41 flows will ultimately discharge into the existing farm dams.

The TUFLOW modelling will be updated to incorporate the Tranche 41 future subdivision. The council base flood model will be updated to include the survey data within the terrain.

The developed flood model will include the proposed subdivision and basin works. The TUFLOW model utilised a 3 X 3m grid size, as a result there will be some simplifying of the terrain. The developed flood model will then be evaluated the updated base model.

The model will be run for the following design storms and durations;

Event	Duration (mins)
PMF	60*
1%	30
	360
	720
5%	60
	360
	1080

*PMF 60mins based on document issued for the meeting on the 11 May 2012 "Camden Council Flood Modelling requirements".

The following flood mapping will be prepared

- Flood extents for the 5% AEP, 1% AEP and PMF
- Velocity Mapping for the 1% AEP
- Hazard Mapping 1% AEP
- Flood Level Difference for the 5% AEP, 1% AEP and PMF

The flood model will then need be updated as the development application and subdivision works certificate design are completed.

Pondicherry

A flood and water cycle assessment has undertaken as part of the planning proposal, the assessment modelled the 1% AEP for the critical storm event to identify the preliminary footprint to inform the creation of the Indicative Layout Plan for the precinct. The strategy identified a lake that would have a stormwater detention component to manage peak flows off the precinct.

The preliminary flood assessment has informed the design process, additional details will be provided to the lake and associated detention design that can be incorporated into additional flood modelling.

The TUFLOW modelling will be updated to incorporate the Pondicherry lake and future subdivision. The council base flood model will be updated to include the survey data within the terrain.

The developed flood model will include the proposed subdivision and basin works. The TUFLOW model utilised a 3 X 3m gride size, as a result there will be some simplifying of the terrain. The developed flood model will then be evaluated the updated base model.

The model will be run for the following design storms and durations;

Event	Duration (mins)
PMF	60*
1%	30
	360
	720
5%	60
	360
	1080
20%	30
	540
	1440

*PMF 60mins based on document issued for the meeting on the 11 May 2012 "Camden Council Flood Modelling requirements".

The following flood mapping will be prepared

- Flood extents for the 5% AEP, 1% AEP and PMF
- Velocity Mapping for the 1% AEP
- Hazard Mapping 1% AEP
- Flood Level Difference for the 5% AEP, 1% AEP and PMF

The flood model will then need be updated as the development application and subdivision works certificate design are completed

A comparison of the Council requirements and GDC proposition is attached.

Memorandum

Flood Modelling – Tranche 41

Tranche 41 Indicative Layout Plan		
Council	GDC Proposition	Comments
TUFLOW Regional Flood Model 20% (30min, 540min, 1440min) 5% (60min, 360min, 1080min) 1% (30min, 360min, 720min) PMF (60min)	TUFLOW Regional Flood Model 5% (60min, 360min, 1080min) 1% (30min, 360min, 720min) PMF (60min)	The rare storm events are the control for the basin footprints used to inform the ILP. The frequent storm events relate to the outlet design and can be investigated when more detail is available.
Outputs • Flood extents and peak flow hydrographs for the 20%, 5% AEP, 1% AEP and PMF • Velocity Mapping for the 20%, 5%, 1% AEP • Hazard Mapping 20%, 5%, 1% AEP • Flood Level Difference for the 5% AEP, 1% AEP and PMF	Outputs • Flood extents for the 5% AEP, 1% AEP and PMF • Velocity Mapping for the 1% AEP • Hazard Mapping 1% AEP • Flood Level Difference for the 5% AEP, 1% AEP and PMF	Flood mapping will inform the ILP.

Tranche 41 Development Application		
Council	GDC Proposition	Comments
TUFLOW Regional Flood Model 50% (30min, 540min, 1440min) 20% (30min, 540min, 1440min) 5% (60min, 360min, 1080min) 1% (30min, 360min, 720min) PMF (60min)	TUFLOW Regional Flood Model 20% (30min, 540min, 1440min) 5% (60min, 360min, 1080min) 1% (30min, 360min, 720min) PMF (60min)	As part of the DA process greater detail will be available to update flood modelling
Outputs • Flood extents and peak flow hydrographs for the 50%, 20%, 5% AEP, 1% AEP and PMF • Velocity Mapping for the 50%, 20%, 5%, 1% AEP • Hazard Mapping 50%, 20%, 5%, 1% AEP • Flood Level Difference for the 50%, 20%, 1% AEP and PMF	Outputs • Flood extents for the 5% AEP, 1% AEP and PMF • Velocity Mapping for the 1% AEP • Hazard Mapping 1% AEP • Flood Level Difference for the 5% AEP, 1% AEP and PMF	

