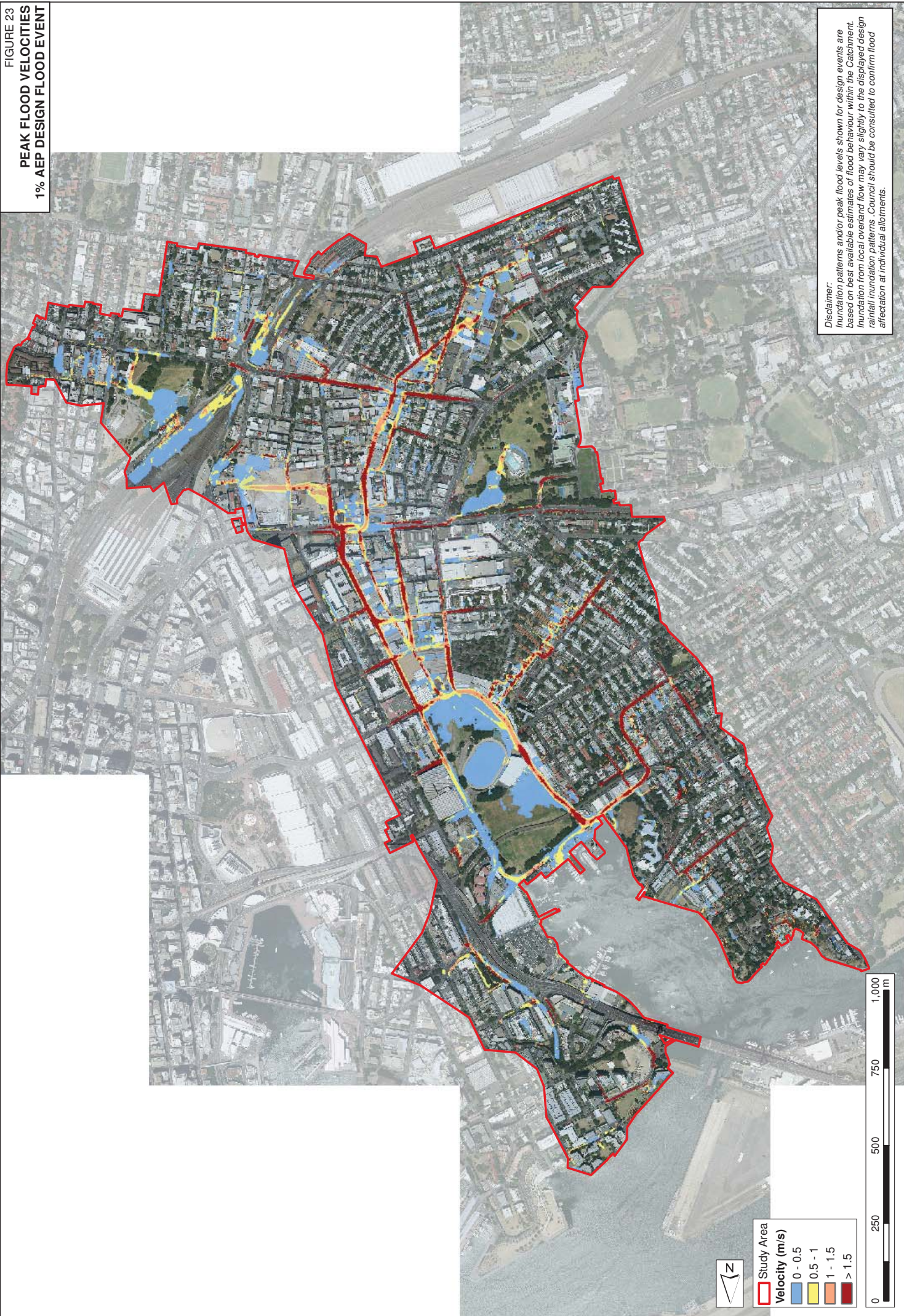
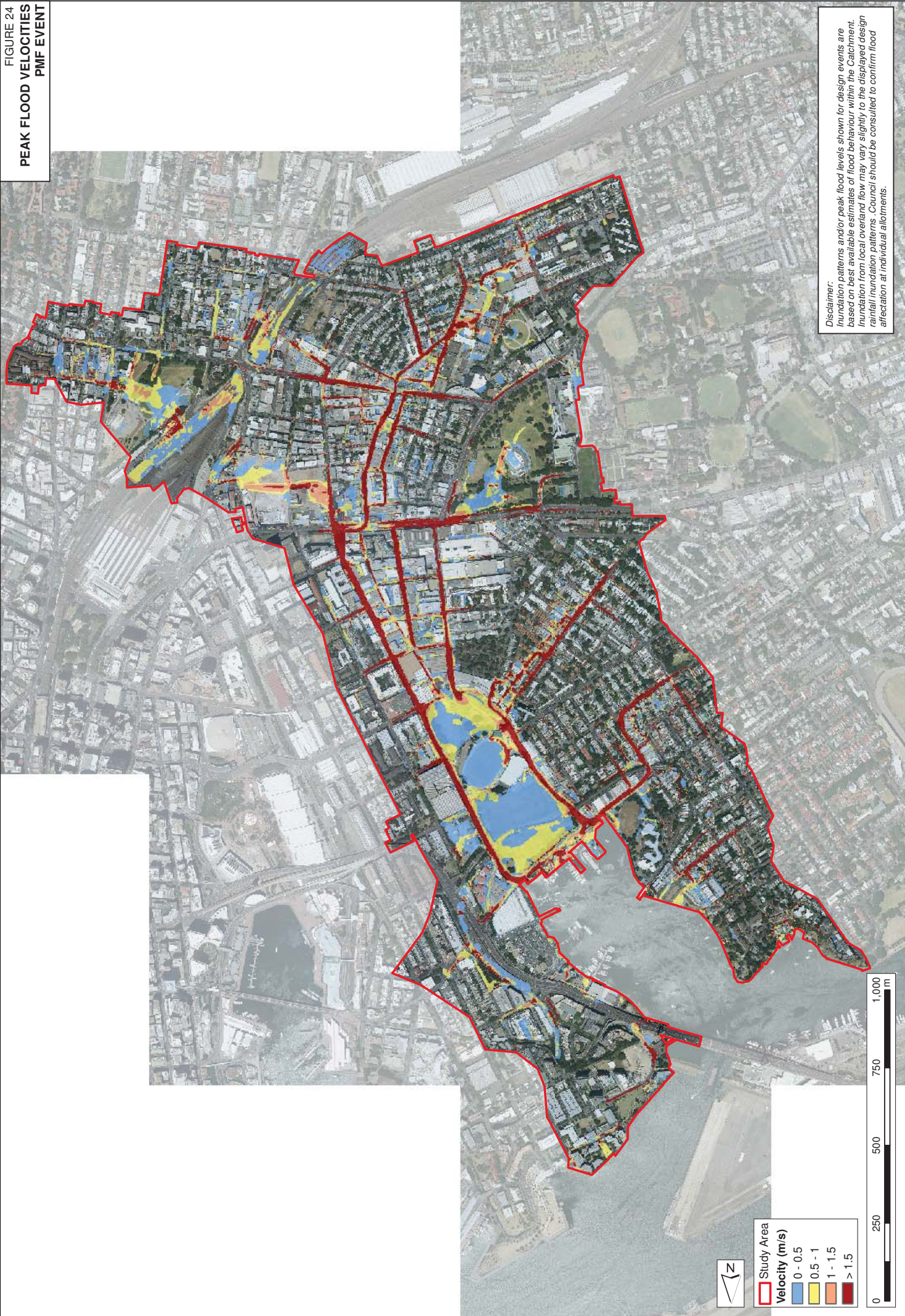


FIGURE 23
PEAK FLOOD VELOCITIES
1% AEP DESIGN FLOOD EVENT



Disclaimer:
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

FIGURE 24
PEAK FLOOD VELOCITIES
PMF EVENT



Disclaimer:
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

FIGURE 25
BLACKWATTLE BAY FLOOD PROFILES
ALL DESIGN FLOOD EVENTS

J:\jobs\117102\1TU\FLOW\BW_Existing\results\Longitudinal_Profiles\FS_Update_Aug2014\Profile_BW_Aug14.xlsx

