



# Narromine Shire Council Agricultural Land Use Strategy Intensive Plant Agriculture

February 2013





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# 1. Introduction

## 1.1 Objectives

GHD has been commissioned by the NSW Department of Planning and Infrastructure (DoPI) and Narromine Shire Council (NSC) to undertake a Rural Lands Strategy. This strategy was funded under Round 7 of the Department's Planning Reform Fund Program.

The main output of this Strategy is in the form of two reports, one focusing on the provision of land for intensive plant agriculture and the second focusing on the provision of land for rural residential uses around Narromine, Trangie and Tomingley.

This report, the **Agricultural Lands Strategy – Intensive Plant Agriculture** forms the first of the two reports. The key objectives of this report are to:

- ▶ Identify and protect existing land utilised for intensive plant agriculture; and
- ▶ Identify any additional land appropriate for intensive plant agriculture.

## 1.2 Definition of Intensive Plant Agriculture

The Narromine Local Environment Plan 2011 was released in December 2011. Intensive plant agriculture under this LEP means any of the following:

- a) the cultivation of irrigated crops for commercial purposes (other than irrigated pasture or fodder crops),
- b) horticulture,
- c) turf farming,
- d) viticulture.

At the project inception meeting it was agreed that focus of the Rural Lands Strategy would be on intensive irrigated agriculture (eg citrus, olives, and vegetables) and not on areas planted to cotton.

In addition, this strategy considers predominantly soil-based plant production as opposed to 'protected' or greenhouse production.

## 1.3 Location

Narromine Local Government Area (LGA) is located in the Central West of NSW (Figure 1) and has a population of approximately 6,800 and comprises the three urban centres of Narromine, Trangie and Tomingley. The LGA covers an area of 5,224 km<sup>2</sup> and is located downstream of Dubbo on the Macquarie River. The region is well serviced by transport links with Narromine and Trangie located on the Mitchell Highway and Tomingley located on the Newell Highway. Narromine is located 40km by road from Dubbo and 442km from Sydney. Narromine and the adjoining LGA of Warren are the most irrigated dependant areas of the Macquarie-Castlereagh region. Many farms in the region have been developed for broadacre irrigation with cotton being the predominant enterprise. The Narromine shire is also unique in that it has a number of citrus and nursery plant enterprises which are reliant on irrigation water and contribute greatly to the social and economic fabric of the region.

## 1.4 Methodology

GHD completed a literature review of existing intensive plant agriculture in the LGA including the scale and value of production. In addition, GHD sourced a range of data from public databases on aspects that influence the viability of intensive plant agriculture in the LGA, particularly those relating to irrigation water availability and financial factors influencing viability.

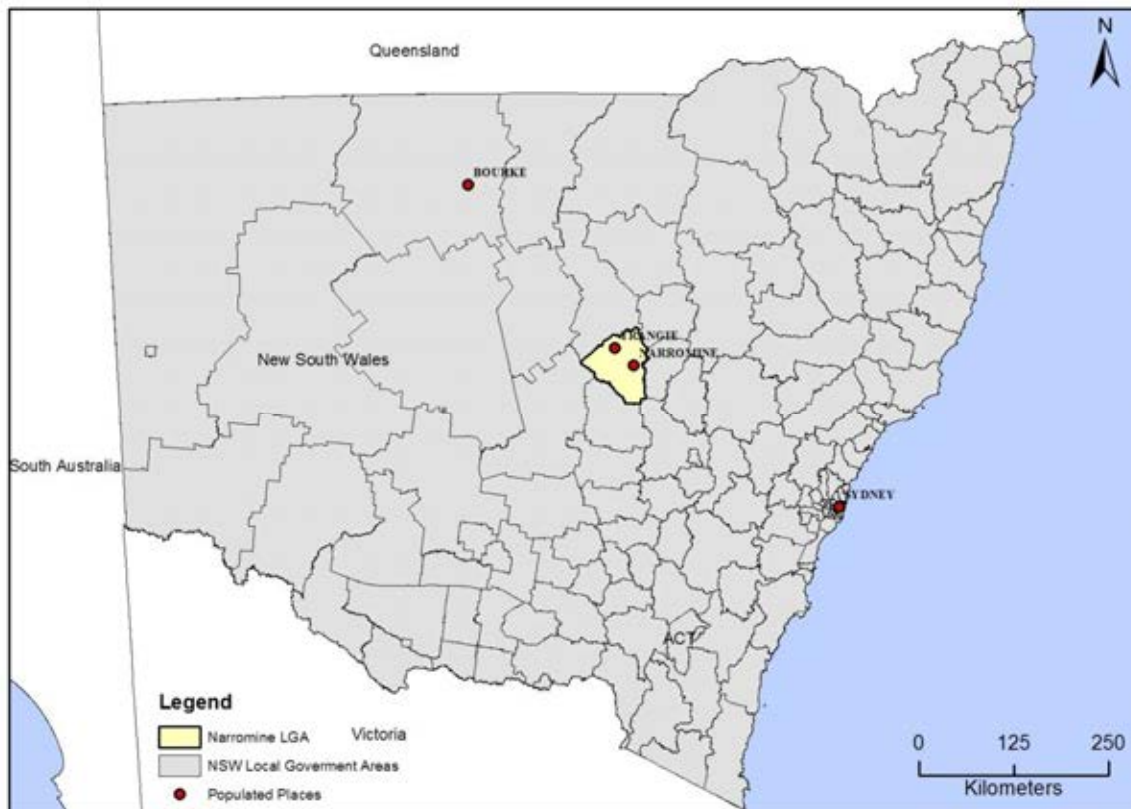
NSC provided GHD with required GIS information to assist with general mapping and also for developing the constraints analysis for the recommended location for the intensive plant agriculture area.

NSW Department of Primary Industries (DPI) and NSW Office of Environment and Heritage provided GIS information for soils and other natural resource conditions.

GHD staff completed an inspection of the relevant areas of the shire on 15 March 2012 to gain an understanding of the resource conditions and constraints for intensive plant agriculture. On the same day GHD facilitated a workshop at Narromine Shire Council Chambers to discuss the methodology to consider the intensive plant agricultural industry of the shire and to develop criteria to be used in recommending minimum lot sizes.

NSC had invited selected farmers and agency staff to attend the workshop but unfortunately no farmers were able to attend on the day. GHD recommends that a draft of this report be provided in-confidence to the invited farmers seeking their feedback prior to the document being made publicly available.

**Figure 1 Narromine LGA**



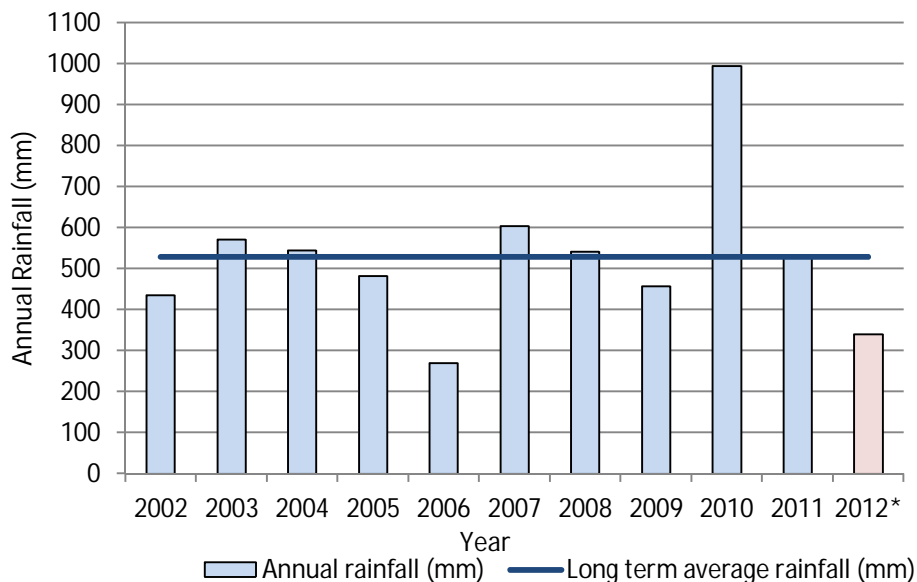
## 2. Agricultural Resource Base

Narromine Shire has a range of natural resource attributes that influence the type and extent of agricultural production. These are discussed below.

### 2.1 Climate

The long term average annual rainfall for Narromine is 527 mm but this is characterised by significant variability (see Figure 2). For example, in 2010 annual rainfall was close to 1,000 mm while in 2006 only about 250 mm was recorded.

**Figure 2 Ten year annual rainfall against the long term average**



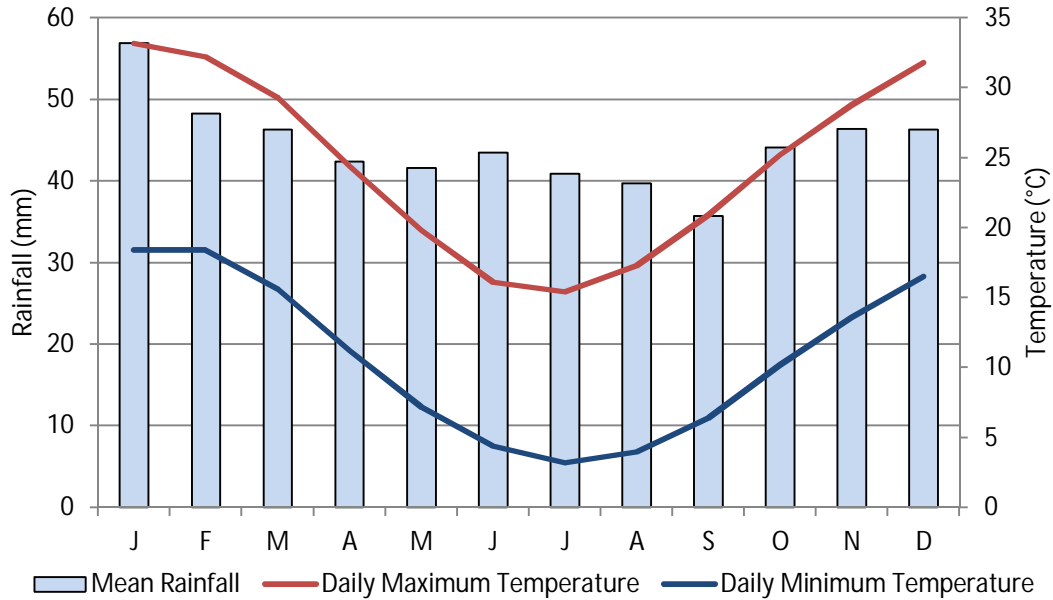
Source: Bureau of Meteorology (2012) Rainfall recorded at Narromine (Alagalah St) – Station No. 051037 (\*2012 data is recorded to end of June)

Figure 3 shows that rainfall is relatively evenly distributed throughout the year with a slight predominance during the summer. One of the major factors influencing plant growth other than rainfall is temperature. Hot summer temperatures result in high evapo-transpiration rates which constrain summer crop production. In general summer crops and permanent planted crops (eg fruit trees) cannot be successfully grown unless irrigation water is available. Surface and groundwater irrigation resources are discussed in section 3.

The climate is generally suited to rainfed winter crop production (cereals and oilseeds) as well as pasture production for grazing livestock although the variability in rainfall introduces significant production risks which may be alleviated by irrigation (depending on water allocations available).



**Figure 3 Narromine climatic conditions**



Source: Bureau of Meteorology (2012) Rainfall recorded at Narromine (Alagalah St) – Station No. 051037

Temperature recorded at Trangie Research Station AWS – Station No. 051049

## 2.2 Land Capability

Land in NSW is commonly classified according to the capability of the land to remain stable under particular land uses. The 8-class classification is shown in Table 1.

**Table 1 Land Capability**

Broad Category	Class	Description
Land capable of being regularly cultivated (Slope < 10%)	Class 1	No special soil conservation works or practices necessary.
	Class 2	Soil conservation practices such as strip cropping, conservation tillage and adequate crop rotation.
	Class 3	Structural soil conservation works such as diversion banks, graded banks and waterways, together with soil conservation practices as in Class 2.
Land not capable of being regularly cultivated but suitable for grazing with occasional cultivation (Slope 10% - 25%)	Class 4	Soil conservation practices such as pasture improvement, stock control, application of fertiliser and minimal cultivation for the establishment or re-establishment of permanent pastures.
	Class 5	Structural soil conservation works such as absorption banks, diversion banks and contour ripping, together with the practices as in Class 4.

Broad Category	Class	Description
Land not capable of being cultivated but suitable for grazing  (Slope > 25%)	Class 6	Soil conservation practices including limitation of stock, broadcasting of seed and fertiliser, prevention of fire and destruction of vermin. This class may require some structural works.
	Class 7 Class 8	Land best protected by green timber. Cliffs, lakes or swamps and other land incapable of sustaining agricultural or pastoral production.

Source: Cunningham et al 1988.

It should be noted that the land capability class may not necessarily be associated with land suitability, especially for agricultural land uses that are less soil dependent (eg intensive animal industries such as chicken raising, greenhouses) or for permanent tree crops (eg horticulture and forestry).

Figure 4 is a map of Land Capability in the rural areas of the Shire (RU1 Zone). Table 2 shows that the majority of the land is Class 2 (59%) while an additional 47,000 ha (9%) of the rural area is classed as Flood Irrigation with these areas being mainly located adjacent to the Macquarie River and between the townships of Narromine and Trangie. Less than 7% of the LGA has land that is Class 5 and above with these lands predominantly being located in the south-east of the LGA where there are extensive areas of remnant vegetation.

**Table 2 Land capability within RU1 Primary Production Zone**

Land Capability	Area (ha)	%
1	42,170	8.3%
2	300,550	59.0%
3	21,974	4.3%
4	63,639	12.5%
5	16,267	3.2%
6	12,631	2.5%
7	2,333	0.5%
8	1,645	0.3%
Flood Irrigation	47,049	9.2%
State Forest	706	0.1%
Urban Area	132	0.0%
	<b>509,095</b>	<b>100.0%</b>

In general it is recommended that intensive plant agriculture is located in areas with Land Capability classifications 1, 2 and Flood Irrigation.

## 2.3 Soil fertility

NSW DoPI is in the process of delivering the Strategic Rural Land Use Policy, which will be applied state-wide in areas with land of high agricultural value and increasing activity in coal and coal seam gas. Currently DoPI is in the process of preparing a regional plan for the Central West and has provided NSC with a draft GIS layer of the soil fertility for the Narromine LGA. Table 3 provides an estimation of the inherent soil fertility for the Narromine LGA according to a five-class system based on links between fertility classes and particular soil types (OEH 2012). A map of the soil fertility classes for Narromine LGA is shown in Figure 5. The majority of soil within the Narromine LGA is of moderate fertility (68%) while approximately 4% is classed as either moderately high or high fertility.

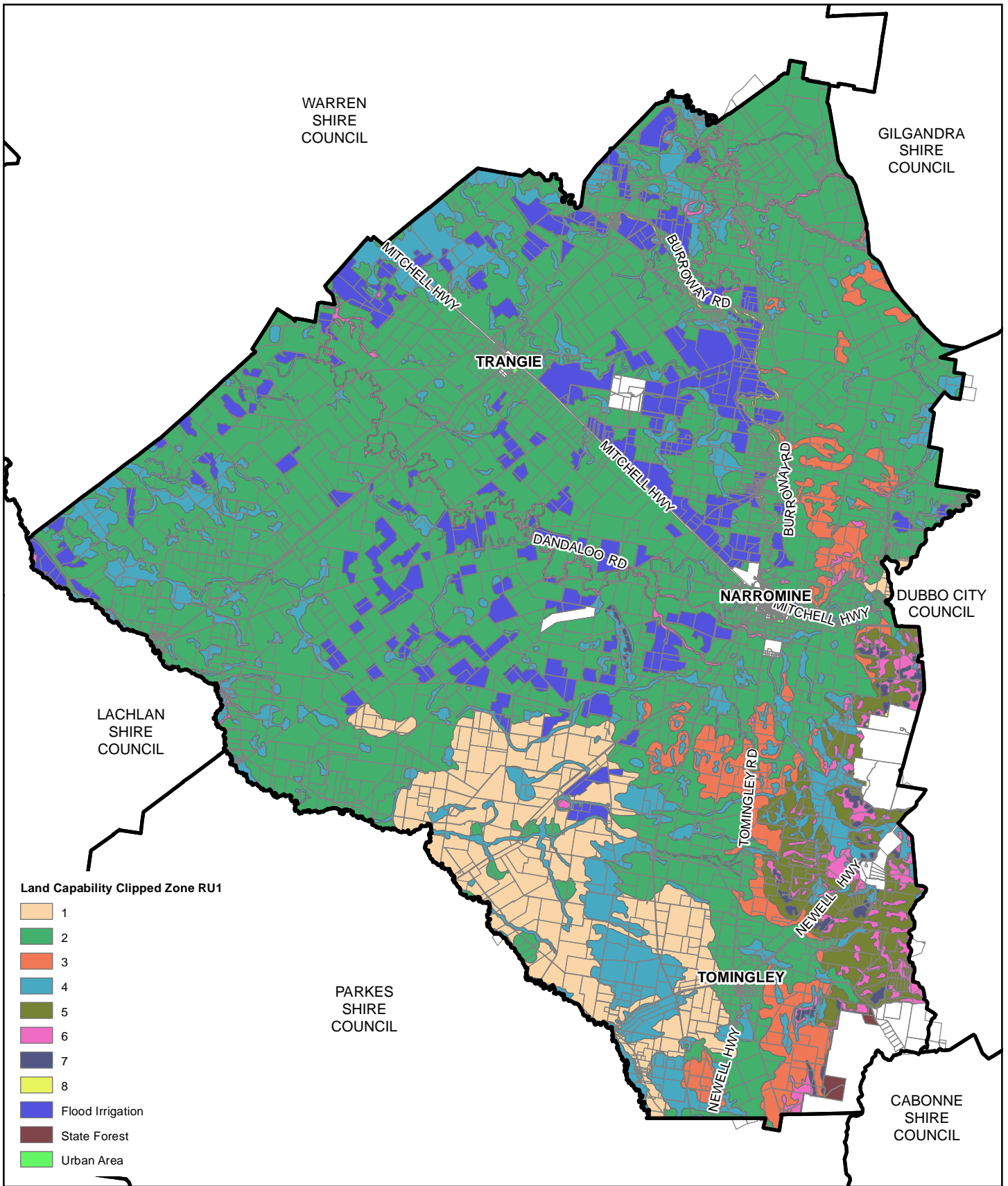
**Table 3 Soil fertility classes for Narromine LGA**

Soil Fertility Class	Area (ha)	%
Low	14,965	2.8%
Moderately Low	131,145	24.9%
Moderate	356,257	67.7%
Moderately High	14,340	2.7%
High	7,719	1.5%
Not Assessed	1,430	0.3%
<b>Total</b>	<b>525,856</b>	<b>100.0%</b>

## 2.4 Environmentally sensitive land

Figure 6 shows the environmentally sensitive land within the Narromine LGA, with such land subject to one or more of the following: steep slopes, shallow soils, salinity, temporary or permanent inundation, high proportion of rock outcrop, high soil dispersibility and erosion potential or the presence of karst systems. Environmentally sensitive land is predominately located along the eastern boundary of the shire.

