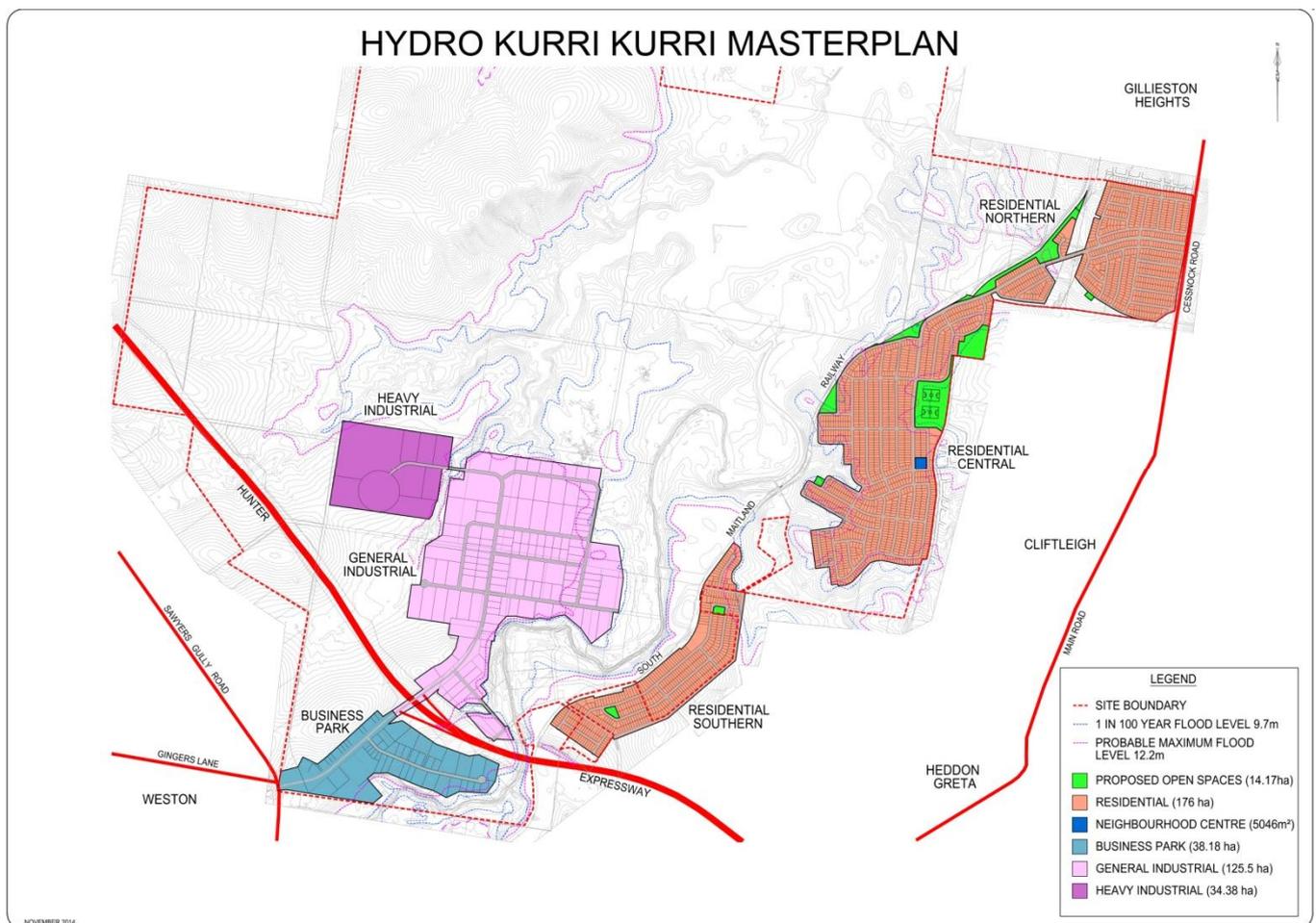




CONSULTING SURVEYORS | TOWN PLANNERS | CIVIL ENGINEERS | PROJECT MANAGERS

# Hydro Aluminium Kurri Kurri Subdivision Design Report



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Issue	Details of Change	Prepared	Reviewed	Date
A	Draft Issue for Review	MD	--	08/08/14
B	Final, following joint review	RH	MD	22/09/14
C	Adjustment to road, water and fee costs	RH	MD	2/10/14
D	Adjusted to reflect latest ecology and electricity easement information. Costings split out as an attachment. Further review feedback incorporated.	RH	MD	25/10/14
E	Adjusted the bulk earthworks assessment including removing outdated plan. Removed costings into a separate report.	RH	DE	1/12/14
F	Removed outdated zoning map and reference to costing report	RH	--	3/12/14

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## 1 Overview

The purpose of this report is to consolidate and refine work previously undertaken by the Hydro Project Team into a clearly defined Subdivision Design Plan for both the Residential and Industrial subdivisions. The objective is a plan suitable for submission to Council in support of a rezoning proposal and delivering the highest and best use outcome across all landholdings.

The prepared subdivision designs and supporting engineering drawings and documentation respect the site's constraints and opportunities, whilst being reflective of the true end product the market is likely to demand.

Throughout this process periodic checks were made of key parameters which could impact the project's viability and, where required, concepts were refined to improve the overall efficiency, logic and ultimate end use of the subdivision layouts. The resulting designs are largely in keeping with the Preliminary Masterplan but amended in response to site constraints regarding flooding and slope.

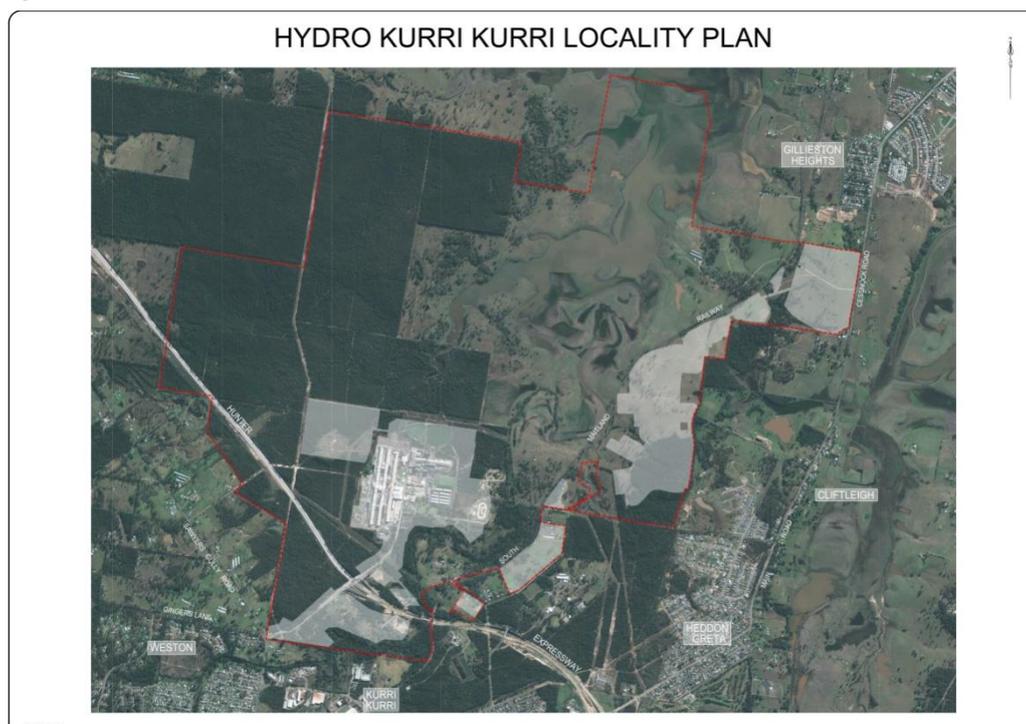
In summary the Residential and Industrial subdivisions present opportunity to extract value from the Hydro land holdings. The lands future development is:

- Strategically logical within a planning context;
- Viable in terms of constraints, opportunities, access and servicing; and
- Marketable for product delivery.

### 1.1 Introduction

The site encompasses approximately 80ha of a disused smelter plant and some 2,000ha of buffer lands located on the border of both Maitland and Cessnock Local Government areas. The landform over the site varies, however the vast majority of the potential development land is of gentle slope up to 1v:20h, suitable for residential and industrial development.

Figure 1 - Location & Surrounds



## **1.2 Constraints and Opportunities**

The Hydro land holdings are significant in size and scale, with a substantial amount of land suitable for development, and other areas more suited to remaining undeveloped. The proposed subdivision designs, engineering documentation and layouts have considered all constraints, and found opportunities to maximise the long term potential yield and financial return for Hydro as a land owner in regards to any divestment of land.

The outcome from the subdivision design process is that there is significant development potential for large areas of Hydro's land holdings without having any significant environmental impacts. Proposed staging of this development is largely driven by the water and sewer constraints and capital costs of road, water and sewer construction.

Below is a summary of the key constraints that have been reviewed and taken into consideration with notes on the impact of each on the subdivision design.

### **1.2.1 Development Parcel Geometry**

The proposed Residential lots are regular in shape with areas compatible with a lot size analysis, see 2.3 Product Definition for details. Lot widths are generally in the range of 15m to 18m which provides for a range of commercially available project homes. Solar access is considered for all lots and where necessary lots are either lengthened or widened, particularly on southern slopes to accommodate at least three hours of sunlight on a 5m by 5m private open space area within the lot at any time throughout the year.

Industrial lots have been proposed with a range of lot sizes comparable with the analysis in section 3 of this report.

### **1.2.2 Flooding**

The extents of development are constrained by the 100 year flood level which is a product of back water flooding from the Hunter River. As the flood level is produced by flood storage, the flood level is consistent along the eastern and western extents at a level of 9.7m AHD. Minor filling of the flood plain is considered acceptable to regularise the development footprint and has been adopted. Any land identified below the flood level other than the small amount of minor filling has not been considered for residential or industrial purposes.

### **1.2.3 Slope Analysis**

The slope of the residential land grades from flat to approximately 15% in the north eastern corner. Development of heavily sloped land is best achieved by aligning the lots parallel to the contours and reducing the lot width to reduce the amount of height difference across the individual lots. Modern construction techniques tend to require slab on ground housing which can be accommodated on the narrower lots as the cut/fill heights are reduced.

Development within the proposed industrial land has similarly been considered and will suit large flat allotments.

### **1.2.4 Flora and Fauna**

The development footprint has been limited to those areas of the site not affected by significant existing vegetation. Studies have identified endangered ecological communities of local and national significance within the bounds of the Hydro site which have been

predominantly excluded from the proposed development footprint. The master plan has been adjusted to meet the target volumes of retained vegetation types identified in these studies.

#### **1.2.5 Bushfire**

As the development footprint has been limited to predominately non vegetated areas, the bushfire hazard has been significantly reduced for the residential sites.

The industrial lands are not significantly affected by known bushfire constraints, and can be further refined as the bushfire and ecology studies are concluded.

#### **1.2.6 Noise and Vibration**

The areas of the site expected to be affected by noise and vibration are limited to the rail corridor and the land adjoining Cessnock Road. The land adjoining the rail corridor has been designed with lots 60m in length which will provide adequate area for noise attenuation mounds, landscaping or fencing/walls within the rear of lots. Internal roads parallel to Cessnock Road are proposed in the north eastern portion of the site which will provide adequate acoustic setback from Cessnock Road for residential development. Similarly, acoustic landscaped mounding and setbacks should reduce any affectation to acceptable living standards.

#### **1.2.7 Visual**

Views from the proposed residential land will be available over the surrounding flood prone rural landscape to the west, north and east. Views of the residential subdivision will be from adjacent residential lands and adjoining rural parcels very similar to the current Gillieston Heights and Cliftleigh residential estates.