Tranche 41 Subdivision Certification		
Council	GDC Proposition	Comments
TUFLOW Regional Flood Model 50% (30min, 540min, 1440min) 20% (30min, 540min, 1440min) 5% (60min, 360min, 1080min) 1% (30min, 360min, 720min) PMF (60min)	TUFLOW Regional Flood Model 20% (30min, 540min, 1440min) 5% (60min, 360min, 1080min) 1% (30min, 360min, 720min) PMF (60min)	If no changes to design from the DA, then updated flood modelling is unnecessary.
Outputs • Flood extents and peak flow hydrographs for the 50%, 20%, 5% AEP, 1% AEP and PMF • Velocity Mapping for the 50%, 20%, 5%, 1% AEP • Hazard Mapping 50%, 20%, 5%, 1% AEP Flood Level Difference for the 50%, 20%, 1% AEP and PMF	Outputs • Flood extents for the 5% AEP, 1% AEP and PMF • Velocity Mapping for the 1% AEP • Hazard Mapping 1% AEP Flood Level Difference for the 5% AEP, 1% AEP and PMF	

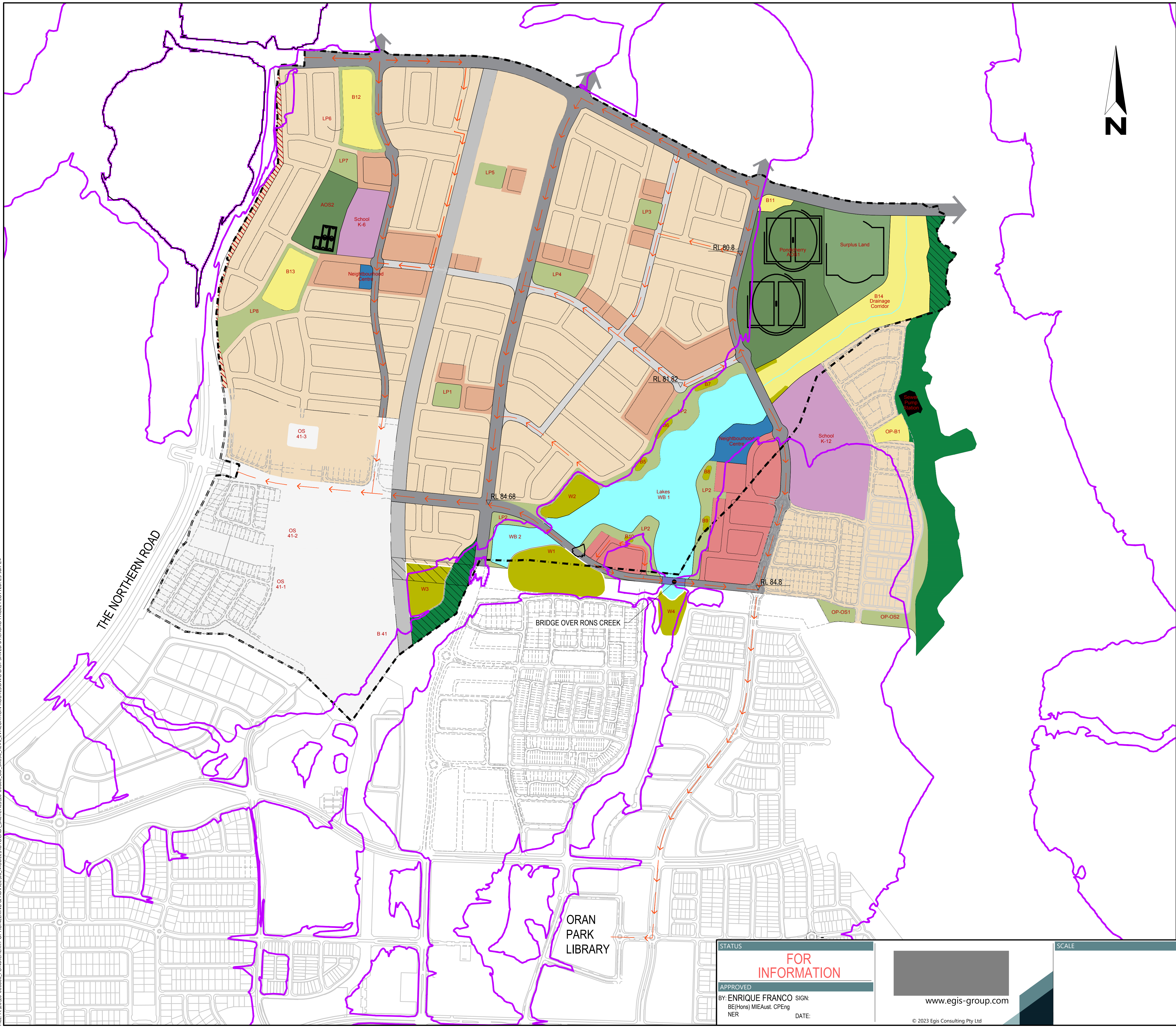
Flood Modelling – Pondicherry

Pondicherry Indicative Layout Plan		
Council	GDC Proposition	Comments
TUFLOW Regional Flood Model 20% (30min, 540min, 1440min) 5% (60min, 360min, 1080min) 1% (30min, 360min, 720min) PMF (60min)	TUFLOW Regional Flood Model 5% (60min, 360min, 1080min) 1% (30min, 360min, 720min) PMF (60min)	The rare storm events are the control for the basin footprints used to inform the ILP. The frequent storm events relate to the outlet design and can be investigated when more detail is available.
Outputs • Flood extents and peak flow hydrographs for the 20%, 5% AEP, 1% AEP and PMF • Velocity Mapping for the 20%, 5%, 1% AEP • Hazard Mapping 20%, 5%, 1% AEP Flood Level Difference for the 5% AEP, 1% AEP and PMF	Outputs • Flood extents for the 5% AEP, 1% AEP and PMF • Velocity Mapping for the 1% AEP • Hazard Mapping 1% AEP • Flood Level Difference for the 5% AEP, 1% AEP and PMF	Flood mapping will inform the ILP.