It is recommended that these environmentally sensitive areas be avoided for intensive plant agriculture because of the constraints to production.

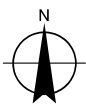
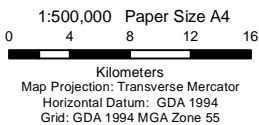


**Land Capability Clipped Zone RU1**

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- Flood Irrigation
- State Forest
- Urban Area

**LEGEND**

- Cadastre
- Local Government Area

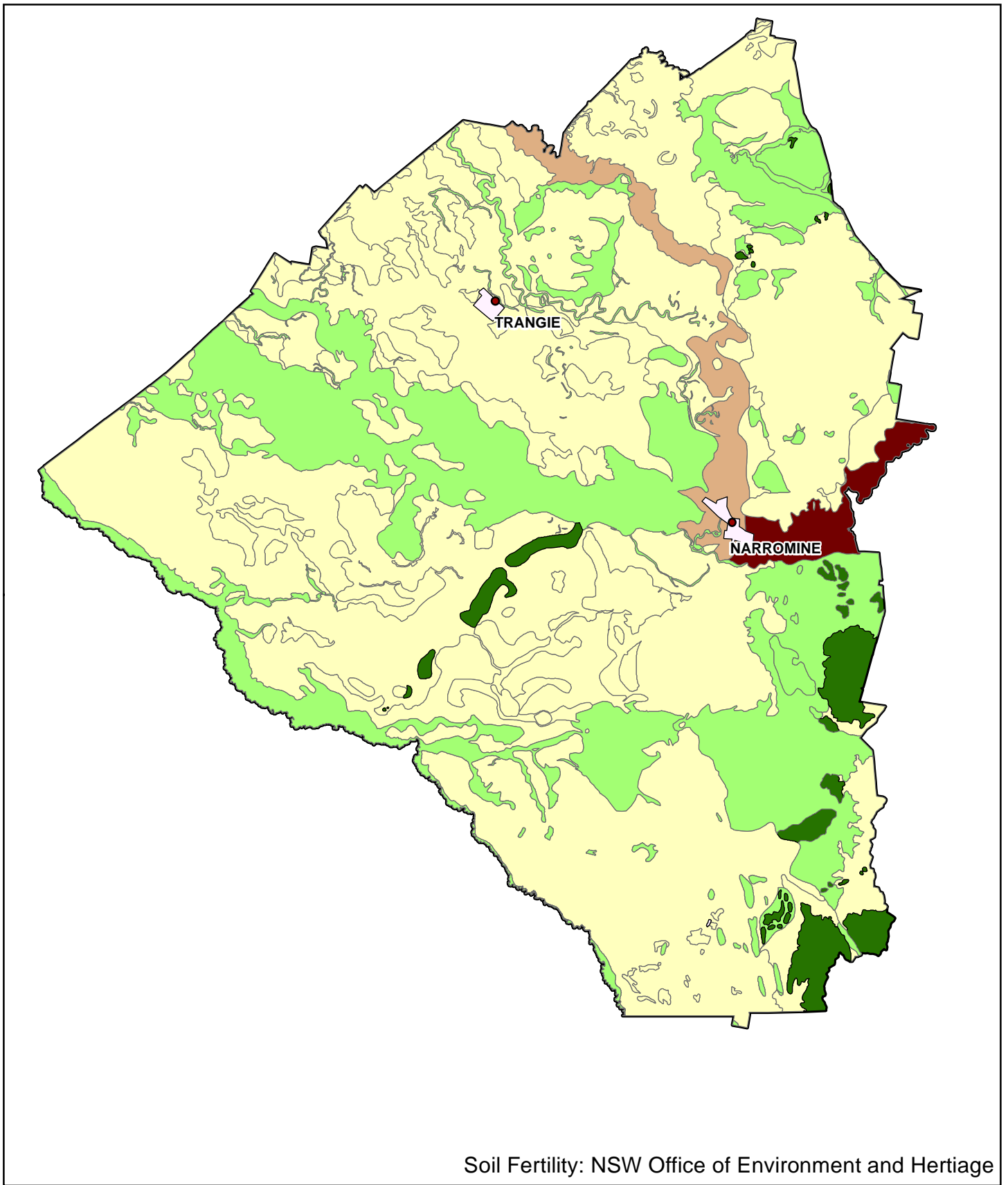


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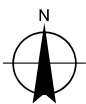
**Land Capability within  
Land Zoned RU1 Primary Production Figure 4**





- Towns
- Estimate\_F
- Low
- Moderately low
- Moderate
- Moderately high
- High
- Not assessed
- LGA

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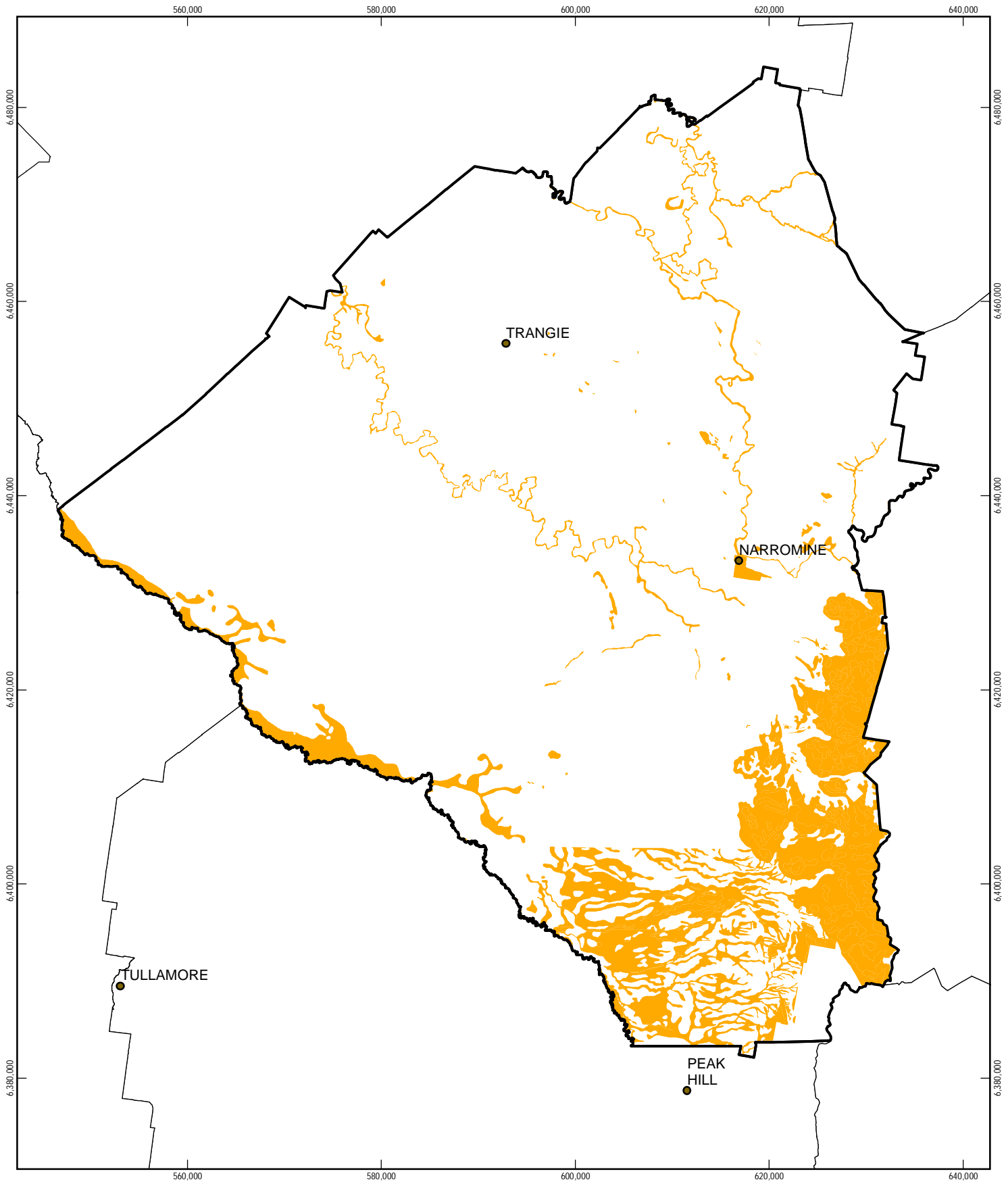


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Soil Fertility

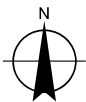
Figure 5



**LEGEND**

- Towns
- NARROMINE
- Narromine\_DrylandSalinity2004
- Narromine\_ErosionAreas
- Narromine\_SoilRegolithSENSW
- Narromine\_LandCapability

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**Environmental Sensitive Land**

**Figure 6**



### 3. Irrigation Policies and other Guidelines Influencing Intensive Plant Agriculture

Successful soil-based intensive plant agricultural production relies on the existence of suitable biophysical (eg soil and water) and other (eg market-related) attributes. Of particular importance is the availability of a high security irrigation water resource. Following are water-related policies and infrastructure (irrigation schemes) that influence water availability in Narromine Shire. Both surface and groundwater resources are discussed.

Following are details of surface water and groundwater resources in the Narromine LGA.

#### 3.1 Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source

The Macquarie River traverses Narromine Shire and this provides a valuable surface irrigation water resource. Surface water from the river is allocated under the *Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source*.

The water sharing rules in the Plan “provide water for the environmental needs of the Macquarie and Cudgegong Regulated Rivers Water Source and direct how the water available for extraction is to be shared” (*DIPNR 2004 p.2*). The Plan took effect on 1 July 2004 and guides water management and sharing amongst river users and the environment. The Water Sharing Plan limits average annual extractions to 391,900 megalitres (ML).

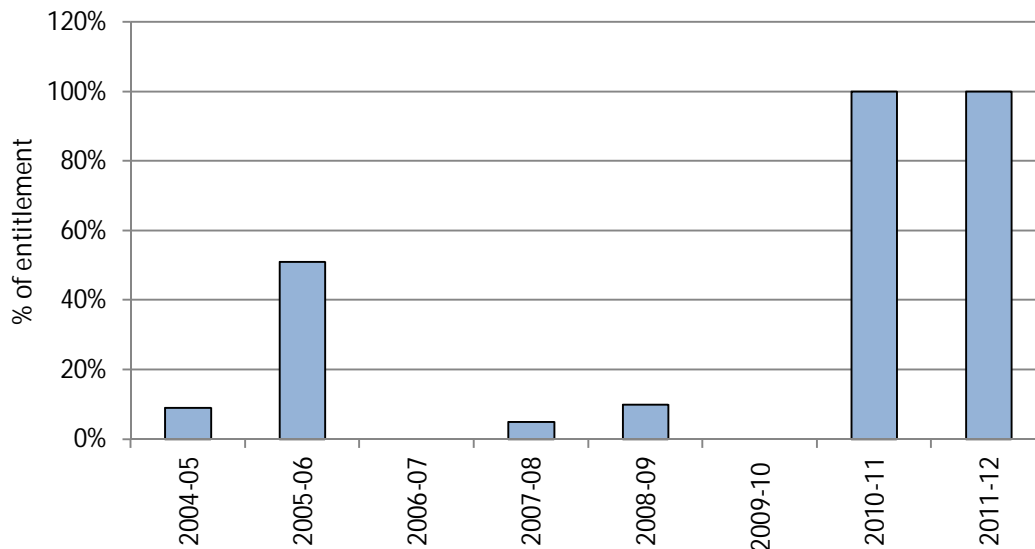
Water Access Licences (WAL) are required by users to extract water with four main types of licences for surface water (Table 4) and an additional Supplementary classification. The predominant access type is for General Security. The total availability and usage to date (18 April 2012) of water by different licence categories for 2011-12 is shown in Table 4.

**Table 4 Surface Water Entitlements for the Macquarie-Cudgong Regulated River 2011-12**

Surface Water Type	Total Share Component	Water Made Available	Usage (YTD)	No. of WAL's
General Security	631,716	309,540	268,425	614
High Security	13,828	13,828	2,884	73
Supplementary	50,041	50,043	1,131	534
Stock and Domestic	5,049	5,041	687	199
Local Water Utility	18,805	18,805	6,909	9
Unregulated	N/A	N/A	N/A	N/A
<b>Total</b>	<b>719,439</b>	<b>397,257</b>	<b>280,035</b>	<b>1,429</b>

The annual allocation of water varies depending on licence type. In dry years, allocation for General Security water may be zero. Figure 7 shows zero allocation of General Security water in 2006-07 and 2009-10 compared to 100% allocation in 2010-11 and 2011-12. The percentage allocations are closely linked to annual rainfall as shown in Figure 2. The allocation of High Security water (Figure 8) is more reliable being at 100% each year since 2004-05 with the exception of 2007-08 when allocation was 80%.

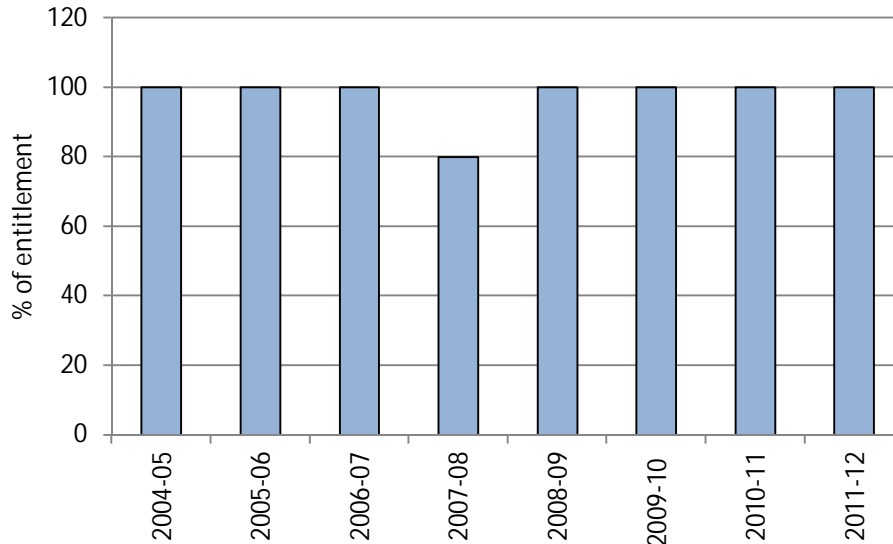
**Figure 7 General Security entitlement (%) for the Macquarie-Cudgong Regulated River 2004-12**



Source: NSW Office of Water



**Figure 8 High Security entitlement (%) for the Macquarie-Cudgong Regulated River 2004-12**



Source: NSW Office of Water

Approximately 600 users have surface water entitlements from the Macquarie River with 500 of these users small in size, each with less than 2,000 ML of entitlement. Landholders with WALs generally have two choices for accessing surface irrigation water: riparian (ie pumping directly from the Macquarie River) or as a member of an irrigation scheme (see 3.3 below).

It should be noted that WALs are not tied to the land which means that trading in entitlements is permissible.

### 3.2 Water Sharing Plan for the Lower Macquarie Groundwater Sources 2003

In addition to surface water, irrigation water in the Narromine Shire is also available from groundwater sources. The allocation of groundwater is determined by the *Water Sharing Plan for the Lower Macquarie Groundwater Source*. The Plan guides water management and sharing rules amongst the six aquifers that comprise this groundwater source (see Figure 10). This groundwater sharing plan took effect on 1 October 2006 and will cease on 30 June 2017.