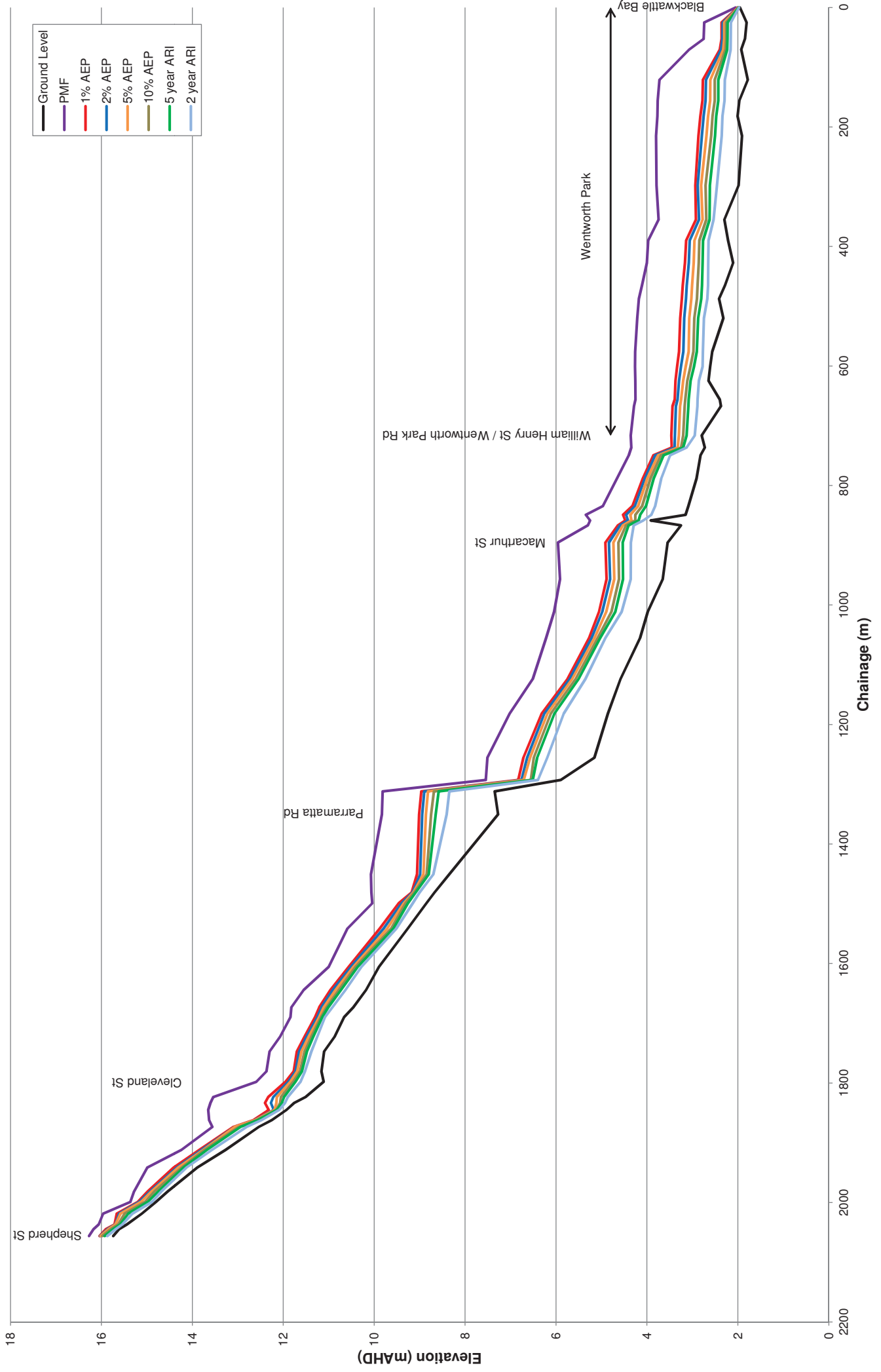


FIGURE 26
WENTWORTH PARK STORAGE FLOW COMPARISONS
1% AEP DESIGN FLOOD EVENT

J:\Jobs\111021\TUFLOW\BW_Existing\results\Figure26_Hydrographs.xlsx

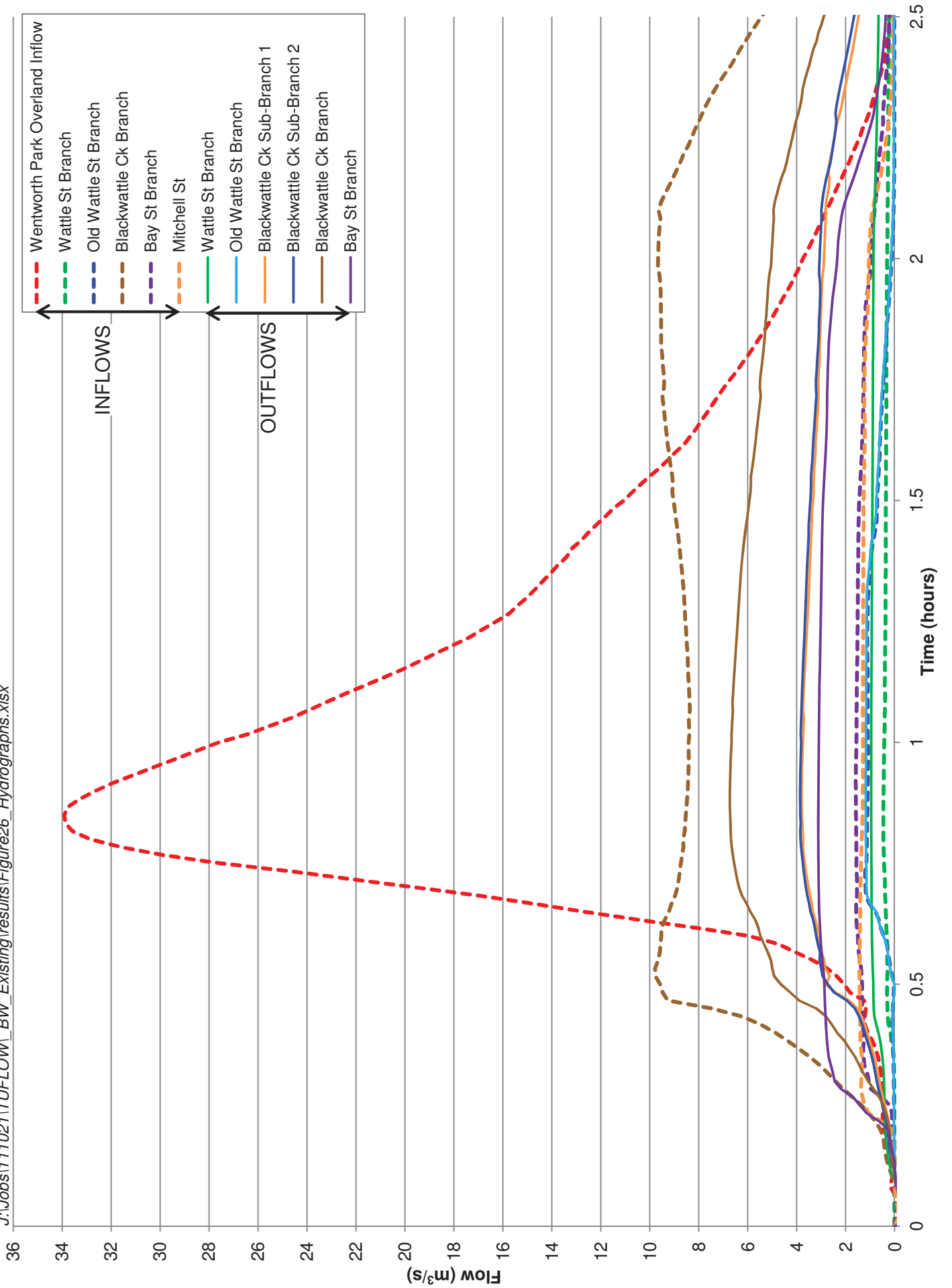
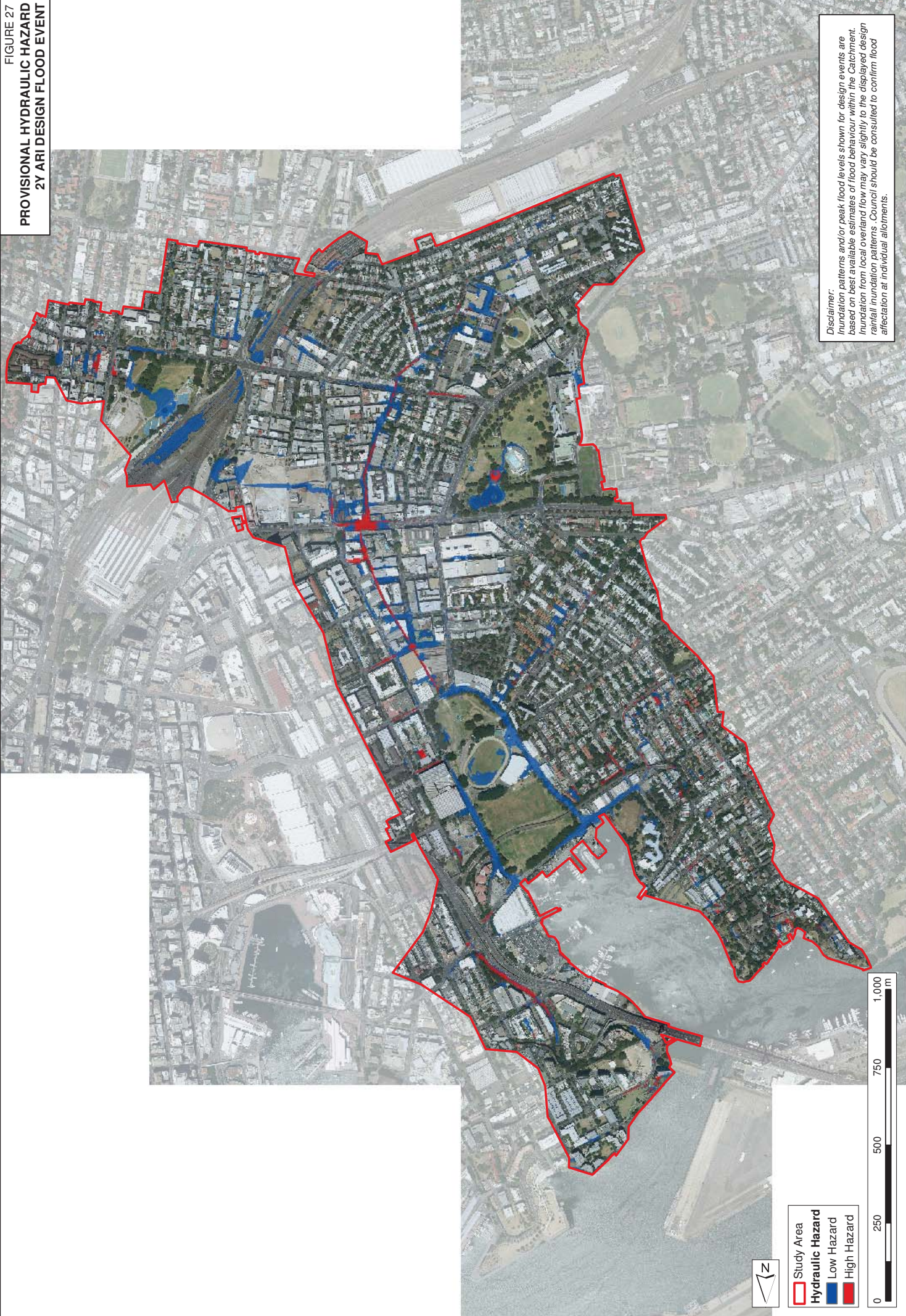


FIGURE 27
PROVISIONAL HYDRAULIC HAZARD
2Y ARI DESIGN FLOOD EVENT

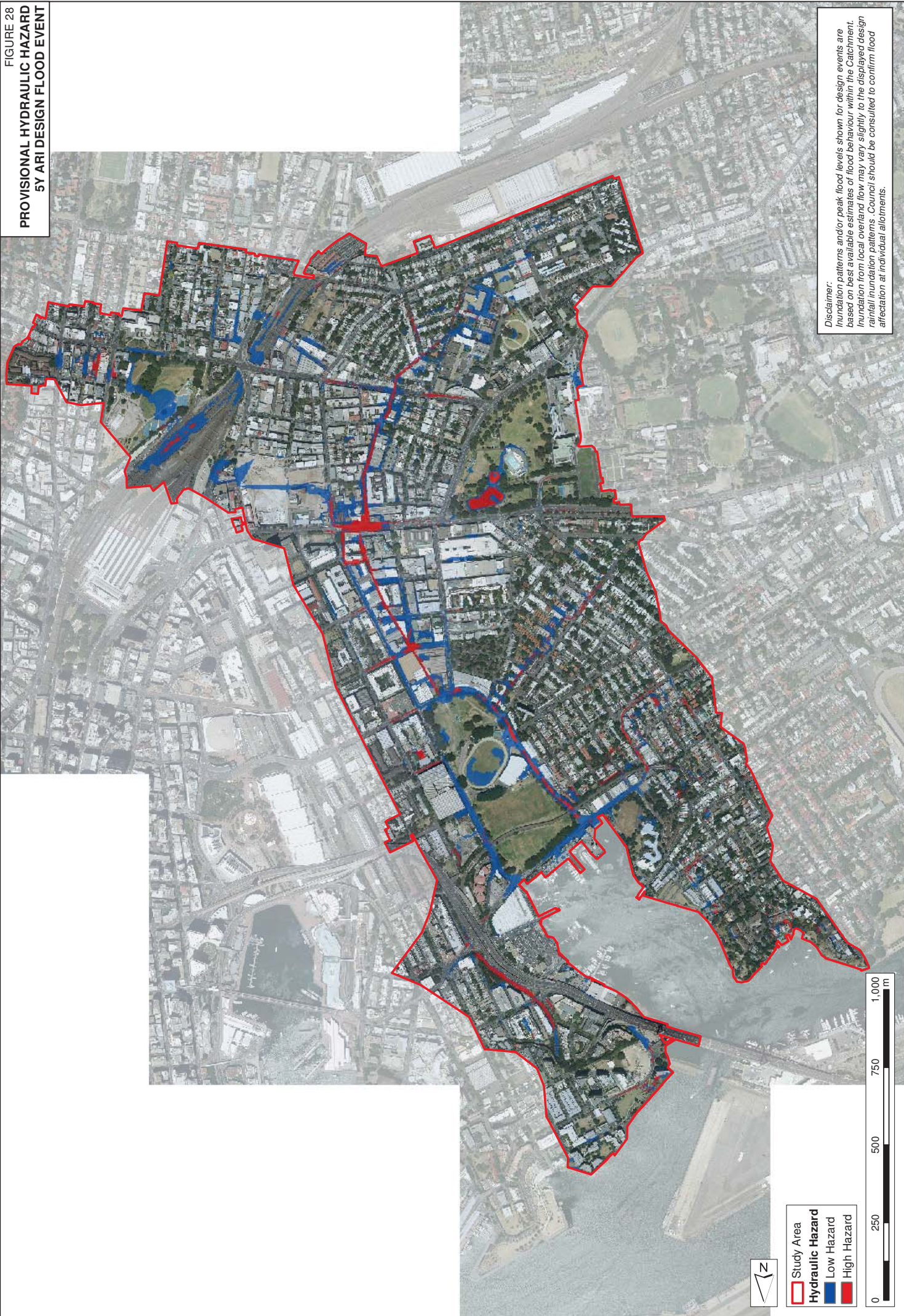


Disclaimer:
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affliction at individual allotments.

Study Area
Hydraulic Hazard
Low Hazard
High Hazard



FIGURE 28
PROVISIONAL HYDRAULIC HAZARD
5Y ARI DESIGN FLOOD EVENT



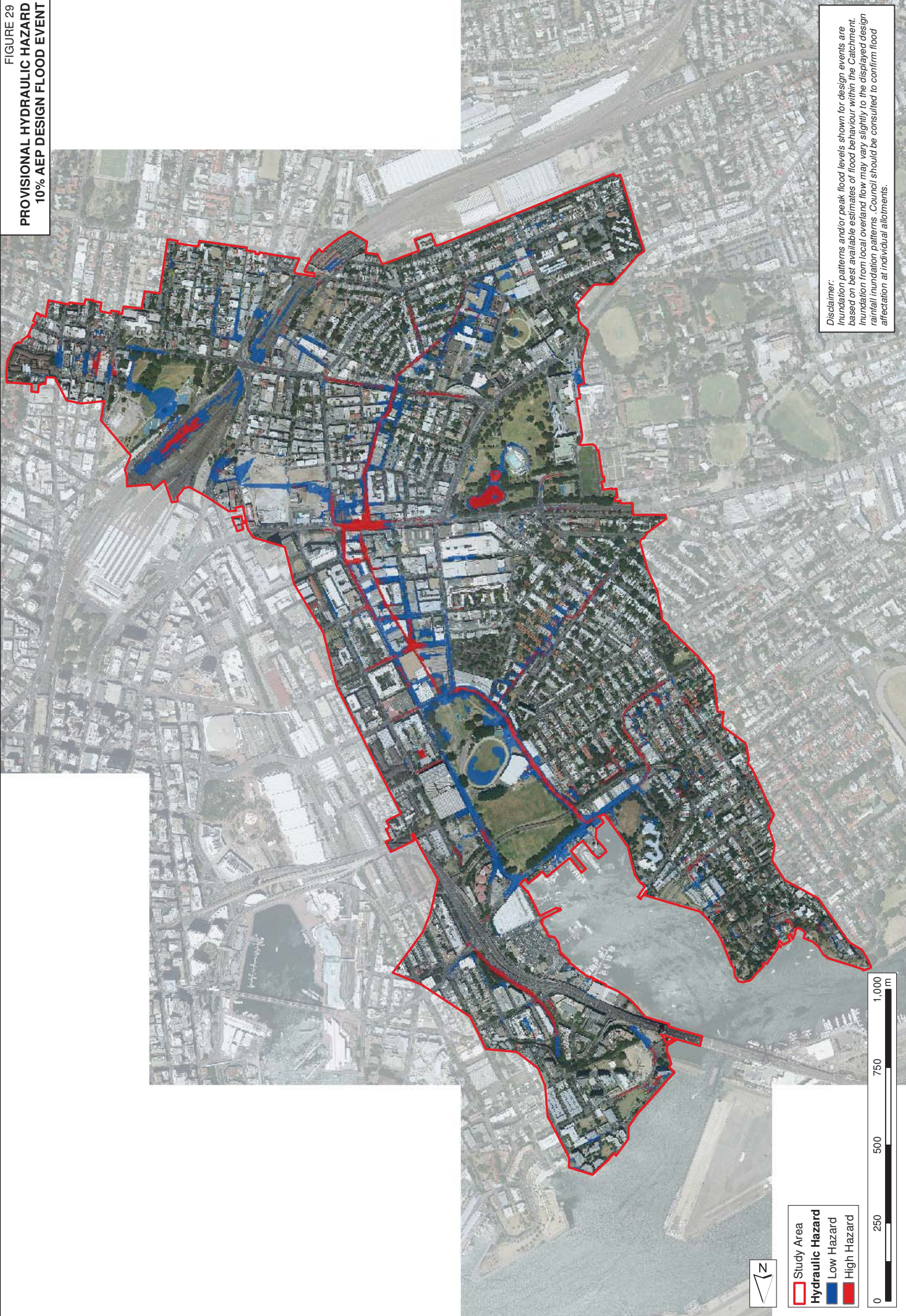
Disclaimer:
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.