Pondicherry Development Application		
Council	GDC Proposition	Comments
TUFLOW Regional Flood Model 50% (30min, 540min, 1440min) 20% (30min, 540min, 1440min) 5% (60min, 360min, 1080min) 1% (30min, 360min, 720min) PMF (60min)	TUFLOW Regional Flood Model 20% (30min, 540min, 1440min) 5% (60min, 360min, 1080min) 1% (30min, 360min, 720min) PMF (60min)	As part of the DA process greater detail will be available to update flood modelling
Outputs • Flood extents and peak flow hydrographs for the 50%, 20%, 5% AEP, 1% AEP and PMF • Velocity Mapping for the 50%, 20%, 5%, 1% AEP • Hazard Mapping 50%, 20%, 5%, 1% AEP Flood Level Difference for the 50%, 20%, 1% AEP and PMF	Outputs • Flood extents for the 5% AEP, 1% AEP and PMF • Velocity Mapping for the 1% AEP • Hazard Mapping 1% AEP Flood Level Difference for the 5% AEP, 1% AEP and PMF	

Pondicherry Subdivision Certification		
Council	GDC Proposition	Comments
TUFLOW Regional Flood Model 50% (30min, 540min, 1440min) 20% (30min, 540min, 1440min) 5% (60min, 360min, 1080min) 1% (30min, 360min, 720min) PMF (60min)	TUFLOW Regional Flood Model 20% (30min, 540min, 1440min) 5% (60min, 360min, 1080min) 1% (30min, 360min, 720min) PMF (60min)	If no changes to design from the DA, then updated flood modelling is unnecessary.
<u>Outputs</u> • Flood extents and peak flow hydrographs for the 50%, 20%, 5% AEP, 1% AEP and PMF • Velocity Mapping for the 50%, 20%, 5%, 1% AEP • Hazard Mapping 50%, 20%, 5%, 1% AEP Flood Level Difference for the 50%, 20%, 1% AEP and PMF	<u>Outputs</u> • Flood extents for the 5% AEP, 1% AEP and PMF • Velocity Mapping for the 1% AEP • Hazard Mapping 1% AEP Flood Level Difference for the 5% AEP, 1% AEP and PMF	

Attachment E – Flood Evacuation Map



LEGEND

PMF FLOOD EXTENT

ZONING BOUNDARY

ESCAPE ROUTE

ROAD LEVEL — RL XX.XXX

STATUS

FOR INFORMATION

APPROVED

BY: ENRIQUE FRANCO SIGN:
BE(Hons) MIEAust. CPEng
NER
DATE:

www.egis-group.com

SCALE

DRAWING TITLE

PONDICHERRY - ESCAPE ROUTES

DRAWING No.	DATE	REVISION
20-00800_UD_SK050_REV0_EVACUATION ROUTES	25/01/2024	0

FILE: H:\20\20-00800_PONDICHERRY OPTIONEERING & ADVICE\06_MODEL\AUTOCAD_SKETCHES\20-00800_UD_SK050_REV0_EVACUATION ROUTES.DWG LAST SAVED BY:LAURO FAGEL PLOTTED: 25-Jan-24

Attachment F – Flow Rate Analysis (XP-Rafts)

FOR INFORMATION

MEMORANDUM

UPPER SOUTH CREEK BASIN B1 COMPARISON OF FLOWS

24 January 2024

Author(s)	Neil Luzano
Entity	Water Resources
Version	00
Reference	20-000800

1 INTRODUCTION

Egis has undertaken hydrologic modelling in XPRAFTS to compare flows in relation to the sizing of Basin B1 that is intended to provide attenuation of flows for the Oran Park and Pondicherry Precinct Developments. The upper South Creek Regional Model (WMAwater) provided by Council has been used as basis to establish pre-development and post-development scenarios for the catchment.

2 HYDROLOGIC MODELLING

The parameters included in the modelling are discussed in the following sections.

2.1 Council Model (Upper South Creek Regional Model)

The 'user guide' of the Council model provides the modelling parameters including the impervious fractions, hydraulic roughness, rainfall losses, and critical storm events. It is noted that the majority of the Oran Park Precinct area has been considered to be built and is therefore modelled as urban residential as discussed in the user guide. On the other hand, majority of the Pondicherry area has been considered to be undeveloped and therefore modelled as bushland. Catchment parameters are summarised in the table below.

TABLE 2-1: CATCHMENT PARAMETERS

LAND USE TYPE	IMPERVIOUS FRACTION	PERVIOUS MANNINGS COEFFICIENT	IMPERVIOUS MANNINGS COEFFICIENT
Urban Residential	60%	0.025	0.015
Bush	0%	0.04	0.015

2.2 Pre-developed Scenario

This scenario has been modelled to establish the site conditions prior to any development occurring within the catchment. The Council model has been updated to define the Oran Park and Pondicherry Precinct areas as undeveloped. Therefore, catchment nodes in XPRAFTS have been updated to align with the Bush land use type.