Views to and from the industrial subdivision are from all aspects, the most significant change will be for new industrial precinct to the south of the existing smelter site.

#### **1.2.8 Serviceability**

All utility services are readily available to the subject lands.

The Cliftleigh water and sewer infrastructure will not support the development however the water and sewer can be adequately supplied from the existing Kurri Kurri infrastructure with upgrades undertaken as required. This fundamentally drives the staging plan to run from the south to the north east.

Electricity, gas and communications can be augmented and extended into the development from the existing and surrounding networks or systems.

#### **1.2.9 Mine Subsidence**

Mine subsidence affects a band of approximately 100m in width running north south through the proposed northern residential precinct. Advice from the geotechnical engineers and Mine Subsidence Board has been observed and no development is proposed within the affected area.

### 1.3 Subdivision Design

The Hydro land holdings provide a strategically located site that can be considered for future new development, both from an industrial or employment perspective, and residential housing.

The combination of these two complimentary land uses is essential to ensure a long term viable development outcome.

The continued population growth of the Lower Hunter is affected by new employment and business growth, and given the convenient site location close to the new Hunter Expressway and existing services, the Hydro site has many essential qualities and key attributes to attract future developers.

The potential industrial areas total approximately 198 hectares of land, which is larger than any existing estates in the Lower Hunter. The industrial subdivision has been divided into three precincts in consideration of servicing time frames, construction costings, likely usage and the logical sequencing or staging to match. These have been named to reflect likely usage with the Business Park precinct in the south, General Industrial precinct on the current smelter area and Heavy Industrial precinct to the west. Any new industrial development is likely to begin in the southern precinct.

The potential residential subdivision occupies the eastern parts of the Hydro land holdings, adjacent to the existing Cliftleigh and Gillieston Heights residential areas, and bordering the South Maitland Railway line.

The total Hydro land area that forms part of the residential subdivision is approximately 255 Ha, including 128Ha of saleable residential land. There are also some non-Hydro parcels that should be developed in conjunction with the Hydro lands and these have been shown in the updated Masterplan but are not included in land area and cost calculations.

Using a traditional Lower Hunter subdivision scenario, the Hydro residential lands would equate to an estimated 2088 allotments (predominantly 600m<sup>2</sup> in size). This report also looks into more creative and contemporary methods to maximise dwelling yields. In this regard the subdivision design is flexible to future demands, trends and the housing market.

The updated master plan and supporting engineering documentation provides a sound platform upon which to make decisions on the future of the Hydro lands, particularly when linked to the Servicing Report as this has been. It is clear that there is a large amount of land suitable for development, however the key issue with land development is time frames and rate of sale. There is certainly a great opportunity to advance or unlock the site's development potential.

Figure 2, below, shows the updated Masterplan and Figure 3 shows the associated rezoning plan. Sections 2 and 3 of this report go into more detail on the Residential and Industrial subdivisions. Detailed versions of all plans and associated approximate costings are attached.

Figure 2 - Updated Masterplan

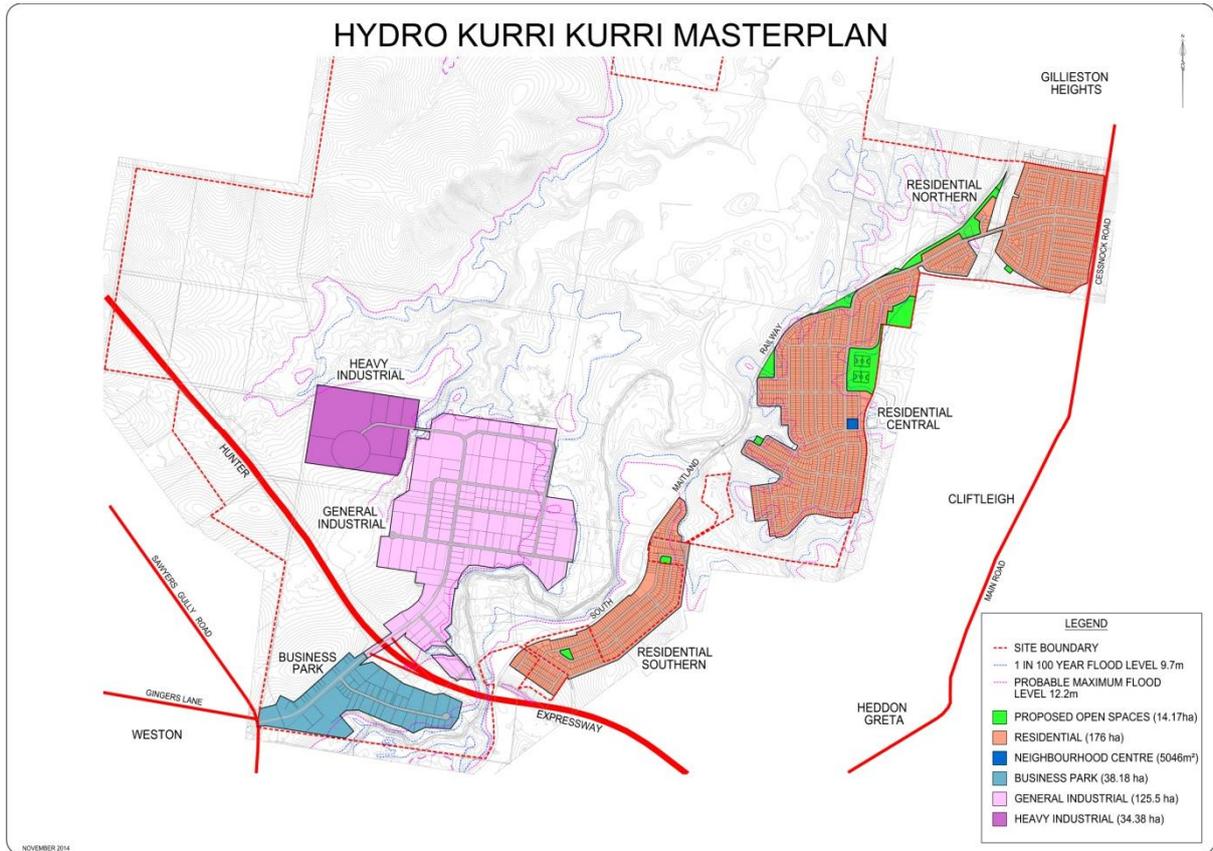
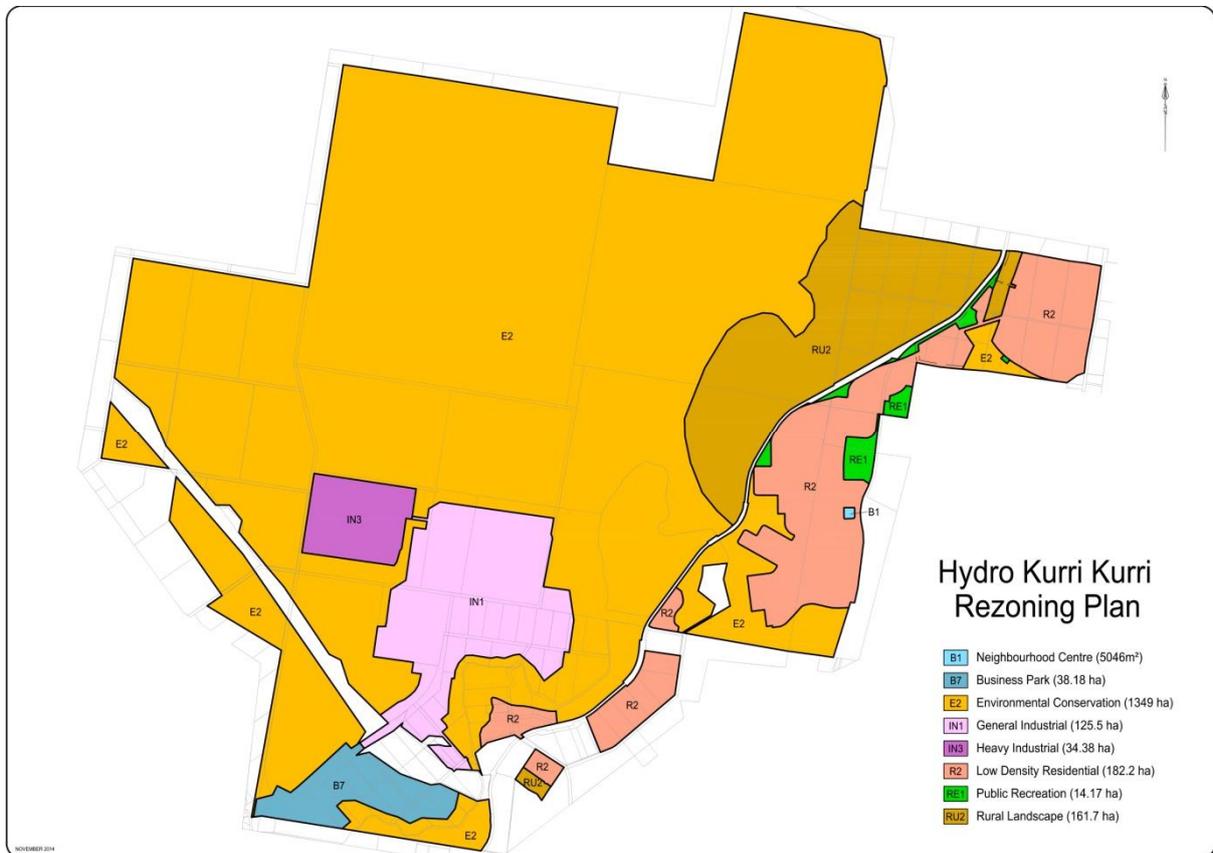


Figure 3 - Rezoning Plan



## 2 Residential Precincts

### 2.1 Project scale

The residential subdivision is located in the eastern extremities of the site directly adjoining existing land which is identified within strategies for future residential zoning or development. The area comprises approximately 255ha of mostly cleared grazing land with some isolated areas of dense vegetation. The terrain is mostly flat with some areas of moderate slope, however these areas are still suitable for residential development. The seldom used South Maitland Railway line which links Kurri Kurri and Maitland forms a defined western boundary to the flood plains beyond. The review of constraints and opportunities detailed earlier has determined that the land has suitable attributes for residential development and dwelling yield in the order of 2100 lots.

For reference we have reviewed some local developments to put into context the scale of this proposed development and provide indicative timeframes for a project of this magnitude.

#### Seaside Village Fern Bay – Rawson Communities

Commenced	2006
Number of Lots	884
Lots remaining	650
Sales Rate (lots pa)	30



Saddlers Ridge, Gillieston Heights - Mirvac

Commenced	2007
Number of Lots	444
Lots remaining	98
Sales Rate (lots pa)	70



Northlakes Estate Cameron Park – McCloys

Commenced	2002
Number of Lots	1500
Lots remaining	150
Sales Rate (lots pa)	120



The Sanctuary, Fletcher - Landcom

Commenced	2009
Number of Lots	750
Lots remaining	503
Sales Rate (lots pa)	42



## 2.2 Supporting land uses

A development of this size does not only comprise of residential allotments. Many complementary land uses and facilities are required to support the future community. These land uses need to be planned for during this concept phase to determine the quantity of land required, and locate the most appropriate areas.

This Subdivision Design Plan includes consideration of and allowances for the following uses:

- Education
- Commercial and Retail
- Community Centre
- Open space for both active and passive uses

The application rate required for each of these uses has been derived from a variety of Government guidelines and economic assessment reports for similar scaled development sites, on a pro rata basis.

The Landcom Design Guidelines for open space have highlighted the need for open space to:

- Be meaningful to place and community;
- Be multifunctional and adaptable;
- Provide Diversity;
- Encourage social interaction;
- Promote health and wellbeing ;
- Provide equity and accessibility;
- Embody environmental sustainability; and
- Ensure financial sustainability.