- Study Area
- Hydraulic Hazard
- Low Hazard
- High Hazard



FIGURE 29
PROVISIONAL HYDRAULIC HAZARD
10% AEP DESIGN FLOOD EVENT



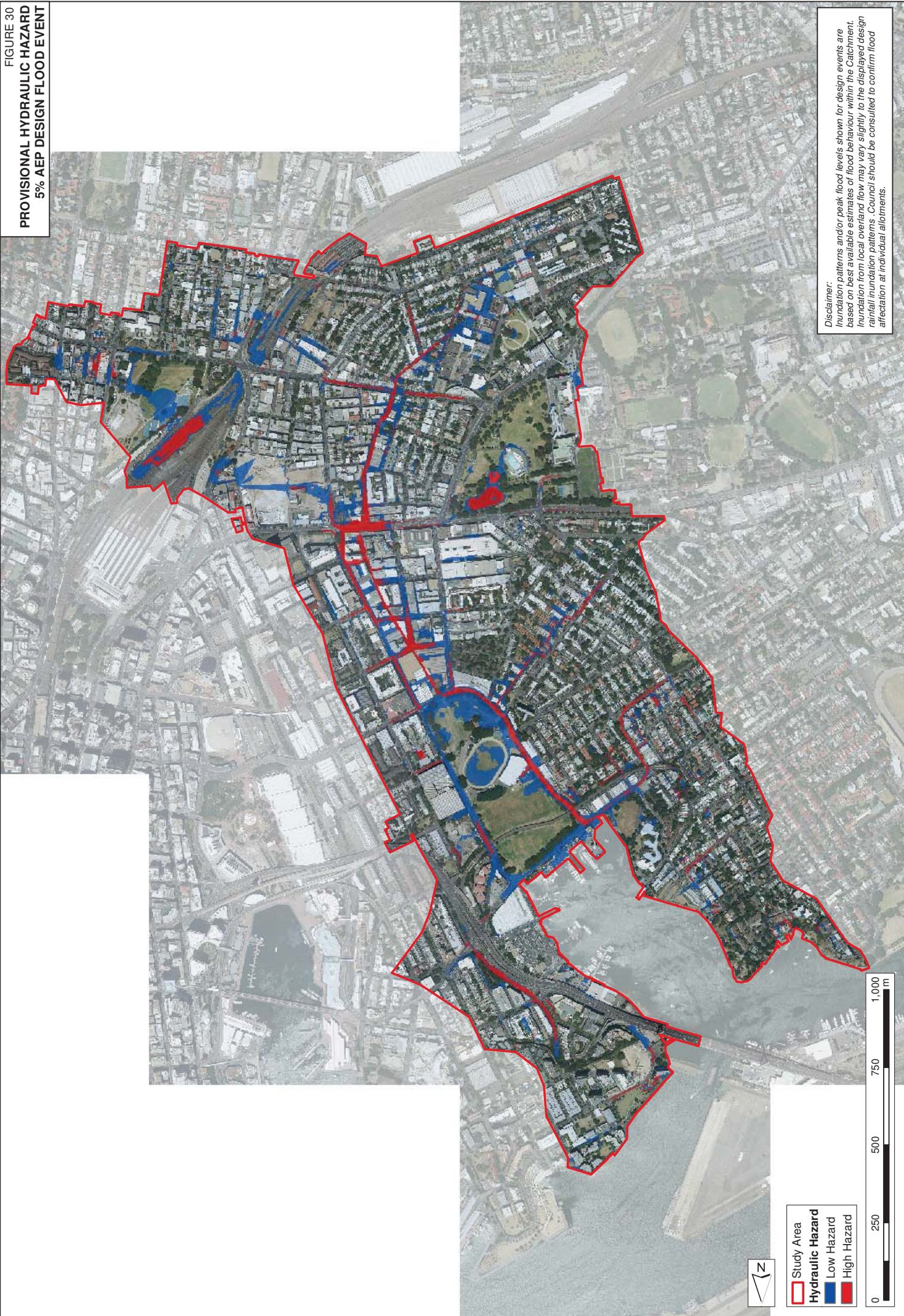
Disclaimer:
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

Study Area
Hydraulic Hazard
Low Hazard
High Hazard

0 250 500 750 1,000 m



FIGURE 30
PROVISIONAL HYDRAULIC HAZARD
5% AEP DESIGN FLOOD EVENT



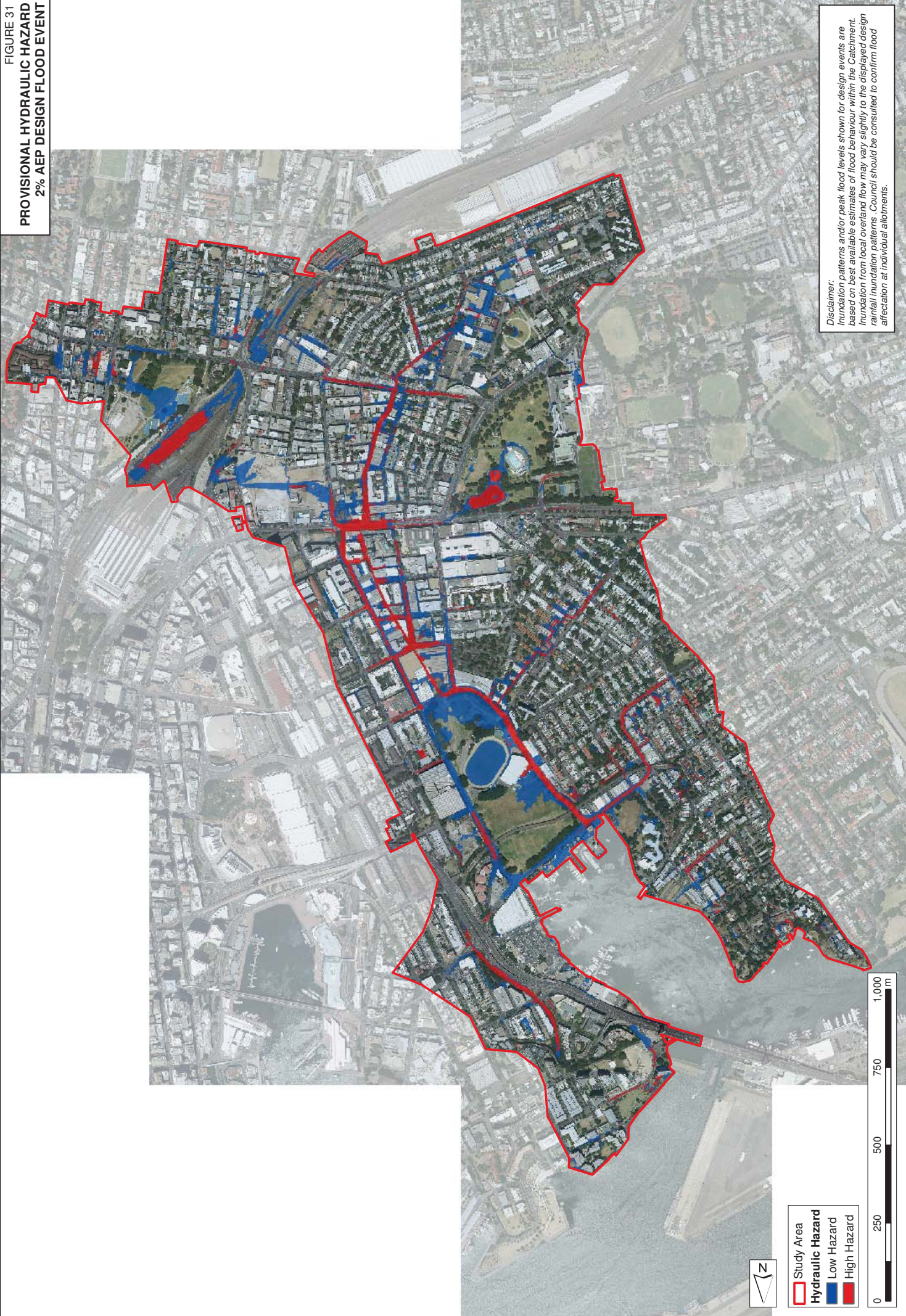
Disclaimer:
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

