

Pasminco Site Masterplan Employment Land Use Assessment

PacLib Management

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1	Introduction	3
1.1	Aims and Objectives of Study.....	3
1.2	Site Context	4
1.3	Remainder of the Report	7
2	Strategic and Policy Perspectives	8
2.1	State Government Policy	8
2.2	Local Government Policies	10
2.3	Implications	12
2.4	Statutory Controls	13
3	Socio- Economic Context	16
3.1	Baseline Analysis.....	16
3.1.1	Population	16
3.1.2	Employment	18
3.1.3	Business Mix and Industry Specialisation	22
3.1.4	Creative Industries	28
3.2	Future Employment Growth	30
3.3	Synopsis	31
4	Lower Hunter Region Industrial Lands Market Analysis	32
4.1	Drivers of Industrial Growth.....	32
4.2	Current Supply of Employment Lands.....	34
4.3	Future Demand of Industrial Land.....	38
4.4	Development Prospects.....	41
5	Summary and Recommendations	43
5.1	Summary.....	43
5.2	Recommendations	44
	Appendix A - Forecasting Industrial Land Demand	46
	Appendix B - Floor space to Employee Ratios	50
	Appendix C – Floorspace to Land Area Ratios	51

Tables

Table 1.	Town Centre Profiles	11
Table 2.	Residential Population Lower Hunter	16
Table 3.	Age Projection 2006-2031, Lake Macquarie LGA	17
Table 4.	Key Labour Mark Indicators	18
Table 5.	Destination LGA for workers living in the Lake Macquarie LGA	19
Table 6.	Origin LGA for persons working in the Lake Macquarie LGA	20
Table 7.	Lower Hunter Region, Employment Change by Industry	24
Table 8.	Lake Macquarie, Employment Change by Industry	25
Table 9.	LQ Analysis Lower Hunter Region	26
Table 10.	Largest Sectors by Employment	26
Table 11.	LQ Analysis for Cardiff	27
Table 12.	Largest Sectors by Employment, Cardiff	28
Table 13.	Industrial Land Supply Lake Macquarie Council.....	34
Table 14.	New Industrial Release Areas, Land has been released, Lower Hunter Region	35
Table 15.	New Industrial Release Areas, Land has been released, Lower Hunter Region	36
Table 16.	Small Industrial Sites: Sydney, Wollongong and Newcastle	37
Table 17.	Land Values Per Square Metre	37
Table 18.	Industry Summary	44
Table 19.	Floorspace to Employee Ratios for Lake Macquarie LGA	50
Table 20.	Floorspace to Land Area Ratios for Lake Macquarie LGA.....	51

Figures

Figure 1.	Site Context.....	4
Figure 2.	Site Location, Existing Infrastructure	5
Figure 3.	Current Zoning	6
Figure 4.	Total Employment.....	7
Figure 5.	Regional Strategy, Major Regional Centres	9
Figure 6.	Working Age Population as percentage of total population, Lake Macquarie LGA	17
Figure 7.	Working Age Population Forecast 2001-2031 Lake Macquarie LGA.....	18
Figure 8.	Occupational Mix	21
Figure 9.	Qualifications of the Workforce	22
Figure 10.	Employment Distribution by Sector	23
Figure 11.	Creative Industries Lake Macquarie LGA	30
Figure 12.	Employment Growth over Time in Lake Macquarie LGA, 2006-2031	47
Figure 13.	Floorspace Requirements in Lake Macquarie LGA, 2006-2031	48
Figure 14.	Land Requirements in Lake Macquarie LGA, 2006-2031 (ha).....	49

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1 Introduction

PacLib Management is currently engaged in the Masterplanning process for the former Pasminco Cockle Creek Smelter Site. This study will inform the Masterplanning process in terms of possible uptake and users of employment land.

The subject site covers an area of approximately 218.2 ha and is located in Boolaroo, Lake Macquarie Local Government Area (LGA). The original Pasminco Cockle Creek smelter began operations in Boolaroo in 1897 as the Sulphide Corporation. The Pasminco smelter ceased operations on 12 September 2003 and Pasminco is since subject to deed of company arrangement. Due to the smelter operation, the land is heavily contaminated and a five year remedial action plan has been approved by the Minister for Planning on 27 February 2007. The remediation work is occurring in stages and it is planned that a parcel of land adjoining to the existing Cardiff Industrial Estate in the north east of the site will be remediated first and released as industrial zoned land.¹

1.1 Aims and Objectives of Study

SGS Economics and Planning was commissioned by PacLib Management to undertake an 'Employment Land Use Study' of the subject site. This assessment investigates the industrial land use opportunities of the subject site in November 2006. The key purpose/objectives of this study include:

- Review of available reports on Commercial and Employment Land Needs at the sub-regional and LGA level;
- Review of reports on centres strategies and the longer term demand for different employment land use including creative industries;
- Review of site attributes suitable to employment uses;
- Discussion of employment self containment issues;
- Preparation of a brief strategy for employment land uses on the site.

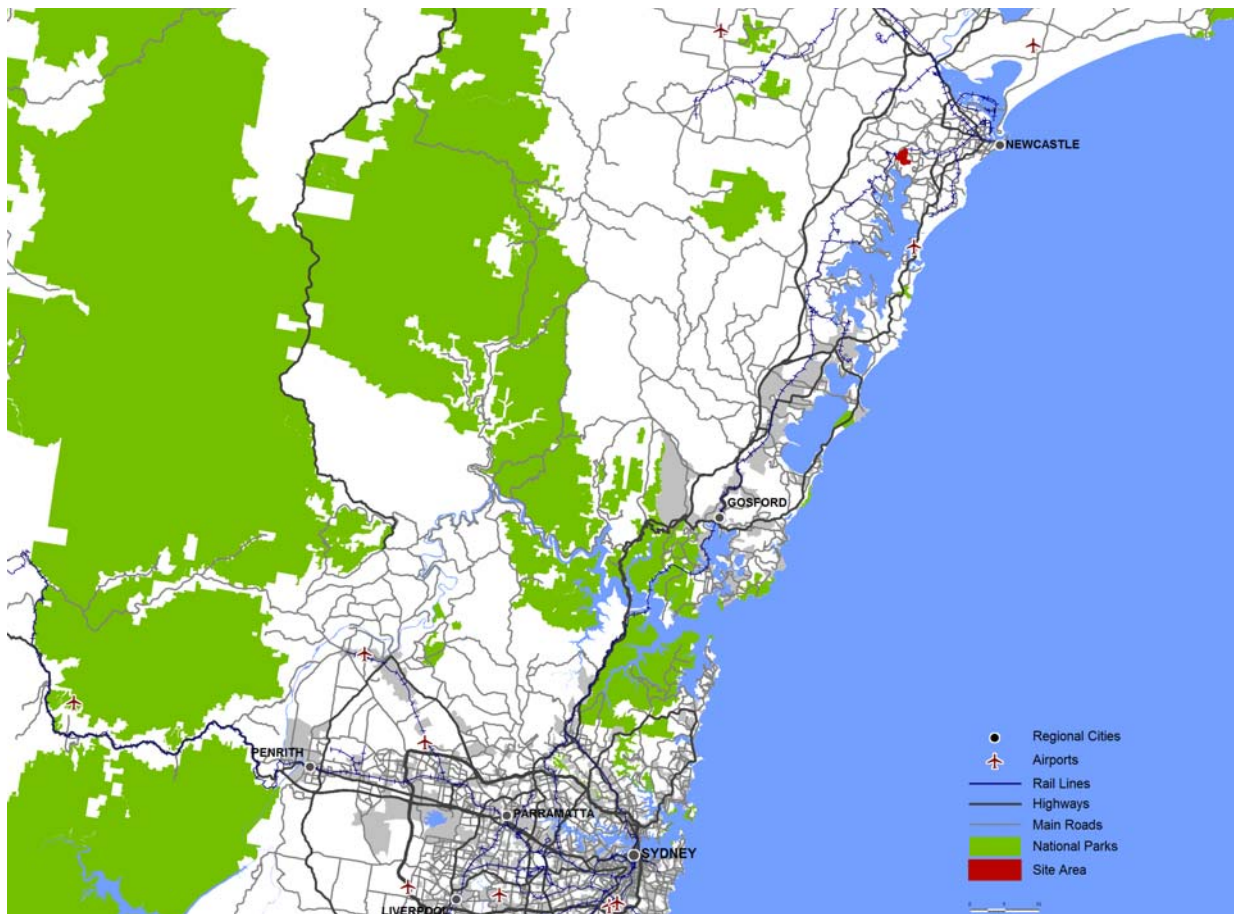
This 'Employment Land Use Assessment' has been prepared to address the above matters.

¹ Pasminco Cockle Creek Smelter, Community Report May 2007.

1.2 Site Context

The Pasminco Site is located at the northern end of Lake Macquarie in the suburb of Boolaroo within Lake Macquarie Council LGA and covers an area of 218.2 ha of land. The site is 130km north of Sydney, 65km north of Gosford and 17km south of Newcastle's Central Business District (CBD). Lake Macquarie is part of the Lower Hunter Region which further includes Newcastle, Maitland, Cessnock, and Port Stephens.

Figure 1. Site Context



Source: SGS 2007

Distance to Main Infrastructure

The Pasminco Site is located next to the established and sought after Cardiff Industrial Estate which was one of the first large scale light industrial areas in the Lower Hunter Region. The site is in close proximity to major arterial routes and other transport infrastructure such as train stations and airports:

- Distance to Williamtown Airport: ca 35 km (on main roads and highway);
- Distance to Newcastle Port: ca. 19 km on Charlestown Road and Pacific Highway;
- Distance to F3 Highway (Sydney Newcastle Freeway): ca. 9.5 km (on George Booth Drive);

- Distance to Pacific Highway: ca. 9.7 km (on Charlestown Road);
- Rail Stations: ca 750 m to Cockle Creek Station (from centre of the site), 2.4 km to Proposed Glendale Station (from the centre of the site);
- Glendale as well as Cardiff are also served by bus.

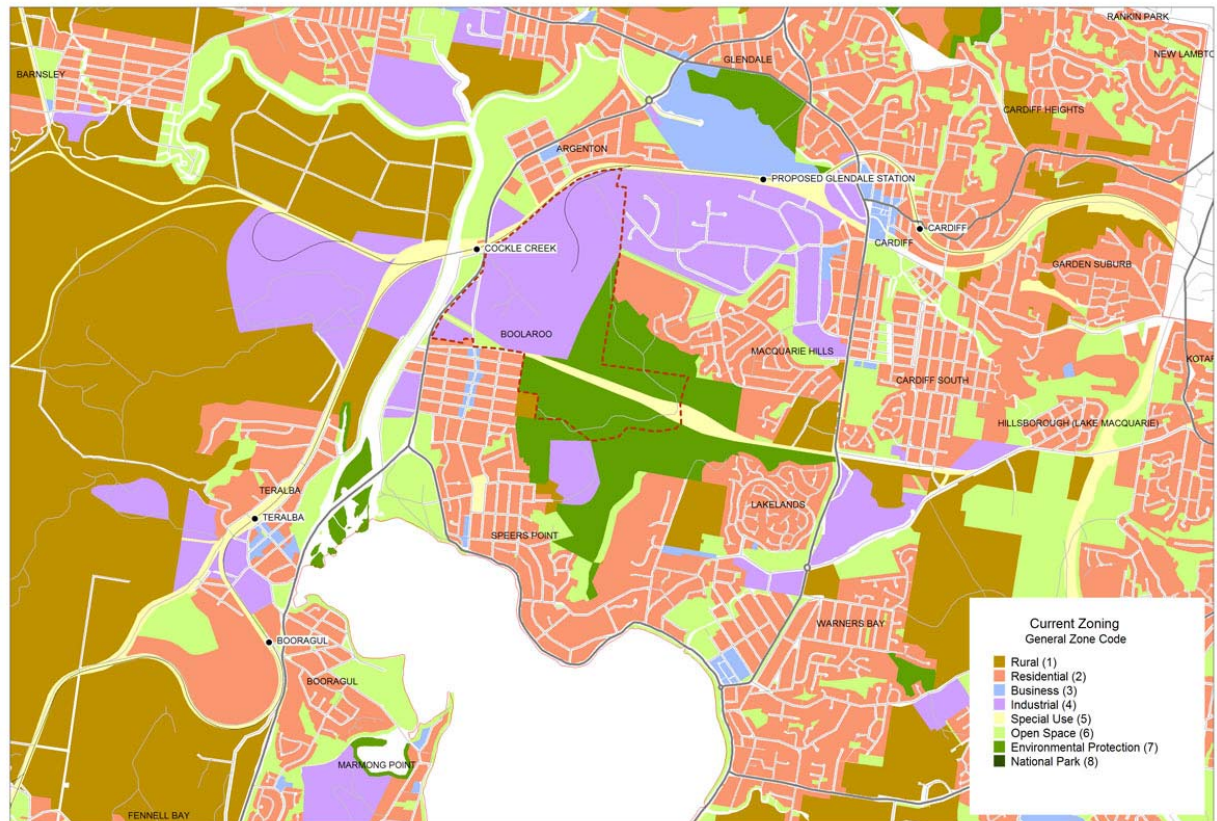
Figure 2. Site Location, Existing Infrastructure



Source: SGS 2007, © Copyright 2007, MapData Sciences Pty Ltd, PSMA.