2.3 Post-development Scenario

This scenario represents the post-development condition used by Egis in the sizing of Basin B1. The Council model has been updated to include ongoing and future developments within the Oran Park and Pondicherry Precinct areas. As such, catchment nodes have been updated to reflect the Urban Residential land use type.

3 MODELLING OUTCOMES

The 1% AEP 30-minute, 360-minute, and 720-minute critical storm events have been run on the models described in the previous section. Peak flows taken from node 1028, representing Basin B1, are provided in the table below.

TABLE 3-1: 1% AEP PEAK FLOWS AT NODE 1028

STORM EVENT	COUNCIL MODEL (M3/S)	PRE-DEVELOPED SCENARIO (M3/S)	POST-DEVELOPED SCENARIO (M3/S)
1% AEP 30-minute TP1	40.4	35.4	36.9
1% AEP 360-minute TP5	39.1	38.5	38.2
1% AEP 720-minute TP8	34.0	33.6	34.7

Results show that the pre-development peak flows are lower than the Council model results, which is due to the increased pervious percentage and roughness of the catchment.

Notably, flows generated under the 360-minute event have a difference of -0.3 m3/s between the pre-development and post-development scenarios. Furthermore, the post-development flows are lower than the Council model results under the 30-minute and 360-minute events. It is expected that this is due to the timing of arrival of flows at Basin B1, which is affected by the changes in catchment land use types.

Hydrographs taken from node 1028 are also provided in Figure 3-1 to Figure 3-3 that demonstrate the changes in timing and resulting peak flows for the different modelling scenarios.