Study Area
Hydraulic Hazard
Low Hazard
High Hazard

0 250 500 750 1,000 m



FIGURE 31
PROVISIONAL HYDRAULIC HAZARD
2% AEP DESIGN FLOOD EVENT

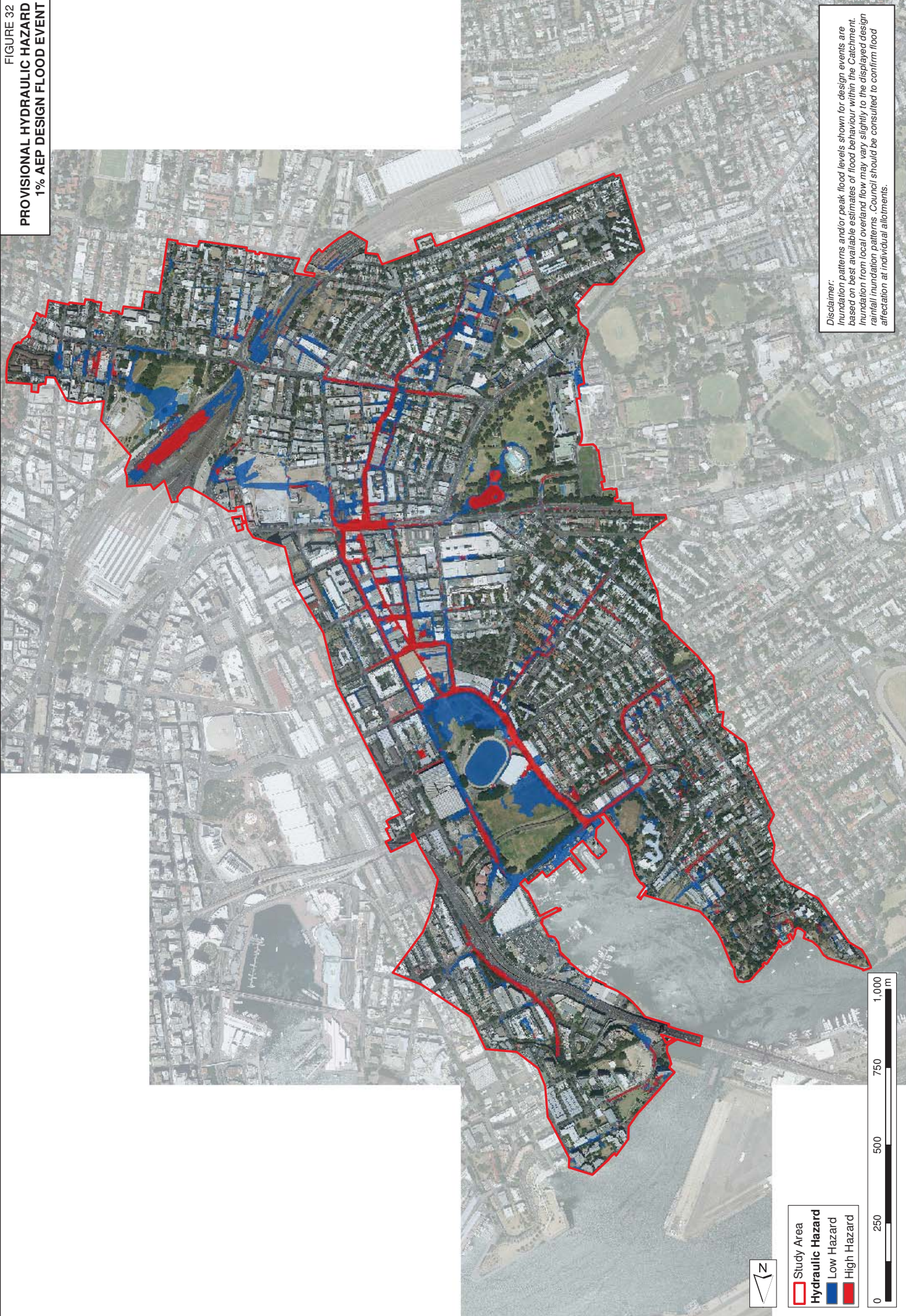


Study Area
Hydraulic Hazard
Low Hazard
High Hazard

0 250 500 750 1,000 m

Disclaimer:
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

FIGURE 32
PROVISIONAL HYDRAULIC HAZARD
1% AEP DESIGN FLOOD EVENT



Disclaimer:
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

Study Area
Hydraulic Hazard
Low Hazard
High Hazard

0 250 500 750 1,000 m



FIGURE 33
PROVISIONAL HYDRAULIC HAZARD
PMF EVENT



Disclaimer:
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

Study Area
Hydraulic Hazard
Low Hazard
High Hazard

0 250 500 750 1,000 m



FIGURE 34
PROVISIONAL HYDRAULIC CATEGORIES
2Y ARI DESIGN FLOOD EVENT

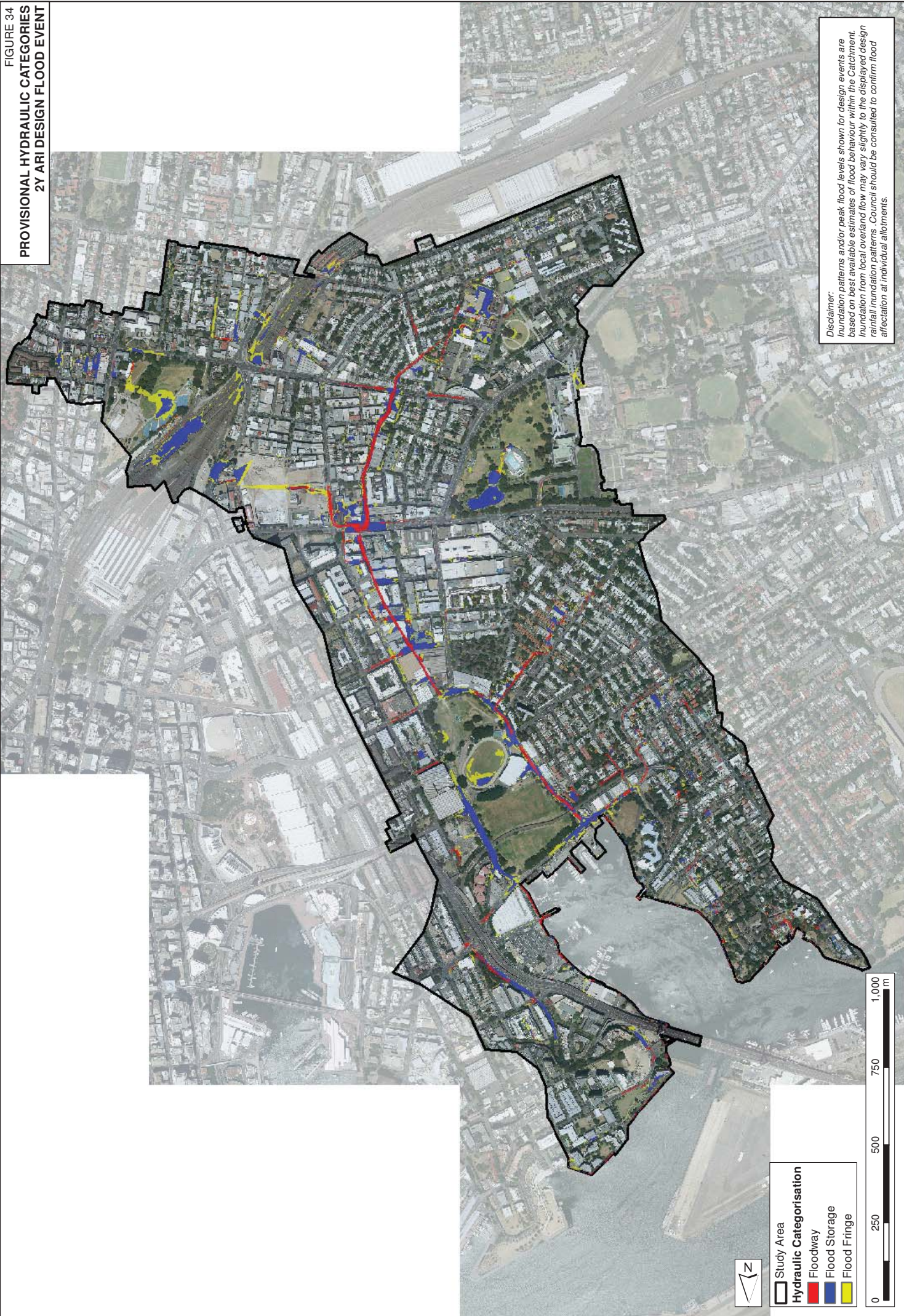
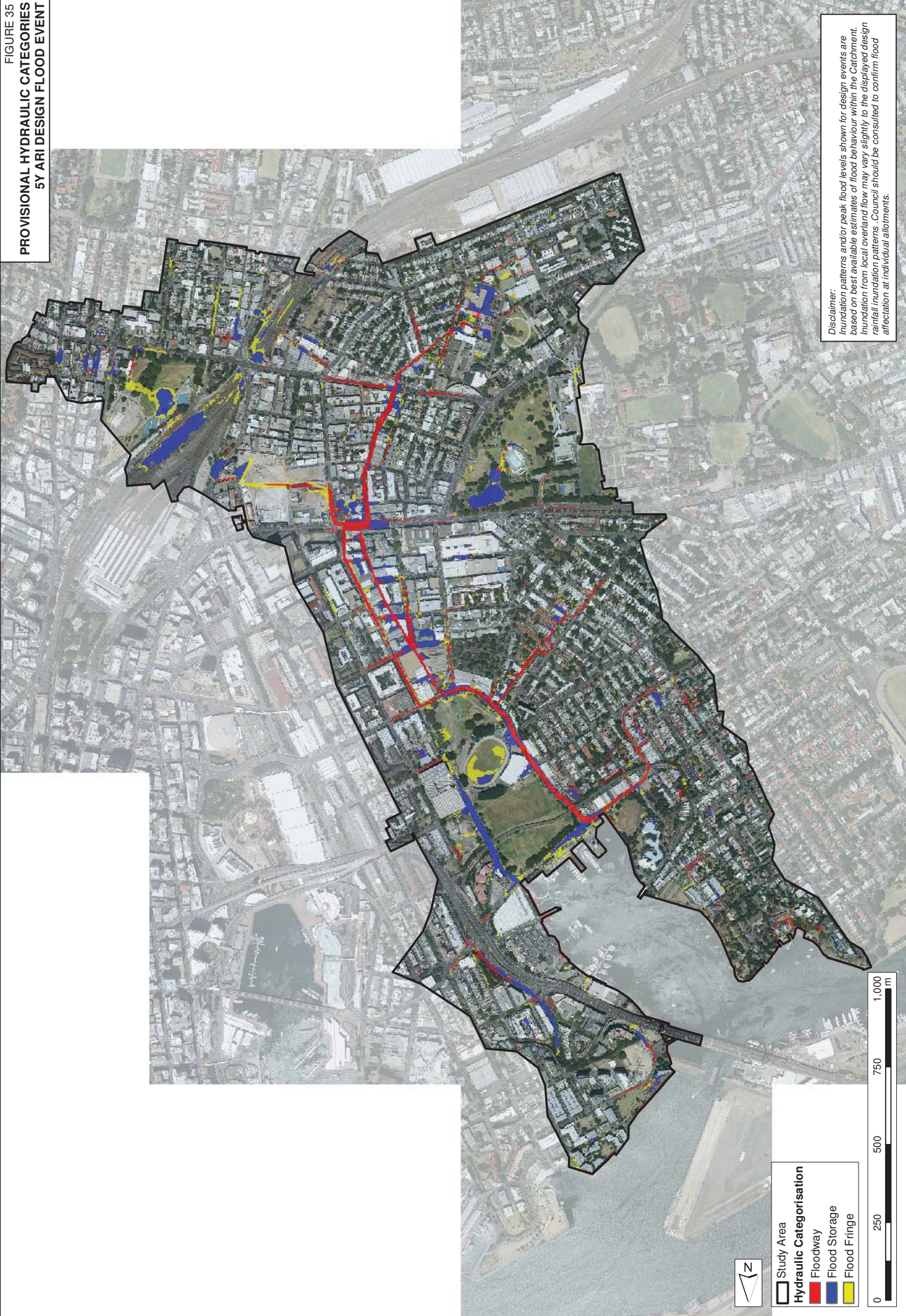