Current Zoning

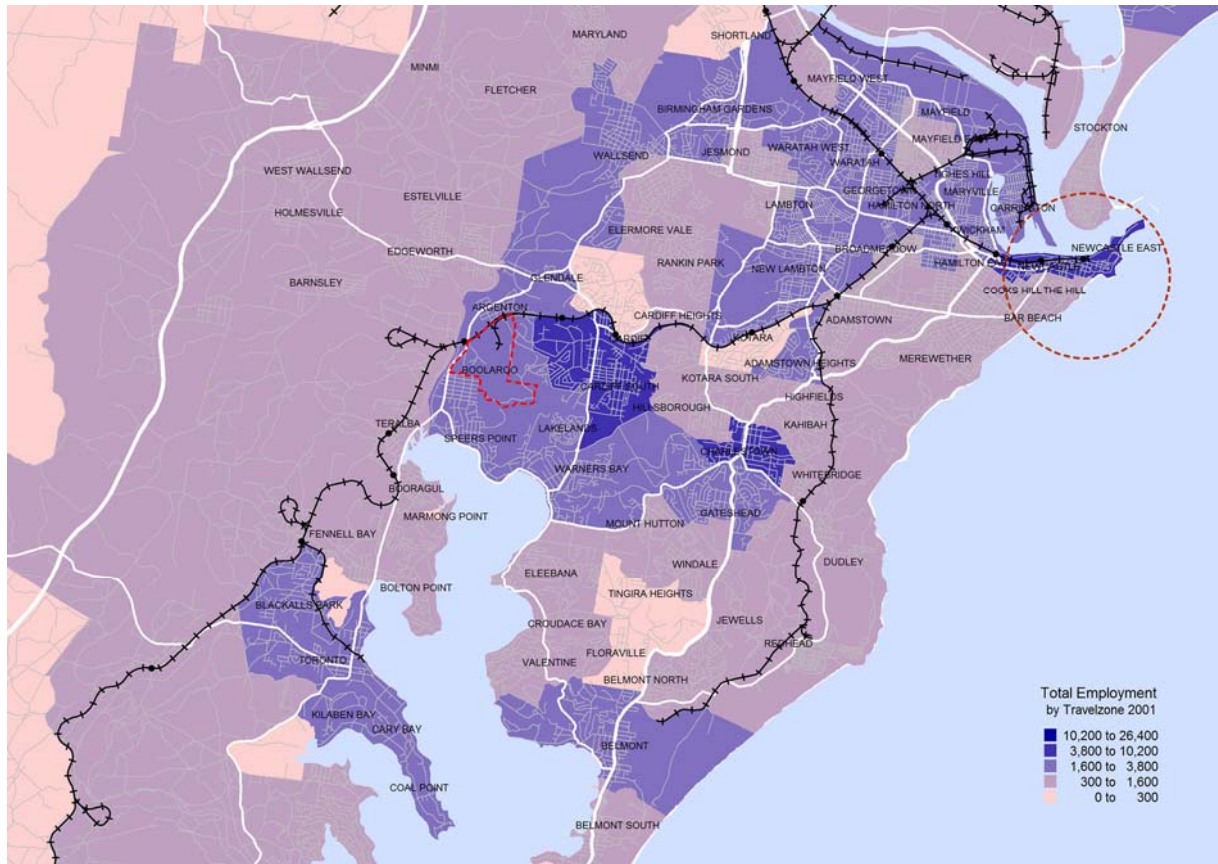
Figure 3 illustrates the current zoning of the land. Most of the land (total of 147.61 ha) is zoned industrial due to its former usage as a smelter. A further 2.61 ha is zoned open space, 10.16 ha is zoned special use (proposed local road reservation), 63.51 ha is zoned environment protection land. The map also shows that the Pasminco land is adjoining the existing Cardiff Industrial Estate, a major employment precinct with over 100ha of industrial land.

Figure 3. Current Zoning

Source: Lake Macquarie Council 2007

Employment Centres

Based on the latest available employment data from 2001, Figure 4 shows that the site is positioned in a major employment corridor, reaching from Newcastle city to the north of Lake Macquarie. It is also important to note that the land is adjoining one of the top three areas in relation to employment density: Cardiff and Cardiff Industrial Estate. In 2001, more than 6,250 people were employed in Cardiff, almost half of the employment of Newcastle Regional City (14,600 jobs in 2001).

Figure 4. Total Employment

Source: TPDC 2001, SGS 2007

In summary, it can be stated that the site is positioned close to arterial routes such as the Sydney Newcastle Highway, the Pacific Highway as well as Newcastle port and railway stations. It also adjoins one of the major employment precincts in the region (Cardiff) and is close to the Glendale retail centre. Most of the land is currently still zoned as industrial which will facilitate the use for industrial purposes.

1.3 Remainder of the Report

The remainder of the report is set out as follows:

- **Section 2:** Strategic and Policy Perspectives
- **Section 3:** Socio-Economic Context;
- **Section 4:** Lower Hunter Region Industrial Lands Prospects;
- **Section 5:** Conclusions and Recommendations.

2 Strategic and Policy Perspectives

2.1 State Government Policy

Key State government policy affecting Lake Macquarie LGA is contained within NSW Government Lower Hunter Regional Strategy and the NSW State Infrastructure Plan. Both provide the foundation to roll-out infrastructure and enable a sustainable growth in areas of urban growth over the next 20+ years.

NSW Government Lower Hunter Regional Strategy

The Lower Hunter Regional Strategy applies to the local government areas of Newcastle, Lake Macquarie, Port Stephens, Maitland and Cessnock and is one of a number of regional strategies currently being prepared by the Department of Planning for high growth areas in NSW. The Regional Strategy is NSW's strategic land use planning framework which will enable a sustainable growth of Lower Hunter Region over the next 25 years. The primary purpose of the Strategy is to ensure that adequate land for housing and employment needs will be available.

Overall, the Lower Hunter Region's population is forecasted to increase by 160,000 people; this will lead to an additional 66,000 jobs and 115,000 new dwellings by 2031. Of the total projected jobs, it is anticipated that 25% or 16,500 jobs will need to be located in major employment land sites. The Lower Hunter Strategy forecasts that 825ha land is required to accommodate the employment growth.

In regards to economic development and employment, the Strategy sets the following aims:

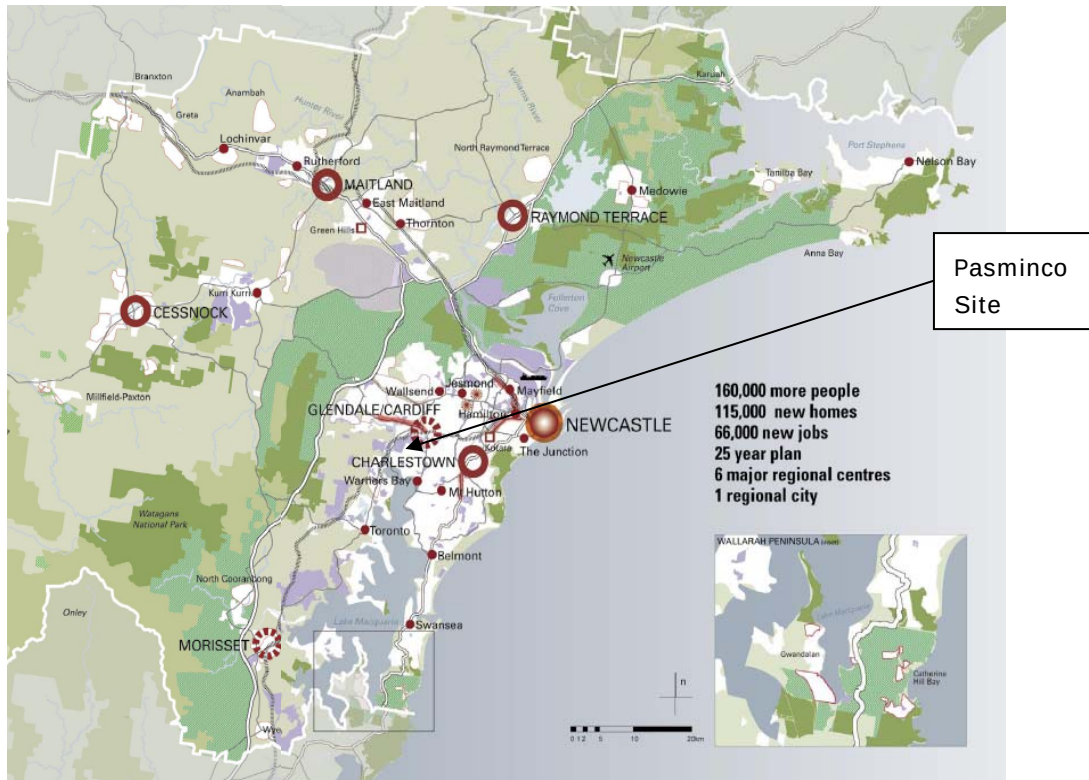
- *Maximise the economic opportunities associated with the Region's competitive advantages, in particular its economic infrastructure and specialised centres;*
- *Ensure sufficient employment lands are available in appropriate locations, including within centres and as traditional industrial land, to provide sufficient capacity to accommodate growth in existing and emerging industries and businesses;*
- *Maintain or improve the employment self sufficiency of the Region; and*
- *Ensure activity within the Lower Hunter complements rather than competes with the economies and communities of adjoining regions.*

The Strategy establishes a hierarchy and network of urban centres. Within the Lake Macquarie LGA, Charlestown is identified as existing, **Glendale/Cardiff** and Morisset as emerging major regional centres. A regional centre is specified as a *concentration of businesses, higher order retailing, employment, professional services and generally including civic functions and facilities and a focal point of for subregional road and transport networks*. It is forecasted that Glendale/Cardiff will cater for 6,200 jobs or 10% of the Hunter Region's employment growth. Glendale is close to the Pasminco site to its north and Cardiff to its north east.

The Regional Strategy also identifies five renewal corridors that link strategic centres and are situated along strategic transport routes. The corridors present opportunities for economic renewal and/or housing renewal and intensification. Close to the Pasminco Site, the Main Road between Edgeworth and Glendale has been identified as a renewal corridor.

Figure 5 highlights the location of the different centres and corridors.

Figure 5. Regional Strategy, Major Regional Centres



Source: Lower Hunter Regional Strategy

SW Treasury State Infrastructure Strategy: NSW 2006-07 to 2015/16

Key transport infrastructure upgrades and upgrades to health and education facilities in the study area will contribute to provide additional jobs in the region and access to key centres in the Hunter Region that will benefit business sectors as well as new communities proposed in the Lower Hunter Regional Strategy.

One of the major infrastructure projects of importance to the Pasminco site is the **Glendale Rail/Transport Interchange** north of site. Glendale currently does not have a railway station and is neither directly connected to the Cardiff industrial area, which is the largest industrial area in Lake Macquarie LGA. The railway line presently separates the industrial estate from Glendale. The new interchange would establish a railway station, a bus-rail interchange as well as a road bridge over the rail line connecting Pennant Street in Cardiff to Main Road in Glendale.

2.2 Local Government Policies

Lake Macquarie Lifestyle 2020 Strategy

The Lake Macquarie Lifestyle 2020 Strategy was adopted in 2001, and helped guide the creation of the Lake Macquarie LEP 2004 and DCP No 1 and No 2.

The strategy sets out the long-term direction for the development of Lake Macquarie and does not confer land use rights. It is establishing four core values to achieve this vision: sustainability, equity, efficiency and liveability.