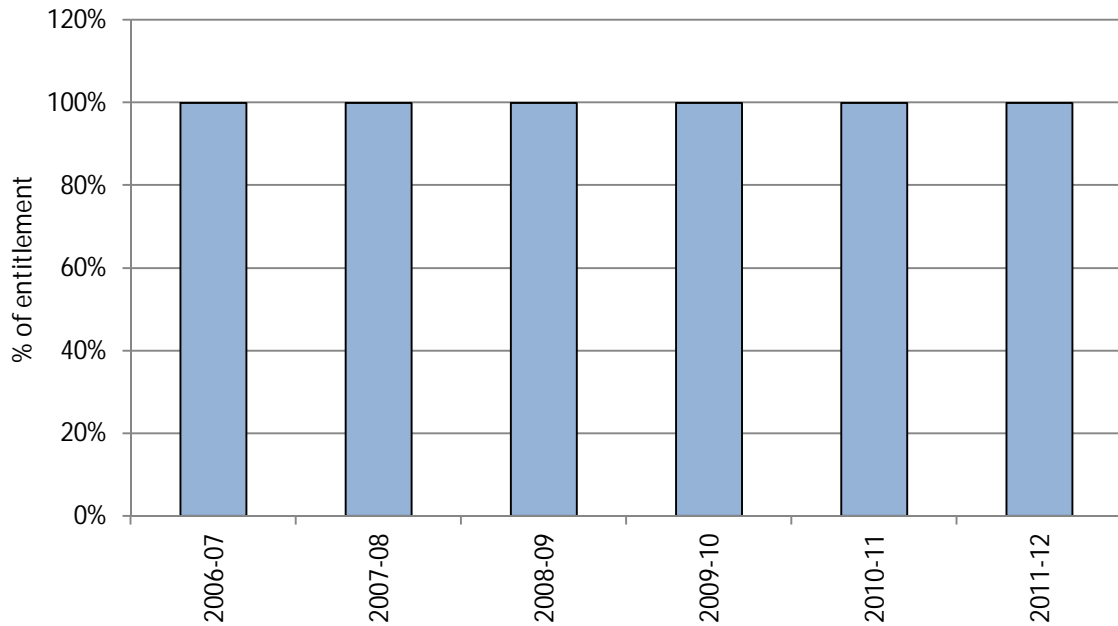
There is also an unregulated groundwater source east of the Macquarie River and a Water Sharing Plan is currently being developed for this area.

The average annual extraction limit of a groundwater source is set as a proportion of average annual 'recharge' to the water source. Restrictions can also be applied by Ministerial announcement if local extraction is causing an "unacceptable" deterioration in groundwater quality, or if there is a threat from pumping of aquifer or aquitard compaction.

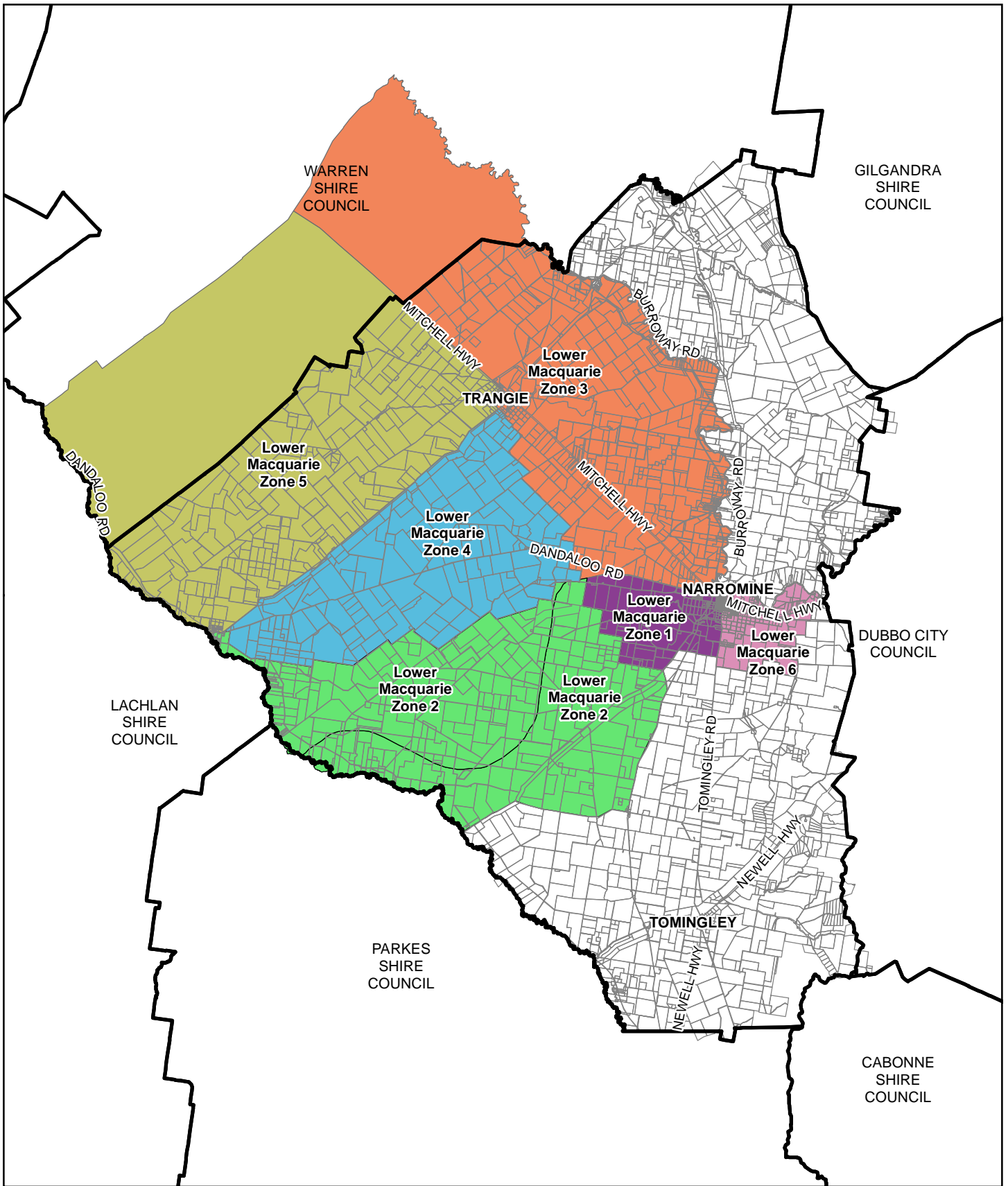
Groundwater WAL categories include those for the local water utility, stock and domestic, and general aquifer access (mainly irrigation). Table 5 shows the average annual licence limit for each zone within the Lower Macquarie Groundwater Source. The local water utilities in Narromine and Trangie have groundwater access licences in zones 1 and 3 respectively.

Table 6 shows the 2011-12 groundwater entitlements by zone and usage to date (18 April 2012). The relatively low usage to date (about 15% of availability) is a result of the relatively high rainfall over the past year. The allocation of high security water for groundwater across all six zones has been at 100% each year since 2006-07 and is shown in Figure 9.

**Figure 9 High Security Entitlement (%) for the Lower Macquarie Groundwater Source**



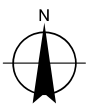
Source: NSW Office of Water



**LEGEND**

- |                       |  |                        |
|-----------------------|--|------------------------|
| Cadastre              | <b>Lower Macq Alluvium Groundwater Mgmt Area</b> | Lower Macquarie Zone 4 |
| Local Government Area | Lower Macquarie Zone 1                           | Lower Macquarie Zone 5 |
|                       | Lower Macquarie Zone 2                           | Lower Macquarie Zone 6 |
|                       | Lower Macquarie Zone 3                           |                        |

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 Grid: GDA 1994 MGA Zone 55



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**Lower Macquarie Alluvium  
 Groundwater Management Zones Figure 10**

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Data source: DPI: Alluvium Groundwater - 2012; NSC: Cadastre, Waterways, Road Names, LGA's, - 2011. Created by:ccameron



Although average groundwater extraction is less than surface water (65,000 ML/yr compared to 390,000 ML/yr), the reliability of groundwater allocation is high especially compared to General Security surface water. In general, groundwater security is on a par with High Security surface water and is thus a valuable resource for intensive plant agriculture particularly for permanent plantings such as citrus. For every year since 2006, groundwater users have had access to 100% of their entitlement.

Groundwater is considered to be less reliable in Zones 4 and 5 due to sandstone geomorphology (other zones are alluvial) and water in Zone 5 is saline (MRFF pers. comm.).

**Table 5 Average Annual Licence Limit per Zone – Lower Macquarie (ML)**

	Average Annual Recharge	Local Water Utility Access Licences	Aquifer Access Licences	Supplementary Water Access Licences
Zone 1	25,500	2,000	19,675	1,172
Zone 2	26,600	-	22,610	-
Zone 3	11,000	1,090	8,260	395
Zone 4	6,000	-	5,100	832
Zone 5	Undefined	-	2398	-
Zone 6	9,600	3	7481	-
<b>Total</b>		<b>3,093</b>	<b>65,524</b>	<b>2,399</b>

**Table 6 Groundwater Entitlements (By Zone) for the Lower Macquarie Groundwater Source 2011-12**

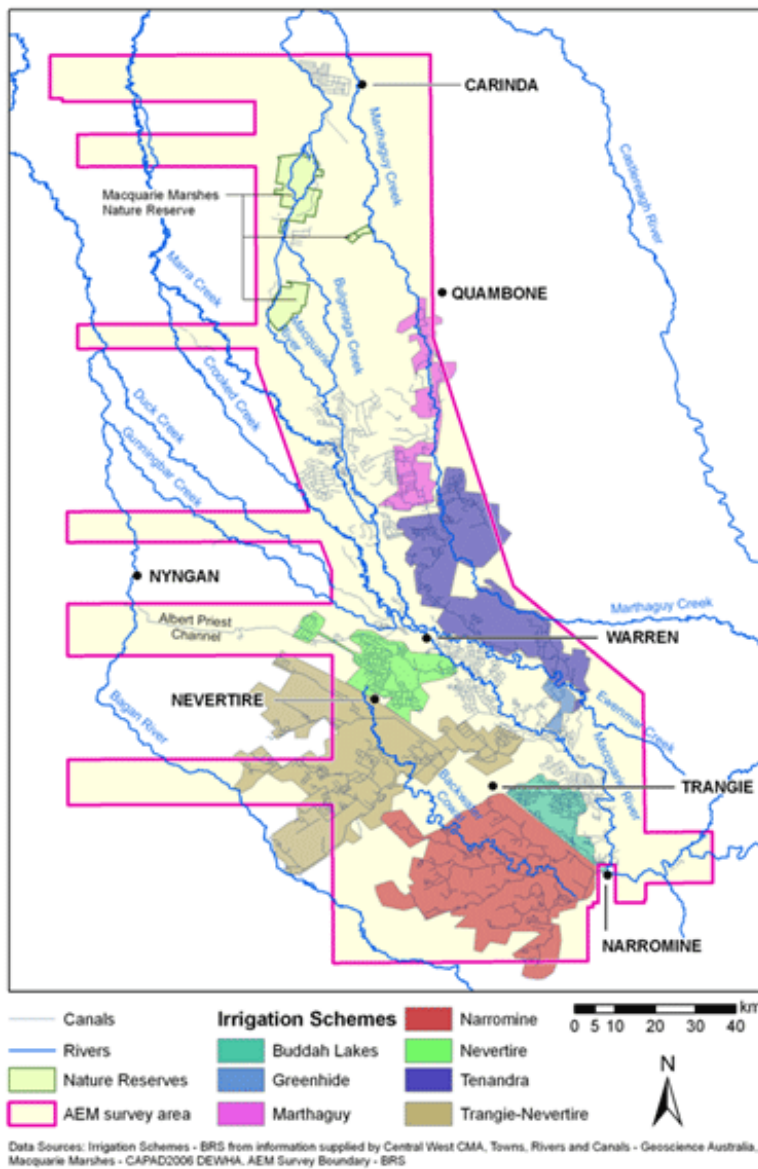
Groundwater	Total Share Component	Water Made Available	Usage (YTD)	No. of WAL's
Zone 1	19,680	19,680	8,289.8	31
Zone 2	22,608	22,608	3,564.5	19
Zone 3	8,263	8,263	595.2	25
Zone 4	5,104	5,104	1,311.6	7
Zone 5	2,477	2,477	178.3	7
Zone 6	7,326	7,326	789.7	31
<b>Total</b>	<b>65,458</b>	<b>65,458</b>	<b>14,729</b>	<b>120</b>



### 3.3 Irrigation Schemes

As stated in section 3.1, surface irrigation water can be accessed directly from the river or via private schemes. There are a total of seven private off-river irrigation schemes in the Macquarie catchment (Figure 11 and Table 7). These schemes account for around 40% of licenced irrigation entitlement in the catchment.

**Figure 11 Map of irrigation schemes**



Source: DAFF (2011)



**Table 7 Private Irrigation Schemes in the Macquarie Catchment**

Scheme	Entitlement (ML)	Area (km <sup>2</sup> )	Members	Channel length (km)
Narromine-Trangie	60,100	120	90	350
Trangie-Nevertire	63,500	102	66	250
Tenandra	34,800		32	150
Buddah-Lakes	32,500	170	19	58
Marthaguy	16,600	35	16	
Nevertire	32,000		15	50
Greenhide	7,800	8.3	10	30
Total	247,300			

Source: MDBC 2007

The schemes use electric pumps to pump the water from the Macquarie River and then distribute to scheme members via clay-lined compacted earth channels. The Narromine-Trangie scheme services the area to the west of the Mitchell Highway. The Trangie-Nevertire scheme services properties to the west of Trangie. The Buddah Lakes scheme also supplies properties to the east of the Mitchell Highway located between Narromine and Trangie.

Currently the Trangie-Nevertire scheme is in the process of implementing a modernisation and rationalisation plan. This involves:

- ▶ Design and construction of a stock and domestic pipeline system.
- ▶ Modernisation of Scheme channels.
- ▶ Upgrading of on-farm infrastructure.
- ▶ Rationalisation of scheme channels and scheme irrigation area (red zone).

### 3.4 Current DCP No. 5 – Intensive Agriculture

The Narromine Shire Council Development Control Plan (DCP) No.5 Intensive Agriculture (Appendix A) was developed in recognition of the fact that planning provisions for agriculture within the Shire were very general in nature and based on traditional cropping and grazing agricultural uses. Council recognised that financially viable intensive agriculture has different requirements for water, soil and land area compared to extensive agriculture.

The DCP recognises that holding sizes are to be appropriate for the use of the land in terms of the area required to accommodate the agricultural activity, required infrastructure and access arrangements. It recognises that traditional forms of agriculture require larger holdings in order to be financially viable and sustainable, whereas more intense types of agriculture may require less land area.

The objectives of the DCP were:



- ▶ To ensure that the development of rural land maximises the long-term sustainability of agriculture and its resource base in the Narromine Shire;
- ▶ To ensure that intensive agricultural development within Narromine Shire is developed in a manner that is sustainable into the future; and
- ▶ To establish development controls that take into consideration environmental attributes and the agricultural potential of rural land; and
- ▶ To provide a performance based criteria for assessing proposed rural subdivisions or dwelling houses associated with intensive agriculture; and
- ▶ To provide transparent and consistent development control guidelines for the development of rural land within Narromine Shire.

Performance based criteria are covered by the requirement that a development application for intensive agriculture needs to be accompanied by a Property Development Plan (PDP). The PDP is to be prepared by an appropriately qualified consultant and is to provide a detailed description of the operation, including a comprehensive agronomic and economic plan for the development.

Records from Narromine Shire Council show that there were a total of four development applications submitted between 2004 and 2010 for intensive plant agricultural subdivisions.



## 4. Land Use

### 4.1 Land Use of the Narromine Shire

Table 8 shows that the predominant land use of the shire is for grazing (55%) and cropping (34%).

**Table 8 Land Use**

Land use - total area (ha)	Estimate	<b>522,225</b>
	Number of establishments	<b>406</b>
Land use - land under crop (including vegetables, fruits, nuts, broadacre crops, grapes and nurseries) - area (ha)	Estimate	<b>175,636</b>
	Number of establishments	<b>320</b>
Land use - land under fallow - area (ha)	Estimate	<b>35,704</b>
	Number of establishments	<b>121</b>
Land use - grazing land (including pastures and rangelands) - area (ha)	Estimate	<b>286,054</b>
	Number of establishments	<b>348</b>
Land use - remnant vegetation and woodland not suitable for grazing - area (ha)	Estimate	<b>4,868</b>
	Number of establishments	<b>61</b>
Land use - land under commercial forestry plantations - area (ha)	Estimate	<b>7,641</b>
	Number of establishments	<b>6</b>

Source: NSW SLA Agricultural Commodities, Small Area Data 2006-07 ABS Cat.No 7125.0

The above does not separate intensive plant agriculture from other crops, however information on the extent of intensive plant production is found in information on irrigation water use (see Table 9). There were 26 businesses irrigating intensive plant crops (fruit trees, vegetables, nurseries, grapevines) in 2005/06.

Table 10 shows that for 2005/06 total agricultural water use in the Narromine LGA (ABS 2008b) was 89,940 ML of which 83,277 ML was for irrigation. Approximately equal amounts of water were sourced from surface and groundwater supplies (Table 10) and this reflects the fact there was a drought year in 2006 (see Figure 2) and that allocation of surface water in 2005-06 was about 50% (see Figure 7).



**Table 9 Pastures and crops irrigated (2005/06) – Narromine LGA**

Pastures and Crops Irrigated	Agricultural businesses (Number)	Agricultural businesses irrigating (Number)	Irrigation volume applied (ML)
Pasture for grazing	348	21	4,112
Pasture for seed production	n.a.	2	n.p.
Pasture for hay and silage	n.a.	19	4,046
Cereal crops cut for hay	n.a.	8	2,147
Cereal crops for grain or seed	301	27	7,839
Cereal crops not for grain or seed	64	13	962
Cotton	31	31	56,787
Other broadacre crops	58	12	3,134
Fruit trees, nut trees, plantation or berry fruits	12	9	2,416
Vegetables for human consumption	4	4	900
Vegetables for seed	3	3	n.p.
Nurseries, cutflowers or cultivated turf	5	5	n.p.
Grapevines	3	3	n.p.
Other crops	n.a.	2	n.p.
<b>Total</b>	<b>409</b>	<b>106</b>	<b>83,277</b>

n.p. not available for publication but included in totals where applicable, unless otherwise indicated

n.a. not available

Source: ABS (2008b)

**Table 10 Sources of irrigation water**

Water source	Volume of water sourced (ML)	Agricultural businesses sourcing water
Groundwater	44,310	82
Surface water	45,325	338

ABS (2008b)



## **4.2 Existing Intensive Plant Agriculture Land Use**

A number of intensive plant agricultural enterprises currently operate within the Narromine Shire. These enterprises have been established due to a combination of factors including the availability of irrigation water (both surface and groundwater) combined with suitable soil types and topography. There is a variety of enterprise types (Table 11) with nurseries & cut flowers and citrus providing the highest value of production. The locations of the enterprises are shown in Figure 12.