FIGURE 35
**PROVISIONAL HYDRAULIC CATEGORIES
 5Y ARI DESIGN FLOOD EVENT**







 Study Area

Hydraulic Categorisation

 Floodway

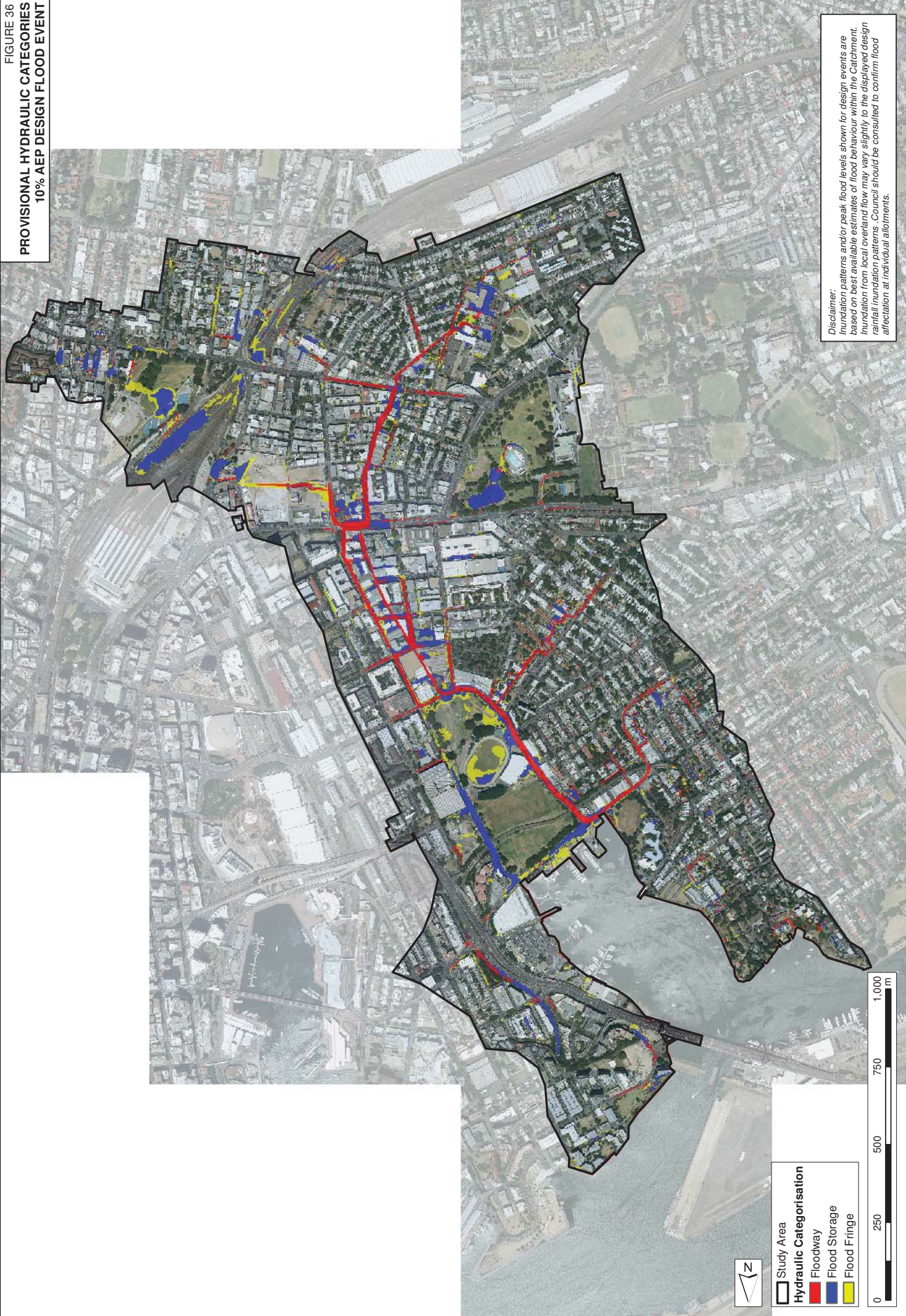
 Flood Storage

 Flood Fringe

0 250 500 750 1,000 m

Disclaimer:
 Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

FIGURE 36
PROVISIONAL HYDRAULIC CATEGORIES
10% AEP DESIGN FLOOD EVENT

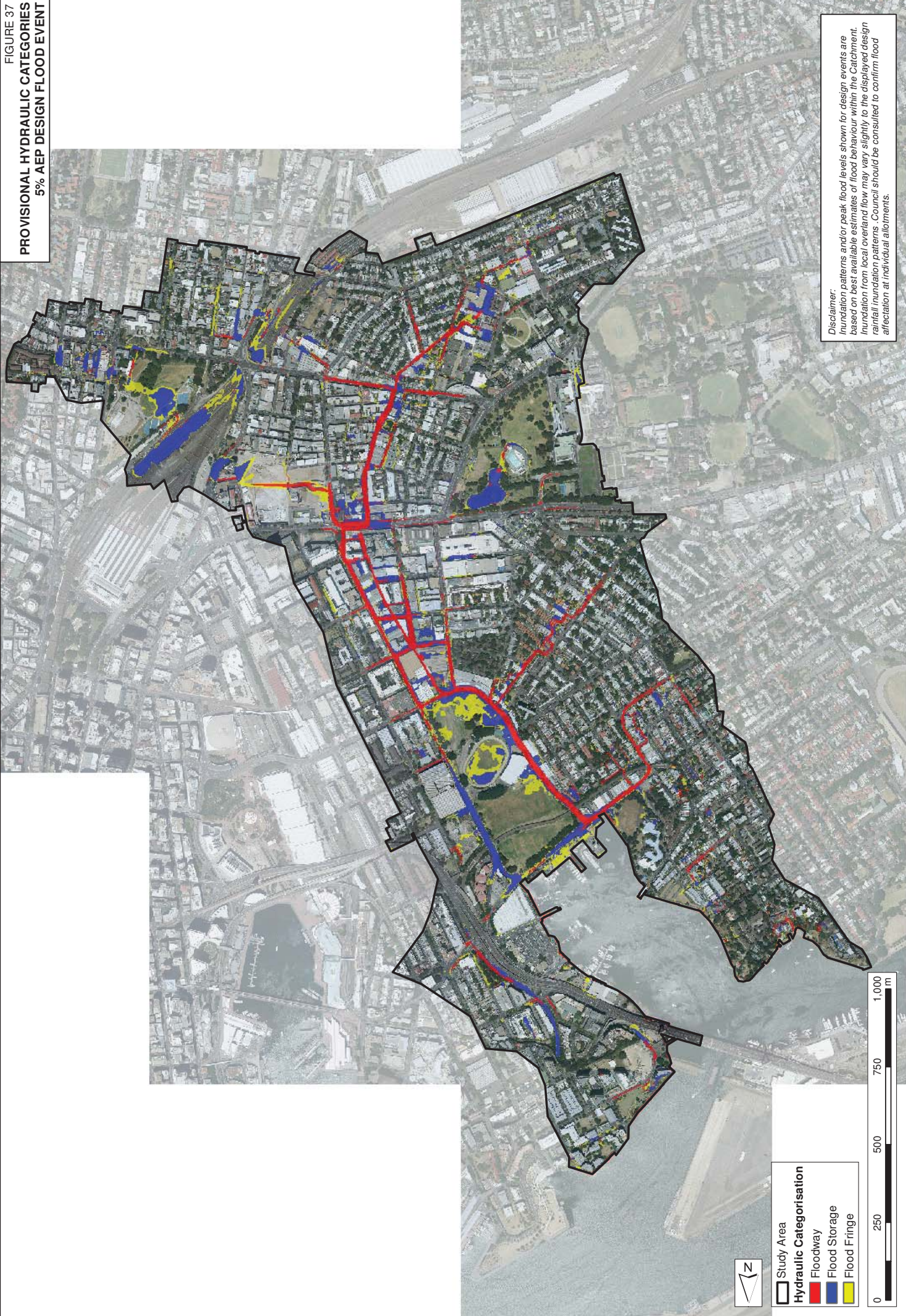


Disclaimer:
 Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

Study Area
Hydraulic Categorisation
 Floodway
 Flood Storage
 Flood Fringe

0 250 500 750 1,000 m

FIGURE 37
PROVISIONAL HYDRAULIC CATEGORIES
5% AEP DESIGN FLOOD EVENT

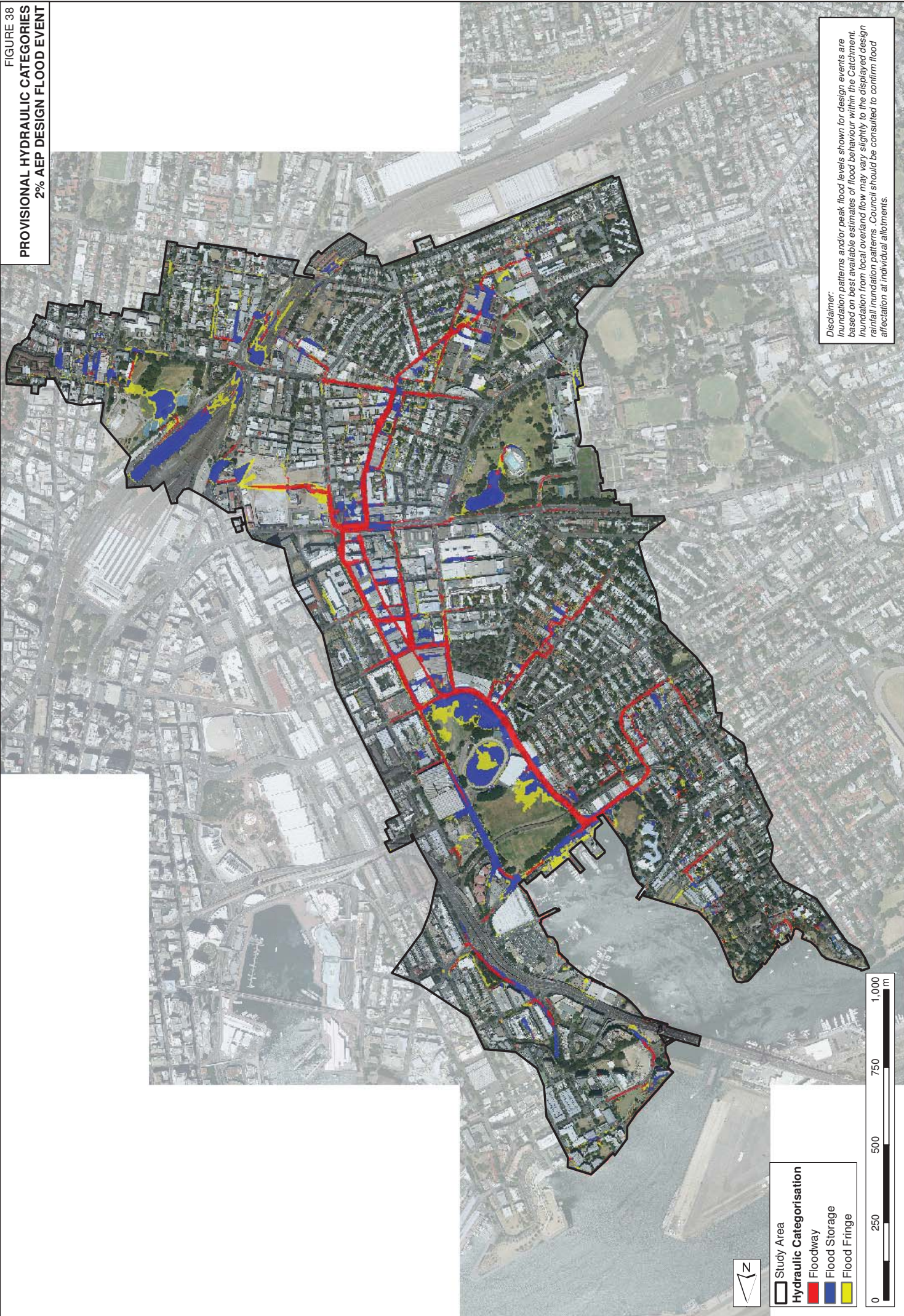


Disclaimer:
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

Study Area
Hydraulic Categorisation
Floodway
Flood Storage
Flood Fringe



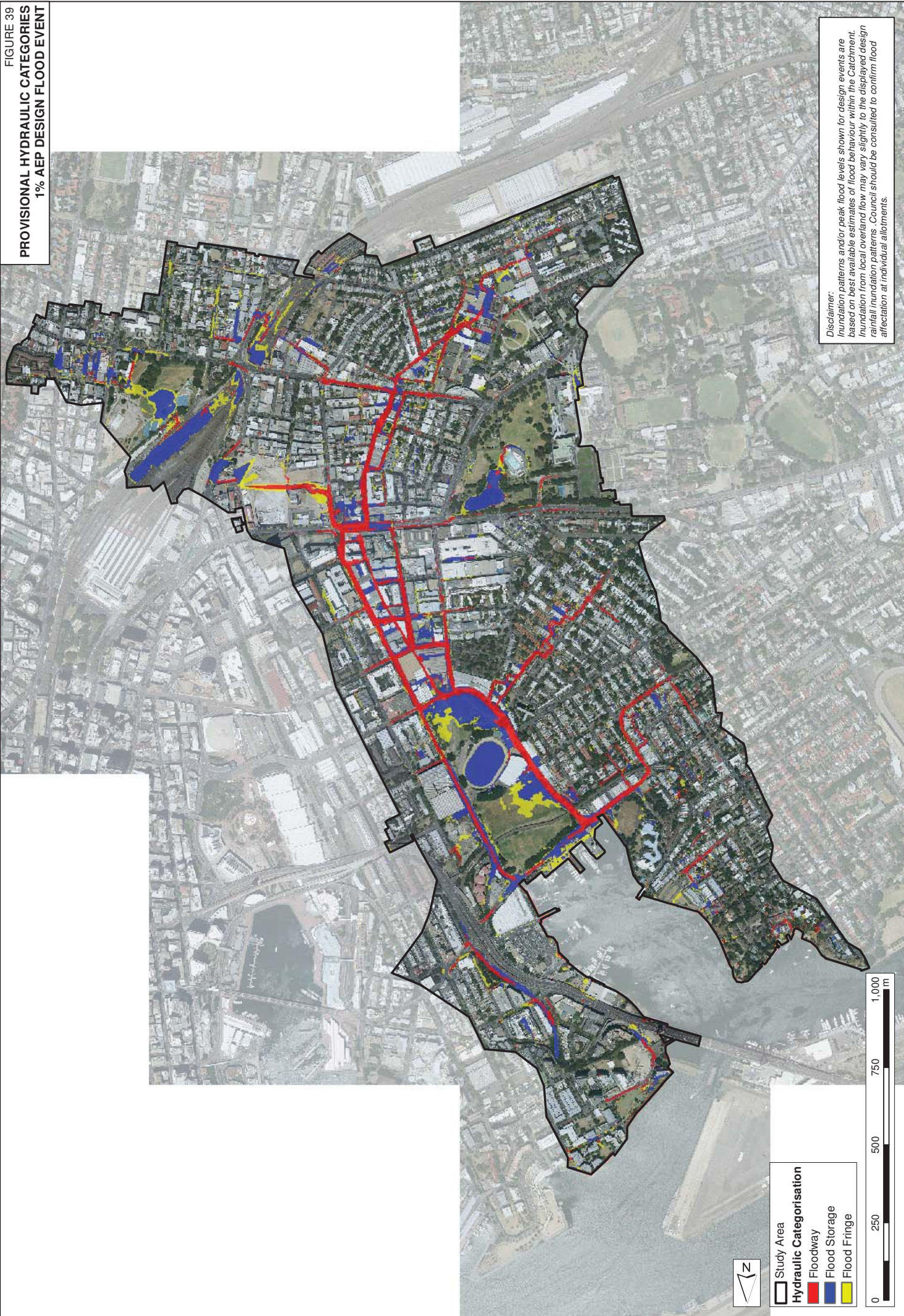
FIGURE 38
PROVISIONAL HYDRAULIC CATEGORIES
2% AEP DESIGN FLOOD EVENT



Disclaimer:
 Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

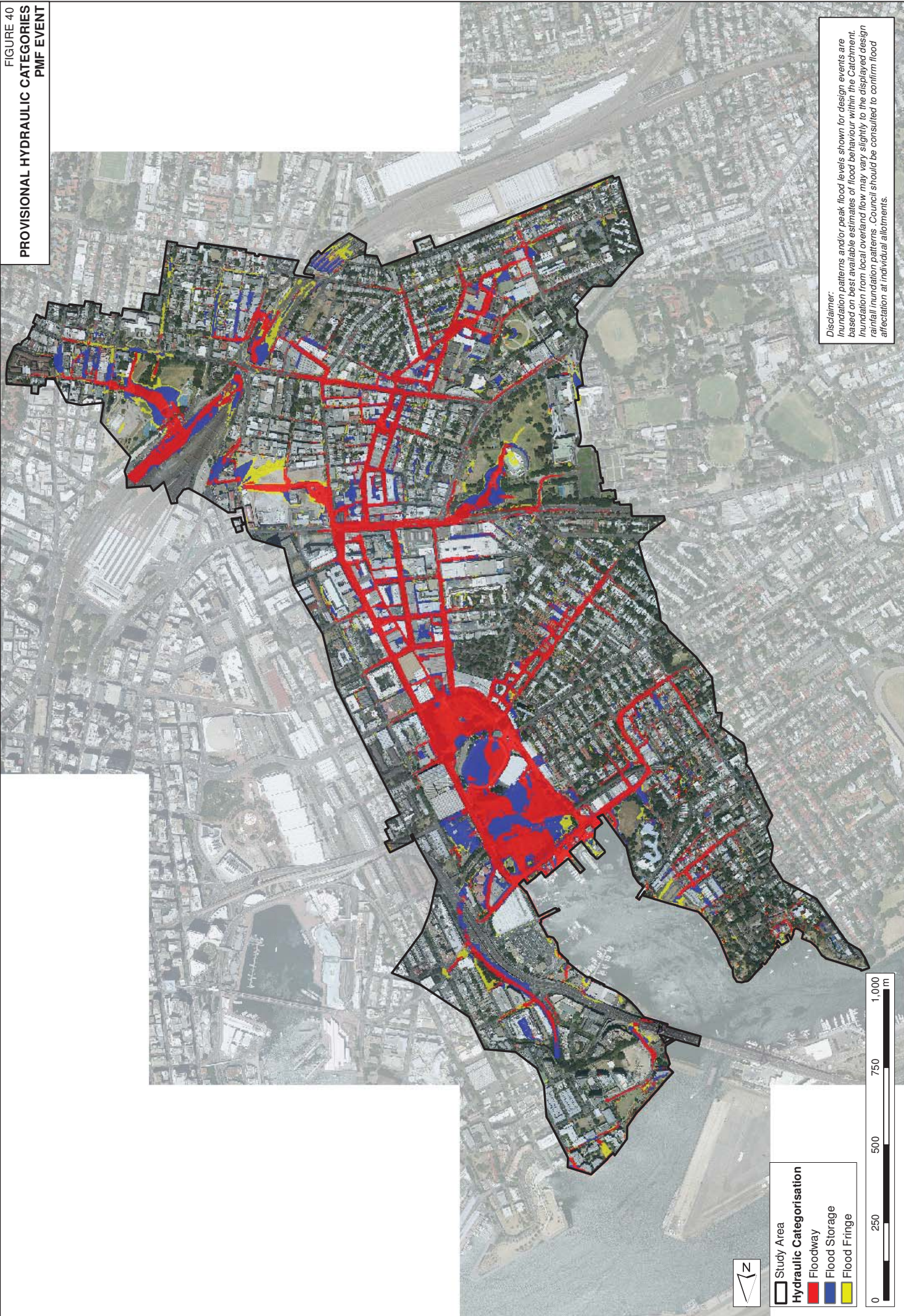
Study Area
Hydraulic Categorisation
 Floodway
 Flood Storage
 Flood Fringe

FIGURE 39
PROVISIONAL HYDRAULIC CATEGORIES
1% AEP DESIGN FLOOD EVENT



Disclaimer:
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

FIGURE 40
PROVISIONAL HYDRAULIC CATEGORIES
PMF EVENT



Disclaimer:
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

Study Area
Hydraulic Categorisation
Floodway
Flood Storage
Flood Fringe

0 250 500 750 1,000 m


FIGURE 41
**IMPACTS - 10% RAINFALL INCREASE
 1% AEP DESIGN FLOOD EVENT**




Disclaimer:
 Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

FIGURE 42
**IMPACTS - 20% RAINFALL INCREASE
 1% AEP DESIGN FLOOD EVENT**

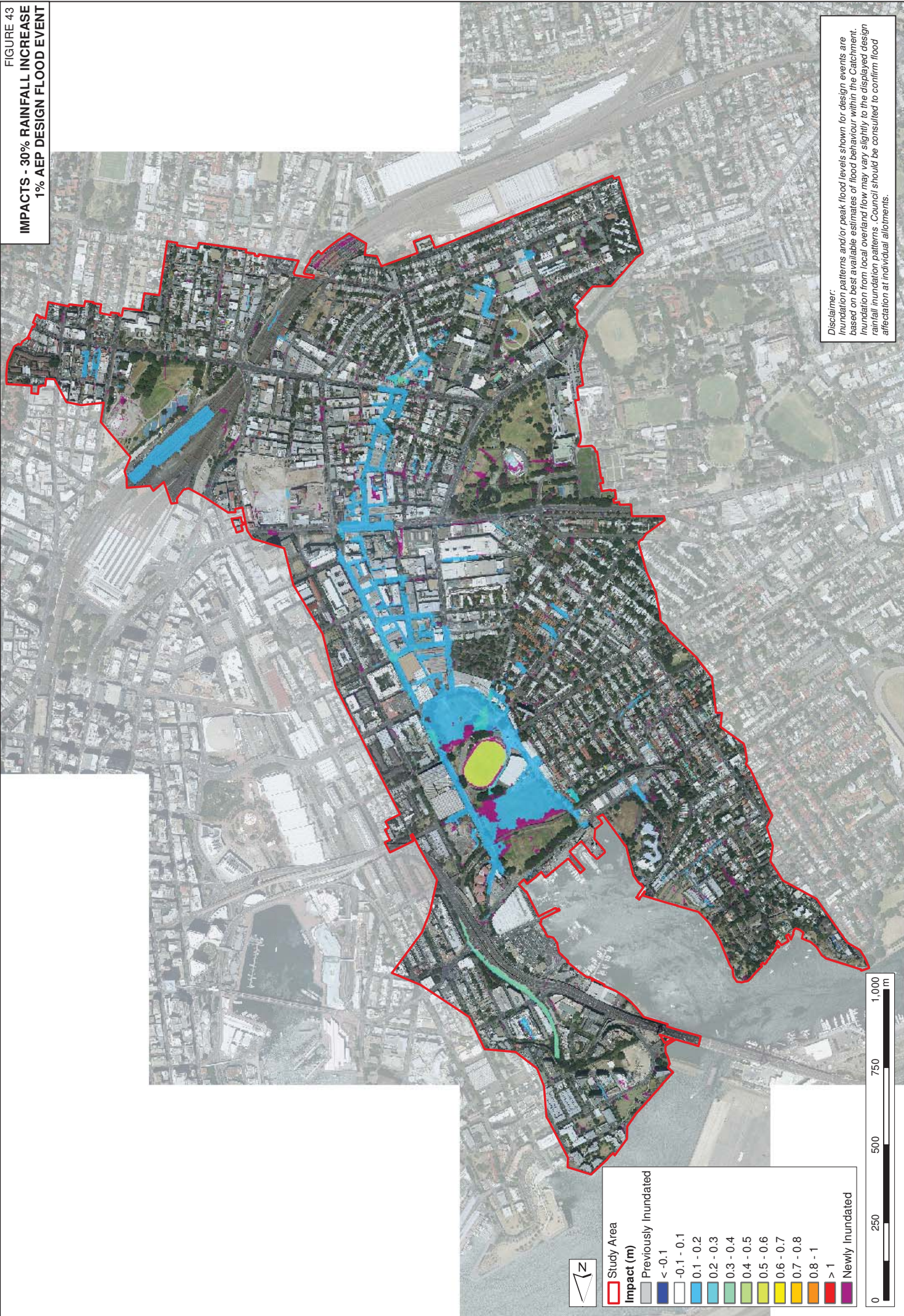



















 Study Area
Impact (m)
 █ Previously Inundated
 █ < 0.1
 █ -0.1 - 0.1
 █ 0.1 - 0.2
 █ 0.2 - 0.3
 █ 0.3 - 0.4
 █ 0.4 - 0.5
 █ 0.5 - 0.6
 █ 0.6 - 0.7
 █ 0.7 - 0.8
 █ 0.8 - 1
 █ > 1
 █ Newly Inundated