With respect to economic growth and subsequently the supply employment lands, the strategy sets out the following vision and aim for Lake Macquarie's future development:

- *City Vision: A place with prosperous economy and a supportive attitude to balanced economic growth, managed in a way to enhance quality of life and satisfy the employment and environment aims of the community (City Vision;)*
- *Aim of the strategy: To provide local employment opportunities for residents and to promote economic development consistent with the City's natural, locational and community resources.*

The strategy defines the subsequent strategic directions to strengthen the city's economic bases:

- *Maximise existing opportunities in order to limit the extent of urban expansion and to provide more efficient use of existing land and infrastructure;*
- *Recognise community, commercial and investor needs though accommodating the City's projected population growth, where feasible, within Centres and established areas;*
- *Focus activities at Centres to maximise accessibility through encouraging industrial and other employment generating activities to locate within urban areas in a way that does not compromise the amenity of this area;*
- *Encouraging the integration of retail and business services, cultural activities, community facilities and services and public transport in Centres;*
- *Locating employment that can be well serviced by public transport;*
- *Encouraging the co-location of complementary industries and businesses;*
- *Locating industries and industrial areas in proximity to the major transport routes and within ready access to the Arterial and Sub-arterial Road network;*
- *Encouraging industrial and other employment generating development necessary to meet the future need of the City and that contribute to the Region's economic activity;*
- *Supporting the aggregation of economic activities that derive benefits from association and concentration in Centres; and*
- *Maintaining the highest and best use of land, specifically within a 10 minute walk of all Centres and transport nodes.*

Within the existing hierarchy of centres, Glendale-Cardiff has been designated as a 'Sub-Regional Centre'. The strategy sets out the following functions of sub-regional centres:

- *Serve City and Regional wide business and residential communities,*
- *Provide a range of high-order speciality retail and commercial activities, entertainment, social services and community facilities*
- *Are located on the major road network*
- *Provide high level of public transport service and accessibility*
- *Are major employment nodes*
- *Are designated to promote their role as a sub-regional centre*
- *Express the character of the city and region.*

In summary, the Lake Macquarie Lifestyle Strategy reinforces the importance of the existing centres and accentuates that any employment activities should be aligned to the centre hierarchy. Any employment lands use of the Pasminco site would therefore support the Lifestyle Strategy due to its proximity to the existing sub-regional centre Glendale/Cardiff. Economic activity on the Pasminco land would reinforce Cardiff's role and allow for a western expansion of the business park. The latter would facilitate the development of business clusters within the Macquarie Lake region.

Town Centre Profiles

Lake Macquarie LGA consists of several villages and town centres which are home to a broad range of businesses and retail shops. Town centres are located at Swansea, Belmont, Charlestown, Cardiff, Glendale, Warners Bay, Mount Hutton, Toronto, and Morisset. Table 1 gives an overview of the different centres, their main characteristics and floor space as well as future development plans. Town centres adjoining the Pasminco site are marked in yellow.

Table 1. Town Centre Profiles

Town Centre	Population 2001 Census	Businesses ANZSIC 2001	Commercial & Retail Floors Space 2002 LM Council	Development 2007 Lake Macquarie Council
Charlestown Sub-regional centre	23,000	2,454 businesses ▪ Department Stores ▪ Government Departments ▪ Major Banks	110,000sqm	▪ 2 eight storey mixed use buildings ▪ 74 residential units ▪ Major redevelopment of Charlestown Square
Glendale Subregional retail centre	27,000	500+ businesses ▪ Shopping Mall: Stockland Glendale ▪ Hunter Sports Centre ▪ TAFE ▪ Movie Complex	60,000sqm (50,000 sqm Stockland Glendale)	▪ \$16 Million expansion to Stockland, Glendale (8,500 sqm), including a new Kmart and several speciality stores ▪ Council has received NSW State Government funding of \$500,000 for the Glendale Integrated Transport Centre including new railway station, bus interchange, commuter car

Town Centre	Population 2001 Census	Businesses ANZSIC 2001	Commercial & Retail Floors Space 2002 LM Council	Development 2007 Lake Macquarie Council
				park, railway over bridge, and integrated disabled facilities
Cardiff	27,000	1,300 businesses ▪ Industrial Park (100ha) ▪ Cardiff village Shopping Centre	38,000sqm	▪ Subdivision and sale of Cardiff Railway Workshop side ▪ Concept plans for Lake Macquarie Convention Centre
Warners Bay	13,000	1,270 businesses ▪ Private Hospital ▪ Retail	23,000sqm	▪ Redevelopment of Ampol Site: 1,600sqm commercial space and apartments ▪ Bulky goods complex on Hillsborough Road
Toronto	30,000	1,705 businesses ▪ Toronto Industrial Park (29 ha) ▪ Toronto Private Hospital ▪ Mining ▪ Retail	61,000sqm	▪ Several mixed-used developments ▪ Rezoning of land to residential
Belmont	23,000	1,811 businesses ▪ Retail ▪ Belmont Hospital ▪ TAFE	47,000sqm	▪ \$31 upgrade Belmont Hospital
Morisset	19,000	988 businesses ▪ Retail: Morisset Mega Markets, Factory outlets ▪ Health Services	10,000sqm	▪ \$25 million aged care facility ▪ Several new supermarkets
Mount Hutton	35,000	▪ Shopping centre	16,000sqm	▪ 39 small lot housing
Swansea	11,000	875 ▪ Residential & tourism	17,000sqm	

Source: Lake Macquarie Council 2007

2.3 Implications

The different State Government and local policy documents have the following implications for the establishment of an employment precinct on the Pasminco land:

- Glendale/Cardiff is defined as a major regional centre in the Lower Hunter Strategy and as a sub regional centre in the Lake Macquarie Strategy. Centres are the main focus of future growths and Glendale/Cardiff will generate 6,200 new jobs within the next 25 years.
- A total of 825ha of land will be needed to accommodate the future job growth in the Lower Hunter Region, most of this will stem from already industrial zoned, but currently vacant land, such as the Pasminco Site.
- The proximity of the Pasminco site to the Glendale/Cardiff major regional centres will be beneficial for future attraction of businesses. The site can be seen as a natural expansion of the Cardiff Industrial Estate.
- There are no environmental constraints regarding the Pasminco site land use.
- There is a strong commitment to enable employment opportunities within the Lake Macquarie LGA and to keep a high self containment rate of workers.
- The envisioned employment land is already close to retail, sports complex etc, which will enable the site to attract workers.
- The planned Glendale railway station and interchange will be of high importance for the development of the northern part of the site as it will improve the connection between Cardiff and Glendale via road and also offer public transport.
- The Town Centres Strategy reflects that there is a high proportion of employment in the retail sector and the site is adjoining three suburbs that have established retail centres: Glendale, Cardiff and Warners Bay. The three neighbouring centres account for more than 40% of the region's total commercial floorspace.
- The renewal corridor Glendale-Edgeworth will enable increased housing density and commercial activity. A growing number of residents will create a higher demand for employment in the region.

2.4 Statutory Controls

Lake Macquarie Local Environmental Plan 2004 (LMLEP 2004)

Within the Lake Macquarie LGA pursuant to LMLEP 2004 there are 2 mixed used zones, 3 industrial zones and one tourism zone which allow commercial, retail and industrial land use. These zones have the following general permissible development:

- Mixed use zone: 3(1) Urban Centre (Core) zone – mixed use development - dwellings and commercial, retail and recreational uses.
- Mixed use zone: 3(2) Urban Centre (Support) Zone – dwellings and land for commercial and retail uses, professional services and home based businesses.
- Industrial zone: 4(1) Industrial (Core) Zone – manufacturing, processing, assembly, storage and distribution.
- Industrial zone: 4(2) Industrial (General) Zone – light industry, retail/commercial uses, high-technology industries, scientific research and development.
 - Key uses permissible with consent include:
 - o Bulk stores
 - o Light industries

- o Storage facilities
 - o Warehouses
- Industrial zone: 4 (3) Industrial (Urban Services) zone – light industry, bulky goods showrooms, research and development, applied technology.
- 6 (2) Tourism and Recreation Zone – commercial recreation and tourist uses.

Special controls additional to zoning provisions are:

- Subdivision standards – no standards for urban centres, consent needed for subdivision in industrial zone 4(1) for the purpose of lots smaller than 4,000sqm and consent needed for subdivision of industrial zones 4(2), 4(3) for lots smaller than 1,500sqm.
- Building height – consent for whole or part of building must not exceed 8 metres; must take surrounding buildings into consideration when determining height.
- Mixed use development – gross floor area for commercial, retail or recreation facilities is not less than 20% of total gross floor area within the site area.
- Part 4, clause 4.4 and 4.5 include heritage provisions.

Lake Macquarie Development Control Plan 2006 (LMDCP 2006)

LMDCP 2006 No.1 set out the controls related to industrial, commercial and retail development. The DCP specifies specific controls for the site's adjoining sub-regional centre Glendate/Cardiff:

- Built form guidelines:
 - Building height – 12m (Core), 10m (Support)
 - Building Setback Urban Centre (Core):
 - o Front setback: street level setback 25% of the facade by up to 3m; 2nd storey setback a minimum of 25% by 3m; 3rd and 4th storey setback 50% of walls 6m from the property boundary and 3m for remainder.
 - o Side and Rear Setback: determined by application of the angle for the sun in mid winter for Lake Macquarie.
 - Building Setback Urban Centre (Support):
 - o Front setback: at street level setback 50% of the facade to 5m from boundary; at street level setback 50% of façade between 3-5m from front boundary; side setback 1.5m for single level and 3m for high buildings.

For the industrial zones DCP 2006 constitutes:

- Building height: 10m (Core), 10m (General, Urban Services), 8.5m adjoining sensitive environment
- Building Setbacks:
 - o Front Setback: 15m (Core), 8m (General, Urban Services)
 - o Side and Rear Setback: 5ms for all zones, 15m adjoining sensitive environment
- Area Plans:

There are specific development controls for the areas of Booloaroo Heritage Precinct south of the Pasminco Site.

With regard to zoning, there are 3 industrial zones under the current LEP. The zoning arrangement is relatively strict as only the industrial core zone 4(1) allows for manufacturing and processing, lots cannot be smaller than 4,000sqm without approval. Zone 4(2) accommodates light industry as well as retail and commercial whereas zone 4(3) is the only on which bulky goods can be located, both zones allow for lots of 1,500sqm.

3 Socio- Economic Context

3.1 Baseline Analysis

An analysis of the baseline socio-economic context in which the subject site is positioned provides a framework for this study to determine the likely usage of the site.

3.1.1 Population

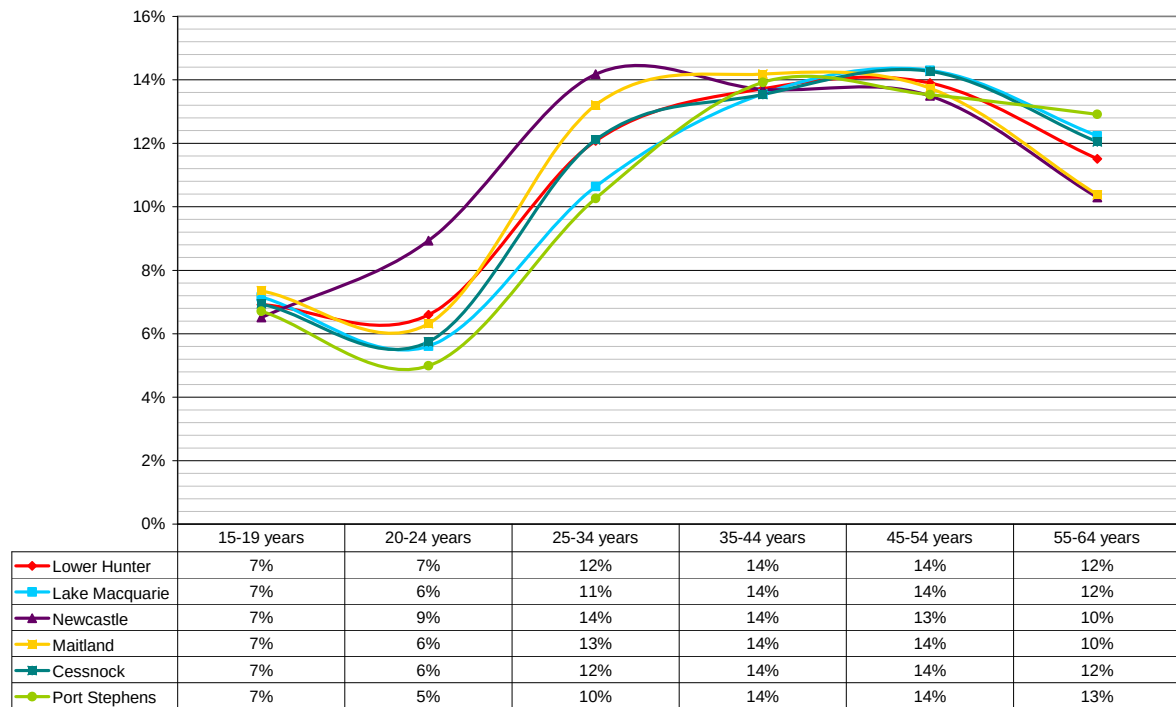
In 2006, the population of the Lower Hunter Region (Newcastle, Lake Macquarie, Port Stephens, Maitland, Cessnock) stood at 491,494 person according to the ABS Census data 2006. Lake Macquarie was the mostly populated LGA in the Lower Hunter with a population of 180,126 residents. Table 2 shows that in the last ten years the population of Lake Macquarie grew at the same rate as Newcastle (6%) which is lower than the high growth rates in Maitland (23%) or Port Stephens (17%), but higher than Cessnock (4%).