The quantum of open space has been initially derived from historic/default standards, as a first pass, however it is widely documented throughout NSW Department of Planning guidelines that these standards are not truly reflective of what current communities require.

The default open space rate is 2.83Ha per 1000 people, of which 1.81Ha per 1000 people is required for active open space for the likes of formal sports grounds and courts. Based on an estimated population of roughly 5,400 persons (~2100 lots x 2.6 person per dwelling) residing in the development, approximately 15ha of open space has been targeted for this subdivision. The constraints noted above mean that considerable passive open space available and the subdivision easily meets and exceeds these targets.

The following table summarises the indicative supporting land uses to serve the proposed development.

Table 1 - Indicative Supporting Land Uses

Land use	Trigger (dwellings)	Area (Ha)	Requirement for subject site
<b>Education</b>			
• Primary School	3,000	4	Possible
• High School	11,250		NA
• TAFE College	180,000		NA
<b>Emergency Services</b>			
• Fire Station	22,500		NA
• Ambulance	18,000		NA
• Police	45,000		NA
<b>Commercial &amp; Retail</b>			
• Town Centre	12,000		NA
• Supermarket	6,000		NA
• Village (GFA 500m <sup>2</sup> )	1,500	0.2	Likely
• Community Centre	1,500	0.2	Likely
<b>Open space</b>			
• Pocket Park	500	0.1 - 0.2	Certain (8 of)
• Local Park	1500	0.2 – 0.5	(2 – 3 of)
• Sports Fields – Local (rugby/soccer x 2 or 1 cricket)	1350	2 - 5	Certain(1 of)
• Sports Courts- Local (netball and tennis)	4,000	1.0	Certain (1 of)
• Alternate Recreation (skate park, BMX)	4000	1.0	Certain (1 of)
• Linear & Linkage (shared pathways)	NA	NA	Certain
• Dog off leash Area	NA	NA	Certain 4 of

Source: Tangent Leisure Consultants 2006, Landcom Guidelines 2006, NSW Western Sydney Growth Corridors, AEC Group, NSW Department of Planning – Open space planning guidelines for local government.

Open space also needs to be located appropriately to provide accessibility and to ensure usage meets the needs of the community. As such the following location / catchment guidelines apply.

Table 2 - Typical Open Space Catchment Distances

Park Type	Radius to most dwellings
Local Park	400m
Sports ground	1,000m
District sports ground	2,000m

Sources: NSW Department of Planning 2010

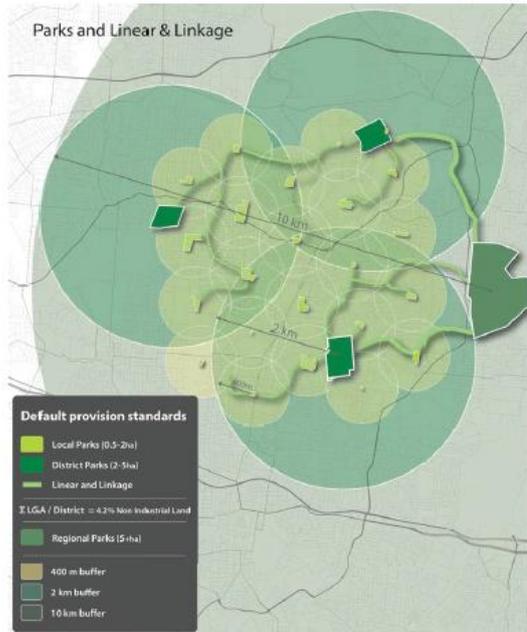


Figure 1. Idealised application of default open space provision standards: Parks and Linear and Linkage

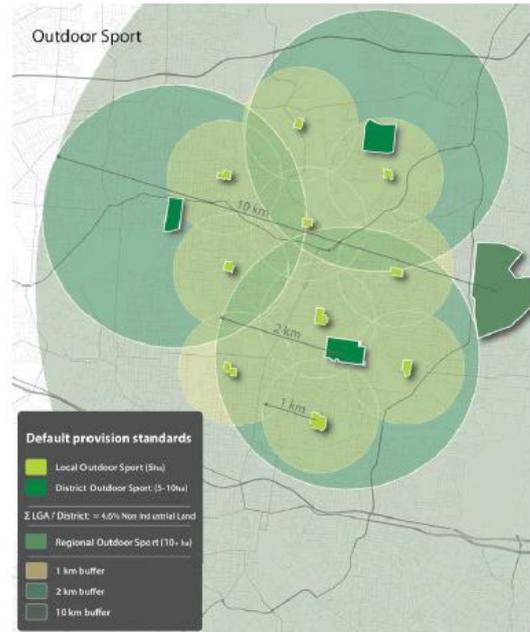
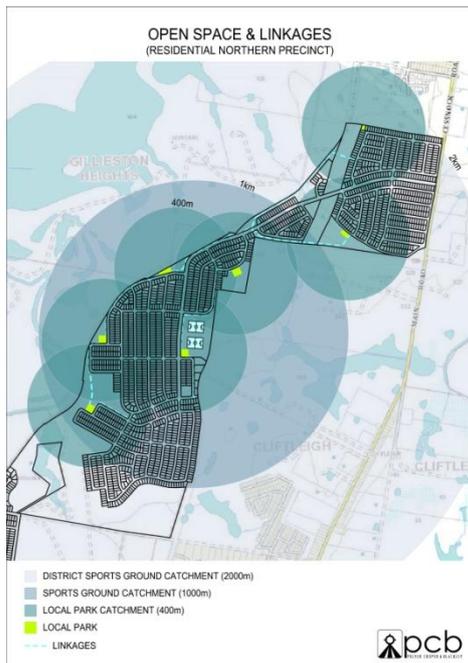


Figure 2. Idealised application of default open space provision standards: Outdoor Sport

The allowances detailed above should form the basis of further detailed studies including the application of standards and detailed negotiation with Government and Council planning staff during the preparation of any rezoning application. Allowances for the Hydro Subdivision Design Plan are shown below.



## 2.3 Product Definition

The expected intent of the proposed development is to become a contemporary residential community, reflective of the sites location within the region, the constraints and opportunities of the site, and the need to deliver affordable residential product.

In order to achieve this objective the product mix being delivered needs careful consideration to determine a true and accurate ultimate yield. The dwelling typologies impact lot sizes and street frontages, and it is imperative that the Subdivision Design ensure the road network created is mindful of the overall development costs to be shared across the ultimate yield.

Changes to household structure over the next 15 years will see a substantial shift in dwelling composition with the most substantial areas of growth being couples without children (24.5% increase) and lone person households (48.1% increase). These increases will result in many downsizer moves from traditional dwellings to smaller, more compact and cost effective housing products.

**Table 3 - Housing Demand by Household Type**

<b>Household Type</b>	<b>2013</b>	<b>2030</b>	<b>Increase</b>	<b>% Increase</b>
<b>Number of households ('000)</b>				
<b>Two-parent families</b>	2,828.6	3,296.7	468.1	16.9%
<b>Single -parent families</b>	1,030.6	1,246.0	215.4	7.8%
<b>Couples without children</b>	2,543.6	3,222.8	679.2	24.5%
<b>Lone person household</b>	2,466.7	3,800.1	1,333.4	48.1%
<b>Group household</b>	368.9	445.9	77.0	2.7%
<b>Total Households</b>	9,238.5	12,011.5	2,773.0	100.0%

Source: National Housing Supply Council – State of supply report 2011.

Sydney’s South West corridor is leading the way in terms of product diversity. That area is aiming, and currently achieving the following product mix for new urban release areas to respond to the future household type demands.

**Table 4 - New Release Product Mix**

<b>Product Type</b>	<b>% by number of</b>
<b>Apartments</b>	6%
<b>Townhouses</b>	20%
<b>Detached &lt; 350m<sup>2</sup></b>	24%
<b>Detached &lt; 450m<sup>2</sup></b>	24%
<b>Detached &lt; 600m<sup>2</sup></b>	21%
<b>Detached 1000 – 2000m<sup>2</sup></b>	5%

Source: South West Growth Centre Structure Plan

The Hunter Region has been slow in responding to the forecast future demands which will require developments to offer a variety of housing product to meet the markets demands. The Hunter is currently still offering the same traditional housing product, but this trend may change in the next 15 years.

LWP’s Huntlee development will be the first in the region to showcase plans on responding to these issues and offer true product diversity and exposure to the widest possible market now and into the future.

A good example of a development where a variety of product is being offered is Landcom’s Bunya development in Sydney’s south west corridor. The development comprises 730 lots with the largest lots being around 600m<sup>2</sup> with smaller offerings down to 330m<sup>2</sup>. Areas within the site have also been set aside for further densification and development of townhouses on smaller allotments again. This subdivision is most representative of desired product mix for the south west growth centre structure plan.

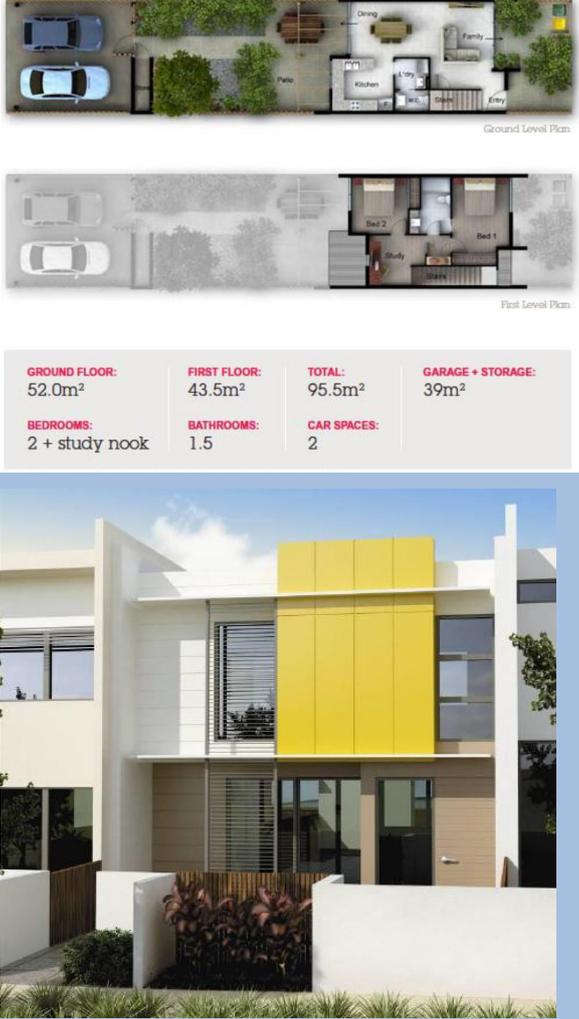


Figure 4 - Typical lots sizes within a stage



Based on current best practice and forecast dwelling requirements the following dwelling typologies are considered suited to the proposed development and have been used in the yield tables, below.