Disclaimer:
 Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

FIGURE 43
**IMPACTS - 30% RAINFALL INCREASE
 1% AEP DESIGN FLOOD EVENT**



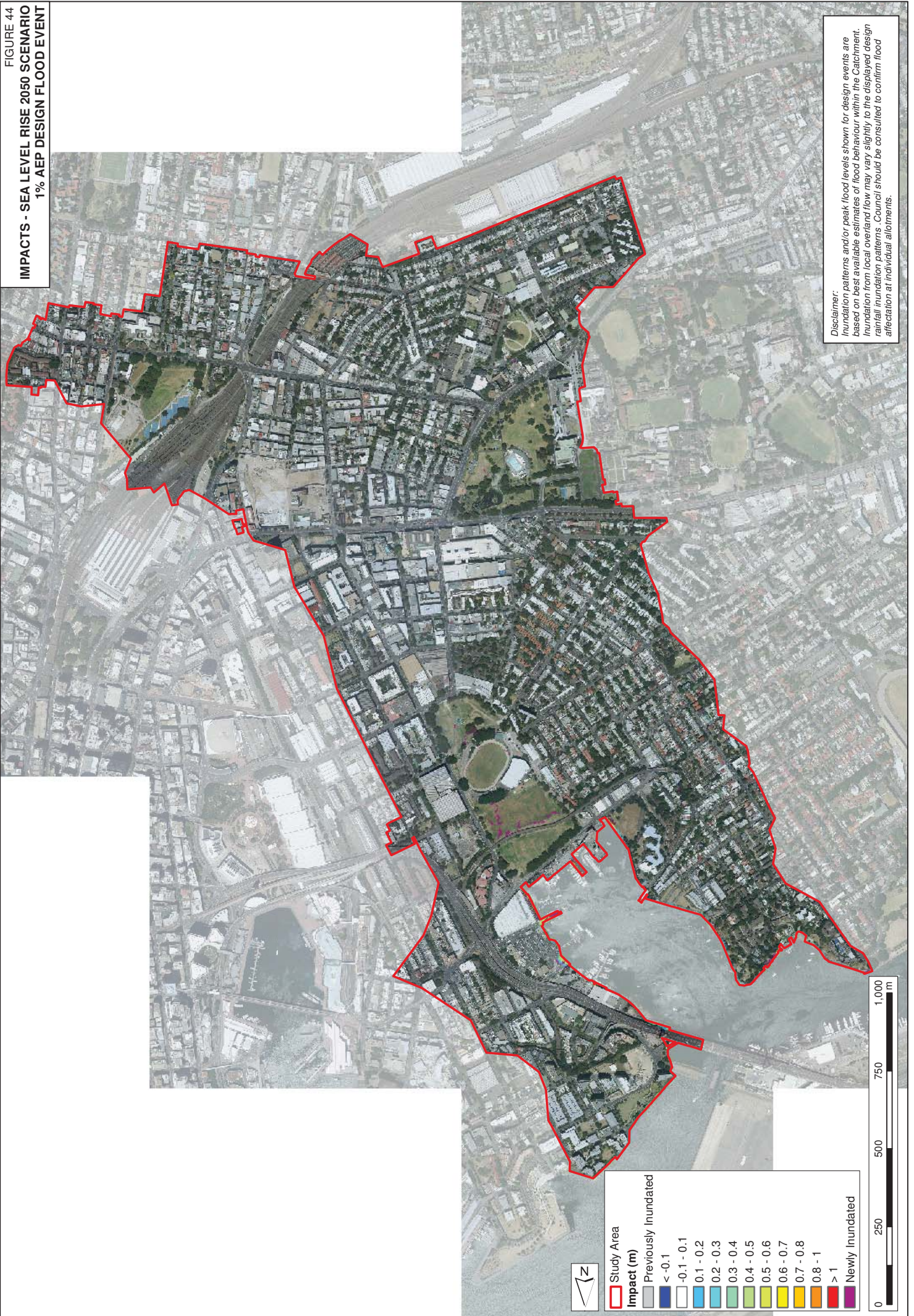


 Study Area
Impact (m)
 <math>< -0.1</math>
 -0.1 - 0.1
 0.1 - 0.2
 0.2 - 0.3
 0.3 - 0.4
 0.4 - 0.5
 0.5 - 0.6
 0.6 - 0.7
 0.7 - 0.8
 0.8 - 1
 > 1
 Previously Inundated
 Newly Inundated

Disclaimer:
 Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

FIGURE 44



**IMPACTS - SEA LEVEL RISE 2050 SCENARIO
1% AEP DESIGN FLOOD EVENT**



Disclaimer:
Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.

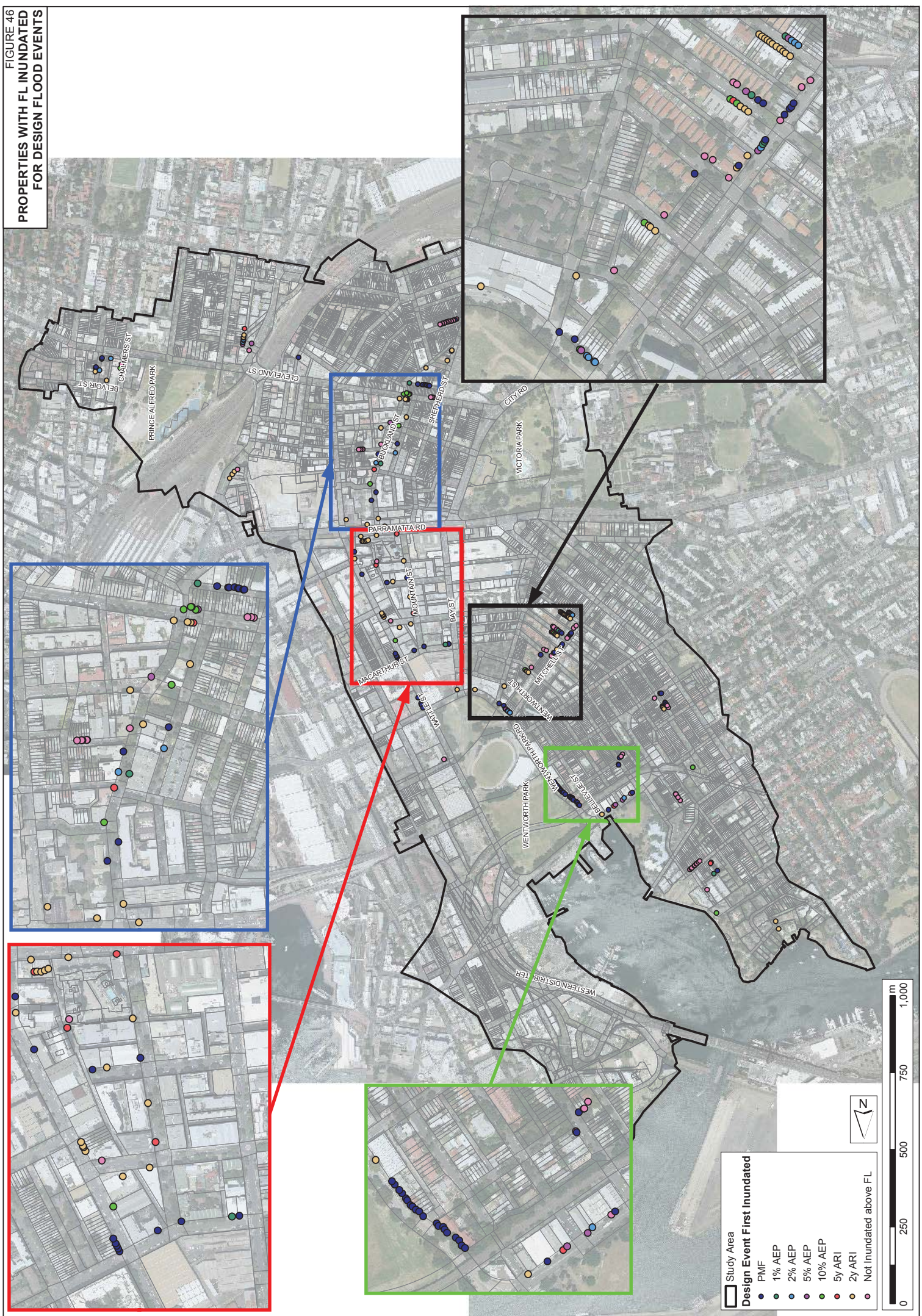
FIGURE 45
**IMPACTS - SEA LEVEL RISE 2100 SCENARIO
 1% AEP DESIGN FLOOD EVENT**




 Study Area
Impact (m)
 Previously Inundated
 < -0.1
 -0.1 - 0.1
 0.1 - 0.2
 0.2 - 0.3
 0.3 - 0.4
 0.4 - 0.5
 0.5 - 0.6
 0.6 - 0.7
 0.7 - 0.8
 0.8 - 1
 > 1
 Newly Inundated

*Disclaimer:
 Inundation patterns and/or peak flood levels shown for design events are based on best available estimates of flood behaviour within the Catchment. Inundation from local overland flow may vary slightly to the displayed design rainfall inundation patterns. Council should be consulted to confirm flood affectation at individual allotments.*

FIGURE 46
 PROPERTIES WITH FL INUNDATED
 FOR DESIGN FLOOD EVENTS



DRAFT



APPENDIX A: GLOSSARY

Taken from the Floodplain Development Manual (April 2005 edition)

acid sulfate soils	Are sediments which contain sulfidic mineral pyrite which may become extremely acid following disturbance or drainage as sulfur compounds react when exposed to oxygen to form sulfuric acid. More detailed explanation and definition can be found in the NSW Government Acid Sulfate Soil Manual published by Acid Sulfate Soil Management Advisory Committee.
Annual Exceedance Probability (AEP)	The chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage. For example, if a peak flood discharge of 500 m ³ /s has an AEP of 5%, it means that there is a 5% chance (that is one-in-20 chance) of a 500 m ³ /s or larger event occurring in any one year (see ARI).
Australian Height Datum (AHD)	A common national surface level datum approximately corresponding to mean sea level.
Average Annual Damage (AAD)	Depending on its size (or severity), each flood will cause a different amount of flood damage to a flood prone area. AAD is the average damage per year that would occur in a nominated development situation from flooding over a very long period of time.
Average Recurrence Interval (ARI)	The long term average number of years between the occurrence of a flood as big as, or larger than, the selected event. For example, floods with a discharge as great as, or greater than, the 20 year ARI flood event will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event.
caravan and moveable home parks	Caravans and moveable dwellings are being increasingly used for long-term and permanent accommodation purposes. Standards relating to their siting, design, construction and management can be found in the Regulations under the LG Act.
catchment	The land area draining through the main stream, as well as tributary streams, to a particular site. It always relates to an area above a specific location.
consent authority	The Council, government agency or person having the function to determine a development application for land use under the EP&A Act. The consent authority is most often the Council, however legislation or an EPI may specify a Minister or public authority (other than a Council), or the Director General of DIPNR, as having the function to determine an application.
design flood	A hypothetical flood representing a specific likelihood of occurrence (for example the 100 year ARI or 1% AEP flood). It is a probabilistic or statistical estimate, generally being based on some form of probability analysis of flood or rainfall data.
design rainfall	Used in the estimation of a flood or the design of a particular component or feature of a hydraulic structure. Design rainfall estimates are based on the intensity, frequency and duration of the storm bursts. The use of a design rainfall in the estimation of a flood does not imply that if such rainfall occurred at a given time, the estimated flood elevations would result.
development	Is defined in Part 4 of the Environmental Planning and Assessment Act (EP&A Act).
	infill development: refers to the development of vacant blocks of land that are

generally surrounded by developed properties and is permissible under the current zoning of the land. Conditions such as minimum floor levels may be imposed on infill development.

new development: refers to development of a completely different nature to that associated with the former land use. For example, the urban subdivision of an area previously used for rural purposes. New developments involve rezoning and typically require major extensions of existing urban services, such as roads, water supply, sewerage and electric power.

redevelopment: refers to rebuilding in an area. For example, as urban areas age, it may become necessary to demolish and reconstruct buildings on a relatively large scale. Redevelopment generally does not require either rezoning or major extensions to urban services.

disaster plan (DISPLAN)	A step by step sequence of previously agreed roles, responsibilities, functions, actions and management arrangements for the conduct of a single or series of connected emergency operations, with the object of ensuring the coordinated response by all agencies having responsibilities and functions in emergencies.
discharge	The rate of flow of water measured in terms of volume per unit time, for example, cubic metres per second (m^3/s). Discharge is different from the speed or velocity of flow, which is a measure of how fast the water is moving for example, metres per second (m/s).
ecologically sustainable development (ESD)	Using, conserving and enhancing natural resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be maintained or increased. A more detailed definition is included in the Local Government Act 1993. The use of sustainability and sustainable in this manual relate to ESD.
effective warning time	The time available after receiving advice of an impending flood and before the floodwaters prevent appropriate flood response actions being undertaken. The effective warning time is typically used to move farm equipment, move stock, raise furniture, evacuate people and transport their possessions.
emergency management	A range of measures to manage risks to communities and the environment. In the flood context it may include measures to prevent, prepare for, respond to and recover from flooding.
flash flooding	Flooding which is sudden and unexpected. It is often caused by sudden local or nearby heavy rainfall. Often defined as flooding which peaks within six hours of the causative rain.
flood	Relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves overtopping coastline defences excluding tsunami.
flood awareness	Flood awareness is an appreciation of the likely effects of flooding and a knowledge of the relevant flood warning, response and evacuation procedures.
flood education	Flood education seeks to provide information to raise awareness of the flood problem so as to enable individuals to understand how to manage themselves and their property in response to flood warnings and in a flood event. It invokes a state of flood readiness.
flood fringe areas	The remaining area of flood prone land after floodway and flood storage areas have been defined.