Table 2. Residential Population Lower Hunter

	1996		2001		2006		Growth 1996-2006	
	No.	%	No.	%	No.	%	No.	%
Lake Macquarie	170,495	38%	177,619	38%	180,126	37%	9,631	6%
Newcastle	133,686	30%	137,307	29%	141,868	29%	8,182	6%
Maitland	49,941	11%	53,803	11%	61,220	13%	11,279	23%
Cessnock	44,362	10%	45,204	10%	46,141	9%	1,779	4%
Port Stephens	51,288	11%	56,677	12%	60,243	12%	8,955	17%
Total	449,772	100%	470,610	100%	489,598	100%	39,826	9%

Source: ABS 2006

In Lake Macquarie, 64% of the population were of working age (15-64 years) in 2006, in line with the Lower Hunter Region average and slightly below the Newcastle average of 67%. In the 25-34 years age bracket, Lake Macquarie had a slightly lower percentage (11%) than the Lower Hunter Region average (11%) as illustrated in Figure 6.

Figure 6. Working Age Population as percentage of total population, Lake Macquarie LGA

Source: ABS 2006

Population forecasts developed by the Department of Planning's Transport and Population Data Centre (TPDC, 2005) anticipate the population of Lake Macquarie to increase by 17.9% to 221,530 residents by the year 2031. Table 3 illustrates that the median age will increase as well as the dependency ratio².

Table 3. Age Projection 2006-2031, Lake Macquarie LGA

Year	Population:	% aged 0-14	% aged 65+	Dependency ratio	Median age
2001	187,800	21%	15%	56	38
2006	191,050	19%	17%	56	40
2011	197,380	18%	18%	57	41
2016	204,000	17%	21%	60	43
2021	210,410	16%	24%	65	45
2026	216,360	15%	26%	72	46
2031	221,530	15%	28%	77	47

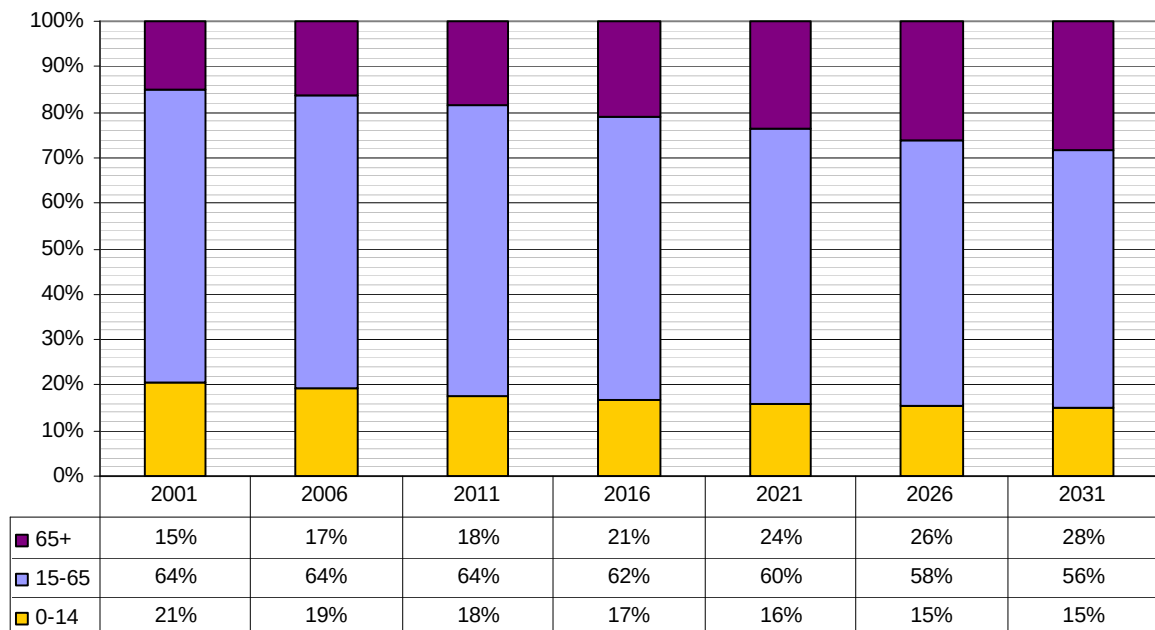
Source: TPDC 2005

An analysis by age group shows (Figure 7) that the overall population increase will not enhance Lake Macquarie's labour pool, as the actual pool of working residents (as a percentage of the total

² Dependency ratio is the number of people aged 0-14 and 65+ per 100 people aged 15-64.

population) will decrease significantly. As a share of total population, the working age group will decrease from 64% in 2001 to 56% in 2031. In absolute numbers, this age group will only increase by 4,770 people over the next 25 years. The major population growth will be driven by an ageing population and a doubling of the 65+ age group. The 65+ age group will increase from 15% in 2001 to 28% in 2031, in absolute numbers this population group will increase by 34,390 people.

Figure 7. Working Age Population Forecast 2001-2031 Lake Macquarie LGA



Source: TPDC 2005

3.1.2 Employment

Table 4 identifies key labour market indicators for the study area. From this analysis it is apparent that the whole Lower Hunter Region has a very large labour pool, characterised by high levels of full-time employment. Lake Macquarie had one of the lowest unemployment rates in the Lower Hunter Region with 6.7%.

Table 4. Key Labour Mark Indicators

	Lake Macquarie	Newcastle	Maitland	Cessnock	Port Stephens	Lower Hunter Region
Total Population	180,126	141,868	61,220	46,141	60,243	489,598
Total Labour Force (15-64 yrs)	114,388	95,211	39,898	29,834	37,549	316,880
% Labour Force Participation	64%	67%	65%	65%	62%	65%
Total Employment	76,737	62,427	27,264	17,976	23,884	208,288
% of total Labour Force	93.3%	92.7%	93.5%	91.4%	92.9%	92.9%

	Lake Macquarie	Newcastle	Maitland	Cessnock	Port Stephens	Lower Hunter Region
% Full-time	62.5%	62.5%	64.3%	62.3%	61.3%	62.6%
% Part-Time	30.8%	30.3%	29.1%	29.2%	31.6%	30.4%
% Unemployment	6.7%	7.3%	6.5%	8.6%	7.1%	7.1%

Source: ABS 2006

Destination of Workers (self containment)

In terms of destination LGA for workers (69,409 people) living in Lake Macquarie, around 46% work within the LGA (32,106). This is followed by 32% of workers working in the neighbouring Newcastle LGA (both Inner and Remainder). Overall, 83% of workers living in Lake Macquarie LGA work within the Hunter Region, 4% work within the Central Coast (most notably in Wyong), and 3% work in the Sydney Region

Table 5. Destination LGA for workers living in the Lake Macquarie LGA

Destination SLA	Number of Persons	Percentage
Hunter Region:		
Lake Macquarie	32,106	46.3
Newcastle Remainder	17,184	24.8
Newcastle Inner	5,363	7.7
Port Stephens	1,206	1.7
Maitland	1,056	1.5
Cessnock	763	1.1
Total	57,678	83.1
Central Coast:		
Wyong	2,279	3.28
Gosford	802	1.16
Total	3,081	4.44
Sydney Regions:		
Inner West	99	0.14
Central West	316	0.46
North West	171	0.25
East	138	0.20
South West	74	0.11
South	100	0.14
North East	64	0.09
North	339	0.49
Inner North	356	0.51
Sydney City	449	0.65
Total	2,106	3.03
No Fixed Address	3,238	4.67
Unknown	2,863	4.12
NSW Undefined	401	0.58
Other	42	0.06

Destination SLA	Number of Persons	Percentage
Hunter Region:		
Total Persons	69,409	100

Source: TPDC 2001

Origin of Lake Macquarie Workers (self sufficiency)

Lake Macquarie LGA has a high rate of self-sufficiency (local jobs occupied by local residents) with over 71% of the jobs within the LGA occupied by Lake Macquarie residents (Table 6). In total 95% of workers travelling to the LGA come from within the Hunter Region, less than 3% are from the Central Coast, and less than 1% are from Sydney.

Table 6. Origin LGA for persons working in the Lake Macquarie LGA

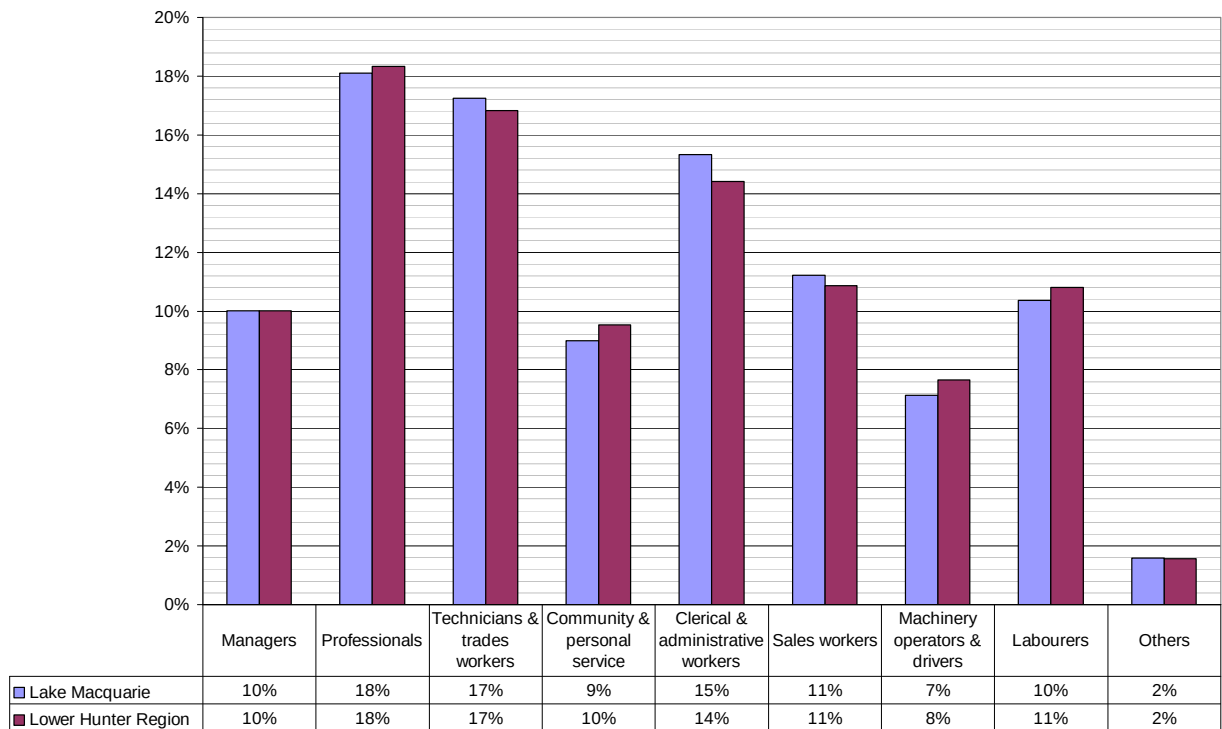
Origin SLA	No. of Persons	%
Hunter Regions:		
Lake Macquarie	32,106	71.29
Newcastle Remainder	7,470	16.59
Newcastle Inner	223	0.50
Maitland	1,071	2.38
Cessnock	826	1.83
Port Stephens	764	1.70
Hunter SD Balance	227	0.50
Total	42,687	94.79
Central Coast:		
Wyong	1,068	2.37
Gosford	244	0.54
Total	1,312	2.91
Sydney Regions:		
Inner West	15	0.03
Central West	72	0.16
North West	85	0.19
East	12	0.03
South West	6	0.01
South	33	0.07
North East	24	0.05
North	33	0.07
Inner North	33	0.07
Sydney City	39	0.09
Total	352	0.78
NSW Other	398	0.88
Other	284	0.63
Total Persons	45,033	100