**Table 5 - Dwelling Typologies**

Product Type	Typical Plan	Lot size								
<p><b>Townhouses</b></p>	 <p>Ground Level Plan</p> <p>First Level Plan</p> <table border="1" data-bbox="512 790 1082 909"> <tr> <td><b>GROUND FLOOR:</b> 52.0m<sup>2</sup></td> <td><b>FIRST FLOOR:</b> 43.5m<sup>2</sup></td> <td><b>TOTAL:</b> 95.5m<sup>2</sup></td> <td><b>GARAGE + STORAGE:</b> 39m<sup>2</sup></td> </tr> <tr> <td><b>BEDROOMS:</b> 2 + study nook</td> <td><b>BATHROOMS:</b> 1.5</td> <td><b>CAR SPACES:</b> 2</td> <td></td> </tr> </table>	<b>GROUND FLOOR:</b> 52.0m <sup>2</sup>	<b>FIRST FLOOR:</b> 43.5m <sup>2</sup>	<b>TOTAL:</b> 95.5m <sup>2</sup>	<b>GARAGE + STORAGE:</b> 39m <sup>2</sup>	<b>BEDROOMS:</b> 2 + study nook	<b>BATHROOMS:</b> 1.5	<b>CAR SPACES:</b> 2		<p>6m wide x 30m deep Minimum 180m<sup>2</sup></p>
<b>GROUND FLOOR:</b> 52.0m <sup>2</sup>	<b>FIRST FLOOR:</b> 43.5m <sup>2</sup>	<b>TOTAL:</b> 95.5m <sup>2</sup>	<b>GARAGE + STORAGE:</b> 39m <sup>2</sup>							
<b>BEDROOMS:</b> 2 + study nook	<b>BATHROOMS:</b> 1.5	<b>CAR SPACES:</b> 2								
<p><b>Small Lot Housing</b> <b>Single or 2 storey</b></p>	 <p>GROUND FLOOR</p>	<p>11m – 14m wide x 30 – 35m deep 330 – 450m<sup>2</sup> Street access or rear lane</p>								



**Rear Access**

14m wide x 32.5 deep  
Minimum 450m<sup>2</sup>





**Standard Lots**

14m – 18m wide x 35 deep  
450 - 600m<sup>2</sup>



**Large Lots**

20m – 25m wide x 50 deep  
Minimum 1,000m<sup>2</sup>



## 2.4 Residential Yield

Given the infancy of the project and the need to further assess the project's feasibility the above principles were used to derive 3 yield scenarios for consideration i.e.

- Traditional – as per recently delivered estates such as North Lakes at Cameron Park;
- Contemporary – scaled down version of SW Sydney Structure Plan, similar to LWP's Huntlee; and
- Contemporary High – As per SW Sydney Structure Plan ratio's.

### Traditional

	Frontage (m)	Lot depth	Lot Area	Frontage %	No of dwellings	Salable Land m <sup>2</sup>
Townhouses	6	30	180	0%	0	0
Detached @ 350m <sup>2</sup>	11	32	350	0%	0	0
Detached @ 450m <sup>2</sup>	14	32	450	10%	250	112,523
Detached @ 600m <sup>2</sup>	17	35	600	80%	1647	988,440
Large Lot @ 1000m <sup>2</sup>	20	50	1000	10%	175	175,036
<b>Total</b>					<b>2,072</b>	<b>1,276,000</b>
					<b>Average Lot Size</b>	<b>616 m<sup>2</sup></b>

### Contemporary (scaled down)

	Frontage (m)	Lot depth	Lot Area	Frontage %	No of dwellings	Salable Land m <sup>2</sup>
Townhouses	6	30	180	5%	305	54,906
Detached @ 350m <sup>2</sup>	11	32	350	20%	666	232,936
Detached @ 450m <sup>2</sup>	14	32	450	30%	784	352,969
Detached @ 600m <sup>2</sup>	17	35	600	35%	754	452,169
Large Lot @ 1000m <sup>2</sup>	20	50	1000	10%	183	183,021
<b>Total</b>					<b>2,692</b>	<b>1,276,000</b>
					<b>Average Lot Size</b>	<b>474 m<sup>2</sup></b>

### Contemporary High (SW Sydney Structure Plan)

	Frontage (m)	Lot depth	Lot Area	Frontage %	No of dwellings	Salable Land m <sup>2</sup>
Townhouses	6	30	180	11%	680	122,449
Detached @ 350m <sup>2</sup>	11	32	350	22%	742	259,740
Detached @ 450m <sup>2</sup>	14	32	450	28%	742	333,951
Detached @ 600m <sup>2</sup>	17	35	600	30%	655	392,884
Large Lot @ 1000m <sup>2</sup>	20	50	1000	9%	167	166,976
<b>Total</b>					<b>2,986</b>	<b>1,276,000</b>
					<b>Average Lot Size</b>	<b>427 m<sup>2</sup></b>

The Subdivision Design Plan currently reflects the traditional option, which will be further refined and enhanced by Hydro and through any rezoning or statutory planning process. Trends in the local housing market with builders, designers and costs for construction will guide the final dwelling yield thereafter.

## 2.5 Residential Subdivision Plan

The following Precinct Staging Plans show the residential subdivision, based on a Traditional yield scenario. As the areas are large, each residential precinct has been further broken into

sub-precincts. Figure 7 - Mix of Residential Land Use, below, is a breakdown of the various categories and percentage of land uses in these plans.