There are also specialist enterprises set up for the propagation of commercial seeds (see Photos 1-6 in Appendix B).

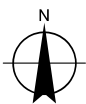


**LEGEND**

**LandUse**

- Intensive horticulture, Intensive horticulture, Nursery
- Intensive horticulture, Shadehouses, Shade house or glass house (includes hydroponic use)
- Irrigated perennial horticulture, Olives, orchard, vineyard
- Irrigated seasonal horticulture, Irrigated seasonal vegetables & herbs, Vegetables - irrigated
- Land in transition, Abandoned land, Abandoned orchard and vine lands; trees/vines not maintained and may be dying; regrowth of native shrubs and trees is occurring
- Seasonal horticulture, Seasonal flowers & bulbs, Cut flowers & herbs
- Perennial horticulture, Tree fruits, Orchard - tree fruits

1:145,016 Paper Size A4  
 0 1 2 3 4  
 Kilometers  
 Map Projection: Transverse Mercator  
 Horizontal Datum: GDA 1994  
 Grid: GDA 1994 MGA Zone 55



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**Intensive Land Use**

**Figure 12**

#### 4.4 Value of Intensive Plant Production

The variety of crops and value of the intensive plant industry in the Narromine LGA in (2005-06) is shown in Table 11. The nursery & cut flower segment has the highest value of production (about \$11 mill) followed by the citrus industry (about \$3.5 mill).

**Table 11 Value of intensive plant production 2005-06**

LGA compared to NSW benchmark	Narromine (A)		New South Wales
Narromine (A)	\$	% of total agriculture in selected LGA	% of benchmark commodity
<b>Nurseries &amp; cut flowers</b>	<b>\$10,966,833</b>	<b>7.9</b>	<b>3.1</b>
Nurseries	\$10,966,833	7.9	5.2
<b>Vegetables</b>	<b>\$632,002</b>	<b>0.5</b>	<b>0.2</b>
All other vegetables for seed	\$25,272	0.0	1.0
Broccoli	\$20,257	0.0	0.3
Cabbages	\$42,205	0.0	0.3
Cucumbers	\$17,006	0.0	0.1
Lettuce	\$22,700	0.0	0.1
Melons - honeydews	\$5,888	0.0	0.2
Melons - rock and cantaloupe	\$31,438	0.0	0.1
Melons - watermelons	\$8,918	0.0	0.1
Pumpkins & triambles & trombones	\$18,187	0.0	0.1
Silverbeet and spinach	\$46,291	0.0	0.5
Sweet corn	\$333,881	0.2	5.8
Tomatoes	\$40,409	0.0	0.2
Zucchini and button squash	\$19,550	0.0	0.3
<b>Citrus Fruit</b>	<b>\$3,486,278</b>	<b>2.5</b>	<b>2.6</b>
Oranges	\$2,730,406	2.0	2.4
Grapefruit	\$1,471	0.0	0.0
Lemons and limes	\$751,953	0.5	13.3





Mandarins	\$2,448	0.0	0.0
<b>Grapes (wine and table)</b>	<b>\$525,933</b>	<b>0.4</b>	<b>0.2</b>
Grapes - wine	\$525,933	0.4	0.2
<b>Other Fruit</b>	<b>\$441</b>	<b>0.0</b>	<b>0.0</b>
Nectarines	\$256	0.0	0.0
Olives	\$24	0.0	0.0
Peaches	\$161	0.0	0.0
<b>Nuts</b>	<b>\$23,757</b>	<b>0.0</b>	<b>0.0</b>
Other nuts	\$23,757	0.0	0.5

Source: NSW Department of Primary Industries – *Value of agricultural production data – interactive spreadsheet*

The agricultural sector has been central to the Narromine LGA in providing economic, social and natural resource outcomes. Broadacre cropping and grazing enterprises are the main contributors to the value of agricultural production in the shire. Access to water (both groundwater and surface water) and favourable soil conditions has allowed agriculture in the shire to diversify into other intensive plant enterprises (citrus, viticulture, vegetables, nurseries and cut flowers) that assist to provide resilience in the economy when faced with fluctuating seasonal and market conditions. Agriculture is the single largest employment industry in the LGA and an important contributor to the social fabric of the region.

Given Narromine's location at the junction of the Mitchell and Newell Highways it is well positioned to allow for the overnight transport of agricultural goods to the major markets of Sydney. In order to provide economies of scale, a number of citrus producers have established central processing and packing facilities in or close to the Narromine town centre in order to process their produce and to provide a central distribution point for delivery to key markets.

The agricultural resource base of the shire presents the opportunity to further broaden the intensive plant agriculture industry within the shire and to continue to offer a diverse and productive agricultural sector.

Historically, the Sydney basin has been a large producer of the perishable goods consumed in Australia's largest city. Production in the Sydney basin is constrained through natural boundaries and faces increasing pressure from urbanisation. Urbanisation in the Sydney basin has led to a decline in agricultural land, further intensification of agriculture as value of land increases and future potential for conflicting land use. As the availability of land declines there is an opportunity for other regional areas of NSW to step in and meet the demand caused by these land shortages and to supply perishable produce to the Sydney markets.

#### 4.5 Intensive Plant Industry Trends

Rising costs of production, reductions in farm gate prices and a strong Australian dollar in recent years has placed increased pressure on many citrus and winegrape growers. The profitability of many of these enterprises has declined in recent years and growers will need to make the decision whether to continue

or retire from their agricultural operations. This section outlines some of the recent trends related to the intensive plant industry in other citrus producing regions in New South Wales and South Australia. These regions have a similar resource base to that of Narromine LGA.

For example, Riverina Citrus commissioned RMCG (2008) to undertake a report examining the rise in costs of key inputs into citrus production since 2005/06. Riverina Citrus wanted to establish the impact these price rises had on the overall cost of citrus production in the MIA.

The report found that there would be a 16% increase in variable costs from 2005/06 and 2007/08. Table 12 highlights the key attributes and expected changes.

**Table 12 Changes in Variable costs from 2005/06 to 2007/08**

Attribute	Adopted change to 2005/06 figures "Conservative Estimate"	Adopted Change to 2005/06 figures "High Estimate"	Comment
Yield/price \$/ha income	Nil	Nil	Yield and prices highly variable and no trend likely to be significant in short time frame. Although yield appears to increase by 5%
Fertiliser cost \$/ha	174%	228%	Grower costs estimated to be 228%. ACCC review is 174% but note prices have risen since ACCC review
Fuel Cost \$/ha	180%	180%	Based on grower estimates. Appears to be broadly consistent with fuel price rises
Chemical cost \$/ha	130%	125%	Grower estimates
Labour cost \$/ha	106%	125%	Grower estimates of 125% may be due to increased yield so ABS Agricultural labour index of 106% used
Power cost \$/ha	109%	118%	Power cost of 2006/07 is 109% from IPART review. Maybe underestimates cost rise if there was a substantial increase from 05/6 to 06/7

Source: RMCG (2008) Costs of Production Citrus

Rising variable costs of production and highly variable prices are reducing the overall gross margin (income less variable costs) received by citrus growers. RMCG estimated that gross margins would decline from \$1,641/ha in 2005/06 to a conservative estimate of \$806/ha for the 2007/08 season.

RMCG (2008) also estimated that the total costs of production (operating costs + capital costs + owner's labour) for citrus (\$/ha) was \$11,513 in 2005/06 and expected to rise to \$12,348 for the 2007/08 season. Table 13 highlights that costs of production are likely to continue to increase and reduce the overall profitability of smaller citrus farms. As these costs of production continue to rise, those farms able to achieve greater economies of scale are likely to achieve greater marketing and production efficiencies and therefore have improved financial viability.

**Table 13 Key costs of production 2005/06 and Estimated 2007/08**

	2005/06 Season Average	2007/08 Season Conservative Estimate	2007/08 Season High Estimate
Total operating costs (\$/ha)	\$6,407	\$7,242	\$8,071
Total capital costs (\$/ha)	\$3,821	\$3,821	\$3,821
Owners labour (\$/ha)	\$1,285	\$1,285	\$1,285
Cost of production (\$/ha)	\$11,513	\$12,348	\$13,177
Cost of production (\$/t)	\$509	\$547	\$582

Source: Adapted from RMCG (2008)

Another analysis of gross margin budgets in the Sunraysia region of NSW examined the effect of yield and price on the gross margin/ha for orange production. Table 14 is a sensitivity analysis of the effect that yield and price have on the gross margin/ha keeping the variable costs constant. For illustrative purposes the on-farm prices received by growers in the MIA averaged around \$150/t for Navels (pers.comm NSW DPI 2011). At these prices growers in the MIA would not have returned a profit in this period.

**Table 14 Effect of yield and price on gross margin /ha**

Yield (t)	On Farm Price (\$/t)								
	\$150	\$200	\$250	\$300	\$350	\$400	\$450	\$500	\$550
20	-\$2,376	-\$1,376	-\$376	\$624	\$1,624	\$2,624	\$3,624	\$4,624	\$5,624
25	-\$2,087	-\$837	\$413	\$1,663	\$2,913	\$4,163	\$5,413	\$6,663	\$7,913
30	-\$1,799	-\$299	\$1,201	\$2,701	\$4,201	\$5,701	\$7,201	\$8,701	\$10,201
35	-\$1,510	\$240	\$1,990	\$3,740	\$5,490	\$7,240	\$8,990	\$10,740	\$12,490
40	-\$1,222	\$778	\$2,778	\$4,778	\$6,778	\$8,778	\$10,778	\$12,778	\$14,778
45	-\$933	\$1,317	\$3,567	\$5,817	\$8,067	\$10,317	\$12,567	\$14,817	\$17,067
50	-\$645	\$1,855	\$4,355	\$6,855	\$9,355	\$11,855	\$14,355	\$16,855	\$19,355

Source: NSW DPI (2011) Gross Margin for Oranges – Washington Navel, Sunraysia district.

Citrus Growers of South Australia Inc. in a *Submission to the Productivity Commission Inquiry into the Citrus Industry* (December 2001) reported that larger and corporate growers are much more profitable



than small growers and that the citrus production in South Australia was competitive and had similar characteristics to the MIA in terms of soils, climatic conditions and irrigation infrastructure. The submission concluded that *“for the industry to remain profitable smaller growers need to increase their property size and if necessary, redevelop their varietal mix. Many are not in a position to do this without some assistance such as low interest loans or other financial incentives. (Citrus Growers of South Australia Inc. 2001).*

## 4.6 Water Resources

The Murray-Darling Basin Authority has released the proposed Basin Plan which specifies the measures the Basin Plan must contain to guide management of the water resources of the Murray–Darling Basin. The proposed Basin Plan outlines the water that must be returned from each catchment to meet the environmental water needs. In relation to the Macquarie-Castlereagh catchment, *‘environmental water recovery to date has already exceeded the Authority’s assessment of the local environmental water needs of the Macquarie–Castlereagh. This means that no further water needs to be recovered to meet local needs and any additional water will contribute to meeting the shared downstream environmental water needs of the Barwon–Darling (MDBA 2012).’*

### 4.6.1 Crop water use

The following table shows the water use (ML/ha) typical of the irrigated crops grown in the Narromine LGA and of relevance to this strategy. Nurseries, cut flowers and cultivated turf are the most intensive users of water (6.5 ML/ha) followed by vegetables (3.9 ML/ha), fruit trees (1.5 ML/ha) and grapevines (1.4 ML/ha).

**Table 15 Application rate (ML/ha) for pastures and crops irrigated – Central West NSW**

Pasture / crop irrigated (2009-10)	ML/ha
Pasture and cereal crops used for grazing or fed off	2.1
Pasture and cereal crops cut for hay	4.7
Other cereals for grain or seed	1.8
Cotton	6.7
Other broadacre crops	1.4
Fruit trees, nut trees, plantation or berry fruits	1.5
Vegetables for human consumption	3.9
Nurseries, cut flowers and cultivated turf	6.5
Grapevines	1.4

Source: ABS (2011)



## 5. Planning for Future Intensive Plant Agriculture

There are a number of elements to consider when planning for the future location of intensive plant agriculture in the Shire. This section outlines the various elements and provides guidance on the selection of the locations best suited to intensive plant production.

### 5.1 Criteria for viable intensive plant agriculture

The success of intensive plant agriculture is dependent on a number of attributes that can broadly be classified as:

- Biophysical (predominantly soil, water and environmental)
- Economic (financial and marketing)
- Social (labour availability and minimisation of land use conflict)

Each of these is discussed below along with recommendations of minimum threshold levels for inclusion within an intensive plant zone. It should be noted that individual crops will have different requirements with respect to the above attributes but the following are designed to provide general guidance for the purpose of establishing an intensive plant zone within the shire.

#### 5.1.1 Biophysical criteria

##### Land capability classification

Intensive plant agriculture generally includes crops that require multiple cultivations within a season (eg vegetable crops) or frequent access for husbandry activities (pesticide application) and harvesting. As a result, topography is an important consideration.

In addition, most crops require irrigation water which can be applied via flood, furrow, drip or spray. Flood and furrow irrigation requires relatively low sloping land with optimum slope generally achieved using laser technology. Drip and spray irrigation can occur on land with irregular slope.

For ease of crop management and establishment of irrigation the following Land Capability classifications are recommended for intensive plant agriculture:

- Land Capability Classifications 1, 2 or Flood Irrigation.

These three categories represent over 75% of land zoned RU1 in the Narromine LGA. These land categories have a slope of less than 10 degree allowing for drainage, cultivating and crop rotation where necessary.

##### Soil fertility

NSW Office of Environment and Heritage as part of the Strategic Regional Land Use Planning delivery has undertaken extensive mapping of the estimated inherent soil fertility for the Narromine LGA. Intensive plant agriculture generally requires appropriate soil types in order to sustain the proposed crops. Depending on the crop type, certain soil conditions are required in order to be regularly cultivated (NSW DPI 2011). The following soil fertility classifications are recommended for intensive plant agriculture:



- Moderately high
- High

#### Irrigation water supply

The future viability of a sustainable intensive plant agriculture industry within Narromine LGA is dependent upon the access and availability of a reliable water source. For surface water, General Security WALs are unreliable (see Figure 7) and not suited to intensive plant agriculture. High Security WALs are more reliable (see Figure 8) although final availability depends on the method of delivery – ie via private schemes or direct from the river (riparian) as discussed in section 3.1.

A disadvantage of the private schemes is the extensive network of earth channels required to deliver water on a 'socialised' basis to customers. The seepage losses for delivery mean that these schemes are most suited to supplying high volumes of water to customers growing similar crops (eg cotton) during a particular season. Delivery of relatively small quantities of water to individual intensive plant agriculture users throughout the year would be inefficient and costly.

Riparian supply of surface water is an option for intensive plant agriculture. The Macquarie River traverses the Narromine LGA from north to south and High Security WALs with pump access along the river would be suitable for intensive plant agriculture. It is recommended that distance from the river for riparian access should be a maximum of five kilometres to ensure that pumping costs are not excessive (MRFF pers. comm.).

A major source of reliable irrigation water is from the groundwater sources. As discussed in section 3.2 groundwater is less reliable in Zones 4 and 5 due to sandstone geomorphology (other zones are alluvial) and water in Zone 5 is saline (MRFF pers. comm.).

To ensure access to reliable irrigation water, the following WALs are recommended for intensive plant agriculture:

- High Security WAL within 5 km of the Macquarie River
- Groundwater WAL within Zones 1, 2, 3 and 6.

#### Environmentally sensitive areas

In general, intensive plant agricultural production is based on highly productive (ie high yielding) enterprises to justify the high infrastructure and operating expenses required for establishment. It is therefore important to avoid environmentally sensitive areas, including those areas with steep slopes, shallow soils, salinity, temporary or permanent inundation, high proportion of rock outcrop, high soil dispersibility and erosion potential or the presence of karst systems. The location of environmentally sensitive land in NSC has been mapped by NSW DPI (see Figure 6).

To ensure optimum conditions for intensive plant agriculture production, the following is recommended:

- Avoidance of environmentally sensitive areas

#### **5.1.2 Socio-economic criteria**

Successful land use planning requires that future land use is likely to remain economically viable for the future. It is difficult to select specific enterprises with prospects of long term viability because of the cyclical nature of markets for produce which are subject to the domestic and international vagaries of demand and supply. While certain crops might demonstrate profitability under current pricing conditions,



experience shows that profitability can fluctuate and a viable business needs to be able to accommodate the expected cycles.

At the same time, restrictions on land use should not be so onerous as to reduce incentives for entrepreneurial investments in intensive plant agriculture.

#### Enterprise size

An important principle that can accommodate potential fluctuations in the viability of enterprises is to ensure that enterprise sizes are sufficiently large so that alternative intensive plant land use is not compromised when a particular business become unviable. Enterprise sizes should be large enough to enable flexibility in alternative crop choice depending on market conditions.

Section 4.5 showed the expected increase in capital and variable costs of production for citrus and the fact that larger farms are more likely to remain viable given their ability to capture economies of scale. For a selected yield (30 tonnes/ha) and price (\$300/tonne) for citrus, Table 14 indicates a gross margin of \$2,701 per hectare. To obtain a total enterprise gross margin income of \$100,000 (considered sufficient to support overhead and living costs) the area of land required would be about 40 hectares ( $\$100,000/\$2,701$  per hectare = 37 hectares).

To ensure optimum flexibility for viable, stand-alone intensive plant agriculture:

- Enterprise sizes of around 40 ha provide potential long-term viability as well as the flexibility for alternative enterprise uses given cyclical market conditions

It is recognised that intensive plant production types other than citrus (eg vegetables or cut flowers) are likely to result in different enterprise size calculations. However, citrus is chosen because it is a crop with a long production history in NSC and a larger enterprise size also enables the principle of ensuring alternative land use is maintained.