Source: TPDC 2001

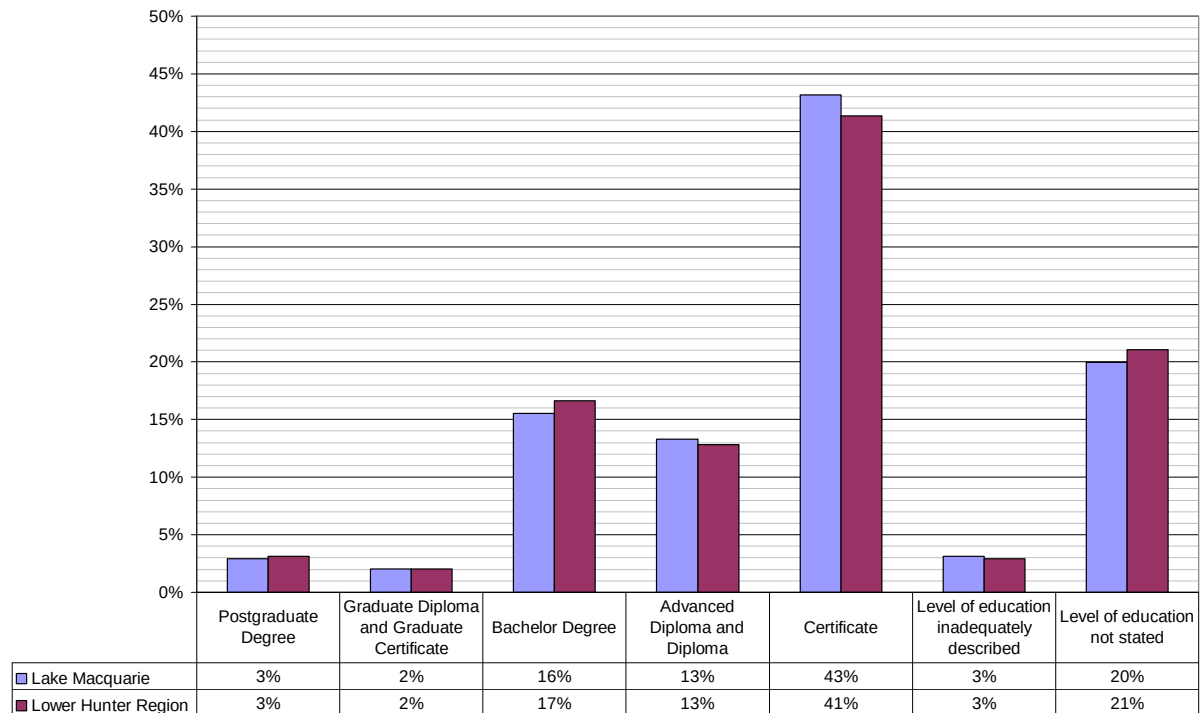
Occupation

Figure 8 displays a break down of population by occupation. Professionals and technicians & trades workers were the two largest occupational groups in Lake Macquarie (18% and 17%) followed by clerical and administrative workers (15%). Lake Macquarie's occupational mix reflects the Lower Hunter Region profile. The occupational mix shows the educational attainment rate of Lake Macquarie (Figure 9). Lake Macquarie has a relatively high proportion of residents engaged in blue collar related sectors, such as technicians and trades workers as well as machinery operators & drivers, sales workers, as well as labourers.

Figure 8. Occupational Mix



Source: ABS 2006

Figure 9. Qualifications of the Workforce

Source: ABS 2006

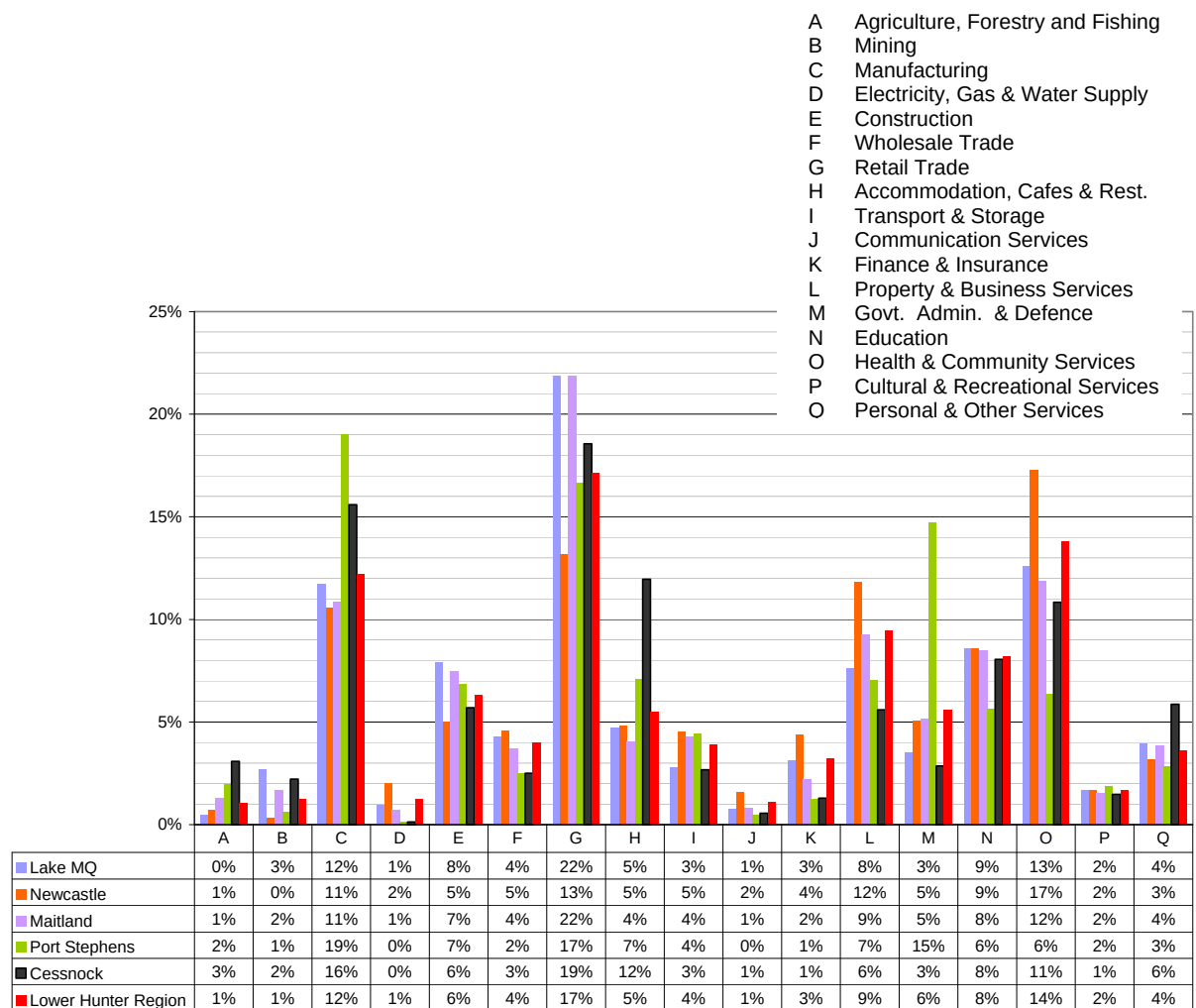
3.1.3 Business Mix and Industry Specialisation

Employment by Industry Sector

The Lower Hunter regional economy is quite diversified; no single sector can be seen as dominant. Whereas in the past, employment was concentrated in coal mining, manufacturing and related service activities, employment now is spread across several sectors.

In 2006, a total of 181,969 people were employed in the Lower Hunter Region, particularly in sectors such as retail trade (17%), health and community services (14%), and manufacturing (12%). Other key employment sectors include education (8%) due to the strong presence of education facilities such as Newcastle University and TAFE.

Within Lake Macquarie LGA, retail trade is the most important sector with 22% of all employment, followed by health and community services with 13% and manufacturing with 12%. Property and business services as well as construction and education ranked also high with respectively around 8% of all employment in the Lower Hunter Region. Figure 10 illustrates these findings.

Figure 10. Employment Distribution by Sector

Source: JTW Data 2006

An examination of trends over the last ten years reveals that in relative terms the importance of mining and manufacturing as well as wholesale trade (whilst still being an overall important sector) has declined in the Lower Hunter Region. Whilst service sectors such as retail trade, finance and insurance, property and business services, transport services, as well as government administration has increased. Overall, retail trade and manufacturing are still the biggest employers in the region.

Table 7. Lower Hunter Region, Employment Change by Industry

Industry	1996	%	2001	%	2006	%	Change in Jobs	% Change
Agriculture, Forestry and Fishing	1,663	1%	2,018	1%	1,860	1%	197	12%
Mining	2,944	2%	1,966	1%	2,261	1%	-683	-23%
Industry	1996	%	2001	%	2006	%	Change in Jobs	% Change
Manufacturing	23,197	15%	21,196	13%	22,223	12%	-974	-4%
Electricity, Gas and Water Supply	2,053	1%	1,889	1%	2,248	1%	195	10%
Construction	9,182	6%	9,301	6%	11,436	6%	2,254	25%
Wholesale Trade	8,166	5%	7,780	5%	7,288	4%	-878	-11%
Retail Trade	25,439	17%	29,799	18%	31,188	17%	5,749	23%
Accommodation, Cafes and Restaurants	8,168	5%	9,548	6%	9,961	5%	1,793	22%
Transport and Storage	5,873	4%	6,256	4%	7,098	4%	1,225	21%
Communication Services	1,929	1%	2,078	1%	1,985	1%	56	3%
Finance and Insurance	4,772	3%	4,729	3%	5,872	3%	1,100	23%
Property and Business Services	12,981	8%	15,104	9%	17,177	9%	4,196	32%
Government Administration and Defence	7,111	5%	7,899	5%	10,184	6%	3,073	43%
Education	11,565	8%	13,221	8%	14,908	8%	3,343	29%
Health and Community Services	18,453	12%	20,769	13%	25,061	14%	6,608	36%
Cultural and Recreational Services	2,761	2%	2,968	2%	3,023	2%	262	9%
Personal and Other Services	5,221	3%	5,941	4%	6,523	4%	1,302	25%
Total ³	153,197	100%	163,705	100%	181,969	100%	28,772	303%

Source: ABS 2006

In Lake Macquarie, the picture is similar. Here the importance of agriculture and mining as well as wholesale trade has declined, whilst service sectors such as finance and insurance, property and business services, transport services, retail trade had increased. Manufacturing has increased employment within Lake Macquarie LGA and retail trade is the biggest employer, followed by manufacturing and health and community services.

³ Note that total includes the categories 'not stated' (1996: 132, 2001: 752, 2006: 179) and 'non-classifiable Economic Units (1996: 1,587, 2001: 491, 2006: 1,492).

Table 8. Lake Macquarie, Employment Change by Industry

Industry	1996	%	2001	%	2006	%	Change in Jobs	% Change
Agriculture, Forestry and Fishing	337	1%	326	1%	222	0%	-115	-34%
Mining	1,868	4%	1,157	3%	1,270	3%	-598	-32%
Manufacturing	5,291	13%	5,641	13%	5,545	12%	254	5%
Electricity, Gas and Water Supply	506	1%	452	1%	449	1%	-57	-11%
Construction	3,364	8%	3,283	7%	3,745	8%	381	11%
Wholesale Trade	2,367	6%	2,305	5%	2,034	4%	-333	-14%
Retail Trade	8,780	21%	10,010	22%	10,353	22%	1,573	18%
Accommodation, Cafes and Restaurants	2,064	5%	2,105	5%	2,236	5%	172	8%
Transport and Storage	1,151	3%	1,235	3%	1,320	3%	169	15%
Communication Services	360	1%	503	1%	363	1%	3	1%
Finance and Insurance	979	2%	1,100	2%	1,467	3%	488	50%
Industry	1996	%	2001	%	2006	%	Change in Jobs	% Change
Property and Business Services	2,800	7%	3,546	8%	3,603	8%	803	29%
Government Administration and Defence	1,262	3%	1,404	3%	1,652	3%	390	31%
Education	3,119	7%	3,586	8%	4,056	9%	937	30%
Health and Community Services	5,053	12%	5,556	12%	5,954	13%	901	18%
Cultural and Recreational Services	581	1%	802	2%	786	2%	205	35%
Personal and Other Services	1,403	3%	1,703	4%	1,853	4%	450	32%
Non-Classifiable Economic Units	444	1%	130	0%	409	1%	-35	-8%
not stated	31	0%	235	1%	53	0%	22	71%
Sum	41,729	100%	45,079	100%	47,317	100%	5,610	254%

Source: ABS 2006

Location Quotient Analysis, Lower Hunter Region

An important means of examining the strength of various industries relative to another geographical area is through the use of location quotient (LQ) analysis. In this case, JTW destination data from the latest release in 2006 has been used to calculate LQs, by comparing the Lower Hunter Region with New South Wales.

LQs greater than 1 are indicative of relative specialism. Based on this measure, Lower Hunter Region's areas of relative strength compared with New South Wales are listed in Table 9. These figures need to be considered in conjunction with the number of people employed, to gain an understanding of the size, as well as the relative strength of these industries.