flood liable land	Is synonymous with flood prone land (i.e. land susceptible to flooding by the probable maximum flood (PMF) event). Note that the term flood liable land covers the whole of the floodplain, not just that part below the flood planning level (see flood planning area).
flood mitigation standard	The average recurrence interval of the flood, selected as part of the floodplain risk management process that forms the basis for physical works to modify the impacts of flooding.
floodplain	Area of land which is subject to inundation by floods up to and including the probable maximum flood event, that is, flood prone land.
floodplain risk management options	The measures that might be feasible for the management of a particular area of the floodplain. Preparation of a floodplain risk management plan requires a detailed evaluation of floodplain risk management options.
floodplain risk management plan	A management plan developed in accordance with the principles and guidelines in this manual. Usually includes both written and diagrammatic information describing how particular areas of flood prone land are to be used and managed to achieve defined objectives.
flood plan (local)	A sub-plan of a disaster plan that deals specifically with flooding. They can exist at State, Division and local levels. Local flood plans are prepared under the leadership of the State Emergency Service.
flood planning area	The area of land below the flood planning level and thus subject to flood related development controls. The concept of flood planning area generally supersedes the “flood liable land” concept in the 1986 Manual.
Flood Planning Levels (FPLs)	FPLs are the combinations of flood levels (derived from significant historical flood events or floods of specific AEPs) and freeboards selected for floodplain risk management purposes, as determined in management studies and incorporated in management plans. FPLs supersede the “standard flood event” in the 1986 manual.
flood proofing	A combination of measures incorporated in the design, construction and alteration of individual buildings or structures subject to flooding, to reduce or eliminate flood damages.
flood prone land	Is land susceptible to flooding by the Probable Maximum Flood (PMF) event. Flood prone land is synonymous with flood liable land.
flood readiness	Flood readiness is an ability to react within the effective warning time.
flood risk	<p>Potential danger to personal safety and potential damage to property resulting from flooding. The degree of risk varies with circumstances across the full range of floods. Flood risk in this manual is divided into 3 types, existing, future and continuing risks. They are described below.</p> <p>existing flood risk: the risk a community is exposed to as a result of its location on the floodplain.</p> <p>future flood risk: the risk a community may be exposed to as a result of new development on the floodplain.</p> <p>continuing flood risk: the risk a community is exposed to after floodplain risk management measures have been implemented. For a town protected by levees, the continuing flood risk is the consequences of the levees being overtopped. For an area without any floodplain risk management measures, the continuing flood risk is simply the existence of its flood exposure.</p>

flood storage areas	Those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood. The extent and behaviour of flood storage areas may change with flood severity, and loss of flood storage can increase the severity of flood impacts by reducing natural flood attenuation. Hence, it is necessary to investigate a range of flood sizes before defining flood storage areas.
floodway areas	Those areas of the floodplain where a significant discharge of water occurs during floods. They are often aligned with naturally defined channels. Floodways are areas that, even if only partially blocked, would cause a significant redistribution of flood flows, or a significant increase in flood levels.
freeboard	Freeboard provides reasonable certainty that the risk exposure selected in deciding on a particular flood chosen as the basis for the FPL is actually provided. It is a factor of safety typically used in relation to the setting of floor levels, levee crest levels, etc. Freeboard is included in the flood planning level.
habitable room	<p>in a residential situation: a living or working area, such as a lounge room, dining room, rumpus room, kitchen, bedroom or workroom.</p> <p>in an industrial or commercial situation: an area used for offices or to store valuable possessions susceptible to flood damage in the event of a flood.</p>
hazard	A source of potential harm or a situation with a potential to cause loss. In relation to this manual the hazard is flooding which has the potential to cause damage to the community. Definitions of high and low hazard categories are provided in the Manual.
hydraulics	Term given to the study of water flow in waterways; in particular, the evaluation of flow parameters such as water level and velocity.
hydrograph	A graph which shows how the discharge or stage/flood level at any particular location varies with time during a flood.
hydrology	Term given to the study of the rainfall and runoff process; in particular, the evaluation of peak flows, flow volumes and the derivation of hydrographs for a range of floods.
local overland flooding	Inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.
local drainage	Are smaller scale problems in urban areas. They are outside the definition of major drainage in this glossary.
mainstream flooding	Inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam.
major drainage	<p>Councils have discretion in determining whether urban drainage problems are associated with major or local drainage. For the purpose of this manual major drainage involves:</p> <ul style="list-style-type: none"> ■ the floodplains of original watercourses (which may now be piped, channelised or diverted), or sloping areas where overland flows develop along alternative paths once system capacity is exceeded; and/or ■ water depths generally in excess of 0.3 m (in the major system design storm as defined in the current version of Australian Rainfall and Runoff). These conditions may result in danger to personal safety and property damage to both premises and vehicles; and/or ■ major overland flow paths through developed areas outside of defined drainage reserves; and/or

- the potential to affect a number of buildings along the major flow path.

mathematical/computer models	The mathematical representation of the physical processes involved in runoff generation and stream flow. These models are often run on computers due to the complexity of the mathematical relationships between runoff, stream flow and the distribution of flows across the floodplain.
merit approach	<p>The merit approach weighs social, economic, ecological and cultural impacts of land use options for different flood prone areas together with flood damage, hazard and behaviour implications, and environmental protection and well being of the State's rivers and floodplains.</p> <p>The merit approach operates at two levels. At the strategic level it allows for the consideration of social, economic, ecological, cultural and flooding issues to determine strategies for the management of future flood risk which are formulated into Council plans, policy and EPIs. At a site specific level, it involves consideration of the best way of conditioning development allowable under the floodplain risk management plan, local floodplain risk management policy and EPIs.</p>
minor, moderate and major flooding	<p>Both the State Emergency Service and the Bureau of Meteorology use the following definitions in flood warnings to give a general indication of the types of problems expected with a flood:</p> <p>minor flooding: causes inconvenience such as closing of minor roads and the submergence of low level bridges. The lower limit of this class of flooding on the reference gauge is the initial flood level at which landholders and townspeople begin to be flooded.</p> <p>moderate flooding: low-lying areas are inundated requiring removal of stock and/or evacuation of some houses. Main traffic routes may be covered.</p> <p>major flooding: appreciable urban areas are flooded and/or extensive rural areas are flooded. Properties, villages and towns can be isolated.</p>
modification measures	Measures that modify either the flood, the property or the response to flooding. Examples are indicated in Table 2.1 with further discussion in the Manual.
peak discharge	The maximum discharge occurring during a flood event.
Probable Maximum Flood (PMF)	The PMF is the largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation, and where applicable, snow melt, coupled with the worst flood producing catchment conditions. Generally, it is not physically or economically possible to provide complete protection against this event. The PMF defines the extent of flood prone land, that is, the floodplain. The extent, nature and potential consequences of flooding associated with a range of events rarer than the flood used for designing mitigation works and controlling development, up to and including the PMF event should be addressed in a floodplain risk management study.
Probable Maximum Precipitation (PMP)	The PMP is the greatest depth of precipitation for a given duration meteorologically possible over a given size storm area at a particular location at a particular time of the year, with no allowance made for long-term climatic trends (World Meteorological Organisation, 1986). It is the primary input to PMF estimation.
probability	A statistical measure of the expected chance of flooding (see AEP).
risk	Chance of something happening that will have an impact. It is measured in terms of consequences and likelihood. In the context of the manual it is the likelihood of

	consequences arising from the interaction of floods, communities and the environment.
runoff	The amount of rainfall which actually ends up as streamflow, also known as rainfall excess.
stage	Equivalent to water level. Both are measured with reference to a specified datum.
stage hydrograph	A graph that shows how the water level at a particular location changes with time during a flood. It must be referenced to a particular datum.
survey plan	A plan prepared by a registered surveyor.
water surface profile	A graph showing the flood stage at any given location along a watercourse at a particular time.
wind fetch	The horizontal distance in the direction of wind over which wind waves are generated.

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APPENDIX B: IDENTIFICATION OF POTENTIAL FLOOD LIABLE BUILDINGS

B1. Introduction

As a precursor to the future Floodplain Risk Management Study and Plan and to further investigate potentially flood liable regions within the catchment, selected properties have been surveyed to identify potential flood liable buildings. The selected properties are displayed in Figure B1 and were chosen using the two step method described below:

1. The 1% AEP design flood depth grid was inspected using a GIS program. Properties in the immediate vicinity of flood depths greater than 0.5 metres were noted as being in a flood prone region; and then
2. Using Google Earth the tagged properties were visually inspected to determine if over floor inundation may be possible during a flood event. Generally, properties that have floor levels approximately at or below the kerb level were identified as potentially flood liable and were selected for detail floor level survey.

Using the surveyed floor levels and modelled design flood levels, the flood liability of the selected properties was able to be determined.

FIGURE B1
SURVEYED PROPERTIES
BLACKWATTLE BAY



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Parcel Tags as on Council Cadastre (GIS Tag)	Photo Name	Number of Buildings	Street Number	Street Name	Easting (m)	Northing (m)	Indicative Ground Level (mAHD)	RESIDENTIAL BUILDING			NON-RESIDENTIAL BUILDING				
								Lowest Habitable Floor Level (m AHD)	Floor Construction Pier (S) Slab (S) Other (describe)	Type Commercial (C) Industrial (I) Public (P)	Name and Nature of Use/Business	Lowest Floor Level (mAHD)	Floor Construction Pier (P) Slab (S) Other (describe)		
521613	2 Bridge Road.jpg	1	2	Bridge Road	332569.1	6250109.0	2.00				C	Kauri Foreshore Hotel - Pub	-0.02	S	
521615	4 Bridge Road.jpg	1	4	Bridge Road	332554.4	6250097.8	1.99				C	Carnival & Party Warehouse - Party supplies retailer	2.45	S	
521616	6 Bridge Road.jpg	1	6	Bridge Road	332538.7	6250087.1	2.02				C	Fiat - Furniture supplier	2.20	S	
521617	8 Bridge Road.jpg	1	8	Bridge Road	332529.3	6250080.8	2.02				C	Hello Happy Pty Ltd	2.29	S	
521618	10 Bridge Road.jpg	1	10	Bridge Road	332507.8	6250065.4	2.07				C	Ruby Star Traders - Furniture retailer	2.35	S	
521620	12 Bridge Road.jpg	1	12	Bridge Road	332501.0	6250060.9	1.98				I	Osmond Air Services - Air conditioning installers	2.44	S	
521623	14-18 Bridge Road.jpg	1	14 to 18	Bridge Road	332488.5	6250052.4	2.03				C	BWS - Liquor retailer	3.09	S	
521626	20 Bridge Road.jpg	1	20	Bridge Road	332470.9	6250039.4	2.38			P	C	Reece Plumbing - Plumbing supplies retailer	2.77	S	
522343	38 Burton Street.jpg	1	38	Burton Street	332305.0	6249066.9	8.54				C	Project & Café	5.28	S	
525509	137 Broadway.jpg	1	137	Broadway	333343.8	6249282.1	5.68				C	Electric Monkeys	5.28	S	
	139 Broadway.jpg	1	139	Broadway	333338.8	6249232.3	5.68				C	Chubby Girl's Bunz Shop - Bakery	5.28	S	
	141 Broadway.jpg	1	141	Broadway	333333.9	6249232.3	5.68				C	Tattoo World	5.28	S	
	143 Broadway.jpg	1	143	Broadway	333329.1	6249232.1	5.18				C	ICM Mobile Phone Access	5.28	S	
	145 Broadway.jpg	1	145	Broadway	333323.8	6249232.0	5.18				C				
526433	86 Cleveland Street.jpg	1	86	Cleveland Street	333195.5	6248790.3	11.42				P				
526435	88 & 90 Cleveland Street.jpg	1	88	Cleveland Street	333200.1	6248789.3	11.35				P				
526437	89 & 90 Cleveland Street.jpg	1	90	Cleveland Street	333204.5	6248787.8	11.29				P				
526444	97 Cleveland Street.jpg	1	97	Cleveland Street	333189.4	6248749.1	11.59				P				
526445	99 Cleveland Street.jpg	1	99	Cleveland Street	333193.8	6248746.8	11.44				P				
526446	101 Cleveland Street.jpg	1	101	Cleveland Street	333198.8	6248746.6	11.42				P				
529443	9-15 MacArthur Street.jpg	1	9 to 15	MacArthur Street	333115.7	6246962.2	3.87				S	Thai Tha Hai - Restaurant	11.78	S & P	
614246	93 Glebe Street.jpg	1	93	Glebe Street	332733.3	6249540.5	11.26				S				
95 Glebe Street.jpg		1	95	Glebe Street	332730.0	6249543.5	11.22				S				
97 Glebe Street.jpg		1	97	Glebe Street	332725.3	6249545.0	11.02				S				
99 Glebe Street.jpg		1	99	Glebe Street	332721.4	6249547.3	10.98				S				
101 Glebe Street.jpg		1	101	Glebe Street	332717.6	6249550.0	10.87				S				
103 Glebe Street.jpg		1	103	Glebe Street	332714.0	6249552.5	10.85				S				
96 Mitchell Street.jpg		1	96	Mitchell Street	332708.1	6249579.7	9.46				S				
98 Mitchell Street.jpg		1	98	Mitchell Street	332705.9	6249576.7	10.43				S				
100 Mitchell Street.jpg		1	100	Mitchell Street	332703.4	6249574.1	10.43				S				
102 Mitchell Street.jpg		1	102	Mitchell Street	332701.3	6249571.2	10.88				S				
104 Mitchell Street.jpg		1	104	Mitchell Street	332699.4	6249567.8	10.88				S				
622676	12 Phillip Street.jpg	1	12	Phillip Street	332793.9	6249614.9	5.64				P				
15 Broughton Street.jpg		1	15	Broughton Street	332769.4	6249613.3	8.06				P				
622677	24 Broughton Street.jpg	1	24	Broughton Street	332750.2	6249581.1	8.57				P				
24a Broughton Street.jpg		1	24a	Broughton Street	332744.5	6249586.3	8.43				P				
82 Mitchell Street.jpg		1	82	Mitchell Street	332731.0	6249605.1	8.82				P				
84 Mitchell Street.jpg		1	84	Mitchell Street	332727.9	6249601.4	9.10				P				
88 Mitchell Street.jpg		1	88	Mitchell Street	332721.4	6249593.0	9.30				P				
92 Mitchell Street.jpg		1	92	Mitchell Street	332718.0	6249589.3	9.50				P				
90 Glebe Street.jpg		1	90	Glebe Street	332720.3	6249507.0	11.31				P				
92 Glebe Street.jpg		1	92	Glebe Street	332714.0	6249511.8	11.30				P				
94 Glebe Street.jpg		1	94	Glebe Street	332707.6	6249516.9	10.97				P				
96 Glebe Street.jpg		1	96	Glebe Street	332701.5	6249521.9	11.02				P				
98 Glebe Street.jpg		1	98	Glebe Street	332695.1	6249526.1	11.12				P				
100 Glebe Street.jpg		1	100	Glebe Street	332688.2	6249530.4	11.26				P				
106a Mitchell Street.jpg		1	106a	Mitchell Street	332683.2	6249548.0	12.13				P				
106 Mitchell Street.jpg		1	106	Mitchell Street	332681.1	6249542.3	12.43				P				
108 Mitchell Street.jpg		1	108	Mitchell Street	332675.8	6249538.8	12.72				P				
110 Mitchell Street.jpg		1	110	Mitchell Street	332673.2	6249535.8	12.86				P				
112 Mitchell Street.jpg		1	112	Mitchell Street	332671.0	6249531.4	12.97				P				
623773	41 Campbell Street.jpg	1	41	Campbell Street	332693.9	6249480.7	13.00				P				
43 Campbell Street.jpg		1	43	Campbell Street	332691.6	6249482.1	12.93				P				
45 Campbell Street.jpg		1	45	Campbell Street	332688.9	6249484.2	12.94				P				
47 Campbell Street.jpg		1	47	Campbell Street	332685.1	6249486.6	12.85				P				
49 Campbell Street.jpg		1	49	Campbell Street	332681.6	6249489.3	12.94				P				
51 Campbell Street.jpg		1	51	Campbell Street	332678.8	6249491.6	12.99				P				
53 Campbell Street.jpg		1	53	Campbell Street	332675.9	6249494.0	12.98				P				
55 Campbell Street.jpg		1	55	Campbell Street	332673.1	6249495.9	13.10				P				
623775	120 Mitchell Street.jpg	1	120	Mitchell Street	332655.0	6249504.8	13.09				P				