It is also noted that intensive plant agriculture could be established within a section of a larger broadacre farm, thus providing the farms with diversification of enterprises that can potentially reduce business risks to improve long term viability.

#### Market preparation and transportation

Narromine is located at the intersection of the Mitchell and Newell Highways and is therefore well positioned to allow for the overnight transport of agricultural goods to the major markets of Sydney, Melbourne and Brisbane.

To assist with market access of citrus, a number of citrus producers have established central processing and packing facilities in or close to Narromine (see Photos 7 and 8 in Appendix B). Centralisation of these facilities creates economies of scale and promotes efficient loading for transportation. In addition, the facilities can source seasonal labour requirements from a larger labour pool in Narromine compared to Trangie.

To ensure optimum access to market preparation (transportation of harvested produce to a central processing and packing facility) and transport links it is recommended that intensive plant agriculture:

- be located within 20 kms of Narromine or Trangie;



### Labour availability

Intensive plant production requires relatively more labour inputs compared to broadacre agriculture. Intensive plant agriculture is generally less mechanised than broadacre agriculture with peak labour requirements required for harvesting.

There is a limit to the extent that labour will travel for work and if this distance is exceeded there would be negative impacts on long term viability. It is therefore recommended that:

- an intensive plant zone be located within 20 km of Narromine or Trangie

### **5.1.3 Additional social criteria (land use conflict)**

Additional social considerations (apart from the socio-economic criteria discussed above) relate to compatibility of intensive plant agriculture within the district (ie absence of land use conflict). Intensive plant agriculture involves a number of operations which cause dust (cultivation), noise (irrigation pumps, other machinery) and odour which can impact on neighbouring properties. Also, intensive plant agriculture is likely to involve the use of pesticides and it is important that their use does not negatively impact on other forms of agriculture.

In general, land use conflicts can be avoided through use of buffers to separate different land uses, with provision of appropriate buffers (ie distance, vegetative, topographic etc) located within the intensive plant property.

Avoidance of land use conflicts with residential areas also relies on a strategic planning approach to ensure the appropriate siting of rural residential development in relation to agricultural areas.

NSW DPI (2007) recommends the following minimum distance buffers for horticulture operations:

- with residential areas - 300 metres
- with rural dwellings – 200 metres

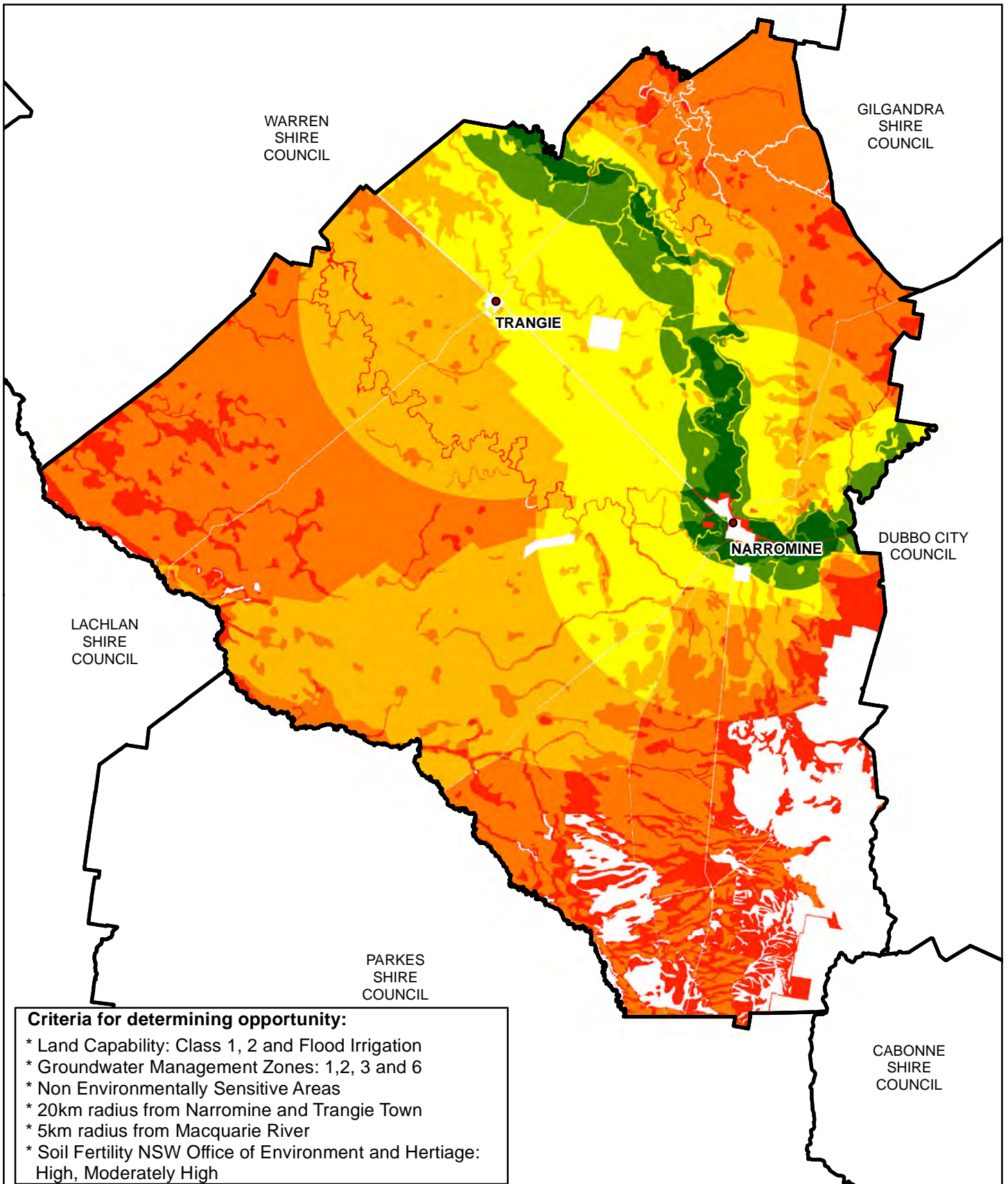
### **5.1.4 Opportunities mapping**

For a number of the criteria discussed above, GIS data is available that can be used to develop a map of those areas with opportunities for intensive plant agriculture. The opportunity areas are those more likely to be best suited to viable intensive plant agriculture (see Figure 13).

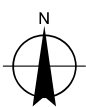
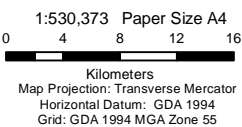
The criteria used to develop the opportunities mapping are:

- Land Capability Classifications 1, 2 or Flood Irrigation
- Soil fertility class – moderately high or high
- Within 5km of Macquarie River (ie available for riparian irrigation)
- Groundwater Zones 1, 2, 3 and 6.
- Areas not designated as environmentally sensitive
- Areas within 20km of Narromine and 20 km of Trangie towns





LEGEND



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Opportunity for Intensive Agriculture Figure 13

## 6. Minimum Lot Size and Dwelling Entitlements

The information discussed in Sections 2- 5 describes the conditions and characteristics that are essential for establishing an intensive plant agricultural zone on an existing lot or holding. If however an intensive plant agriculture enterprise is to be created on a new lot and requires a dwelling entitlement then further considerations are required.

Section 5.1.2 above indicated that a viable size for a citrus farm for particular price and yield assumptions was approximately 40 ha. However, this calculation is based on an assumption that the land would be used for intensive plant agricultural production only and it does not consider the implications of the parcel of land having a dwelling entitlement (ie approval for the landowner to construct a residential dwelling to enable better management of the property). It was decided to test the 40 ha as a minimum lot size and areas greater and smaller than 40 ha.

If a parcel of land has a dwelling entitlement it potentially has impacts on a number of factors associated with agriculture in the district. These factors are listed and discussed below in Table 16. Table 17 provides a subjective weighting (0.5 - 1.5) assigned to each factor while Table 18 provides the scoring rationale. The purpose of this assessment is to ensure that prime quality agricultural land is used for agricultural purposes and not for non-agricultural purposes (eg rural residential) which is likely to alienate the land from future agricultural production.

The information for each of the criteria is captured in Table 19 (raw scores for factors for selected land sizes) and Table 20 (weighted scores). Note that the weighting for each factor (between 0.5 and 1.5) was determined at the workshop in Narromine. The raw scores are GHD's recommendations.

**Table 16 Dwelling entitlement impacts**

Factor	Assessment
Fragmentation and/or loss of agricultural land from unsuitable settlement minimised	In general, smaller lot sizes have the potential to result in the fragmentation and possible loss of agricultural land. This occurs when land developed for intensive plant production becomes unviable for the chosen enterprise (eg through market downturn) but the smaller lot size means the land is not viable for an alternative agricultural enterprise. This land may then become alienated from future productive agriculture.
Environmental impacts of rural settlement minimised	Smaller areas are expected to have slightly more negative environmental impacts due to increased percentage of land used for infrastructure (house, sheds, yards etc) and thus a relatively larger footprint impacting on biodiversity and soil conditions.
Agricultural land valued for its agricultural potential	Information from other land use strategies (eg Cowra Rural Lands Discussion Paper) indicates that larger lot sizes deter speculation in land (eg for rural residential purposes) so that the price of land reflects its agricultural value and is not inflated by potential non-agricultural use.
Critical mass of farms maintained	Depending on market arrangements, it may be preferable for a number of farms to be co-located within a region to enable

Factor	Assessment
	shared marketing facilities, including packing sheds. If a critical mass of farms is not reached, the viability of a shared marketing facility is compromised.
Agriculture can respond to variability in climate, commodity prices and externalities	Larger farm sizes provide scope for diversification of enterprises and thus reduce the risk of market downturns where single enterprises are involved. Larger farms are also more resilient in the face of a cost-price 'squeeze'.
Avoid land use conflict	It is likely that buffers will be required to minimise land use conflict between intensive plant agriculture and other land uses (broadacre agriculture and residential). Lots will need to be of sufficient size to accommodate buffers.
New entrants to farming	Smaller lot sizes in theory will be cheaper to purchase compared to larger lots and thus be more accessible to new farm entrants.

The importance of the above factors varies. Table 17 provides a weighting for each of these that was proposed at the workshop. The weightings were considered to be within a range of 0.5 (mildly important) to 1.5 (very important).

**Table 17 Dwelling entitlement impacts – assessment of weighting**

Factor	Weighting
Fragmentation and/or loss of agricultural land from unsuitable settlement minimised	1.5
Environmental impacts of rural settlement minimised	0.9
Agricultural land valued for its agricultural potential	1.2
Agriculture can respond to variability in climate, commodity prices and externalities	1.4
Avoid land use conflict	1.4
New entrants to farming	0.6

The consultants considered a range of potential lot sizes that investors might consider for intensive plant agriculture that would require a dwelling entitlement. We compared lot sizes of 20, 40, 100 and 200 hectares and assessed what impact each lot size would have on the additional socio-economic factors outlined in Table 16. These impacts were given a score between 1 (low chance of meeting the required outcome) and 10 (high chance of meeting the required outcome). The justification for the scores are provided in Table 18. Raw scores are suggested in Table 19 and adjusted with the weightings from Table 17 to provide weighted scores in Table 20.



**Table 18 Dwelling entitlement impacts – scoring rationale**

Factor	Score Assessment
Fragmentation and/or loss of agricultural land from unsuitable settlement minimised	Lot sizes of 100ha and 200ha have minimal risk of fragmentation and loss of agricultural land and thus receive a score of '10'. 20ha and 40ha lot sizes have increased potential to result in loss and fragmentation of land with scores of '5' and '7' respectively (Table 19).
Environmental impacts of rural settlement minimised	Likely to have negative impacts for the 20ha area only.
Agricultural land valued for its agricultural potential	Land area of 200 ha was considered to have a maximum score of '10' with smaller land areas assigned progressively lower scores.
Critical mass of farms maintained	Smaller lot sizes are likely to encourage a higher number of entrants to a particular type of intensive plant production and thus increase numbers who might be interested in also investing in central marketing facilities.
Agriculture can respond to variability in climate, commodity prices and externalities	Agriculture will continue to face a cost:price 'squeeze' with smaller farms being less resilient. Scores increased from smaller to larger lot size.
Avoid land use conflict	Scores were graded from low for smaller lot sizes to high for larger lot sizes.
New entrants to farming	Smaller areas will be more affordable for new entrants and therefore 20ha has the highest score. However, it should be noted that new entrants have the option of not purchasing land as leasing, contracting and sharefarming is available.





**Table 19 Dwelling entitlement impact (raw score)**

Criteria	Minimum Lot Size (ha)			
	20	40	100	200
<b>Biophysical</b>				
Loss and fragmentation of agricultural land from unsuitable settlement minimised	5	7	10	10
Environmental impacts of rural settlement minimised	8	10	10	10
<b>Economic</b>				
Agricultural land valued for its agricultural potential	10	4	5	6
Critical mass of farms maintained	3	9	8	7
Agriculture can respond to variability in climate, commodity prices and externalities	5	8	9	10
<b>Social</b>				
Avoid land use conflict	5	8	9	10
New entrants to farming	10	9	7	5
<b>Total</b>	<b>46</b>	<b>55</b>	<b>58</b>	<b>58</b>

The weighted scores (Table 20) indicate that 20 ha is the least favourable lot size for intensive plant agriculture with a dwelling entitlement while 200 ha is the most favourable. The difference between 20 ha and 40 ha is 13 points; between 40 ha and 100 ha is six points; and between 100 ha and 200 ha is two points. The marginal difference declines markedly above 100 ha lot size.

GHD recommends a minimum lot size of 40 hectares within the intensive plant zone that also enables a dwelling entitlement.

It should be noted that this analysis is largely subjective and subject to differing interpretations by users. However, it is built on sound criteria for protecting agricultural land for the future but also recognising the benefits of attracting entrepreneurs to the shire to take advantage of the favourable resource conditions for viable intensive plant agriculture.

If 40 ha is chosen as a minimum lot size for a dwelling entitlement for intensive plant agriculture, it is important to understand the potential lot yield that would result if all land available for subdivision was actually subdivided. If this yield is proven to be excessive, limits to subdivision will be required, for example using a Development Control Plan. These issues are discussed below.



**Table 20 Dwelling entitlement impact (weighted score)**

Criteria	Weighting	Minimum Lot Size (ha)			
		20	40	100	200
<b>Biophysical</b>					
Loss and fragmentation of agricultural land from unsuitable settlement minimised	1.5	7.5	10.5	15	15
Environmental impacts of rural settlement minimised	0.9	7.2	9	9	9
<b>Economic</b>					
Agricultural land valued for its agricultural potential	1.2	3.6	4.8	6	7.2
Critical mass of farms maintained	1.1	11	9.9	8.8	7.7
Agriculture can respond to variability in climate, commodity prices and externalities	1.4	7	11.2	12.6	14
<b>Social</b>					
Avoid land use conflict	1.4	7	11.2	12.6	14
New entrants to farming	0.6	6	5.4	4.2	3
<b>Total</b>		<b>49</b>	<b>62</b>	<b>68</b>	<b>70</b>

## 6.1 Lot yield from a 100 ha minimum lot size

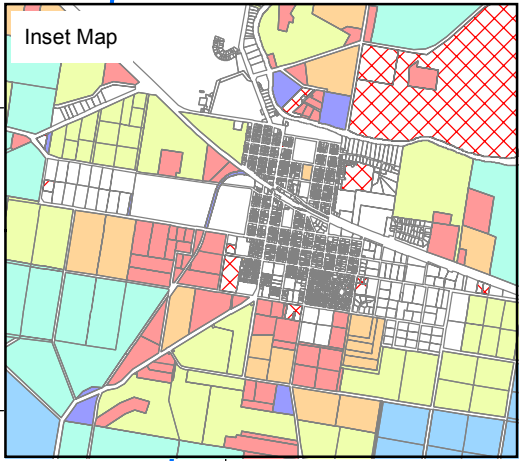
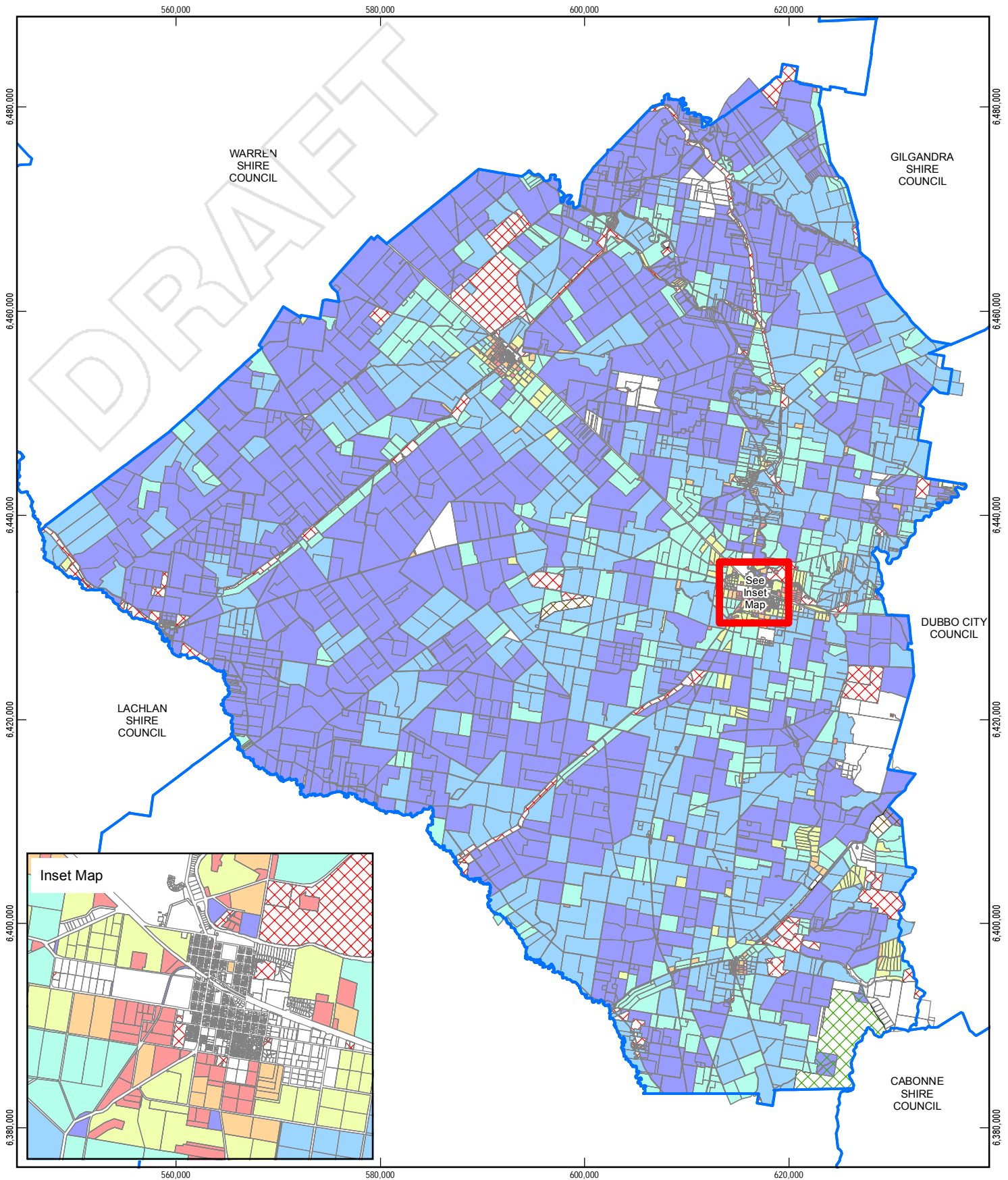
### 6.1.1 Current holdings analysis (RU1 Zone)

Holdings data was supplied by Narromine Shire Council and is summarised in Table 21 and spatially in Figure 14 for land zoned as RU1 Primary production. There are 1,084 holdings and of these 35% are less than 100 ha in size although these 35% of holdings comprise only 1% of the total land area. Around 85% of the total land area is contained in holdings larger than 400 ha in size.