Table 9. LQ Analysis Lower Hunter Region

Industry Name	LQ Hunter over NSW	No of Jobs Lower Hunter Region	No Jobs in NSW
221 Iron and Steel Forging	10.78	127	178
213 Basic Non-Ferrous Metal Manufacturing	6.85	1,910	4,210
017 Poultry Farming	4.35	654	2,270
471 Rail Freight Transport	3.96	603	2,300
B00 Mining, nfd	3.83	362	1,426
189 Other Basic Chemical Product Manufacturing	3.73	218	883
246 Specialised Machinery and Equipment Manufacturing	3.39	1133	5,046
115 Oil and Fat Manufacturing	3.26	100	463
239 Other Transport Equipment Manufacturing	3.01	1,402	7,046
212 Basic Ferrous Metal Product Manufacturing	2.89	455	2,375
183 Fertiliser and Pesticide Manufacturing	2.71	125	696
261 Electricity Generation	2.68	385	2,168
211 Basic Ferrous Metal Manufacturing	2.53	2,447	14,619
521 Water Transport Support Services	2.48	566	3,447
020 Aquaculture	2.25	103	692
060 Coal Mining	2.19	1,560	10,743
760 Defence	2.11	2,536	18,145
229 Other Fabricated Metal Product Manufacturing	2.10	920	6,625
470 Rail Transport, nfd	2.09	224	1,620

Source: ABS 2006

Table 10. Largest Sectors by Employment

Industry Name	LQ Hunter over NSW	No of Jobs Lower Hunter Region	No Jobs in NSW
802 School Education	1.07	8916	125844
840 Hospitals	1.32	8241	94187
451 Cafes, Restaurants and Takeaway Food Services	1.18	7738	99263
411 Supermarket and Grocery Stores	1.31	5273	61009
810 Tertiary Education	1.21	3995	49762
860 Residential Care Services	1.33	3932	44649

Source: ABS 2006

Table 9 reveals that in 2006 the Lower Hunter Region had significant strength in 'iron and steel forging' as well as manufacturing such as 'basic non-ferrous metal manufacturing' and 'poultry farming', recording LG's of 10.78, 6.85 and 4.35 respectively. The Lower Hunter Area also has an extensive relative specialisation in transport and mining. In terms of employment, the education sector, hospitals as well as cafes and the retail sector have the highest overall number of employees as already discussed previously.

It is noted that when compared with NSW, the Lower Hunter Region has a relatively high relative specialisation in the primary metal and machinery manufacturing industry.

Location Quotient Analysis, Cardiff

The Pasminco Site is adjoining the already established industrial area Cardiff. Therefore, it is important to analyse the relative strength of Cardiff compared to Lake Macquarie LGA. In this case, JTW destination data from 2001 has been used to calculate LQs as the 2006 data for the smallest statistical areas 'travelzones' has not been released yet.

Table 11. LQ Analysis for Cardiff

Industry Name	Cardiff No of Jobs	LQ over Lake Macquarie
Poultry Processing	193	6.84
Poultry and Smallgood Wholesaling	78	6.57
Professional and Scientific Equipment Manufacturing	60	6.05
Electrical and Equipment Manufacturing	78	5.88
Laundries and Dry-Cleaners	167	5.34
Pump and Compressor Manufacturing	53	5.27
Electrical and Electronic Equipment Wholesaling	77	4.59
Machinery and Equipment Wholesaling	161	4.33
Basic Iron and Steel Manufacturing	160	3.76
Architectural Aluminium Product Manufacturing	53	3.72
Industrial Machinery and Equipment Manufacturing	51	3.44
Fabricated Metal Product Manufacturing	58	3.30
Car Retailing	174	3.24
Building Supplies Wholesaling	89	2.75
Railway Equipment Manufacturing	67	2.73
Courier Services	65	2.50
Road Freight Transport	187	2.35
Manufacturing, undefined	147	2.35
Mining and Construction Machinery Manufacturing	117	2.17
Central Government Administration	138	1.69
Electrical Services	92	1.65
Cleaning Services	114	1.55
Automotive Repair and Services	99	1.48
Health Services	58	1.27

Source: ABS 2001

Table 11 shows that in 2001, Cardiff had a relative specialisation in Poultry Processing (Ingham Enterprises) with a LQ of 6.84, as well as in manufacturing such as 'professional and scientific equipment manufacturing', 'electrical and equipment manufacturing', scoring 6.05 and 5.88. The dominant sectors of relative specialisation in Cardiff are food processing, general manufacturing (basic iron and steel manufacturing), light manufacturing and wholesaling as well as automotive industries and transport and logistics.

Regarding employment, Ingham Enterprise (poultry processing) is the largest employer in Cardiff, followed by the road freight transport, car retailing sectors as well as machinery and equipment, wholesaling and manufacturing.

Table 12. Largest Sectors by Employment, Cardiff

Industry	Cardiff South
Poultry Processing	193
Road Freight Transport	187
Car Retailing	174
Laundries and Dry-Cleaners	167
Machinery and Equipment Wholesaling	161
Basic Iron and Steel Manufacturing	160
Manufacturing, undefined	147

Source: TPDC 2001

3.1.4 Creative Industries

Part of our brief for this study was an assessment of the potential for creative industries to be located on the subject site. Lake Macquarie LGA has a very small creative sector with only 466 or 1.03% people employed in creative industries. Architectural Services are the biggest group (95), followed by cinemas (81), radio services (46) and advertising services (42).

Title Industry Sector	Lake Macquarie No of Jobs	% of Creative Jobs	% of Total Jobs	Hunter Region No of Jobs	% of Creative Jobs	% of Total Jobs	GMR, No of Jobs	% of Creative Jobs	% of total jobs
Sound Recording Studios	3	0.32%	0.01%	9	0.20%	0.01%	353	0.27%	0.02%
Music and Theatre Productions	30	3.22%	0.07%	135	2.96%	0.08%	2939	2.26%	0.15%
Performing Arts Venues	12	1.29%	0.03%	44	0.96%	0.03%	492	0.38%	0.02%
Film and Video Services, undefined	0	0.00%	0.00%	0	0.00%	0.00%	148	0.11%	0.01%
Film and Video Production	18	1.93%	0.04%	62	1.36%	0.04%	3403	2.62%	0.17%
Film and Video Distribution	0	0.00%	0.00%	9	0.20%	0.01%	536	0.41%	0.03%
Motion Picture Exhibition	81	8.69%	0.18%	216	4.73%	0.13%	2878	2.22%	0.15%
Radio and Television Services, undefined	3	0.32%	0.01%	3	0.07%	0.00%	343	0.26%	0.02%
Radio Services	46	4.94%	0.10%	140	3.07%	0.09%	1668	1.28%	0.08%
Television Services	6	0.64%	0.01%	188	4.12%	0.11%	7604	5.85%	0.39%
Advertising Services	42	4.51%	0.09%	246	5.39%	0.15%	9889	7.61%	0.50%
Commercial Art and Display Services	43	4.61%	0.10%	160	3.50%	0.10%	4675	3.60%	0.24%
Photographic Studios	0	0.00%	0.00%	0	0.00%	0.00%	0	0.00%	0.00%
Architectural Services	95	10.19%	0.21%	362	7.93%	0.22%	8361	6.44%	0.42%
Publishing, undefined	3	0.32%	0.01%	9	0.20%	0.01%	1087	0.84%	0.06%
Newspaper Printing or Publishing	31	3.33%	0.07%	495	10.84%	0.30%	6902	5.31%	0.35%

Title Industry Sector	Lake Macquarie No of Jobs	% of Creative Jobs	% of Total Jobs	Hunter Region No of Jobs	% of Creative Jobs	% of Total Jobs	GMR, No of Jobs	% of Creative Jobs	% of total jobs
Other Periodical Publishing	6	0.64%	0.01%	9	0.20%	0.01%	5223	4.02%	0.26%
Book and Other Publishing	13	1.39%	0.03%	37	0.81%	0.02%	3501	2.70%	0.18%
Creative Arts	28	3.00%	0.06%	99	2.17%	0.06%	2529	1.95%	0.13%
Arts, undefined	0	0.00%	0.00%	12	0.26%	0.01%	201	0.15%	0.01%
Services to the Arts, undefined	0	0.00%	0.00%	3	0.07%	0.00%	51	0.04%	0.00%
Services to the Arts (not elsewhere classified)	3	0.32%	0.01%	36	0.79%	0.02%	990	0.76%	0.05%
Recorded Media Manufacturing and Publishing	3	0.32%	0.01%	9	0.20%	0.01%	1170	0.90%	0.06%
TOTAL	466		1.03%	2283		1.39%	64943		3.29%

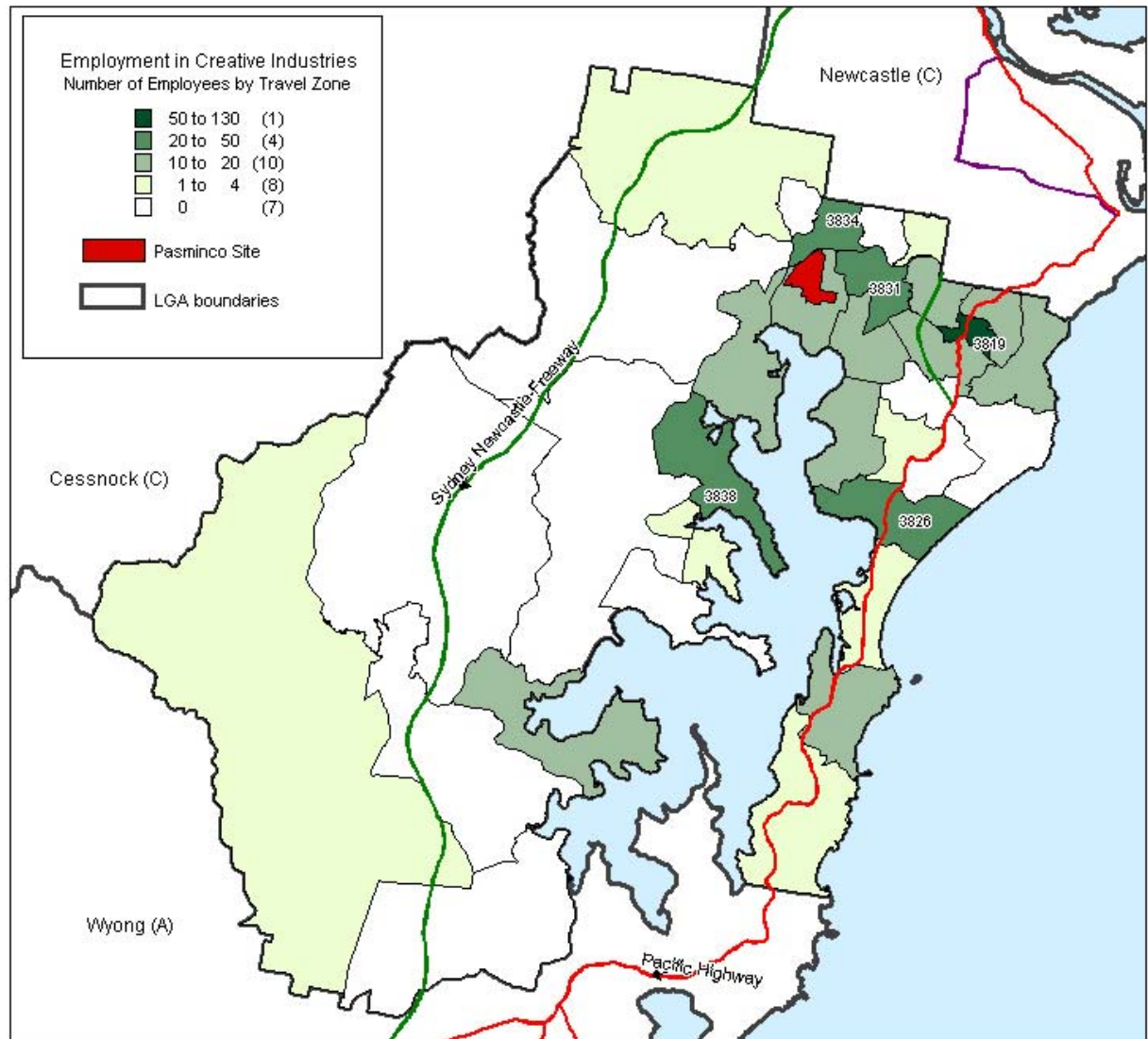
Source: ABS 2001

Previous work by SGS⁴ indicates that creative people and creative industries value (and rely on) those elements of an economy that support and encourage their creativity and the diffusion of ideas. This includes traditional (hard) infrastructure such as transport, communications, power and water, and more importantly items of 'soft infrastructure' (what is perhaps more appropriately termed 'smart infrastructure'). This includes the technological and non-technological factors in the local economy which support or encourage a strong skills base, strong and supportive local governance structures (government, business and educational institutions), lifestyle, and quality of life.