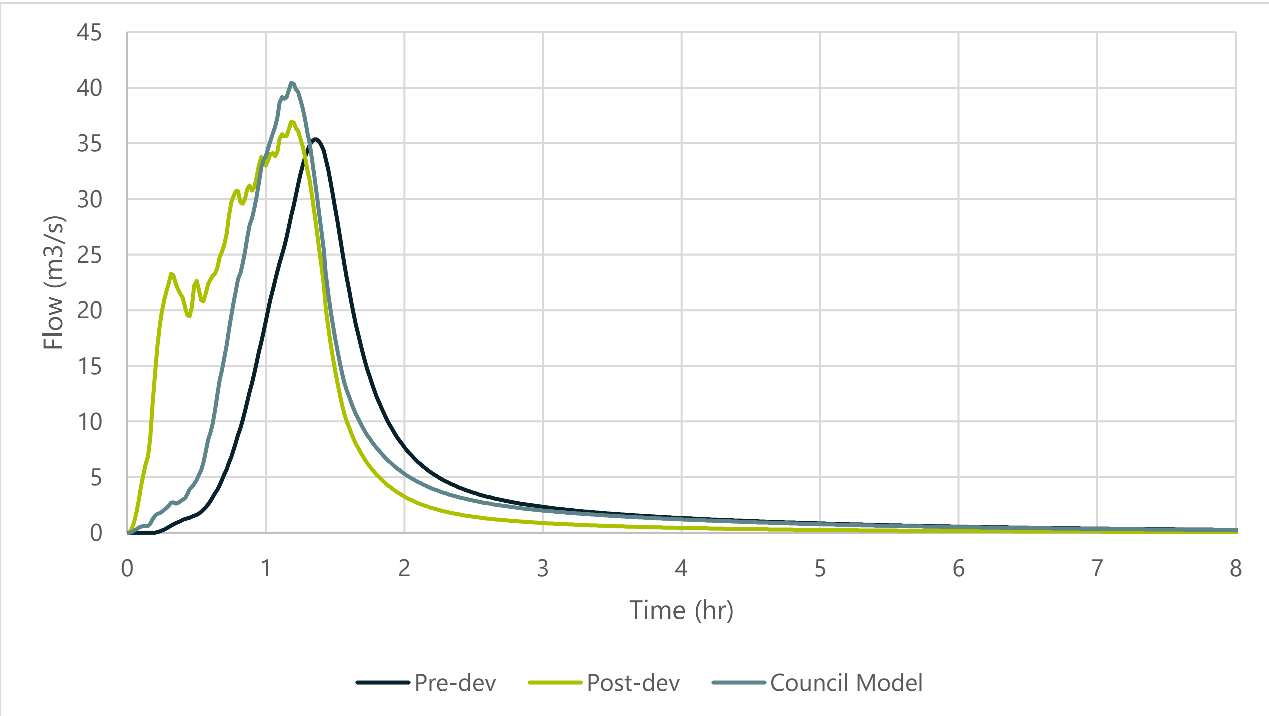


FIGURE 3-1: 1% AEP 30-MINUTE FLOWS

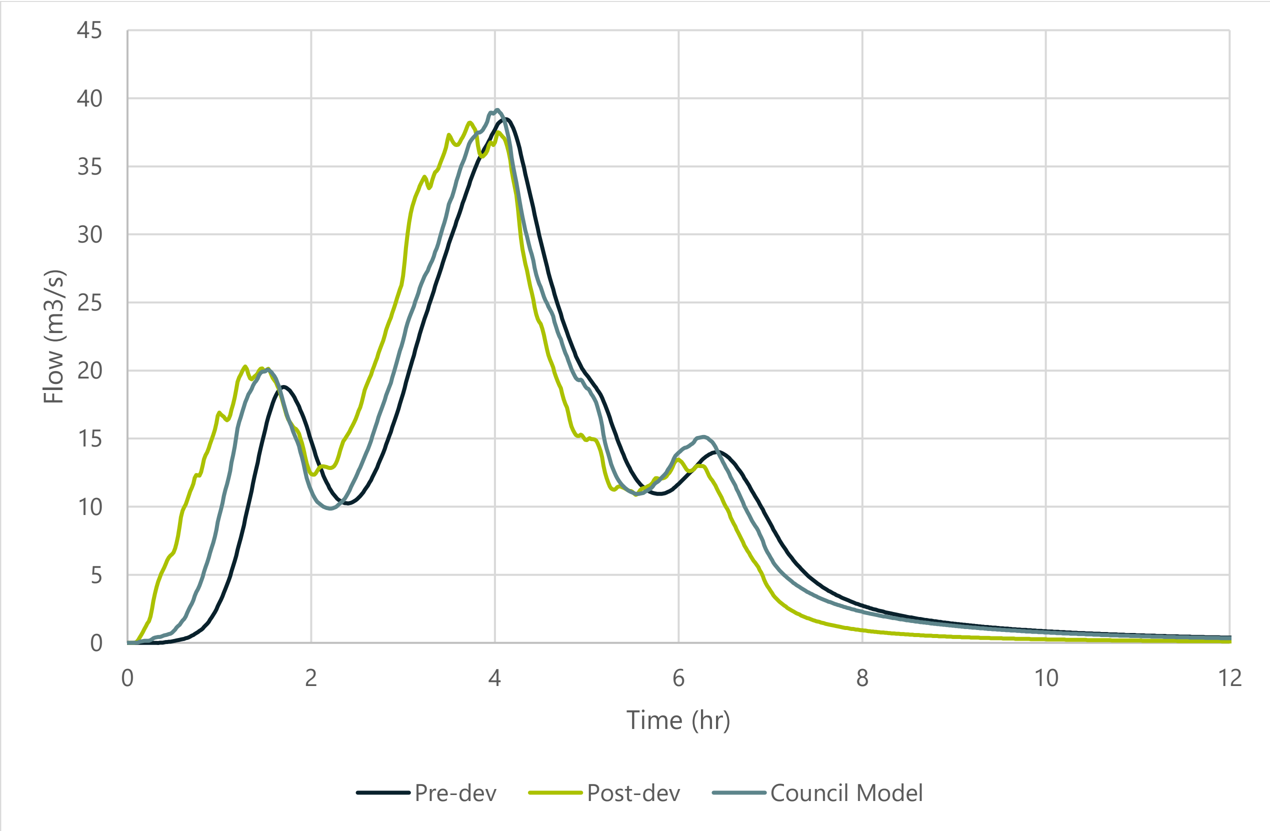


FIGURE 3-2: 1% AEP 360-MINUTE FLOWS

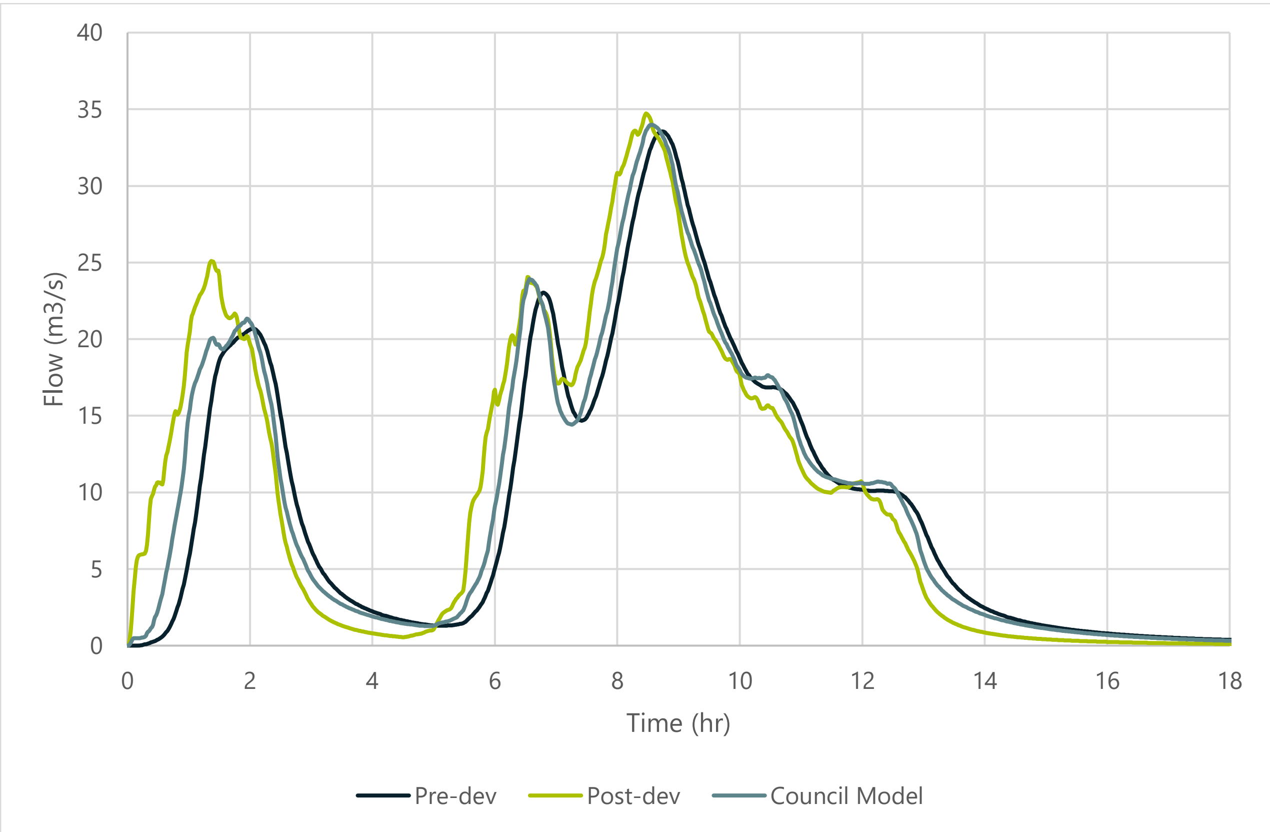


FIGURE 3-3: 1% AEP 720-MINUTE FLOWS

Attachment G – Flow Rate Analysis (Tuflow)

Given that the results of the TuFLOW model for the three different durations are taken and then combined to determine the maximum water level at any given point in the precinct in accordance with the WMAwater modelling guidelines. The critical duration storm for each history station was determined and the flows during those storms were compared between existing and developed to determine the variation of flows between the existing cas and the developed.

A number of history stations both up stream and downstream of the precicnt were selected, the chosen history stations are indicated in the diagrams below.