**Table 21 Holdings analysis RU1 Zone**

Holding size	No. of Holdings	Proportion of Holdings %	Total Area (ha)	Proportion of area %	Average Holding Size (ha)	Median Holding Size (ha)
<= 20ha	213	20%	1,319	0%	6.2	4.3
20-40ha	59	5%	1,756	0%	29.8	29.3
40-100ha	108	10%	6,401	1%	59.3	52.7
100-400ha	247	23%	59,560	13%	241.1	246.1
400-800ha	259	24%	147,475	31%	569.4	545.1
>800ha	198	18%	259,026	54%	1308.2	1052.6
<b>Totals</b>	<b>1,084</b>	<b>100%</b>	<b>475,538</b>	<b>100%</b>		

The holdings analysis maps (Figure 14 and Figure 15) show that holdings sizes less than 100 ha are more predominant within close proximity to the towns of Narromine and Trangie. The larger holdings in the Narromine LGA are located to the west of Narromine towards Trangie where they are linked with the irrigation schemes and also have access to water sources from the Macquarie River.



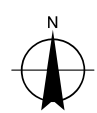
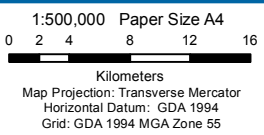
**LEGEND**

- RU1 Zoned Holdings**
- < 20 ha
  - 20 - 40 ha
  - 40 - 100 ha

- 100 - 400 ha
- 400 - 800 ha
- > 800 ha

- Local Government Areas
- Cadastre

- Unmatched Lots - Crown Land
- National Parks
- State Forests



Narromine Shire Council  
Narromine Rural Lands Strategy

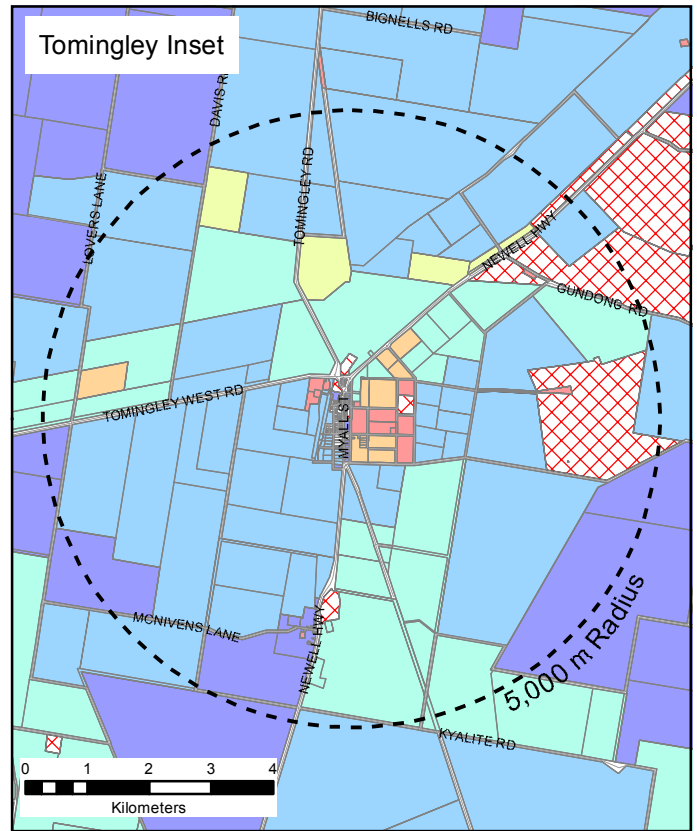
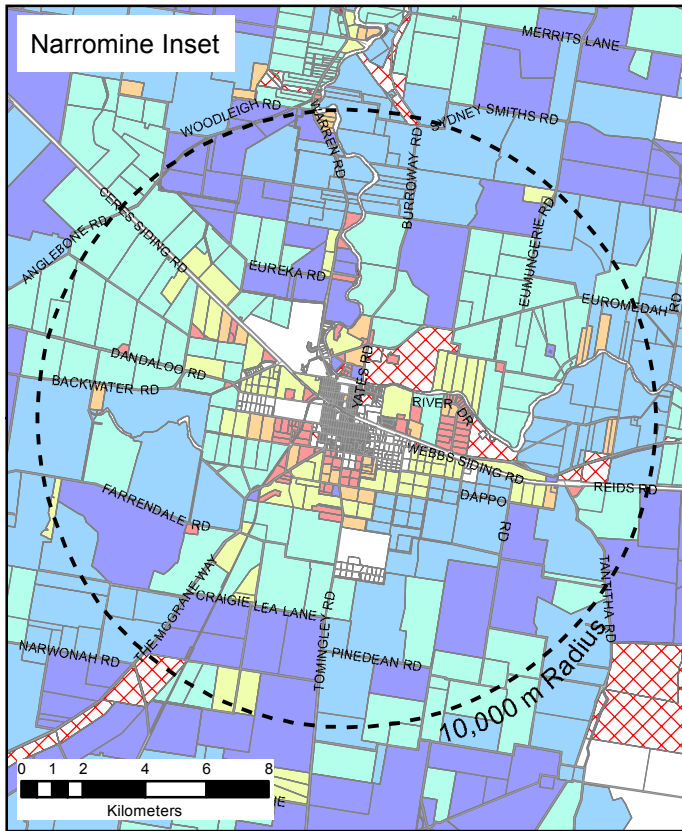
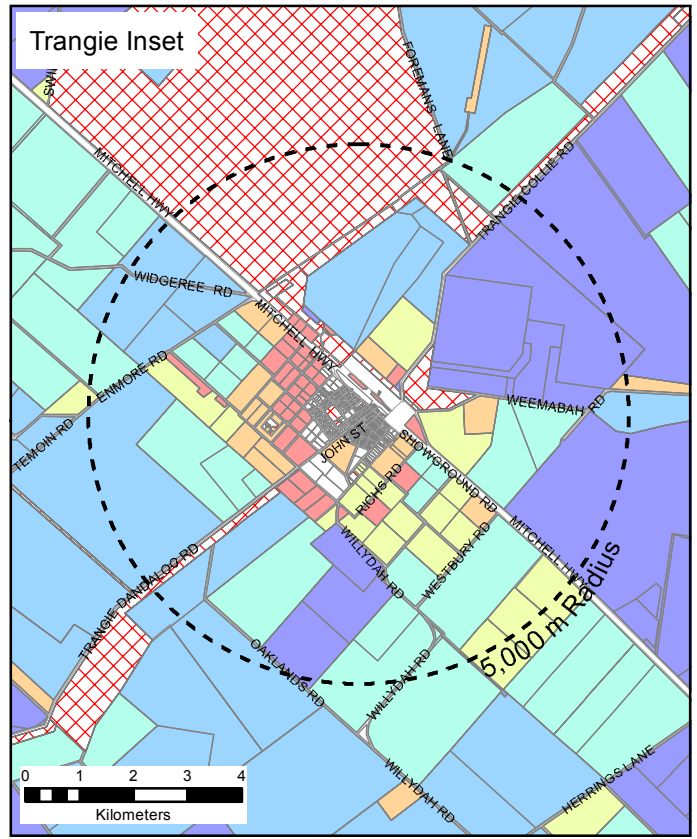
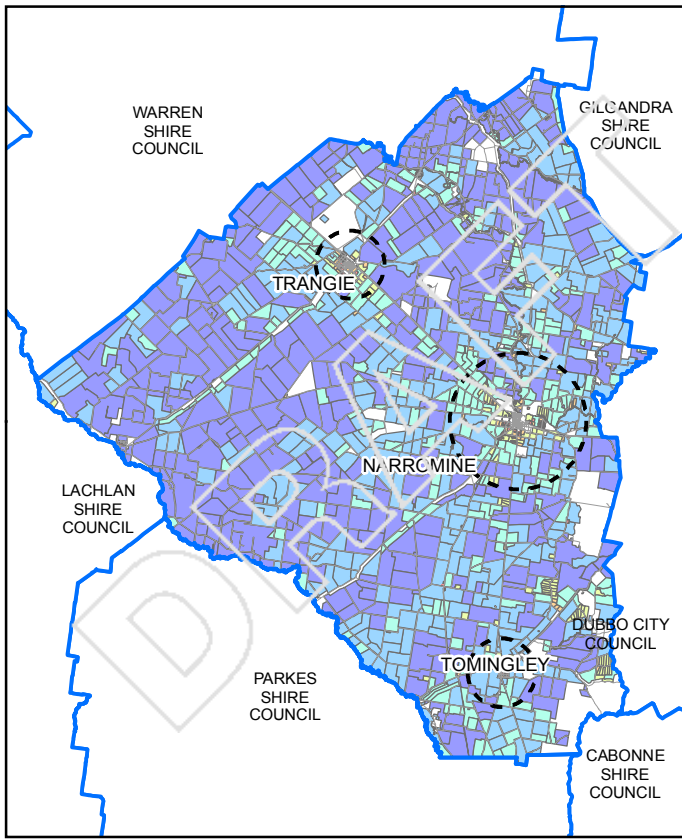
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Revision A  
Date 03 Feb 2012

**Narromine Shire Council  
RU1 Zoned Holdings Sizes**

**Figure 14**

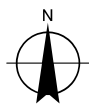
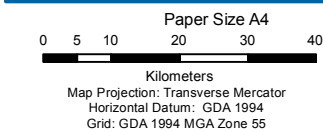
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Data source: Narromine Shire Council: Holdings, LGA Boundaries - 2012. Created by:mabarnier





**LEGEND**

<b>RU1 Zoned Holdings</b>	100 - 400 ha	Surrounding Councils
< 20 ha	400 - 800 ha	NARRAMINE
20 - 40 ha	> 800 ha	Town Buffer Circles
40 - 100 ha		Unmatched Lots - Crown Land



Narramine Shire Council  
Narramine Rural Lands Strategy

Job Number | 22-16054  
Revision | A  
Date | 03 Feb 2012

Narramine Shire Council  
RU1 Zoned Holdings Sizes

Figure 15

### 6.1.2 Lot yields in the intensive plant zone with 40 ha and 100 ha MLS

The above data was used to determine the lot yield from a 40 ha and a 100 ha MLS within the opportunity zone for intensive plant agriculture as described in Figure 13. The analysis indicated the potential for 1,065 additional lots with dwelling entitlements at a MLS of 40 ha, and the potential for 283 additional lots if a MLS of 100 ha is considered.

The theoretical net yield of applying either a 40 ha or 100 ha MLS is unlikely to be achieved based on past experience of only four subdivision applications for intensive plant agriculture in the shire since 2004.

In addition, there is a need to avoid development applications for subdivision of 40ha or 100ha lots without a clear intention that the lots will be used for intensive plant agriculture (ie rural residential by stealth). It is proposed that this can be achieved through the inclusion of suitable clauses within the LEP for the intensive plant zone and additional restrictions within a DCP if required.

## 6.2 Intensive Plant Agriculture Zone

It is recommended that under the Narromine LEP (2011) an RU4 Primary Production – Small Lots zone be created with appropriate objectives and land uses that shape the long term future use of this land. The extent of the RU4 Zone would be as described in the opportunity map (Figure 13). The Lot Size Map should be amended to show the area of RU4 as having a minimum lot size of 40 ha. Suggested LEP subdivision and dwelling clauses are described below.

### 6.2.1 Subdivision clause

The following is an option for a new clause in the Narromine LEP 2011.

#### **Clause X.X Rural subdivision for intensive plant agriculture with a dwelling**

1. *The objectives of this clause are as follows:*
  - a) *To apply controls on subdivision which is intended to include an associated dwelling, to avoid land being used for non-sustainable intensive plant agriculture.*
2. *This clause applies to the following rural zones:*

*RU4 Primary Production Small Lots*
3. **Land in a zone to which this clause applies may, with development consent, be subdivided for the purpose of intensive plant agriculture to create a lot of a size that is consistent with the minimum size shown on the Lot Size Map in relation to that land.**
4. *However, such a lot cannot be created if an existing or new dwelling house would as a result of the subdivision, be situated on the lot unless the consent authority is satisfied that:*
  - b) *The land is being or will be used for the purpose of intensive plant agriculture and,*
  - c) *The quality and area of the land is suitable for the commercial production of the proposed or existing intensive plant agriculture use and,*
  - d) *The dwelling house is required to support the carrying out of any such purpose, and*

- e) *The land is subject or will be subject to irrigation requiring a licence under the Water Act 1912 or Water Management Act 2000 and the volume and entitlement of water available under this licence is adequate of the proposed use. The licence should be either a High Security surface water licence or a Groundwater licence.*
- f) ***Services for the supply of electricity and other infrastructure to support the agricultural activity are available or adequate arrangements have been made to make them available when required.***
- g) ***the sustainable intensive plant agriculture activity must have commenced or been established before the subdivision is registered.***

*Note. The SEPP (Rural Lands) 2008 and the Department of Primary Industries 'Assessing Intensive Plant Agriculture Developments' sets out other relevant issues for consent authorities to consider when assessing intensive plant agriculture applications.*

## **6.2.2 Dwelling clause**

This would be a revision of clause 4.2B in Narromine LEP 2011.

### **4.2B Erection of dwelling houses on land in certain rural and environmental protection zones**

*(1) The objectives of this clause are as follows:*

- (a) to minimise unplanned rural residential development,*
- (b) to enable the replacement of lawfully erected dwelling houses in rural and environmental protection zones.*

*(2) This clause applies to land in the following zones:*

- (a) Zone RU1 Primary Production,*
- (b) Zone RU4 Primary Production Small Lots*
- (b) Zone E3 Environmental Management.*

*(3) Development consent must not be granted for the erection of a dwelling house on land in a zone to which this clause applies, and on which no dwelling house has been erected, unless the land is:*

- (a) a lot that is at least the minimum lot size specified for that land by the Lot Size Map, or*
- (b) a lot created under an environmental planning instrument before this Plan commenced and on which the erection of a dwelling house was permissible immediately before that commencement, or*
- (c) a lot resulting from a subdivision for which development consent (or equivalent) was granted before this Plan commenced and on which the erection of a dwelling house would have been permissible if the plan of subdivision had been registered before that commencement.*

*Note. A dwelling cannot be erected on a lot created under clause 9 of State Environmental Planning Policy (Rural Lands) 2008 or clause 4.2.*



*(4) Despite subclause (3), development consent may be granted for the erection of a dwelling house on land to which this clause applies if:*

*(a) there is a lawfully erected dwelling house on the land and the dwelling house to be erected is intended only to replace the existing dwelling house, or*

*(b) the land would have been a lot referred to in subclause (3) had it not been affected by:*

*(i) a minor realignment of its boundaries that did not create an additional lot, or*

*(ii) a subdivision creating or widening a public road or public reserve or for another public purpose.*

*(5) Despite any other provision of this clause, development consent must not be granted for the erection of a dwelling house on land within Zone RU4 unless the consent authority is satisfied that:*

*(a) The land is being or will be used for the purpose of intensive plant agriculture and,*

*(b) The quality and area of the land is suitable for the commercial production of the proposed or existing intensive plant agriculture use and,*

*(c) The dwelling house is required to support the carrying out of any such purpose, and*

*(d) The land is subject or will be subject to irrigation requiring a licence under the Water Act 1912 or Water Management Act 2000 and the volume and entitlement of water available under this licence is adequate of the proposed use.*

*(e) Services for the supply of electricity and other infrastructure to support the agricultural activity are available or adequate arrangements have been made to make them available when required.*

*(f) The sustainable intensive plant agriculture activity must have commenced or been established over XX% of the lot before the dwelling house is [approved] or [commenced] (Council to insert appropriate % or works).*

### **6.3 Additional intensive plant agriculture DCP**

Additional conditions that could be included in a DCP are outlined below (note that the DCP controls would be triggered only where a dwelling entitlement is envisaged):

- ▶ The proponent completes a Property Development Plan (PDP) outlining the development with relevant information on crop type, production, infrastructure, plant & equipment, and marketing.
- ▶ A development application will be required for a dwelling and it will be contingent on the following aspects in the PDP being addressed:
  - All access roads are clearly identified and constructed to Council's requirements;
  - At least 75% of the irrigation system for the initial stage of development is in place;
  - At least 75% of all the required on site machinery and plant is purchased;
  - All storage space for half of the overall development is to be completed;
  - All earthworks for half of the overall development is to be completed;
  - All plants or seeds required for half of the overall development are purchased or contracts in place for their purchase.