Creative industries and creative workers place a high value on an area's lifestyle attributes. This will be influenced by the quality of, and accessibility to, local recreation, leisure and entertainment facilities, as well as the depth and strength of the area's cultural infrastructure. It will also be determined by the area's openness, the community's acceptance of diversity, and its social cohesion. Creative entrepreneurs increasingly require locations within and around sites that provide relatively low-cost, modern office space, access to high-speed bandwidth and high-end facilities, and access to networks of individuals and companies with complementary skills, particularly business and legal skills.

The clustering of creative industries within the Lake Macquarie Council mirrors the above findings (Figure 11). Almost 30% of the creative industries are located in Charlestown, the major centre in Lake Macquarie LGA, another cluster is around the Cardiff town centre (8%) and the rest is dispersed.

⁴ SGS Report 'Fairfield Creative Industry Centre' and 'Perth Creative Quarter'

Figure 11. Creative Industries Lake Macquarie LGA

Source: SGS 2007

3.2 Future Employment Growth

The Lower Hunter Regional Strategy forecasts an increase of 160,000 residents and 66,000 jobs in the region by 2031. Most of the growth will take place in the major centres: Glendale/Cardiff, Charleston, Newcastle, Maitland, Cessnock and Raymond Terrace. The anticipated population growth will lead to increased consumer spending. The latter will stimulate additional employment and demand for retail and commercial areas, and employment lands to accommodate this growth.

Due to the existing education facilities in the Lower Hunter Region the labour force supply in the region is well skilled. Furthermore, the diversity of industry sectors indicates a wide spread of skills that is able to attract a variety of industries. A detailed forecast of employment will be discussed in Chapter 4.3.

3.3 Synopsis

Considering the labour market indices, it can be stated that Lake Macquarie LGA and the Lower Hunter Region have a high percentage of population of working age. The future increase in population will expand the skills pool, but also lead to an increasing ageing population with its own needs that have to be addressed e.g. health services. The labour market participation rate is high for both areas with a relatively low unemployment of around 7% (which will have decreased since 2006).

Almost 80% of the Lake Macquarie LGA residents work within the Lower Hunter Region and three quarters of all jobs within the LGA are taken up by local residents. Professionals and technicians and trades workers were the highest professional group which mirrors the educational attainment with 43% of the population having graduated with a 'certificate' .

The Lower Hunter Region economy is diversified and key employment sectors are retail trade, health and community services and manufacturing. Primary sectors such as agriculture and mining are on the decline whereas service sectors such as finance and insurance, property and business services are on the rise. Manufacturing still plays a very important role in the region and is a growing sector within Lake Macquarie LGA. The region has strength in metal related industries such as iron and steel forging and basic non-ferrous metal manufacturing.

An analysis of the creative industry in the Lower Hunter Region shows that the sector is very small and accounts for only 1.4% of all jobs in the region. In Lake Macquarie LGA, creative industry is concentrated in Charlestown. This can be attributed to the fact that creative people and industries are looking for a thriving and vibrant environment and are thus clustering in one of the most urban suburb in the LGA.

4 Lower Hunter Region Industrial Lands Market Analysis

4.1 Drivers of Industrial Growth

Broad Economic Trends

In the last fifty years, the Lower Hunter Region has undergone a transition away from a concentration on primary industries to a more service intensive regional economy. Historically, Hunter's economic base was built around the extraction and processing of raw materials: coal mining, steel manufacturing and forestry. Today, following more than two decades of restructuring, the region's economic base is diverse and the dominance of one economic sector is no longer apparent. The following trends can be observed for the Lower Hunter's economy⁵:

- A decline in large-scale heavy manufacturing. A particularly striking feature of the compositional changes in the Hunter region's manufacturing industry is the shift in employment from basic metal products – low value added steel and aluminium products – to fabricated metal products, which tend to require more sophisticated and knowledge intensive work processes.
- A strong service economy with strengths in the traditional human services categories (education, health and community services) and in the distributional services (transport, wholesale and retail trade). This illustrates the importance of the Lower Hunter as regional centre.
- Increasing export competition - the Hunter region as a whole has had increasing export competition, especially in traditional industries such as agriculture, coal mining (China and South Africa) and manufacturing. However, the Hunter has benefited from a greater rate of inter-regional exports (wine and wine generated tourism and education have been important contributors in this regard).
- Increasing levels of educational attainment – the proportion of the Hunter population aged 15 or over with a degree or diploma qualifications jumped from just over 6% in 1986 to over 18% in 2001. Accompanying this has been a pronounced upskilling of the region's workforce. The number of professionals in the region has nearly doubled since 1991, while unskilled labourers have declined by a third.
- A rapid rise in the employment of residents in most service sectors, which reveals how the Hunter region's economy is diversifying, with greater activity in the retailing and leisure sectors, but also in business services to the manufacturing sector.

As a result, the Lower Hunter economy has become more diversified and complex, with significant growth in the wine industry, tourism and hospitality, community services, education, business and

⁵ O'Neill et al: Urban development and the lower Hunter: understanding context, connections and flows, 2007, chapter 4, p. 174 – 202.

producer services, personal services and finance. The Hunter region is NSW largest tourist destination outside of Sydney, benefiting from its natural and heritage assets, thriving wine industry and access to Sydney.

Trends for Industrial Land

The growth of the Hunter Region's economy has also shared some spread effects from Sydney's rapid recent economic growth. In recent years the Hunter Region has experienced increased popularity amongst developers and users of industrial land, offering a suitable alternative to the traditional industrial suburbs of the Sydney Greater Metropolitan Region. New industrial developments along the F3 Freeway and the New England Highway, which stem directly from Newcastle-Sydney economic connections, are emerging and in high demand. These include industrial estates such as Beresfield Industrial Area or Thornton Industrial Estate, which are marketed as providing close and easy access to the freeway.

The Pasminco site has no direct access to the highway, but is reasonably well connected to major transport infrastructure (9.5km distance to F3 Highway, 9.7km distance to Pacific Highway, 19km to Newcastle Port). The site can therefore still profit from its location within the Sydney GMR region, access to the Sydney GMR market and its network of suppliers to various industries. The latter are all likely to be key considerations in the current and future location decisions of industry.

The increasing popularity of the Hunter region has been the result of numerous 'push' and 'pull' factors. These factors are as follows:

Push Factors (from GMR areas):

- Increasing rents and outgoings
- Lack of appropriate zoned industrial land
- Small lot sizes

Pull Factors (to the Lower Hunter):

- Availability of serviced land
- Proximity to F3 and Newcastle port
- Lower rents and cheaper land
- Growing population and customer base
- Highly skilled local workforce

4.2 Current Supply of Employment Lands

Lake Macquarie LGA

According to Lake Macquarie Council data, the total stock of industrial land zoned 4(1) Industrial Core and 4(2) Industrial General in Lake Macquarie LGA was 620.5 ha in 2007. Of this land, approximately 83% (516.3ha) was occupied, and only a further 15% was vacant, and a further 106.4 ha of supplement land is subject to constraints. This results in a shortage of industrial land in Lake Macquarie LGA. All industrial land are summarised in Table 13. The Pasminco site is not included in the table as it is currently under remediation and cannot be used for industrial activities.

Table 13. Industrial Land Supply Lake Macquarie Council

Suburb	Total Stock		Total Stock		Occupied		Vacant		Constrained	
	2004	2007	2004	2007	2004	2007	2004	2007	2004	2007
	ha	ha	2004	2007	2004	2007	2004	2007	2004	2007
Argenton	5.1	5.1	5.1	5.1	0.0	0.0	0.0	0.0	0.0	0.0
Barnsley	9.2	9.2	6.2	9.2	3.0	0.0	2.5	2.5		
Belmont North	18.4	11.2	9.6	11.2	8.8	0.0	8.8	8.8		
Bennetts Green	57.6	66.6	41.8	54.0	15.8	12.6	14.0	14.0		
Boolaroo (1) ⁶	8.3	8.3	8.3	8.3	0.0	0.0	0.0	0.0		
Boolaroo (2) ⁷	9.7	9.7	0.0	0.0	9.7	0.0	9.7	9.7		
Cameron Park	46.2	46.2	5.6	41.7	40.6	4.6	10.0	10.0		
Cardiff	111.5	111.5	110.2	108.2	1.3	1.9	0.0	0.0		
Carey Bay	3.1	3.1	1.5	1.5	1.6	0.0	0.0	0.0		
Cooranbong	2.9	2.9	2.9	2.9	0.0	0.0	0.0	0.0		
Edgeworth	10.0	10.0	8.1	8.1	1.9	1.97	0.0	0.0		
Gateshead	56.4	56.4	51.6	52.8	4.8	3.64	1.0	1.0		
Glendale	7.9	7.9	7.9	7.9	0.0	0.0	0.0	0.0		
Hillsborough Rd	30.5	30.5	28.3	30.3	2.3	0.2	0.0	0.0		
Medcalf Street	10.9	10.9	10.9	10.9	0.0	0.0	0.0	0.0		
Morisset	79.5	79.5	19.9	47.2	59.6	32.3	10.0	10.0		
Rathmines	24.9	24.9	10.6	11.9	14.3	13.0	10.4	10.4		
Redhead	68.4	27.2	21.1	15.9	47.3	11.2	33.5	33.5		
Swansea	4.8	4.9	3.6	4.4	1.3	0.5	0.0	0.0		

⁶ Boolaroo 1 refers to land adjoining Creek Reserve Road (Lake Macquarie Council has its operational depot on this land).

⁷ Boolaroo 2 refers to the triangle paddock between Lake Road and the Railway Line (north west of the Pasminco Site)

Suburb	Total Stock		Total Stock		Occupied		Vacant		Constrained	
	2004	2007	2004	2007	2004	2007	2004	2007	2004	2007
	ha	ha	2004	2007	2004	2007	2004	2007	2004	2007
Teralba (1)	20.2	20.2	20.2	20.2	0.0	0.0	0.0	0.0	0.0	0.0
Teralba (2)	24.0	24.0	23.4	24.0	0.6	0.0	0.0	0.0	0.0	0.0
Toronto	3.9	3.9	3.7	3.7	0.3	0.2	0.0	0.0	0.0	0.0
Toronto West	35.2	35.2	15.6	34.9	19.6	0.3	6.5	6.5	6.5	6.5
West Wallsend	11.2	11.2	2.0	2.0	9.2	9.2	0.0	0.0	0.0	0.0
TOTAL	659.8	620.50	418.10	516.3	242.0	91.61	106.4	106.4	106.4	106.4

Source: Lake Macquarie Council 2007

Lower Hunter Region

A survey of industrial land within the Lower Hunter Region in 2001 indicated that there was approximately 5,020 hectares of land zoned for industrial use (Newcastle counting for 50% or 2,546ha).⁸ Some significant changes have occurred in the regional industrial land market since then. There has been acceleration in the demand for vacant zoned land, as well as significant price increase for developed and undeveloped lots. The latter can be attributed to the growth in light manufacturing and the international resource boom that lead to an increased demand for businesses related to support services for mining and power related industries. To match the increasing demand for land, there have been major land releases in the area. Table 14 indicates that more than 650ha of land have been released in the last six years (excluding the above discussed industrial areas in Lake Macquarie). Table 15 illustrates that potentially a further 1,785ha of land could be released over the next decades.

Table 14. New Industrial Release Areas, Land has been released, Lower Hunter Region

Location	Area (ha)	Lot Size	Price/Release	Key Users	Key Features
Newcastle LGA					
Steel River Eco-Industrial Park	104ha	4,000sqm to 10 ha	\$180/sqm Strata Units: \$1,500/sqm	Mix of Users: Metal Manufacturing, Research, Technology	Serviced land, next to Newcastle port
Maitland LGA					
Thornton Industrial Estate	90ha	1,800sqm-2.9ha	--	Transport, Automotive Industry, Light Manufacturing	Next to New England Highway Land and construction packages for sale
Rutherford: Racecourse Business Park	60ha	1,500sqm-1ha	\$120/sqm	Bulky Goods Retailing, new release area, Hunterland is selling 2.7ha currently	Next to New England Highway
Port Stephens LGA					
Tomago: Hunter Industrial Park (Domaine Property)	20.7ha	2,100sqm-7,000sqm	\$110/sqm	Transport, Logistics, Manufacturing	Pacific Highway

⁸ Maitland City Council, Maitland Urban Settlement Strategy 2006, p. 46.