Figure 5 – Residential: Northern & Central Precincts Staging Plan

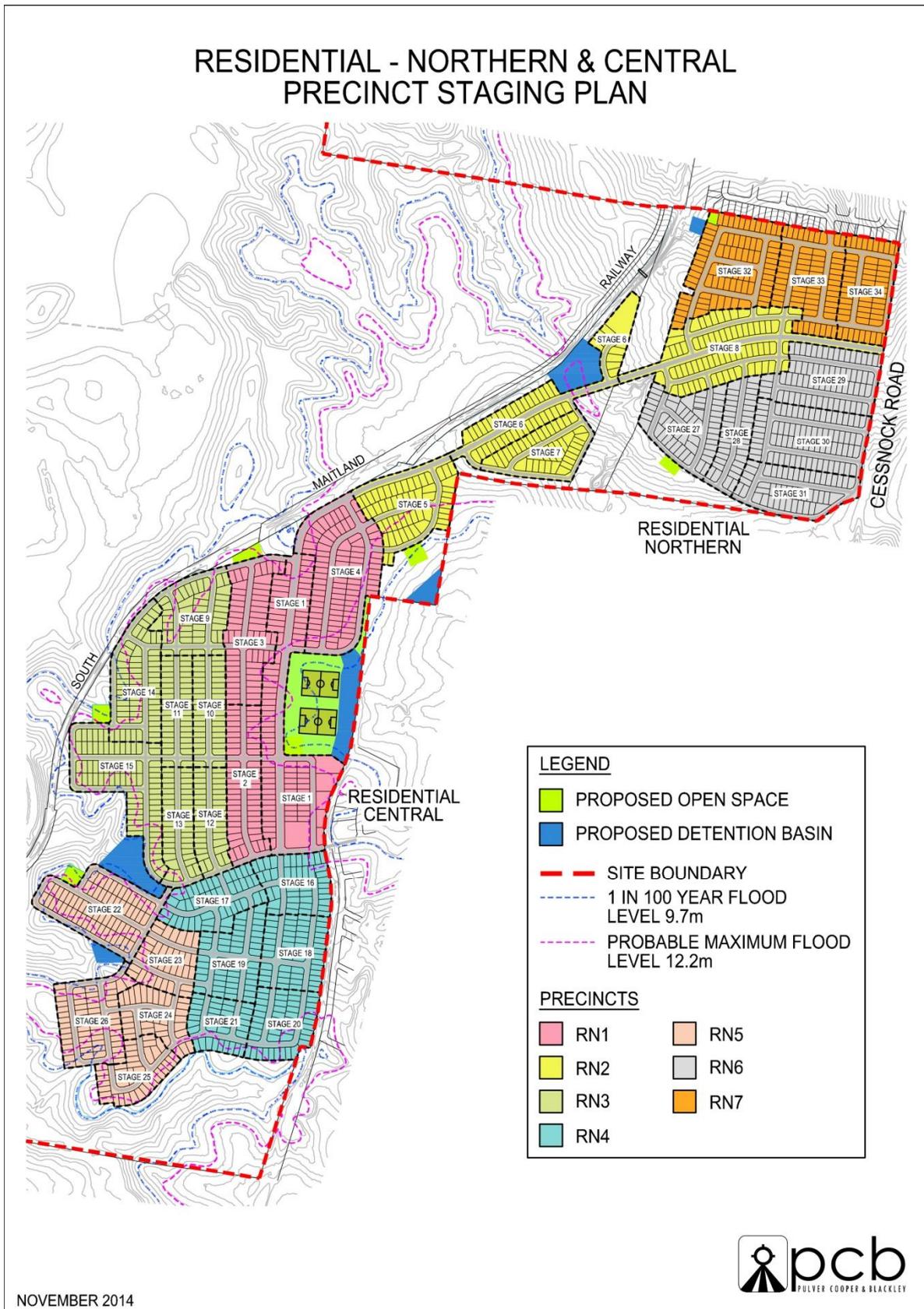


Figure 6 - Residential: Southern Precincts Staging Plan

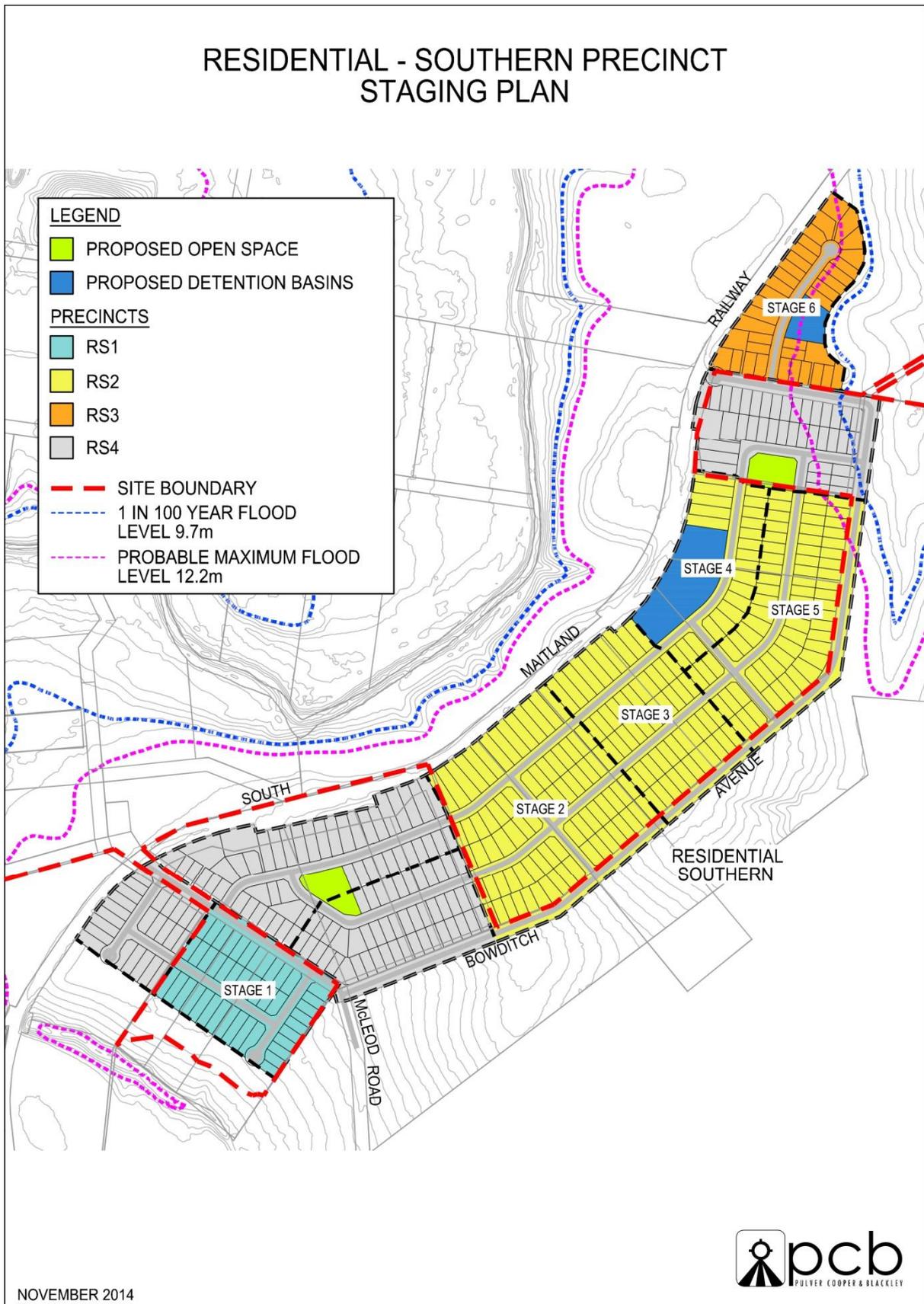
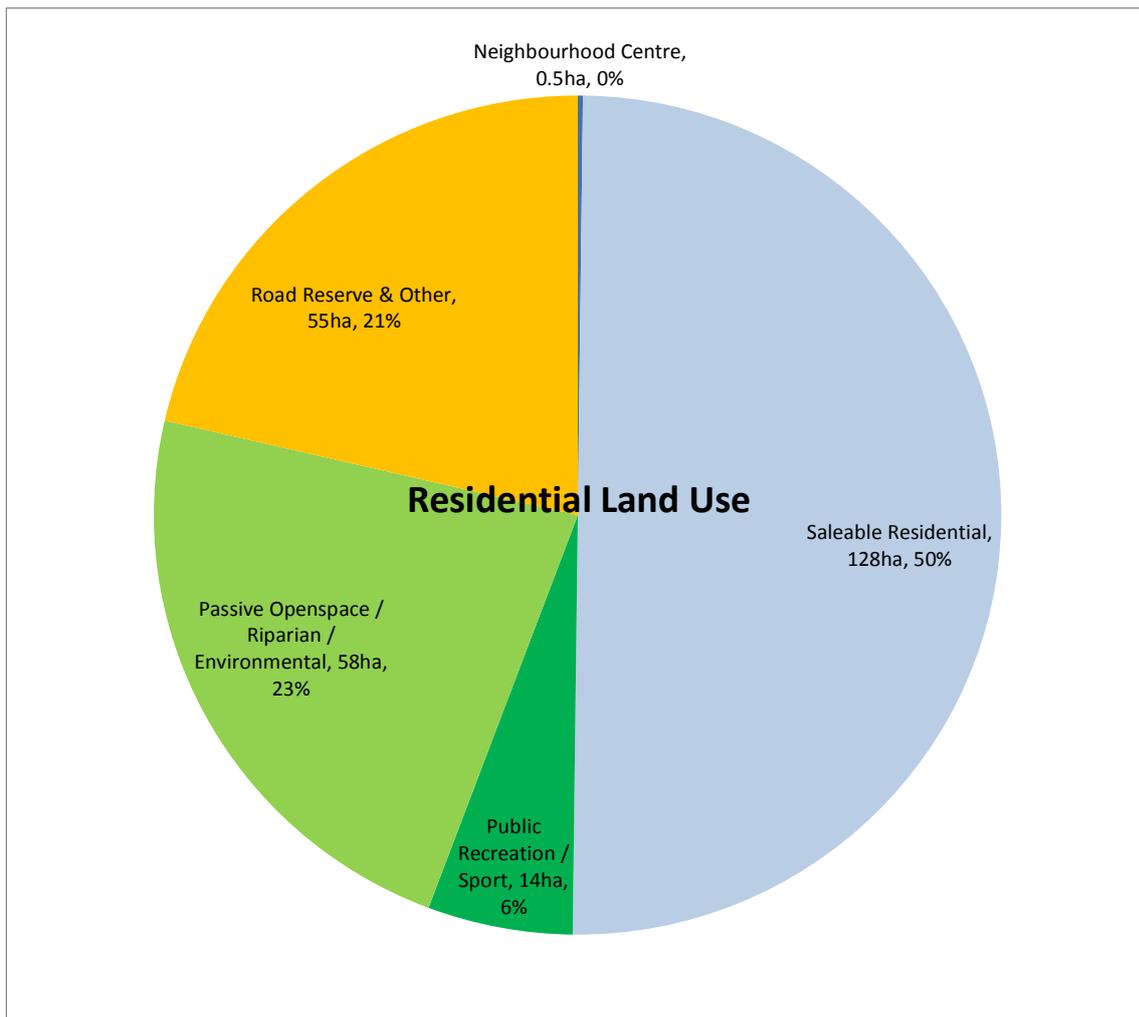


Figure 7 - Mix of Residential Land Use



Note that the residential plans and areas exclude the block to the west of the South Maitland Railway that has been included in the re-zoning plan. Also note that the plans show non-Hydro land holdings that should be developed in conjunction with the Hydro lands but the areas above are for Hydro portions only.

### 3 Industrial Precincts

#### 3.1 Project Scale

The industrial precincts are located in the south western portion of the property holdings, adjoining and divided by the recently constructed Hunter Expressway. The majority of this industrial land utilises the former Hydro Aluminium smelter footprint with additional areas of suitable land also being considered.

The area considered suitable for future industrial land uses equates to 198Ha of saleable industrial land.

A review of the Industrial Land Supply Analysis report previously prepared by Urbis for Hydro indicates there will be demand throughout the Lower Hunter as a result of population growth for the next 15 years totalling 239Ha of additional employment land. Urbis suggest this 239Ha will have a take up rate of between 8.4 to 10.5Ha per annum. This translates to a local demand within the Cessnock LGA of 38Ha or 1.9Ha per annum (15 years).

**Table 6 - Existing industrial land supply in Cessnock LGA**

Location	Total Area (ha)	Occupied (ha)	Vacant (ha)
<b>4(a) Industrial</b>			
Kurri Kurri	60	45	15
Cessnock (Tunnel Rd)	10	0	10
<b>TOTAL 4(a) land</b>	<b>70</b>	<b>45</b>	<b>25</b>
<b>4(b) Light Industrial</b>			
Cessnock	16.4	12	4.4
Kurri Kurri	23.3	18.6	4.7
Weston	10.5	7.1	3.4
Branxton	13.6	9.7	3.9
<b>TOTAL 4(b) land</b>	<b>63.8</b>	<b>47.4</b>	<b>16.4</b>
<b>4(h) HEZ</b>			
	<b>870</b>	<b>0</b>	<b>870</b>

Source: Cessnock City Council City Wide Settlement Strategy.

The Urbis report further states an indicative take up rate of 5 – 10Ha per annum for the proposed industrial precinct which represents achieving approximately 60% - 95% of the Lower Hunters industrial land sales. At these rates the Industrial Precincts take up would run for 20 to 40 years.

The potential industrial lands by scale is very substantial on a Regional and State level, being larger than the Lower Hunter’s most established industrial area at Cardiff. The Cardiff industrial area saleable land area totals 135Ha, took approximately 20 years to establish, and is supported by a large population base.

Figure 8 - Cardiff Industrial Estate – Approx 135Ha



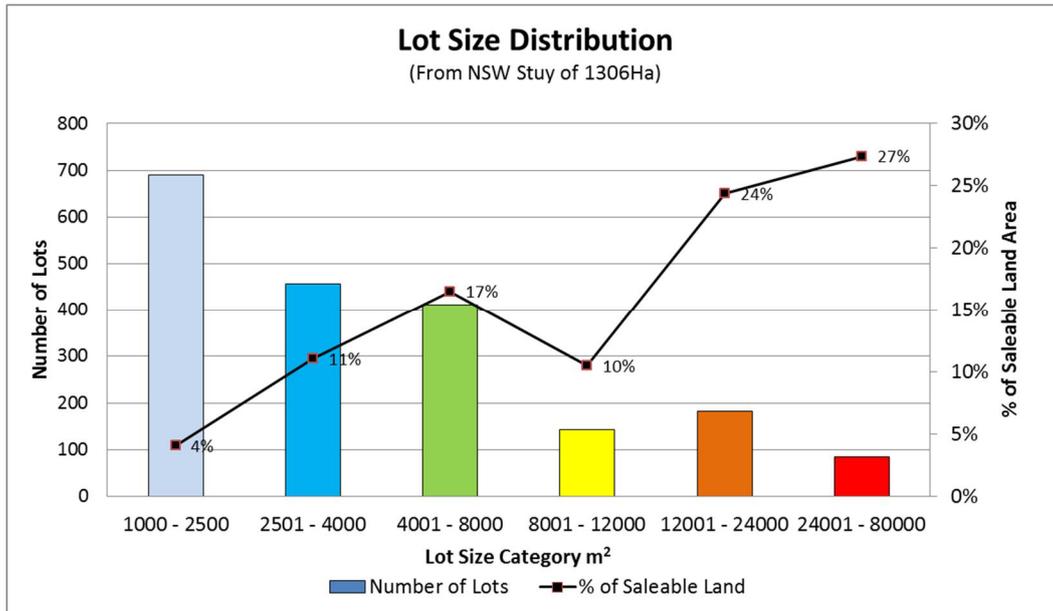
### 3.2 Product

In order to accurately produce a Subdivision Design for the industrial precincts it is essential to understand the lot size distribution across prominent existing industrial subdivisions to ensure a development meets the demands of end users. Successful subdivision also requires the ability to be flexible on a stage by stage basis to ensure delivery of the required product consistently throughout the life of the project.

A comprehensive understanding of this lot size distribution has been gained through the analysis of in excess of 2,000ha of industrial land and has formulated the following general guide to the mix required for a typical 100ha of saleable industrial land. The Categories noted in the following tables and charts are described in Table 7 - Industrial Facility Typologies, below

Figure 9 - Ideal Industrial Lot Size Distribution

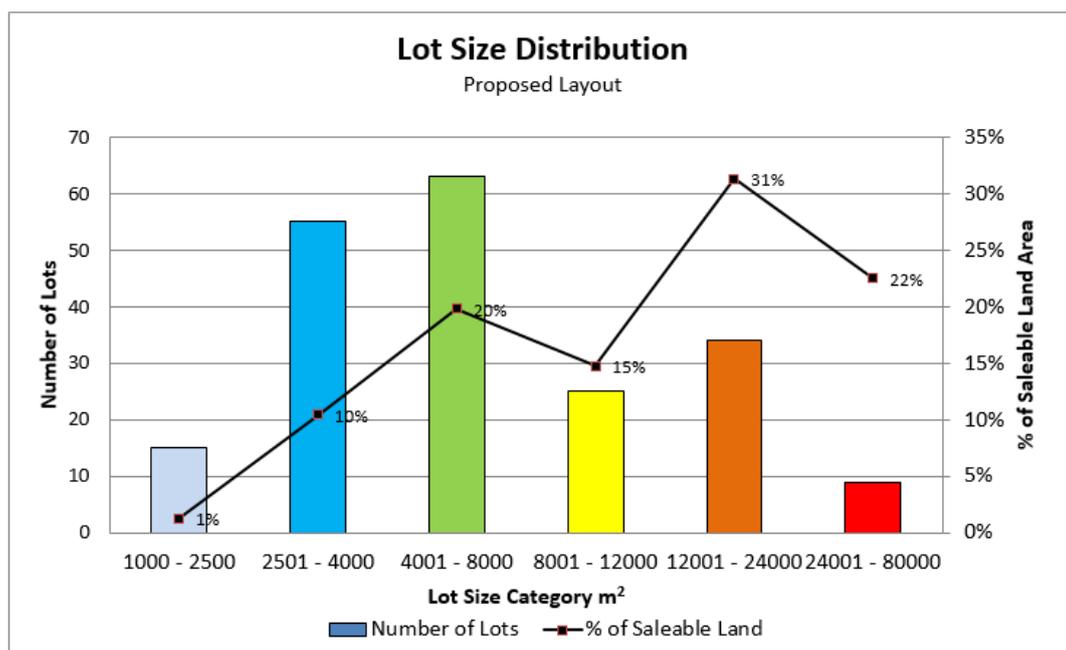
Category	Lot Size Range	Number of Lots	Percentage of Lots	Area (Ha)	% of Saleable Area
1	1000 - 2500	689	35%	133.1	4%
2	2501 - 4000	456	23%	144.5	11%
3	4001 - 8000	411	21%	215.8	17%
4	8001 - 12000	142	7%	136.9	10%
5	12001 - 24000	183	9%	318.5	24%
6	24001 - 80000	84	4%	357.7	27%
	<b>Total</b>	<b>1965</b>		<b>1306.6</b>	
			<b>Median</b>	<b>3,276 m2</b>	
			<b>Maximum</b>	<b>80,800 m2</b>	



The proposed industrial subdivision has been aligned with this ideal and would result in the following product mix. The area shown is for lots only and excludes roads.