- Energy sustainability issues
- A designated building envelope (consider access, flood, fire, sewage) is identified that does not negatively impact on the viability of the intensive plant enterprise or neighbouring enterprises.

The above will limit subdivision to those who are genuine about intensive plant agriculture and largely remove the risk of land being subdivided principally for residential purposes.



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Appendix A

# Development Control Plan No.5

Intensive Plant Agriculture



# Intensive Agriculture



**Narromine Shire Council  
Development Control Plan No. 5  
Intensive Agriculture**



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## **1.0 INTRODUCTION**

Historically, planning provisions for agriculture within the Narromine Shire local government area were very general and were based on traditional grazing and cropping type agricultural uses. However as agricultural land uses differ in their requirements for resources such as water, soils and land area in order to be financially viable and sustainable they cannot be treated as homogenous from a land use planning perspective.

Holding sizes are to be appropriate for the use of the land in terms of the area required to accommodate the agricultural activity, required infrastructure and access arrangements. To ensure that the impacts of a particular agricultural activity remains on the land and to protect it from external effects, the holding must also have adequate area so that adequate buffer distances can be provided between the agricultural activity and adjoining land uses. Traditional forms of farming require larger holdings in order to be financially viable and sustainable, whereas other more intense types of agriculture may require less land area.

This plan supports the notion that dwelling houses on rural land are to be substantiated on economic, environmental and social grounds as necessary to fully realise the agricultural potential of the land.

This plan does not support unnecessary non-agricultural improvements to properties, which artificially increases rural land values.

## **2.0 NAME OF PLAN**

This plan is named Narromine Shire Council Development Control Plan No. 5 - Intensive Agriculture.

## **3.0 DATE OF COMMENCEMENT**

Council adopted this plan on 19 November 2002 (Resolution No 2002/456).

This plan commenced on the date that Amendment No. 2 to Narromine Local Environmental Plan 1997 was gazetted. This being the 11 June 2004

## **4.0 RELATIONSHIP TO OTHER PLANS**

The Local Environmental Plan (LEP) applying to the land is Narromine Local Environmental Plan 1997 (as amended).

This Development Control Plan (DCP) supports the provisions of the Narromine Local Environmental Plan 1997 (as amended), by providing more detailed provisions comprising development control objectives, guidelines, standards and performance criteria.

As required by the Environmental Planning & Assessment Act 1979, the Council must take the provisions of this Development Control Plan into account when considering development applications. However, the Development Control Plan is a performance-based statutory document and it will be applied having regard to the individual merits of each development application. Where the Development Control Plan is inconsistent with the Narromine Local Environmental Plan 1997 (as amended), the latter will prevail.

In circumstances where there may be any inconsistency between the requirements contained in this plan and Council Development Control Plans No.3 (Exempt Development) and No. 4 (Complying Development), the provisions of this plan will prevail.

## 5.0 LAND TO WHICH THIS PLAN APPLIES

This plan applies to all land within the Narromine Shire local government area that is within Zone No 1(a) (General Rural) as shown on the Narromine Local Environmental Plan 1997 maps titled: "Narromine Shire", "Trangie and Environs, Tomingley" and "Narromine and Environs".

## 6.0 DEFINITIONS

**Agriculture** means:

- (a) the cultivation of crops, including cereals, fruit and vegetables and flower crops, or
- (b) the keeping or breeding of livestock, bees or poultry or other birds for commercial purposes but, does not include intensive agriculture, intensive livestock keeping establishments or anything otherwise separately defined in this plan.

**Existing Holding** means

- (a) except as provided by paragraph (b), the whole area of a lot, portion or parcel of land as it was on 24 February 1989, or
- (b) where, on 24 February 1989, a person owned 2 or more adjoining or adjacent lots, portions or parcels of land, the aggregation of all of those lots, portions or parcels as they were at that day; or
- (c) land that forms a whole of an existing holding as it was on 24 February 1989 and is identified in a Public Register held in the office of the Council and confirmed in writing by Council that the land is an existing holding.

**Economic Sustainability:** the ability of a business or practice to maintain a reasonable income over an agreed business or practice lifetime. **Note:** reasonable income may be interpreted as being capable of supporting an average household, considering median household income in the Narromine Local government Area at the time, as determined by the Australian Bureau of Statistics (ABS).

**Environmental Sustainability:** the ability of an area or existing holding of or land parcel to retain its value in terms of the biophysical environment over an agreed business or practice lifetime.

**Forestry** includes arboriculture, silviculture, forest production, the cutting, dressing and preparation, otherwise than in a sawmill, of wood and other forest products and the establishment of roads required for the removal of wood and forest products and for forest protection.

**Holding** means one (1) or more adjoining allotments under the same ownership.

**Intensive agriculture** means:

- (a) a place or building used predominantly for the economically, environmentally and socially sustainable commercial production of fibre, flowers, fruits, mushrooms, pastures or fodder, timber, turf, vegetables, viticulture or the like, where production is usually beyond the natural capability of the land involved; or
- (b) the commercial keeping or breeding (or both) of livestock which are substantially dependent on high quality forage, such as horse studs or similar enterprises,

but does not include animal boarding or training establishments or intensive livestock keeping establishments.

**Property Development Plan (PDP)** means a plan prepared for a specific holding of land, which outlines how the land is to be developed and used for an economically, environmentally and socially sustainable agricultural undertaking. A Property Development Plan where referred to in this plan is to be prepared in accordance with Narromine Development Control Plan No.5 – Intensive Agriculture as adopted by Council on 19 November 2002.

**Rural worker's dwelling** means a dwelling:

- (a) located on a parcel of land on which a dwelling house is or is intended to be located, and
- (b) used as the principal place of residence by persons employed in a rural occupation conducted on that land.

**Social Sustainability:** the ability of land to retain its inherent characteristics and significance over time in terms of its historical links to the past, aboriginal and european heritage considerations and archaeology on the site.

**Vacant Land** means land devoid of dwellings



## 7.0 AIMS AND OBJECTIVES

The general aim of this plan is to ensure that the aims and objectives of the Narromine Local Environmental Plan 1997 (as amended) are achieved in relation to development of the land to which this plan applies.

The objectives of this plan are:

- To ensure that the development of rural land maximises the long-term sustainability of agriculture and its resource base in the Narromine Shire; and
- To ensure that intensive agricultural development within Narromine Shire is developed in a manner that is sustainable into the future; and
- To establish development controls that take into consideration environmental attributes and the agricultural potential of rural land; and
- To provide a performance based criteria for assessing proposed rural subdivisions or dwelling houses associated with intensive agriculture; and
- To provide transparent and consistent development control guidelines for the development of rural land within Narromine Shire.

## 8.0 PROPERTY DEVELOPMENT PLANS

### 8.1 What is a Property Development Plan?

A Property Development Plan (PDP) is a plan prepared specifically for an individual holding to assist in the justification of various forms of development within Zone 1(a) General Rural.

A PDP combines the environmental, economic and social assessment of a property's suitability and capability in supporting a specific development proposal. The PDP must prove that the intensive agricultural activities to take place on the land are economically, environmentally and socially sustainable. A PDP also outlines the planning, implementation and sustainable management of a development proposal.

A PDP is to accompany development applications for certain subdivisions or for obtaining permission to erect a dwelling house associated with an intensive agricultural land use where required by Amendment 2 to the Narromine Local Environmental Plan 1997.

A PDP is to assist in demonstrating to Council that the aims and objectives of the Narromine Local Environmental Plan 1997 (as amended) and this DCP can be achieved by the proposed development.

A PDP to support a development application is to be in an A4 typed and stapled format with clear headings for each section. Supporting information is to be included as appendices to the PDP. The use of photos and diagrams is encouraged.

As some of the information contained in a PDP regarding financial details is confidential, the PDP should contain a summary of the applicant's financial details, but include the detailed information as an appendix and marked "Confidential". This will ensure that such information is not made public. Such information may however be referred to other government authorities or consultants of Council but only for the purpose of assessing an application.

## **8.2 Who Is To Prepare A Property Development Plan?**

A PDP where required by the Narromine Local Environmental Plan 1997 (as amended) is to be prepared by an appropriately qualified consultant/s or is to be certified by such consultant/s.

The consultant/s will need to possess tertiary qualifications in agricultural sciences and/or land management, have at least 2 years practical experience in that field, and be a member or eligible to be a member of a professional agricultural, natural resources management or land use planning association that has a code of ethics.

A number of other professional consultants may also be required in obtaining the required information for the PDP.

Suitable details of all consultants used are to be included as an appendix of the PDP in order to determine compliance with this plan.

The PDP must also include a written-signed statement by the suitably qualified consultant/s advising of their involvement in the preparation of and/or certification of the PDP and stating that the consultant has no vested interest in the proposal.

To assist in the drafting of the PDP, it is recommended that the consultant complete the 'PDP Checklist' at Appendix A to ensure all required components of the PDP have been addressed.

## **8.3 What Information Is To Be Provided In A PDP**

### **8.3.1 The Proposed Development**

The PDP is to provide a detailed description of the operation carried out or proposed for the site, outlining the processes and seasonal operations involved. This description is to include the inputs and outputs of the operations.

Justification of why any proposed dwelling house may be essential to the operations of the site is also to be clearly outlined by the PDP.

Photographs, diagrams, flow charts or the like are encouraged for inclusion in the report to illustrate the processes of the operations.

### **8.3.2 Site Analysis Plan**

The site analysis plan provides a useful tool for the proponent to ascertain the opportunities and constraints of the land and adjoining land for the proposed activity.

The content of the site analysis plan will depend on the nature and extent of the proposed development and the following list is a guide to the information that should be included within the plan:

- Lot numbers and Deposited Plan numbers
- Boundaries, easements and fences
- Topographic features such as contours, drainage, dams, watercourses and ridgelines
- North point
- Existing use of the land and adjoining lands
- Agricultural suitability
- Land capability
- Groundwater / aquifer details
- Flood prone areas
- Existing vegetation
- Existing dwellings, buildings and structures on the land and adjoining lands
- Existing and proposed access points and services such as power, roads, telecommunication, water, gas
- Prevailing seasonal winds
- Views from and to the site
- Sources of emissions such as noise, odour, dust etc
- Contaminated and potentially contaminated land, soils, fill and waste disposal areas
- Areas affected by land degradation i.e erosion, water logging, irrigation, landforming
- Archaeological and heritage sites
- Bushfire hazards

### **8.3.3 Soils**

The PDP is to include a soil survey identifying the soil types and soil capability of the land to support the existing or proposed agricultural activity and any likely impacts that may arise and how those impacts may be managed.

Such investigation should include but not be limited to the following:

- Horizon information and depth

A description of each horizon should include:

- Colour – an indicator of organic matter, iron compounds and aeration. It is also an indicator of the drainage of a soil and its nutrient content
- Structure- how well a soil handles the activity. Does it break into clods/aggregates or does it collapse on digging? How large are the clods/aggregates is important to determining plant growth.
- Texture – the proportion of gravel, sand and clay or silt in a soil
- Plant root distribution – an indicator of compaction
- Soil life – presence of earth worm tunnels, ant tunnels, beetle larvae chambers

If the soil is part of the resource base for agriculture, chemical soil tests should be undertaken to determine management requirements and suitability. Such tests should be routinely undertaken thereafter, to monitor changes. The frequency of monitoring is determined by the intensity of nutrient removal eg annual tests for crops while every few years for grazing. Such soil tests need to be planned, to allow a representative sample to be collected.

Laboratory tests should encompass the following (and should be carried out in a NATA accredited laboratory):

- pH (in water or Calcium Chloride)
- Cation Exchange Capacity (CEC)
- Exchangeable cations (Calcium, Magnesium, Potassium, Aluminium, Sodium), exchangeable Calcium Percentage and Exchangeable sodium percentage if sodicity is suspected
- Phosphorous (P) available and total (and method used)
- Nitrate Nitrogen ( $\text{NO}_3$ )
- Sulfur (mainly for pasture)
- Calcium magnesium ratio (Ca:Mg)
- Electrical Conductivity (EC1:5)
- Trace elements depending on what is proposed. A plant tissue test may be more helpful than a soil test.

It is advised that assistance be obtained in determining and assessing these results.

Using the above characteristics and values, an appraisal of the capability of the soil to the proposed use is to be undertaken. Operations such as tillage and water use, application and frequency should also be included in this appraisal.

An assessment of soil erosion potential and the impacts on ground and surface water quality should also be assessed.

For engineering works, earthworks and structures appropriate geotechnical investigations should also be undertaken.

Details of how potential impacts are to be addressed by the development should be outlined. These include sediment and erosion



control plans, and soil management practices appropriate to the particular land use.

#### **8.3.4 Vegetation**

The PDP is to outline the extent of Native Vegetation that will be removed as a result of the proposed development and the impacts that this may have on the existing habitat of Native Fauna and any effects that clearing may have on the vegetation system in the locality. Any proposed re-vegetation should be included in the PDP.

Where the proposed clearing meets or exceeds the thresholds of the Native Vegetation Conservation Act 1997 then consultation is required with the Department of Land and Water Conservation. The appropriate approvals must be obtained prior to any land being cleared.

The PDP should outline the risk of bushfires and the mitigation measures proposed.

#### **8.3.5 Surface Waters and Groundwater/Aquifers**

The PDP will identify the location of and a description of any rivers, creeks, dams, cowals, or other water sources that are situated on or adjacent to the property. The location and depth of any groundwater/aquifers are also to be identified.

Maps of an appropriate scale should be included showing any such water sources and/or groundwater/aquifers.

The PDP must consider the impacts of flooding and local flooding on the existing or proposed land use. This is to include the existing levels and estimated levels of flood water inundation impacts of the proposed development including any existing or proposed water storage or treatment facilities on the property.

The PDP is to analyse the likely impacts of the existing or proposed land use on surface and groundwater and the measures taken or proposed to minimise such impacts.

Impacts to be addressed, include but are not restricted to the following:

- (a) Change in groundwater/aquifer levels (depth to groundwater/aquifer)
- (b) Surface or groundwater contamination, from increased chemical and/or nutrient levels
- (c) Siltation of watercourses
- (d) Salinity

The PDP is to outline how any effluent, chemicals or contaminated water from the property will be treated and/or disposed of and detailing any approvals and licences required from any Government Authority or Council.

### **8.3.6 Water Supply**

The PDP is to specify that adequate provision for water has been made available to the site. This is to be achieved by providing the following:

- (a) Details of the quantity of water required by the proposed or existing land use.
- (b) Details of the quality of water required by the proposed development
- (c) Evidence that the required water allocation has been obtained and the source of that water. This will include all water licences obtained, as are required.
- (d) Details of any water storage facilities, including freshwater, tail water or contaminated water.
- (e) A statement of agreement to secure the water allocation to the site. This statement is to include how the water allocation is to be achieved.
- (f) An analysis showing the adequacy of the water quality, or details of how the water quality will be improved to the required standard.

### **8.3.7 Infrastructure/Plant**

The PDP is to list and describe all existing and proposed infrastructure and plant necessary for the operations of the proposed or existing activity of the site. This list should include but is not restricted to the following:

- (a) Specialised equipment and machinery
- (b) Specialised handling, processing and storage facilities
- (c) Fencing, buildings and other structures, yards, contour banks, dams, ground levelling and earthworks
- (d) Adequacy of access roads to the site and any required works
- (e) Layout and design of internal roads and loading and unloading areas
- (f) Adequacy of the electricity supply to the site and its distribution over the site. Also include any required upgrades.
- (g) Specialised irrigation or water system and its likely impact on waterways and aquifers.

The design and function details for the infrastructure and equipment required by the proposed or existing land use are also to be included.

### **8.3.8 Economic Function**

The PDP is to provide information relating to the financial position or a forecast of the current and proposed agricultural enterprises of the subject allotment to demonstrate to Council the integrity and longevity of the project.

In order to prove the financial integrity and longevity of a proposed agricultural enterprise, or for one that has been operating for less than 5 years, the PDP is to include but not be limited to the following information:

- (a) The total costs required for setting up the development including purchase of land, capital works, market research, professional advice and services, any other costs.
- (b) Planning, research and funding investigations which have been undertaken.
- (c) Costs that have already been outlaid or covered.
- (d) Written proof from the proponents financial institution of procurement of a loan or the availability of funds for financing the development.
- (e) How many people does or will the development employ or contract work out to, and anticipated associated costs.
- (f) A threat and strength business plan for five (5) years, showing the existing and proposed cash flows and projections of profits and losses. Note, some developments may require a longer time frame than five years to reach full production.
- (g) The staging of the development and any future expansions proposed.
- (h) A marketing strategy for the products including details of accessing markets and any contract arrangements, where they exist.
- (i) A contingency plan if income is less than anticipated.