Figure H1: Location of history stations reviewed

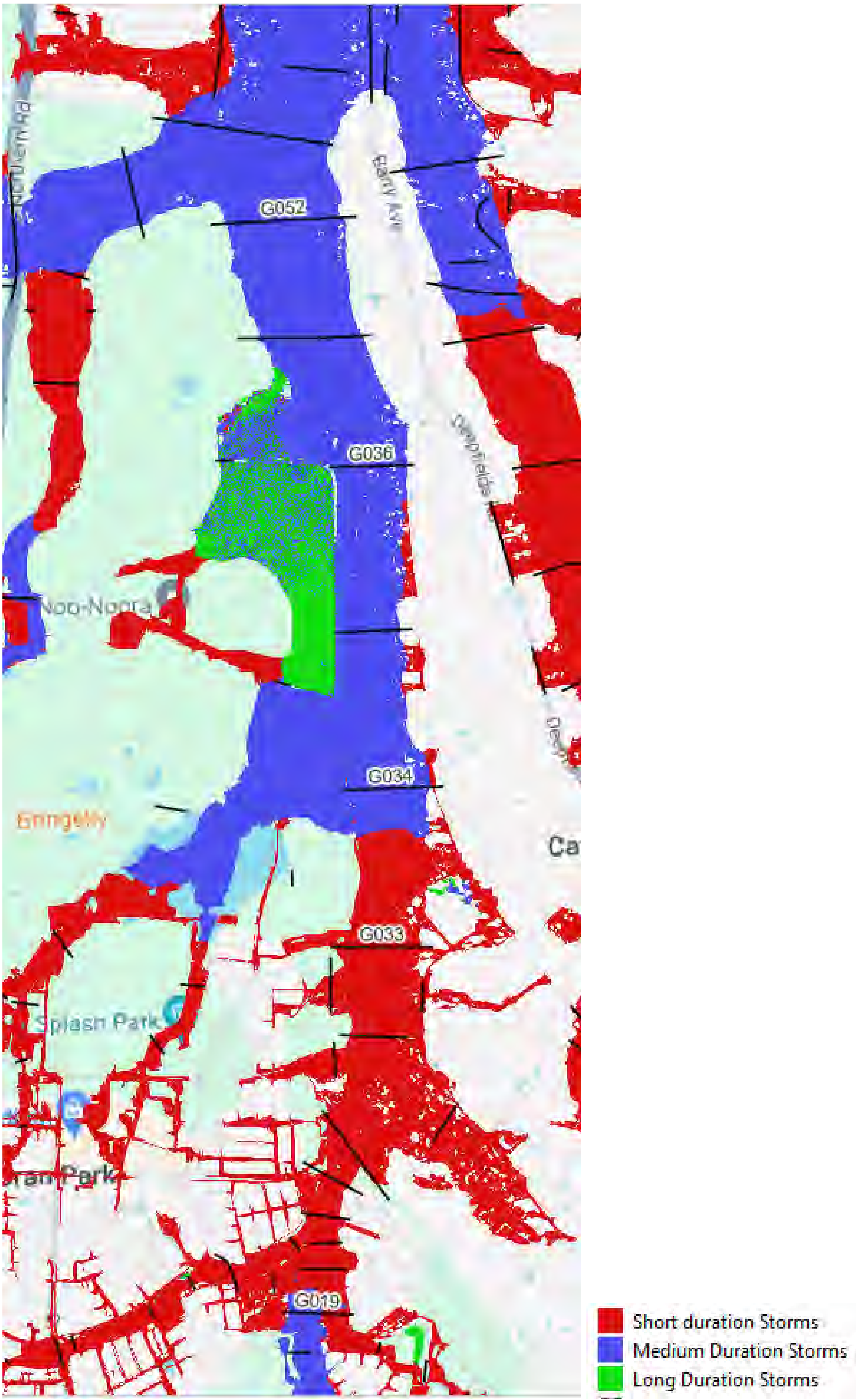


Figure H2: Regions controlled by each duration during a PMF storm event.

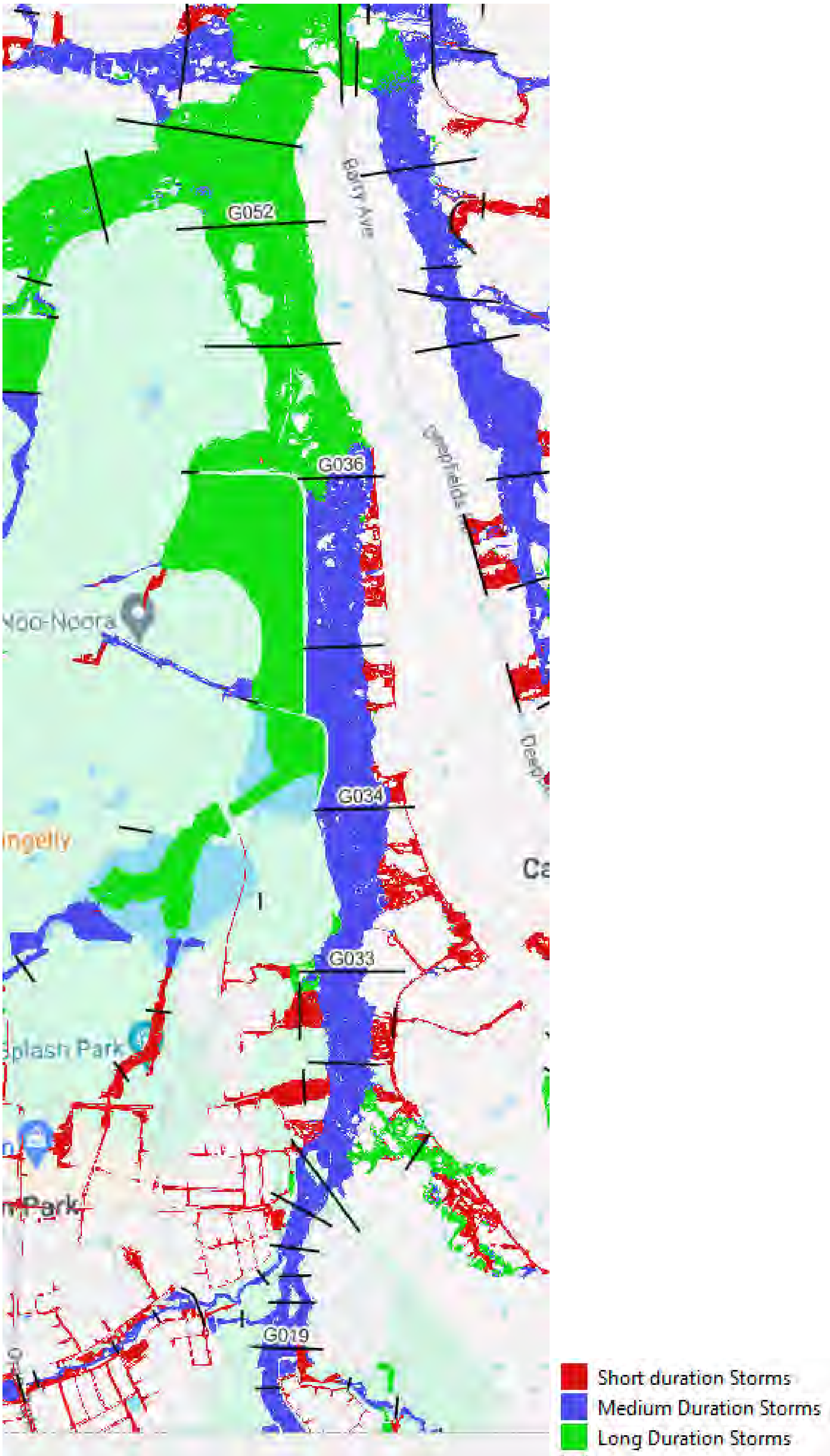


Figure H3: Regions controlled by each duration during a 10% to 1% storm event.