Figure 10 – Proposed Industrial Product Mix

Category	Lot Size Range	Number of Lots	Percentage of Lots	Area (Ha)	% of Saleable Area
1	1000 - 2500	15	7%	2.1	1%
2	2501 - 4000	55	27%	18.1	10%
3	4001 - 8000	63	31%	34.4	20%
4	8001 - 12000	25	12%	25.6	15%
5	12001 - 24000	34	17%	54.4	31%
6	24001 - 80000	9	4%	39.1	22%
<b>Total</b>		<b>201</b>		<b>173.7</b>	
		<b>Median</b>		<b>5,127 m<sup>2</sup></b>	
		<b>Maximum</b>		<b>117,236 m<sup>2</sup></b>	



In preparing the industrial subdivision plan PCB has applied the above criteria to ensure the road network is reflective of the number of lots required to meet the market demand and is also reflective of the required civil works and costs associated with creating the proposed lots.

**Table 7 - Industrial Facility Typologies**

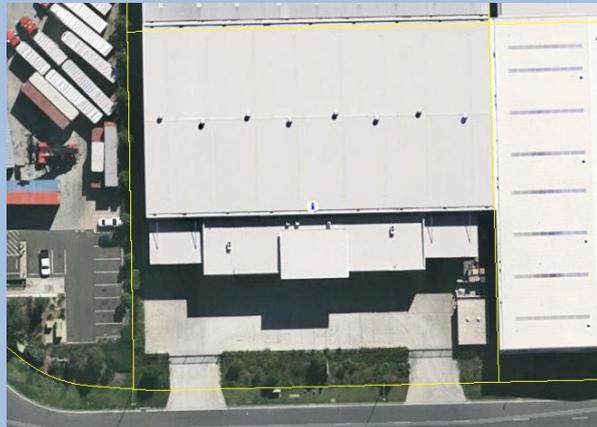
Product Type	Typical Facility	Typical Lot size
<p>Category 1 1,000 – 2,500m<sup>2</sup></p>		<p>40m wide x 40m deep</p>
<p>Category 2 2,501 – 4,000m<sup>2</sup></p>		<p>50m wide x 70m deep</p>



Category 3  
4,001 – 8,000m<sup>2</sup>



75m wide x  
75m deep



Category 4  
8,001 – 12,000m<sup>2</sup>



80m wide x  
100m deep

		
<p>Category 5 12,001 – 24,000m<sup>2</sup></p>	 	<p>150m wide x 150m deep</p>
<p>Category 6 24,001m<sup>2</sup> plus</p>		<p>250m wide x 150m deep</p>



### 3.3 Industrial Yield

The yield from the industrial precincts has been determined following application of constraints and opportunity mapping to the site. From this a road network has been established, where possible utilising existing road reserves and easements. Once a general road network was established the lot size distribution (product) was then applied, and the road network adjusted to optimise and accurately represent the ultimate subdivision plan as presented in Appendices.

The industrial precinct has the potential to yield 198Ha of saleable industrial land equating to about 83% of the forecast demand for the entire Lower Hunter region over the next 15 years. However, due to servicing requirements, costings, population base, general economic conditions and the alternative industrial areas, full development of land is likely to take much longer than 15 years.

**Table 8 - Industrial Precinct Areas**

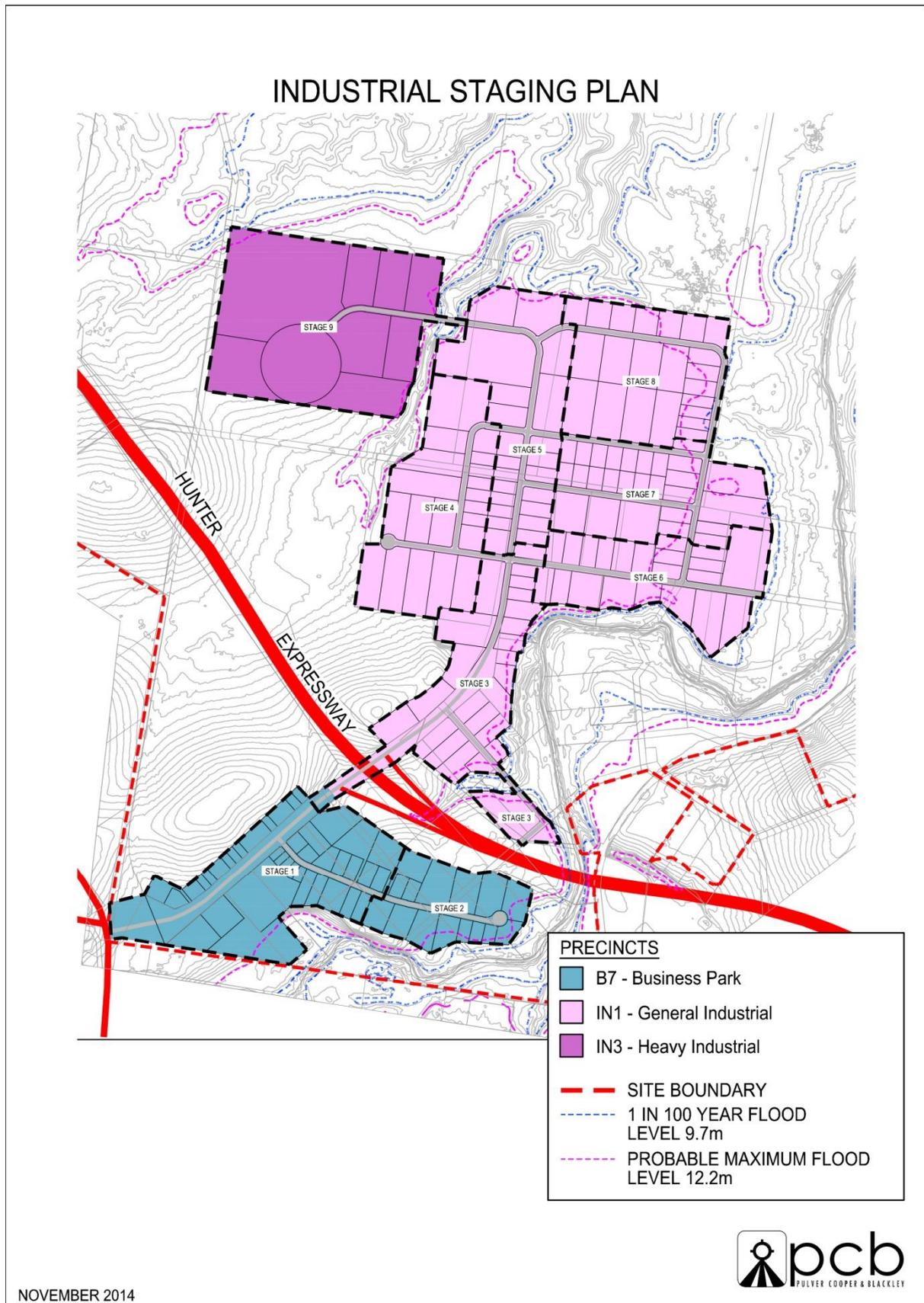
Precinct	Developable Land (Ha)	% of Industrial Precinct
Business Park	<b>38.2</b>	<b>19%</b>
General Industry	<b>125.5</b>	<b>64%</b>
Heavy Industry	<b>34.4</b>	<b>17%</b>
<b>Total</b>	<b>198.1</b>	<b>100%</b>

### 3.4 Industrial Subdivision Plan

The following Precinct Staging Plans show the industrial subdivision zoning, lot layout and potential staging.

An indicative bulk earthworks assessment was conducted and confirmed feasibility of the subdivision layout from an earthworks perspective. It is not known whether developers will or will not bench. The results of Hydro’s extensive clean-up exercise on the landform is also not known. Therefore bulk earthworks costings have not been included.

Figure 11 - Industrial Precincts Staging Plan



## **4 Attachments**

The following plans and report are attached as separate PDF documents.

### **4.1 Updated Masterplan**

### **4.2 Updated Masterplan with Aerial**

### **4.3 Rezoning Map**

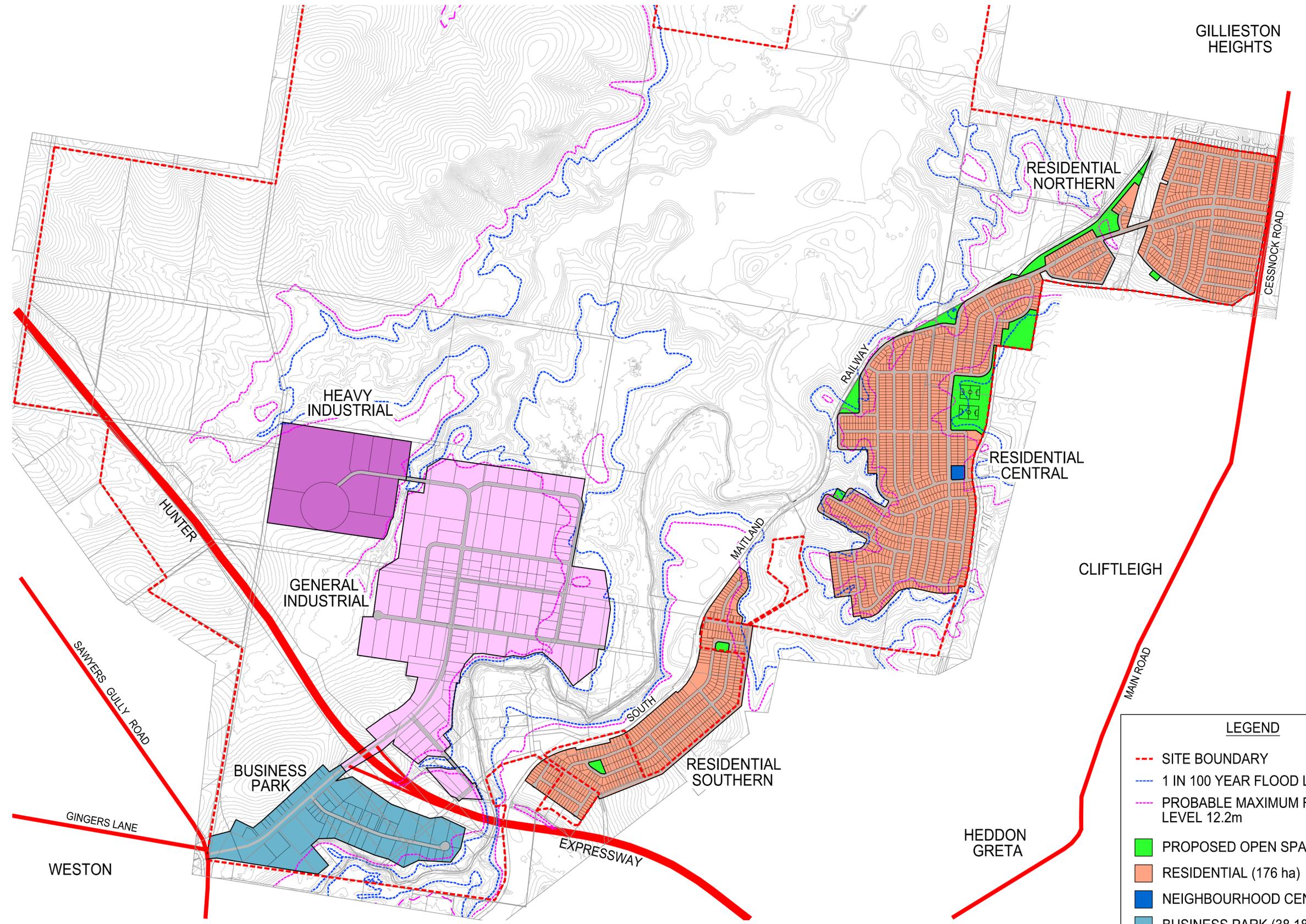
### **4.4 Residential North Lot Layout and Staging Plan**