Parcel Tags as on Council Cadastre (GIS Tag)	Photo Name	Number of Buildings	Street Number	Street Name	Easting (m)	Northing (m)	Indicative Ground Level (mAHD)	RESIDENTIAL BUILDING			NON-RESIDENTIAL BUILDING		
								Lowest Habitable Floor Level (mAHD)	Floor Construction Pier (P) Slab (S) Other (describe)	Type Commercial (C) Industrial (I) Public (P)	Additional Comments	Name and Nature of Use/Business	Lowest Floor Level (mAHD)
529093	29 Levey Street		29	Levey Str	333338.5	6248940.7	11.35	11.76	S				
529095	31 Levey Street		31	Levey Str	333342.3	6248940.9	11.36	11.76	S				
529098	33 Levey Street		33	Levey Str	333345.8	6248941.2	11.45	11.76	S				
529100	35 Levey Street		35	Levey Str	333349.5	6248941.5	11.47	11.77	S				
529102	37 Levey Street		37	Levey Str	333353.2	6248941.8	11.56	12.11	S				
529104	39 Levey Street		39	Levey Str	333357.1	6248942.1	11.64		S				
202399	188 Chalmers Street		188	Chalmers	333132.0	6248720.0	30.24	30.10	S	C			30.43
175710	1-89 Buckingham Street		61 to 89	Buckingham	334196.0	6248699.0	31.57	32.06	S	C			
175722	91 Buckingham Street		91	Buckingham	334188.6	6248650.1	31.93	32.06	P				
175723	93 Buckingham Street		93	Buckingham	334187.9	6248645.8	32.08	32.39	P				
175733	108 Buckingham Street		108	Buckingham	334207.8	6248679.8	31.74	32.43	P				
175734	110 Buckingham Street		110	Buckingham	334207.1	6248675.5	31.74	32.43	P				
529878	4-8 Kelly Street		4 to 8	Kelly Street	333105.6	6249498.9	4.76		S				
528881	29 Kelly Street		25	Kelly Street	333228.5	6249494.5	4.14	6.10	S				
528775	118 Mitchell Street		118	Mitchell St	332660.1	6249523.5	13.55	14.12	S				
521900	17-31 Cowper Street		17 to 31	Cowper St	332879.8	6249710.0	2.33	3.34	S				
520965	A Wentworth Park Road		2A	Wentworth	332887.5	6249777.4	2.33	3.33	S				
520965	D Wentworth Park Road		2D	Wentworth	332898.4	6249787.9	2.45	3.32	S				
520984	46 Wentworth Park Road		40 to 46	Wentworth	332784.0	6249927.6	2.38	2.48	S	C			2.44
522344	38 Burton Street		40	Burton Str	332310.4	6250081.6	9.70	9.92	S	I			9.92
520951	80 Forsyth Street		36	Burton Str	332314.3	6250075.7	8.51	8.92	S				
520950	78 Forsyth Street		38	Burton Str	332319.0	6250069.0	7.74	9.37	S				
520948	74 Forsyth Street		74	Forsyth St	332265.1	6250295.9	5.04	6.75	S				
520947	72 Forsyth Street		72	Forsyth St	332260.9	6250292.7	5.18	6.77	S				
520946	70 Forsyth Street		70	Forsyth St	332257.7	6250290.2	5.29	6.72	S				
520945	68 Forsyth Street		68	Forsyth St	332254.1	6250287.5	5.70	6.74	S				
520944	66 Forsyth Street		66	Forsyth St	332250.9	6250284.8	5.97	7.75	S				
520943	64 Forsyth Street		64	Forsyth St	332247.3	6250281.6	6.24	7.80	S				
520646	29-31 Cook Street		29 to 31	Cook Street	332188.0	6250462.0	2.11	2.36	S				
519070	18 Oxley Street		18	Oxley Str	331943.0	6250482.0	11.74	3.14	S				
608938	7-23 Stewart Street		7 to 23	Stewart St	334981.0	6250476.0	11.74	9.02	S				
519208	2 Garraan Lane		2	Griffin Pl	332224.0	6250370.0	2.76	3.20	S				
519209	3A Garraan Lane		3A	Garraan La	332188.8	6250311.2	5.22	5.44	S				
187364	55 Calder Road		55	Calder Rd	332201.0	6250320.0	3.76	4.26	P				
187362	53 Calder Road		53	Calder Rd	333041.0	6248520.0	17.36	18.43	P				
187360	51 Calder Road		51	Calder Rd	333042.0	6248520.0	17.32	17.89	P				
187358	49 Calder Road		49	Calder Rd	333046.1	6248521.2	17.71	18.30	P				
187356	47 Calder Road		47	Calder Rd	333047.2	6248521.5	17.68	18.11	S				
187354	45 Calder Road		45	Calder Rd	333053.9	6248523.7	17.67	18.11	S				
187352	43 Calder Road		43	Calder Rd	333054.9	6248524.0	17.70	18.19	S				
202235	39 Calder Road		39	Calder Rd	333061.2	6248526.0	17.77	18.60	S				
187346	37 Calder Road		37	Calder Rd	333064.4	6248527.3	17.77	18.56	S				
187344	35 Calder Road		35	Calder Rd	333066.2	6248528.0	17.87	18.56	S				
202234	33 Calder Road		33	Calder Rd	333070.0	6248530.0	17.92	18.17	P				
187338	29 Calder Road		29	Calder Rd	333073.0	6248531.0	17.52	18.17	P				
187336	27 Calder Road		27	Calder Rd	333076.0	6248532.0	17.44	18.21	P				
202233	25 Calder Road		25	Calder Rd	333080.0	6248533.0	17.49	18.23	P				
526407	61 Cleveland Street		61	Cleveland	333083.0	6248535.0	17.49	18.23	P				
526412	59 Cleveland Street		63	Cleveland	333115.0	6248772.0	13.32	13.48	P				
526412	55 Cleveland Street		65	Cleveland	333118.0	6248772.0	13.02	13.50	P				
526443	95 Cleveland Street		95	Cleveland	333118.0	6248772.0	13.02	13.50	P				
533601	57-163 Cleveland Street		157 to 163	Cleveland	333167.0	6248763.0	11.68	11.86	P				
194701	43-47 Vine Street		43 to 47	Vine Street	333181.0	6248719.0	15.60	12.10	P	C			
194705	49-53 Vine Street		49 to 53	Vine Street	333181.0	6248726.0	12.10	12.26	P	C			
194705	55 Vine Street		55	Vine Street	333159.0	6248729.0	12.51	12.60	P	C			
202730	59 Vine Street		59	Vine Street	333148.7	6248730.9	12.83	13.40	P				
202729	59 Vine Street		59	Vine Street	333139.5	6248731.7	12.86	13.40	P				
194711	61 Vine Street		61	Vine Street	333135.0	6248732.0	13.04	13.30	P				
194711	61 Vine Street		61	Vine Street	333135.0	6248732.0	13.09	13.33	P				
194711	61 Vine Street		61	Vine Street	333131.0	6248733.0	13.12	13.49	P				

Parcel Tags as on Council Cadastral (GIS Tag)	Photo Name	Number of Buildings	Street Number	Street Name	Easting (m)	Northing (m)	Indicative Ground Level (mAHD)	RESIDENTIAL BUILDING			NON-RESIDENTIAL BUILDING		
								Lowest Habitable Floor Level (m AHD)	Floor Construction Pier (P) Slab Other (describe)	Type Commercial (C) Industrial (I) Public (P)	Name and Nature of Use/Business	Lowest Floor Level (mAHD)	Floor Construction Pier (P) Slab Other (describe)
194712	63 Vine Street		63	Vine Street	333127.0	6248734.0	13.20	13.38					
194713	65 Vine Street		65	Vine Street	333124.0	6248735.0	13.12	13.45					
519440	12 Junction Street		12	Junction St	331763.0	6249192.0	14.32	11.76		C	Level Of Office at Rear of 3 Storey Building		
519440	12 Junction Street		12	Junction St	331762.0	6249178.0	14.00	10.88		C	Level Floor Old Building Rear of Site		
521860	1A Healey Street		1A	Healey St	331967.0	6249623.0	14.00	14.30			Bottom Floor of 3 Storey Brick Flats		
186501	16 Eveleigh Street		16	Eveleigh St	333549.1	6248647.6	18.28	18.28					
193153	13 Renwick Street		13	Renwick St	332986.9	6247555.6	26.48	26.96					
193154	15 Renwick Street		15	Renwick St	332974.6	6247553.2	26.43	26.97					
193155	17 Renwick Street		17	Renwick St	332968.5	6247552.0	26.36	26.97					
193156	19 Renwick Street		19	Renwick St	332962.3	6247550.8	26.40	26.99					
193157	21 Renwick Street		21	Renwick St	332956.6	6247549.7	26.40	26.99					
193158	23 Renwick Street		23	Renwick St	333728.3	6248579.0	26.35	26.99					
246249	25-27 Renwick Street		25 to 27	Renwick St	333728.0	6248576.8	26.35	26.47					
249852	29 Renwick Street		29	Renwick St	333726.9	6248569.0	26.29	26.56					
613353	35-37 Renwick Street		35 to 37	Renwick St	333724.0	6248549.7	26.51	26.72					
203082	62-134 Shepherd Street		132 to 134	Shepherd St	333064.0	6248657.0	14.47	14.60		P(COMMUNITY)			
183743	138 Shepherd Street		138	Shepherd St	333052.6	6248622.9	14.98	15.20		R			
183744	140 Shepherd Street		140	Shepherd St	333051.3	6248619.1	14.98	15.22		R			
202408	1-19 Regent Street		1 to 19	Regent St	333724.1	6248648.0	28.22			C	Various Retail Stores	28.14	S
621684	21 Regent Street		21	Regent St	336143.8	6248968.7	26.30			C	Various Retail Stores	26.95	S
518066	55-59 Regent Street		55 to 59	Regent St	333772.0	6249050.0	17.81			C	Various Retail Stores	18.10	S
627845	60-65 Regent Street		60 to 65	Regent St	333764.0	6249027.0	17.81			C	Various Retail Stores	17.81	S
515495	67-69 Regent Street		67 to 69	Regent St	333757.0	6249020.0	17.94			C	Various Retail Stores	17.94	S
516920	71-75 Regent Street		71 to 75	Regent St	333745.0	6249006.0	18.11			C	Various Retail Stores	19.16	S
518418	80 Broughton Street		80	Broughton St	32498.2	6249935.8	6.75			P(COMMUNITY)	BROUGHTON ST CHILD CARE CENTRE	7.09	S
202206	12 Boundary Street		12	Boundary St	333135.0	6248876.0	13.06	13.06					
522340	32 Burton Street		32	Burton St	332326.8	6250063.0	6.69	8.38					
522341	34 Burton Street		34	Burton St	332324.8	6250063.4	7.37	8.82					
522022	27 Cardigan Street		27	Cardigan St	332508.5	6249942.3	7.53	7.61					
522023	29 Cardigan Street		29	Cardigan St	332500.1	6249936.4	7.01	7.18					
522024	31 Cardigan Street		31	Cardigan St	332501.1	6249937.1	7.01	7.18					
201521	36-38 George Street		36 to 38	George St	333780.9	6248550.2	26.51			P	Carpark	26.73	S
514080	47-53 Jones Street		47 to 53	Jones St	333146.1	6249954.8	3.12			P	School	4.42	S
521045	42 Lombard Street		42	Lombard St	33261.6	6249961.2	19.41	20.60					
612303	1-73 Mount Vernon		1 to 73	Mount Ver	332197.0	6249431.0	24.85	25.17			Level Dwelling No. 146 Corner St Johns Road and Mt Vernon Lane		
613427	2-8 Wentworth Street		2 to 8	Wentworth St	332903.4	6249726.3	3.07	0.47					