In order to prove the financial integrity and longevity of an existing agricultural enterprise that has been operating for at least 5 years the PDP is to include the following information:

- (j) Cash flow statement over the last five years
- (k) Profit and loss Statement over the last five years

*\*\*Please note that information in this section may be confidential and if disclosed, could prejudice the commercial position of the person supplying the information. Therefore, any sensitive information will be treated in a confidential manner.*

### **8.3.9 Building Envelopes**

If a dwelling is proposed to be constructed on the allotment intended for intensive agriculture, the PDP must demonstrate that the property will contain a suitable sized building envelope, which:

- (a) Does not comprise prime crop and pasture land (except where no reasonable alternative exists); and
- (b) Is unlikely to adversely effect the existing and potential capability of the land and adjacent land to produce food, fibre or energy; and
- (c) Will be able to provide for on-site disposal of treated wastewater, in accordance with AS1547-1994 Disposal Systems for effluent, without causing any impacts on surface or ground water; and

- (d) Is not located in a floodway or watercourse; and
- (e) Will not be inundated by the adopted flood standard event, or is or will be protected by suitable flood mitigation measures, such as levee banks; and
- (f) Has access to adequate water supply for domestic and firefighting purposes; and
- (g) Has a slope of less than 18 degrees and is not subject to slope instability or mine subsistence; and
- (h) Has suitable vehicular access to a formed public road; and
- (i) Is not subject to contaminated or potentially contaminated land.

The PDP is to provide information and analysis to ensure that the above considerations have been adequately addressed.

The PDP should also include a site layout plan of the building envelope and diagrams and cross sections that show the following:

- (a) Location of existing or proposed buildings including any dwelling houses,
- (b) Vehicular access,
- (c) Fire mitigation measures including firebreaks and water storages,
- (d) Buffers from land uses internal and external to the property,
- (e) Any significant natural features in the landscape,
- (f) Effluent waste treatment and disposal system, and
- (g) Flood mitigation measures.

In the circumstances where approval is being sought for more than one dwelling house, Council will require that all dwelling houses must be on the same allotment and where possible all dwelling houses are to be located within the same building envelope.

### **8.3.10 Land Use Conflict Minimisation**

The PDP is to verify that the proposed development will not adversely impact on the land use of any adjoining land nor jeopardise the agricultural potential of any surrounding properties.

The PDP must demonstrate that the site is of adequate size to provide for any required buffers and for potential future expansion of the land use of the subject property. Consideration should also be made in relation to the existing and future land use of neighbouring land. Details of any proposed buffers, including their effectiveness, are to be provided.

Refer to Section 10.1 of this DCPP for some indicative separation distances between specified land uses.

### **8.3.11 Allotment Size**

The PDP is to provide a summary justifying that the size of all proposed allotments or existing allotments are suitable for the proposed development. This will be required for subdivisions of land that have an



area of less than 400 hectares where a dwelling house is or is intended to be located.

The PDP is to take into account all of the factors covered by this section in justifying the suitability of the allotment size for the proposed development.

### **8.3.12 Management and Impact of the Proposed Land use**

The proposed land use may impact on existing agricultural activities on the land and on surrounding land. Details of the assessment of impacts of the proposed use on other lands and proposed mitigation measures must be provided having regard to the following:

- Details of the agricultural practises
- Chemical use and stores, handling and application
- Visual intrusion, noise, odour and amenity
- Labour requirements and facilities including training required
- Land degradation potential impacts

### **8.3.13 Archaeology and Heritage**

To ensure compliance with statutory requirements Council may require the submission of an Aboriginal and / or European assessment of the subject land having regard to the impacts the proposed development may have on any archaeology or heritage.

### **8.3.14 Justification**

All the information provided in the PDP should then be summarised and a conclusion made in justifying the proposed land use and if required the need for an ancillary dwelling house and / or a rural worker's dwelling.

## **9.0 SUBDIVISION STANDARDS FOR INTENSIVE AGRICULTURE ALLOTMENTS**

Council will only consider a development application seeking consent to the subdivision of land for the purpose of a dwelling house ancillary to intensive agriculture on an allotment having less than 400 hectares if the information required in this plan is submitted to Council in the specified PDP format that justifies the proposed development.

Where a dwelling house exists or is proposed on the land the requirements of this section will need to be adhered to prior to receiving a Subdivision Certificate. The requisites outlined in section 10 will need to be addressed prior to construction of a dwelling house on an intensive agriculture allotment.

### **9.1 Buffers**

It is essential that the proposed intensive agricultural use of new allotments do not have any adverse impacts on the surrounding land use or potential land uses. In this regard adequate buffer areas are to be included in the proposed allotment and demonstrated to Council as being adequate for the proposed use and existing neighbouring uses.

Impacts are to be minimised by both responsible land use practices and by the use of suitable buffers. Buffers are essential where there is a potential for land use conflicts.

Buffers are to be created by setting aside a suitable area of land adjacent to the boundary of the property on which the intensive agricultural development is located.

The width of a buffer is determined by the nature of the likely impacts created by the use and by the effectiveness of the type of buffer to minimise such impacts.

Depending upon their width and purpose, buffer strips may be used for the following land uses:

- (a) Grazing and/or cropping
- (b) Revegetation/conservation areas
- (c) Timber plantings
- (d) Any other use deemed appropriate by Council or Government agencies

Council, in consultation with NSW Agriculture and Department of Land and Water Resources (DLWC) and the Environment Protection Authority (EPA), will determine the appropriateness of a proposed or existing buffer.

It is important that the type of buffer used will minimise any adverse impacts upon any neighbouring property.

Buffers assist in reducing the following impact of activities on neighbouring properties such as :

- (a) dust, and odours
- (b) excessive noise levels. A maximum of 5 decibels above the ambient background noise at the boundary of the property with the noise source is the limit not to be exceeded.
- (c) fumes or chemicals
- (d) chemical or nutrients from flowing across properties or into sensitive areas.
- (e) visual impacts
- (f) additional or altered stormwater flow.

NSW Agriculture recommends that the following minimum separation distances be provided and maintained between the specified land use and any residential use not associated with the specified land use.

Each application will be assessed on merit and the following table provides a **guide only** for the suggested minimum buffer distances and may be varied in order to address topographic, climatic and other considerations relating to the activity:-

Land use	Separation Distance
Diesel irrigation pumps	1000 m
Intensive cropping (fruit, nuts, vegetables)	500 m
Dairies	300 m
Hothouses	200 m
Cattle dips and cattle yards	200 m
Cropping (corn, soybeans etc)	200 m
Grazing	0-20 m

## 9.2 Building Envelopes

If a dwelling house is intended to be constructed on the allotment/s for intensive agriculture, the PDP is to demonstrate that the property will contain a suitably sized building envelope, which:

- (a) Does not comprise prime crop and pasture land (except where no reasonable alternative exists); and
- (b) Is unlikely to adversely affect the existing and potential capability of the land and adjacent land to produce food, fibre or energy; and
- (c) Will be able to provide for on-site disposal of effluent, in accordance with AS1547-1994 Disposal Systems for effluent, without causing any impacts on surface or ground water; and
- (d) Is not located in a floodway or watercourse; and
- (e) Will not to be inundated by the adopted flood standard or where suitable flood mitigation, such as levee banks, exist or are proposed; and
- (f) Has access to adequate water supply for domestic and firefighting purposes; and

- (g) Has a slope of less than 18 degrees and is not subject to slope instability; and
- (h) Has suitable vehicular access to a formed public road.

The PDP should also include a site layout plan of the building envelope and diagrams and cross sections that show the following:

- (a) Location of existing or proposed buildings including any dwelling houses,
- (b) Vehicular access,
- (c) Fire mitigation measures including firebreaks,
- (d) Buffers from land uses internal and external to the property,
- (e) Any significant natural features in the landscape,
- (f) Effluent waste treatment and disposal system, and
- (g) Flood mitigation measures.

In the circumstances where approval for more than one dwelling house is being sought, Council will require that all dwelling houses must be on the same allotment and where possible all dwelling houses are to be located within the same building envelope.

The PDP is to provide Council with adequate information to ensure that the abovementioned matters can be considered.

### **9.3 Access**

The developer must provide all weather vehicular access, from a Council road to the property boundary of each allotment created. Access must be either directly or by the creation of a right-of-carriageway over another allotment.

Council's minimum standard for access to each allotment from a Council road is a minimum 4-metre wide gravel roadway, constructed to a minimum of 100mm of gravel in thickness with suitable drainage crossings.

Where access is from a bitumen road Council will require a suitable entrance of full width bitumen seal for a distance of at least 5 metres from the roadway towards the property boundary.

Council will determine if it considers the proposed or existing access to the property to be adequate. Where access is off a highway or state controlled road Council will consult with the RTA regarding the suitability of the access location and entry design.

Internal access is to be provided to ensure the practical function of the land use and all weather access to any dwelling houses. Consideration should also be given to the impacts of dust on neighbouring dwelling houses.

### **9.4 Allotment Sizes**

Allotment size must be justified as being adequate for the existing or proposed use of the land and to allow for:



- (a) the economic, environmental and socially sustainable operation of the proposed land use, and
- (b) any possible future expansion or stages of the development, and
- (c) suitable buffers, and
- (d) an adequate sized building envelope.

Council will consult with NSW Agriculture in determining the adequacy of a proposed allotment size for a proposed or existing agricultural use. Where the use of a proposed allotment has not been determined, that allotment will require a separate future development approval for any dwelling houses.

## **9.5 Water**

Each proposed allotment is to have an allocation for water suitable for the particular proposed or existing use of the land.

Council will consult with NSW Agriculture to determine if the water allocations for the property are adequate for the particular proposed use. For proposed water allocations, the applicant is to provide Council with written evidence that adequate provisions for water are available and secured for the allotment.

Where Council development consent is obtained for the subdivision of land (that is less than 400 hectares on which a dwelling house has been justified), Council will impose a condition of consent ensuring that an adequate water allocation for the dwelling house, fire fighting purposes and the intensive agricultural activity will be available and secured to the land prior to the issue of the Subdivision Certificate.

## **9.6 Suitability of Site**

Council will consult with DLWC and NSW Agriculture in determining the suitability of a site for intensive agricultural development and for dwelling houses associated with such a use.

The suitability of the site for intensive agriculture will be determined by considering the contents of this DCP.

## **10.0 REQUISITES FOR DWELLING-HOUSES ASSOCIATED WITH INTENSIVE AGRICULTURE**

Council will only consent to the construction of a dwelling house on an allotment for intensive agriculture if:

- (a) Council is satisfied by a PDP that such a dwelling house is justified considering the economic, environmental and socially sustainable nature of the agricultural use of the land, and
- (b) Council is satisfied that the requisites outlined in this DCP have been met.

### **10.1 Access**

Access is to be provided from a public road to the location of the proposed dwelling house as outlined in section 10.3 of this DCP. The required access is to be completed prior to obtaining approval for the construction of a dwelling house.

### **10.2 Effluent Disposal**

Evidence is to be provided to Council that all effluent will be able to be treated and disposed of on site, or will be removed from the site.

Council will require the use of aerated on site effluent disposal systems, unless sufficient evidence is provided to support that the use of other systems, will not impact on any groundwaters/aquifers or surface water.

In this regard, a separate application will be required to be submitted to Council for approval of the on site waste management system in accordance with AS1547-1994 Disposal Systems for Effluent.

### **10.3 Established infrastructure**

Where Council is satisfied by a PDP that a dwelling house is ancillary to the proposed use, Council may impose certain conditions on the development approval requiring the establishment of the demonstrated financial commitment to the provision of the following infrastructure items. This demonstrated financial commitment towards the following infrastructure items must be established prior to receiving a Construction Certificate approval for a new dwelling house or prior to receiving a Subdivision Certificate where a dwelling house exists on land that is less than 400 hectares.

#### **Infrastructure Items:**

- (a) All access roads are constructed to Council's requirements;
- (b) Demonstration that all water allocations are obtained and secured;
- (c) At least 75% of the irrigation system for the initial stage of development is in place;

- (d) At least 75% of all the required on site machinery and plant is purchased;
- (e) All storage space for half of the overall development is in place;
- (f) All earthworks for half of the overall development is to be completed;
- (g) All plants, seeds, or livestock or other primary products required for half of the overall development are purchased or contracts in place for their purchase.

#### **10.4 Established Use**

Any required trial periods to monitor the success of a proposed development type are to be completed.

Proof by means of a contract or other that a market for the produce has been established.

Proof of financial commitment by means of a loan or financial statements showing availability of required funds for required development.

Where the dwelling house is deemed ancillary in the development of the land use, all other requisites are to be met prior to the Construction Certificate approval.

Council will consult with NSW Agriculture in determining if an existing use is deemed to be established to a level whereby it could support a dwelling house or would require a dwelling house for the efficient use of the land.

#### **10.5 Building Envelope**

A suitable building envelope is to be established, as outlined by section 10.2, prior to receiving a construction certificate approval for a dwelling house or a subdivision certificate for the subdivision.

#### **10.6 Water allocation**

Council will not consent to the erection of a dwelling house on an allotment used for intensive agriculture unless Council is satisfied that an adequate water allocation is available to the specific use of the allotment.

Council will impose conditions of development consent to ensure that a suitable water allocation has been secured.

## 11.0 CONSULTATIONS

### 11.1 Consultation with Council Staff

It is recommended that developers consult with Council staff early in the conceptual stage of the proposed development to ascertain Council requirements as to what information will be required and how the development application will be processed.

Developers are encouraged to use the services of qualified and practising professionals who are familiar with the requirements of the LEP and DCP in the preparation of Development Applications, PDP's and supporting information for intensive agriculture developments.

### 11.2 Government Agencies

Council will consult with NSW Agriculture and the Department of Land and Water Conservation (DLWC) regarding all applications for consent of:

- (a) subdivision for the purpose intensive agriculture, and/or
- (b) erection of a dwelling house ancillary to intensive agriculture, where such a development is proposed on land within Zone No 1(a) – (General Rural).

This requirement is reinforced in clauses 12(A) and 16 of the amending Narromine Local Environmental Plan No. 2: Intensive Agriculture.

Council will consult with any other State or Federal agency that may have an interest in the proposed development.

A copy of the DA and the PDP will be sent to each of the relevant agencies for comment. Council will take into consideration any comments made by the aforementioned agencies that are received by Council within 30 days from the date of referral.

Formal consultation with the state agencies as outlined by this plan is a separate process from Integrated Developments under the Environmental Planning and Assessment Act 1979, as amended.

### 11.3 Adjoining Neighbours

Council will notify all adjoining neighbours of any development applications lodged for a proposed intensive agricultural land use that involves:

- (a) intensive livestock keeping,
- (b) aerial application of chemical, or
- (c) changes to the natural flow of water through the property.

Council may notify adjoining neighbours of development proposals that Council believes may impact on adjoining neighbours, or their land.



Council reserves the right to determine if adjoining neighbours of a proposed development are notified, unless otherwise required by the Environmental Planning Assessment Act 1979, as amended or the Regulation.

Adjoining neighbours include all owners of properties that directly adjoin a property either by having common boundaries, being located across a road or by being diagonally across from a corner of the property.

Upon notification of a development application for intensive agriculture, adjoining neighbours will be given twenty one (21) days to view a copy of the DA and the PDP at Council's office and to make a written submission, if they wish.

Council will not disclose any private or confidential information contained within the DA or PDP.

Council in assessing and determining an application will take into consideration any written submission received within the specified time of the notification period.

All adjoining neighbours who make a written response regarding a DA will be notified of the determination of the DA.

## **12.0 BREACH OF THE ACT**

It should be noted that where a Council grants consent to a development application based on the contents of a PDP and the criteria contained in the PDP is not complied with, the landowner may be in breach of the development consent. Council may take action under the Environmental Planning and Assessment Act, 1979 as amended to have such matter rectified.

## APPENDIX A

### PROPERTY DEVELOPMENT PLAN (PDP) CHECKLIST

Have I included in the PDP:

Information regarding my relevant qualifications as a Consultant to prepare a PDP?

A written and signed statement advising of my involvement in the preparation and/or certification of this PDP and indicating I have no vested interest in this proposal?

A site analysis plan detailing the information provided in section 9.3.2 of this DCP?

Information regarding soil character and chemical analysis, as outlined in section 9.3.3 of this DCP?

Vegetation matters, such as how much vegetation (including grasses) are likely to be removed with the establishment of the business?

Information regarding surface waters and groundwaters / aquifers on the site and impacts of regional and local flooding on the development.

Details of water quality and quantity and water storage facilities required for the development.

A list and description of existing and proposed infrastructure and plant necessary for the operations of the existing or proposed activity on the site.

Details of the financial integrity and longevity of the project as detailed in section 9.3.8 of the intensive agriculture DCP.

Information on the building envelopes involved, including site layout plans, vehicular access, location of existing and proposed buildings, fire and flood mitigation measures, effluent waste treatment and appropriate buffers.

Minimisation of conflicts of adjoining land uses and associated buffers.

A summary justifying the size of all proposed allotments.

A statement regarding aboriginal and/or European site heritage, if relevant.

If the application is regarding subdivision for Intensive Agriculture, details of the standards outlined in section 10 of the Intensive Agriculture DCP.

If the application is regarding a dwelling house associated with intensive agriculture, details of the standards outlined in section 11 of the intensive agriculture DCP.

Written proof that the allotment has an adequate water allocation and/or license for both the farm activities and if necessary, a dwelling house.



Appendix B  
**Photos from Site Familiarisation**

Photos taken on Thursday 15 March, 2012

Photo 1: Olive plantation on Dappo Road, Narromine



Photo 2: Controlled environment infrastructure on the Eumungerie Road





Photo 3: Controlled environment production seed and nursery enterprise



Photo 4: 'Lime Grove' located on the Trangie Road





Photo 5: Citrus Plantation on the Warren Road



Photo 6: Swanes Roses located just off the Trangie Road



Photo 7: Citrus packing shed located in Manildra St, Narromine



Photo 8: Another citrus packing shed located on the Trangie Road







## GHD

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### Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1	J Lane & P Dellow	P Dellow	<i>P Dellow</i>	J Lane	<i>J Lane</i>	14.5.12
2	J Lane & P Dellow	P Dellow	<i>P Dellow</i>	K Burbidge	<i>K Burbidge</i>	25.5.12
3	J Lane & P Dellow	P Dellow	<i>P Dellow</i>	M Svikis	<i>M Svikis</i>	26.7.12
4	J Lane & P Dellow	P Dellow	<i>P Dellow</i>	M Svikis	<i>M. Svikis</i>	26.2.13