### **4.5 Residential South Lot Layout and Staging Plan**

### **4.6 Industrial Lot Layout and Staging Plan**

- End of Report --

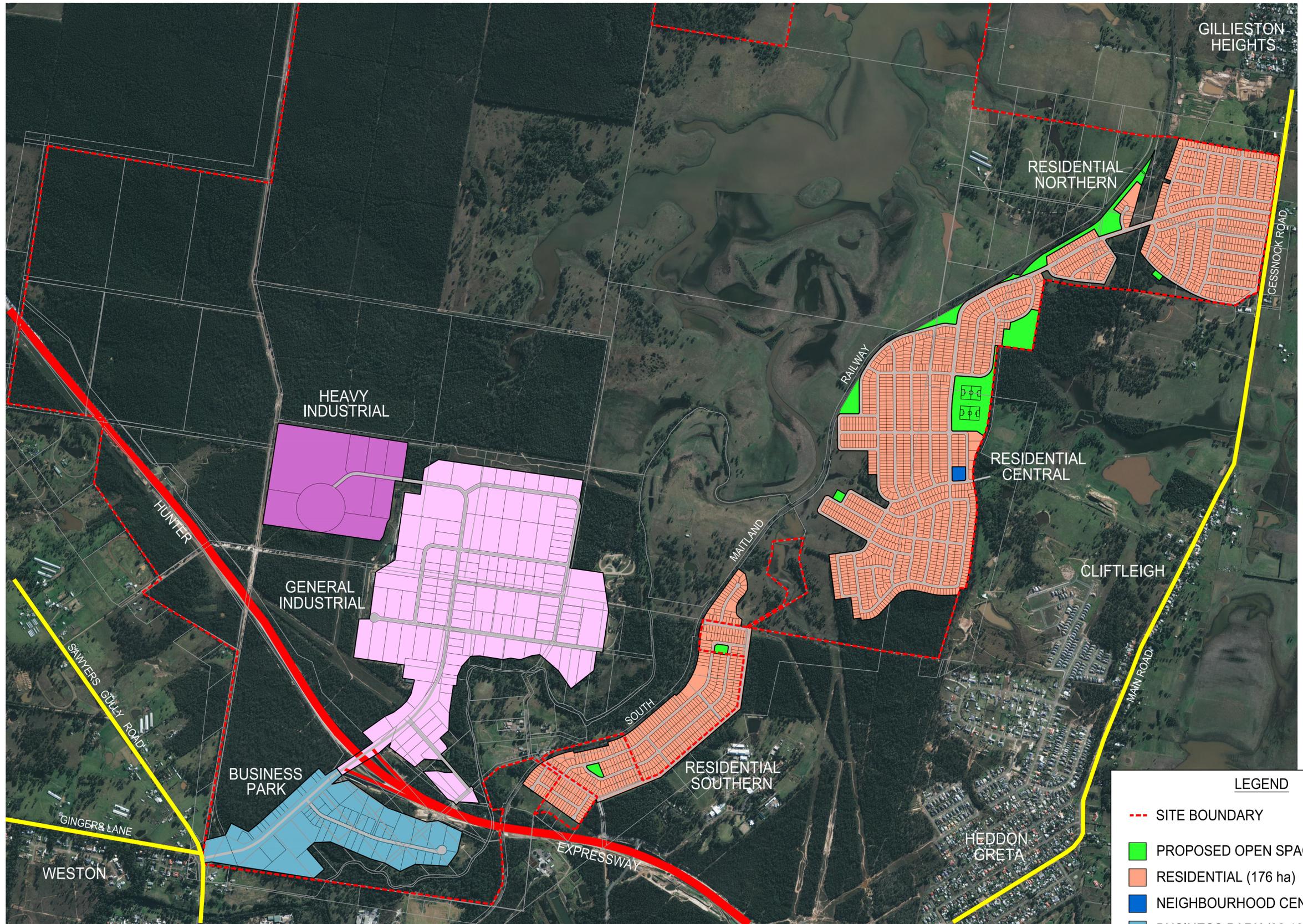
M



**LEGEND**

- SITE BOUNDARY
- 1 IN 100 YEAR FLOOD LEVEL 9.7m
- PROBABLE MAXIMUM FLOOD LEVEL 12.2m
- PROPOSED OPEN SPACES (14.17ha)
- RESIDENTIAL (176 ha)
- NEIGHBOURHOOD CENTRE (5046m<sup>2</sup>)
- BUSINESS PARK (38.18 ha)
- GENERAL INDUSTRIAL (125.5 ha)
- HEAVY INDUSTRIAL (34.38 ha)

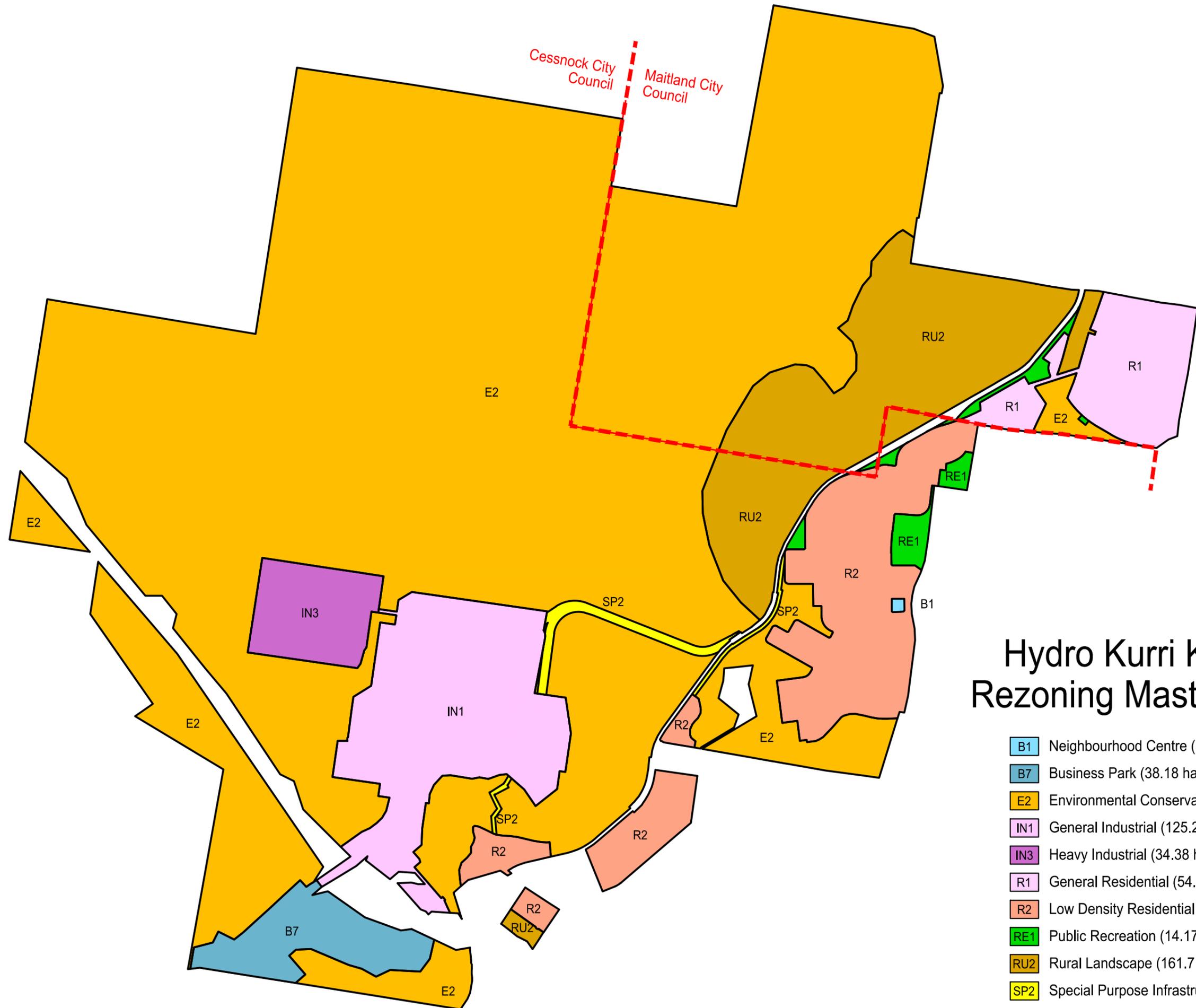
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**LEGEND**

- SITE BOUNDARY
- PROPOSED OPEN SPACES (14.17ha)
- RESIDENTIAL (176 ha)
- NEIGHBOURHOOD CENTRE (5046m<sup>2</sup>)
- BUSINESS PARK (38.18 ha)
- GENERAL INDUSTRIAL (125.5 ha)
- HEAVY INDUSTRIAL (34.38 ha)