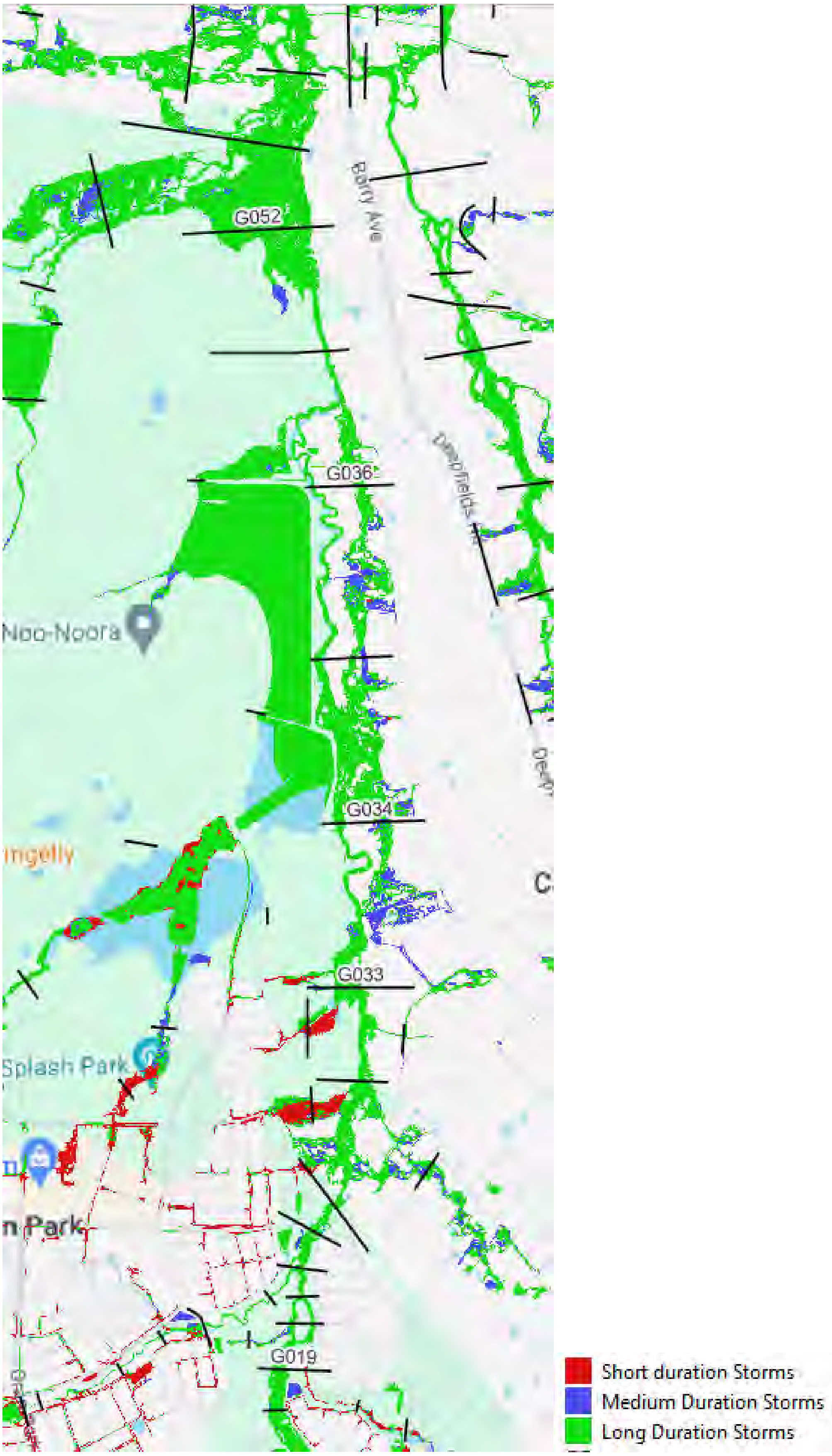


Figure H4: Regions controlled by each duration during a 50% to 20% storm event.

		G019	G033	G034	G036	G052
50% AEP	Existing	12.9783	18.9984	19.9170	20.5833	21.2794
	Developed	**12.9875**	**18.9637**	**19.8997**	**20.5982**	**21.2136**
20% AEP	Existing	20.3677	29.7743	31.5778	32.5938	34.6110
	Developed	**20.3678**	**29.6746**	**31.5370**	**32.5553**	**34.0551**
10% AEP	Existing	25.1983	36.1116	38.4183	40.2668	41.6694
	Developed	**25.1961**	**35.8991**	**38.1229**	**40.1014**	**40.1696**
5% AEP	Existing	31.27	42.9506	45.8838	48.8233	50.4808
	Developed	**31.2883**	**42.8198**	**45.6205**	**48.5709**	**48.0243**
2% AEP	Existing	43.1631	60.6654	64.0201	65.7176	67.221
	Developed	**43.1644**	**60.4950**	**63.6499**	**65.3455**	**70.1820**
1% AEP	Existing	50.3493	72.2468	76.6045	79.1	80.852
	Developed	**50.3495**	**71.8465**	**76.0030**	**78.4872**	**82.8381**
PMP	Existing	318.2224	481.8779	520.0198	686.4991	722.6899
	Developed	**318.2945**	**508.3842**	**525.0907**	**618.9504**	**706.117**

As demonstrated in the above table the flows within the model for all storms from the 20% to the PMF are similar to the existing flows for the entire precinct until the discharge from the Greenway dam.

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