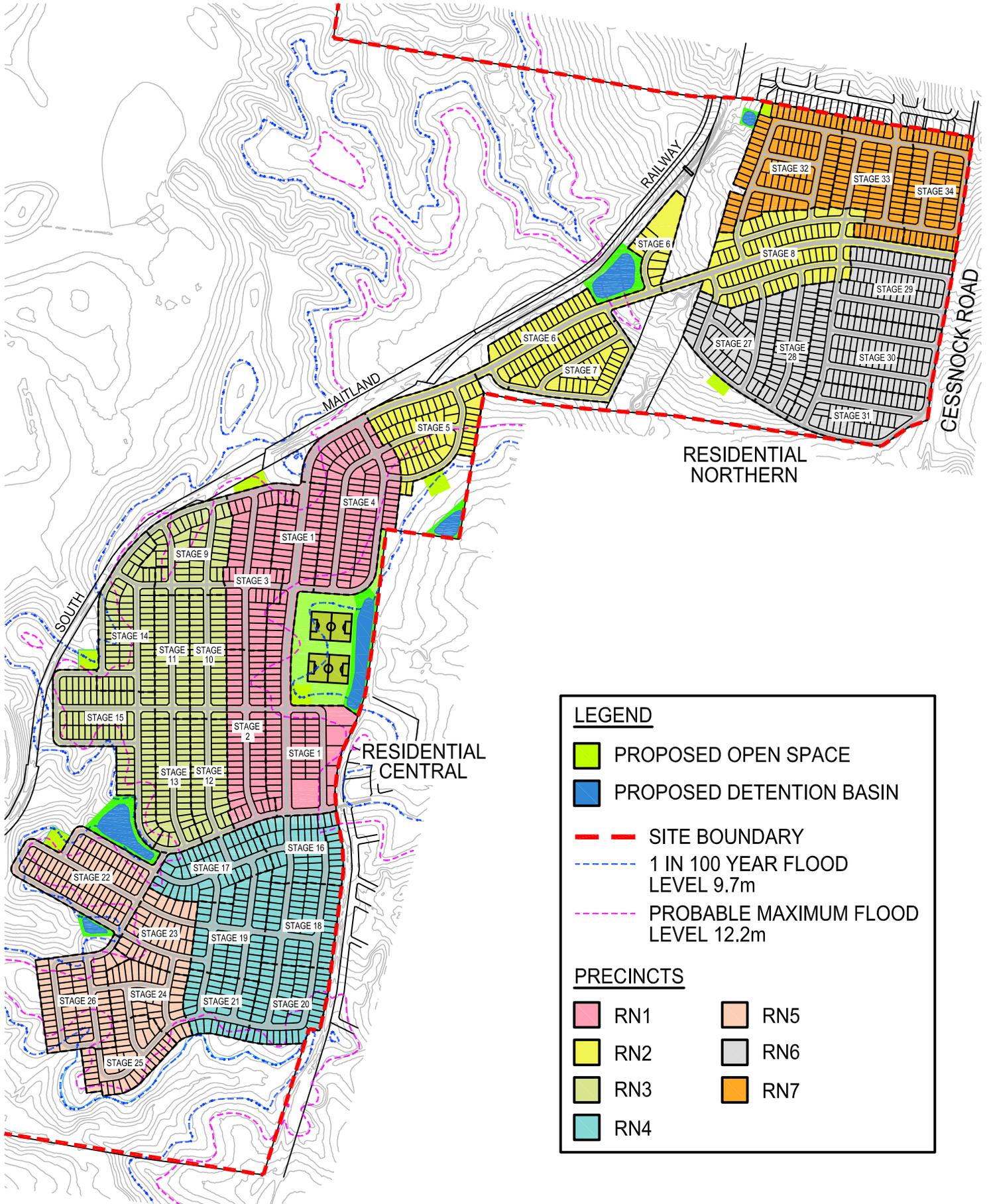




# Hydro Kurri Kurri Rezoning Master Plan

- B1 Neighbourhood Centre (5046m<sup>2</sup>)
- B7 Business Park (38.18 ha)
- E2 Environmental Conservation (1337 ha)
- IN1 General Industrial (125.2 ha)
- IN3 Heavy Industrial (34.38 ha)
- R1 General Residential (54.21 ha)
- R2 Low Density Residential (128.7 ha)
- RE1 Public Recreation (14.17 ha)
- RU2 Rural Landscape (161.7 ha)
- SP2 Special Purpose Infrastructure (10.6 ha)

# RESIDENTIAL - NORTHERN & CENTRAL PRECINCT STAGING PLAN



**LEGEND**

- PROPOSED OPEN SPACE
- PROPOSED DETENTION BASIN
- SITE BOUNDARY
- 1 IN 100 YEAR FLOOD LEVEL 9.7m
- PROBABLE MAXIMUM FLOOD LEVEL 12.2m

**PRECINCTS**

<span style="display: inline-block; width: 15px; height: 15px; background-color: #FFB6C1; border: 1px solid black; margin-right: 5px;"></span> RN1	<span style="display: inline-block; width: 15px; height: 15px; background-color: #FFDAB9; border: 1px solid black; margin-right: 5px;"></span> RN5
<span style="display: inline-block; width: 15px; height: 15px; background-color: #FFFF00; border: 1px solid black; margin-right: 5px;"></span> RN2	<span style="display: inline-block; width: 15px; height: 15px; background-color: #D3D3D3; border: 1px solid black; margin-right: 5px;"></span> RN6
<span style="display: inline-block; width: 15px; height: 15px; background-color: #9ACD32; border: 1px solid black; margin-right: 5px;"></span> RN3	<span style="display: inline-block; width: 15px; height: 15px; background-color: #FF8C00; border: 1px solid black; margin-right: 5px;"></span> RN7
<span style="display: inline-block; width: 15px; height: 15px; background-color: #4682B4; border: 1px solid black; margin-right: 5px;"></span> RN4	

# RESIDENTIAL - SOUTHERN PRECINCT STAGING PLAN

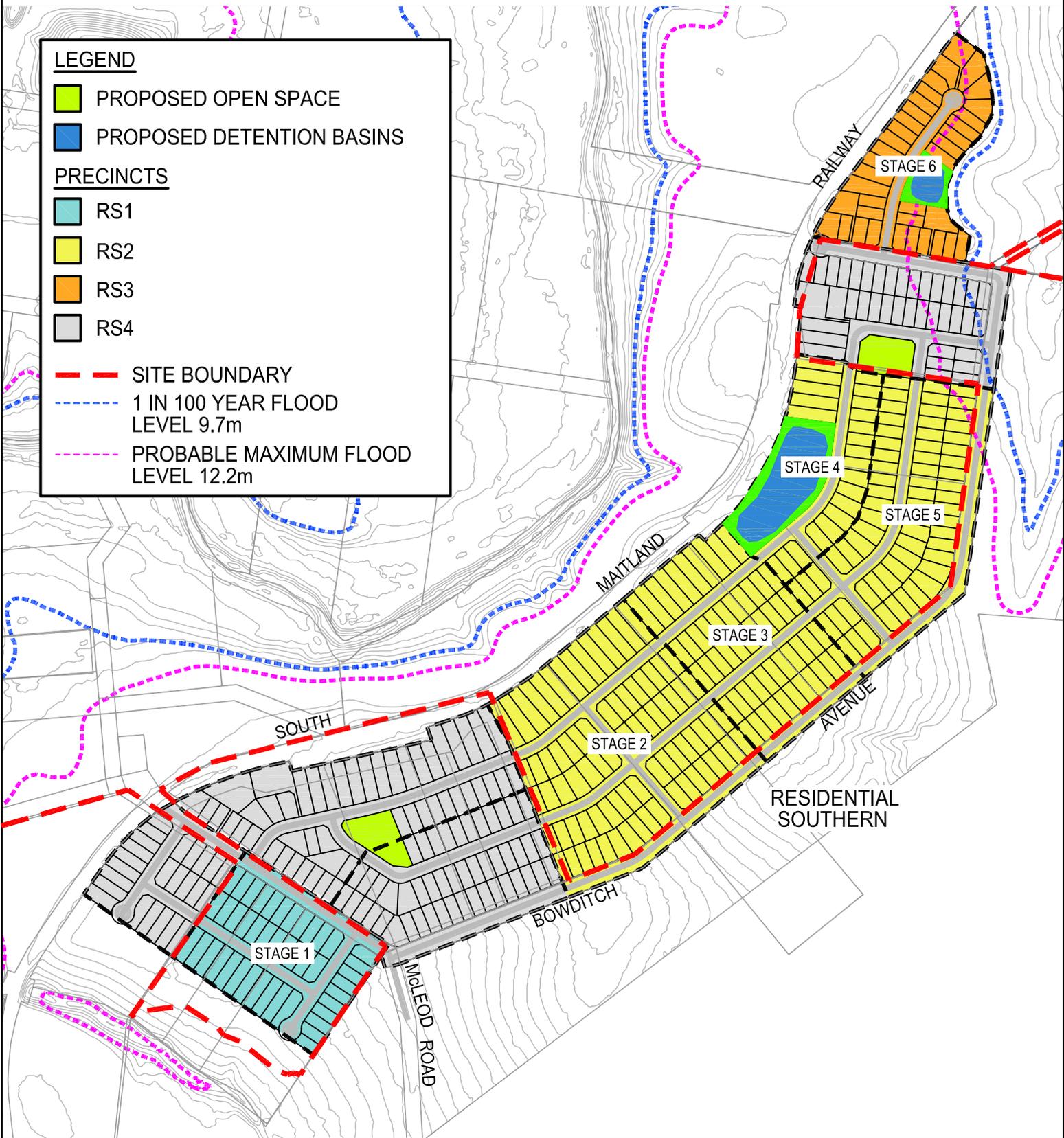
## LEGEND

- PROPOSED OPEN SPACE
- PROPOSED DETENTION BASINS

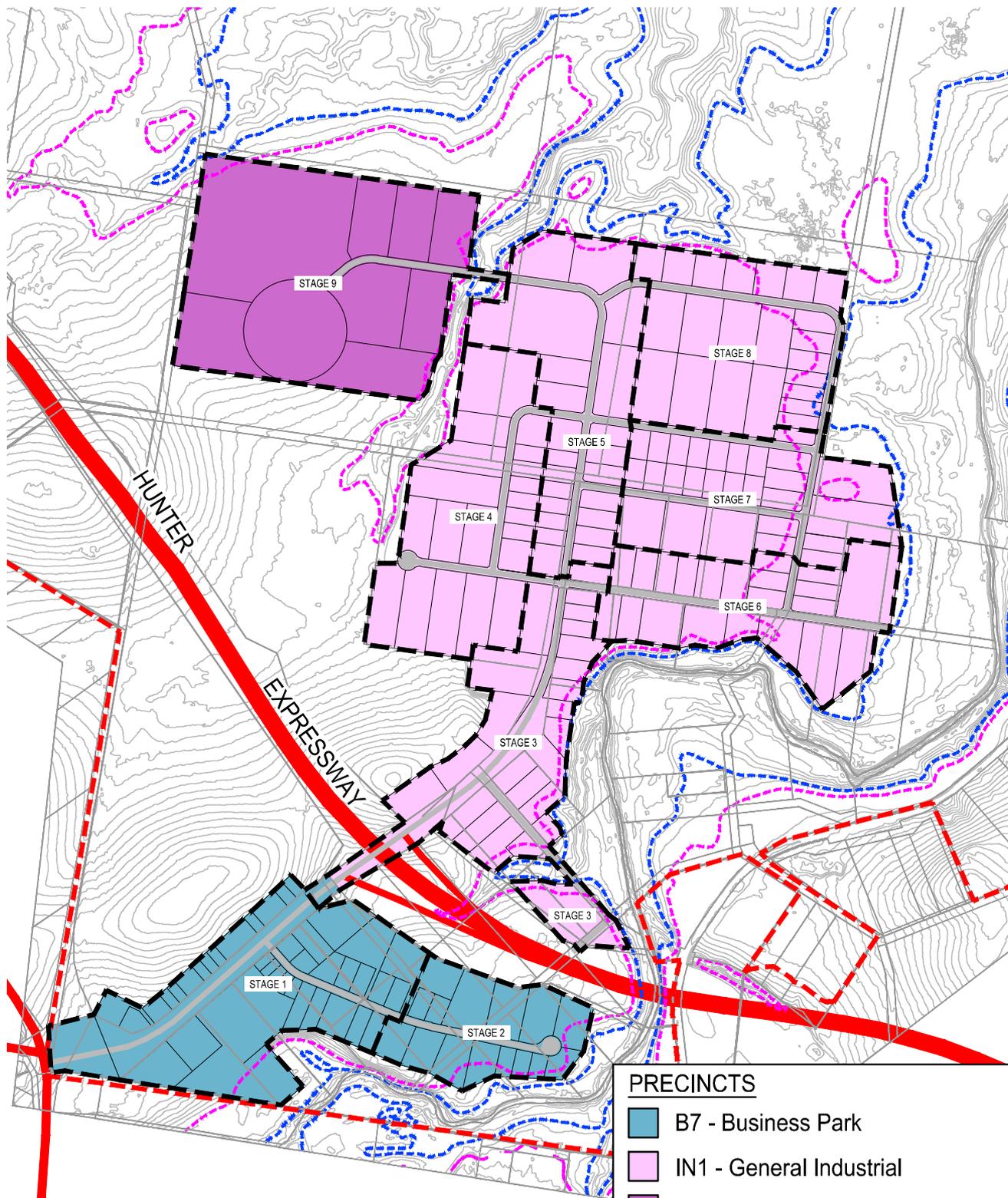
## PRECINCTS

- RS1
- RS2
- RS3
- RS4

- SITE BOUNDARY
- 1 IN 100 YEAR FLOOD LEVEL 9.7m
- PROBABLE MAXIMUM FLOOD LEVEL 12.2m



# INDUSTRIAL STAGING PLAN



**PRECINCTS**

- B7 - Business Park
- IN1 - General Industrial
- IN3 - Heavy Industrial

**— — — — — SITE BOUNDARY**

**- - - - - 1 IN 100 YEAR FLOOD LEVEL 9.7m**

**- - - - - PROBABLE MAXIMUM FLOOD LEVEL 12.2m**