Location	Area (ha)	Lot Size	Price/Release	Key Users	Key Features
Fund)					
Heatherbrae Industrial Park	10ha	1,800sqm	\$100	--	Pacific Highway
Cessnock LGA					
HEZ Hunter Economic Zone	340ha Stage 1: 130ha released	5,00sqm-1ha	Starting \$75/sqm	Manufacturing, food processing, engineering, transport logistics	24/7 operations possible
RLMC Land Holdings					
Tomago (new release area)	240ha	--	--	Lots for larger users	240ha currently for sale by Jones Lang LaSalle
TOTAL	654.7				

Source: SGS Research 2007

Table 15. New Industrial Release Areas, Land has been released, Lower Hunter Region

Location	Area (ha)	Lot Size	Price/Release	Key Users	Key Features
Newcastle LGA					
North Freeway Business Park (Hunterland)	60ha	1,800sqm-several ha	--	Development not approved yet, rezoning application lodged	Extension of Beresfield and Freeway Business Park
Cessnock LGA					
Cessnock Civic	30ha	--	--	Possible Zoning as Light industrial and business support facilities Land not released yet	Next to Cessnock's Business District
RLMC Land Holdings – Possible release areas					
Intertrade Business Park (Port of Newcastle)	150ha	--	First release early 2008	--	App. 50% for industrial general use, 50% for intermodal terminal and related transport/logistics activities
West Wallsend	1545ha	--	--	Possible Use: industrial, commercial, residential	--
TOTAL	1785.5				

Source: SGS Research 2007

Almost all of the recently released land is close to the F3 Highway, New England Highway or Pacific Highway. This shows the trend towards land that is directly located along major transport routes. The Pasminco site is not adjoining a motorway, but it is reasonable close to the F 3 Highway and the Pacific Highway. One of the major benefits of the site – compared to the new release areas - is its location in an already established industrial area. Further, the site is well connected via public transport routes and is in close proximity to a retail centre.

Cost of Land

Cost of land is an important factor in the competitiveness of a site. A comparison of land value of industrial sites located at Botany, Newcastle and Port Kembla Ports can be obtained through analysis of Department of Lands data. 'Representative Land Value's provided by the Department of Lands highlight a selected property which is considered to be representative for that locality and will indicate the market trend. Market trends are identified by the tables and not by the values of specific properties at a given date. Table 16 below illustrates the values of various industrial sites in the GMR.

Table 16. Small Industrial Sites: Sydney, Wollongong and Newcastle

SUBURB	AREA SQ. M	1996 (\$)	2002 (\$)	2003 (\$)	2004 (\$)	2005 (\$)	2006 (\$)	% CHANGE 05 - 06
ALEXANDRIA	2,200	627,000	1,210,000	1,350,000	1,500,000	1,600,000	1,820,000	14%
ARTARMON	2,305	1,020,000	1,540,000	1,610,000	1,850,000	2,010,000	2,050,000	2%
BLACKTOWN	3,142	225,000	526,000	680,000	825,000	900,000	975,000	8%
BOTANY	2,321	375,000	630,000	770,000	825,000	1,000,000	1,500,000	50%
BROOKVALE	2,282	743,000	997,000	1,090,000	1,090,000	1,450,000	2,070,000	43%
CAMPBELLTOWN	2,004	100,000	300,000	420,000	546,000	627,000	658,000	5%
CARDIFF	2,305	135,000	196,000	236,000	272,000	300,000	315,000	5%
CARRINGTON	2,024	128,000	162,000	194,000	272,000	325,000	370,000	14%
DEE WHY	2,110	652,000	971,000	1,060,000	1,110,000	1,160,000	1,160,000	0%
GOSFORD	2,089	128,000	199,000	208,000	303,000	412,000	453,000	10%
HORNSBY	2,088	460,000	619,000	680,000	748,000	822,000	822,000	0%
MARRICKVILLE	1,916	460,000	887,000	1,150,000	1,200,000	1,320,000	1,380,000	5%
MOOREBANK	1,878	166,000	360,000	504,000	630,000	655,000	622,000	-5%
NORTH WOLLONGONG	1,608	99,700	185,000	194,000	213,000	276,000	290,000	5%
PENRITH	2,149	146,000	266,000	319,000	382,000	439,000	482,000	10%
RIVERWOOD	2,039	300,000	502,000	702,000	758,000	909,000	954,000	5%
SILVERWATER	1,853	390,000	560,000	600,000	740,000	825,000	850,000	3%
SMITHFIELD	1,935	202,000	363,000	470,000	510,000	680,000	680,000	0%
TAREN POINT	2,085	434,000	790,000	985,000	1,100,000	1,100,000	1,100,000	0%
UNANDERRA	2,037	101,000	165,000	181,000	226,000	340,000	355,000	4%
Average		344,585	571,400	670,150	755,000	857,500	945,300	
% Variation From Previous Year			9%	17%	13%	14%	10%	
Index (1996=100)		100	166	194	219	249	274	

Source: NSW Department of Land 2005-06

For the purposes of this report, the relevant sites are Cardiff, Carrington (in Newcastle), Gosford and Port Botany. Analysis of this table indicates that there is a considerable variance in land values between the different sites as shown below in Table 17.

Table 17. Land Values Per Square Metre

Location	Land value per sqm
Cardiff (Lake Macquarie)	\$137
Carrington (Newcastle)	\$182
Gosford	\$217
Botany	\$646

This indicates that the land value of industrial land in Botany is almost five times and Gosford 1.5 times more expensive than industrial land in Lake Macquarie. Consultation with Real Estate Agents

suggests that the relatively low cost of industrial land in Lake Macquarie is a major attribute and will attract more businesses from Sydney to relocate to the Newcastle/Lake Macquarie area.

4.3 Future Demand of Industrial Land

Future demand for industrial land in Lake Macquarie can be estimated by forecasting employment numbers for the LGA and applying industry land per employee ratios⁹. This analysis is based on the following three stages:

1. Calculating forecast employment by industry sector over the 2004-2026 period in the Lake Macquarie LGA using the SGS employment growth model;
2. Converting forecast employment growth into floorspace requirements; and
3. Converting floorspace requirements into demand for industrial land.

The results from this analysis are summarised below – a more detailed description of each stage can be found in Appendix A.

Forecast Employment Growth

Based on SGS employment growth estimates (see Appendix A, Figure 12), a total of 13,271 jobs are forecast to be created within the Lake Macquarie LGA between 2006 and 2031. A significant proportion of these are to be found in manufacturing and service sector industries such as retail trade, health and community services, and property and business services.

Of particular interest to this study is that:

- Retail trade will provide for an additional 3,620 jobs;
- The manufacturing sector will provide for an additional 2,043 jobs in all by 2031. Key growth sector within this figure include:
 - o Basic metals and products (+408);
 - o Fabricated metal products (+199); and
 - o Other machinery and equipment (+500);
- Health and Community services will add an additional 1,715 jobs;
- Wholesale trade will provide for an additional 638 jobs;
- Transport and Storage will create an additional 377 jobs.

Forecast Floorspace Requirements

The employment forecasts for Lake Macquarie LGA can be converted into floorspace requirements through applying current floorspace per employee ratios to the number of forecast employees in each industry sector. These ratios have been gathered from land use audit work in Newcastle.

⁹ Industrial land requirements presented in this report are based on Journey to Work (JTW) data and floor space ratios derived from NILES and other comparable studies.

It should be noted here that it is difficult to accurately translate the above estimates of employment growth into precise estimates of the likely demand for industrial floorspace (and as such, industrial land) within the scope of this study, because:

- The study area comprises land comprised within both industrial and mixed-use zones, and as such includes industry sectors, which are not typically located in industrial areas. These include property and business services, health and community services, retailing, education etc;
- Thus, in order to calculate the 'true' nature of demand and supply of land that is suitable for all industry sectors that occupy land within the zonings that were considered during this study (e.g. the 4(1), 4(2), 4(3), we would need to also include the supply of vacant land within all other zonings in which those 'atypical' industry sectors can also be located. (i.e.: mixed use zone 3(1), 3(2)).

As employment generating activities locate on both industrial and commercially zoned land in broad terms, the primary locations where employment of a particular industry sector is typically found are detailed below:

Industry Sector...	Typical Location...
Agriculture	Rural areas, not applicable to this study
Mining	Resource locations, not applicable to this study
Utilities	Industrial land
Manufacturing	Industrial land
Construction	Industrial land and construction sites
Wholesaling	Industrial land
Retailing	Primarily commercial but some activities (bulky goods, automotive retailing) in industrial areas
Transport and storage	Primarily industrial land
Communications	Industrial and commercial
Finance and property	Commercial
Government administration	Commercial
Community services	Commercial / special uses
Recreational and cultural services	Commercial / special uses

Overall it is estimated that an additional 66.6 hectares of both commercial and industrial floorspace¹⁰ will be required by 2031 to cater for the additional employment growth in Lake Macquarie LGA.

¹⁰ Please note that we have included floorspace requirements for all industry sectors in the Lake Macquarie LGA. This is because some service sector activities can be located in both industrial and commercial areas, but it is not viable to predict the split between the demand on industrial and commercial land in the future.

Key sectors demanding space include the manufacturing and especially basic metals manufacturing, retail trade, health and community transport, wholesale trade, and transport and storage services, as well as property and business services (see Appendix B, Figure 13 for further details).

Forecast Land Requirements

When typical floorspace to industrial land ratios are applied (see Appendix C, Figure 14), it is estimated that those industry sectors, which typically occupy industrial land are likely to generate demand for an additional **50.2 ha** of industrial land between 2006 and 2016, and up to **126.2 ha** of industrial land between 2006 and 2031.

Future land requirements can be broken down as follows (see Appendix A, Figure 14):

- Most of the future land requirement comes from the wholesale trade sector which will require an estimated additional **18.5 ha** between 2006 and 2016, and **46.9 ha** in total between 2006 and 2031
- The transport and storage sector will require an additional **11 ha** of industrial land by 2016, and it is estimated that this figure rises to **27.6 ha** by 2031;
- It is estimated that basic metal manufacturing will require an estimated additional **3.9 ha** of industrial land between 2006 and 2016, and **9.7 ha** in total between 2006 and 2031;

Additional demand for industrial land could be generated through growth in the retail sector, in particular bulky goods retailing, which, according to the LMLEP 2004, is permitted in the 4(2) Industrial General Zone and in the 4(3) Industrial Urban Services zone.

The service sector, including retail, accommodation, finance and insurance, government as well as property and business services, is likely to require a further **14.9 ha** of land by 2016. This figure is expected to increase to **37.3 ha** by 2031. Within the services sector, retail trade and property and business services are expected to be the dominant sectors generating future land demand. However, these types of services are typically located in commercial zones, and as such would not be expected to make strong land demands in areas which are included in this study.

Overall, the Lower Hunter regional economy is in a strong growth phase profiting from the worldwide resource boom. There is an overall trend to smarter manufacturing and the service sector, the latter highlighting Newcastle's and Lake Macquarie's role as a regional centre.

Lake Macquarie' industrial land is currently scarce, with only 91ha vacant. Most of the vacant land is located in Morriset (home to Morisset Mega Markets and a range of distribution facilities). Cardiff is highly sought after and only 1.9ha of vacant land are currently on the market. Supply within the Lower Hunter Region is currently increasing; major release areas are located next to the Sydney Newcastle Freeway, the New England Highway as well as the Pacific Highway. Most of this land is serviced or can be purchased with a 'land and construction' deal. More land will be on the market in the next 3-5years and the state owned Regional Land Management Corporation which is holding most of the former BHP Billiton land is likely to release more of its holdings.

Future demand for land in the Lake Macquarie LGA is relatively high with up to 126.2ha needed in the next 24 years and the current supply would not match this demand. Most of the future land requirement will be driven by the wholesale sector, the transport and storage sector and basic metal manufacturing.

4.4 Development Prospects

Broad Trends

With respect to the development at the subject site, the industrial market to be considered is a *regional* one and as such responds to regional as well as local drivers. The Lower Hunter Region has experienced strong demand for employment lands, particularly industrial lands.

The current state of the regional industrial market is the result of a sustained period of economic growth, especially in the raw material sector and with it a high demand for mining servicing industries. Providing the demand for resources remains strong, it is anticipated that existing steel manufacturing companies will most likely expand their operations.

The Lower Hunter Region industrial market is also expanding due to the increased demand from industries that have either driven out of the Sydney market due to high property prices or want to expand their operations and use a Lower Hunter regional base as a hub to service the Central Coast. Land values in Lake Macquarie were still up to 80% lower than in Botany and 40% lower than in Gosford.

Land Supply & Demand

The five major industrial estates in the area are: Cardiff, Cameron Park, Thornton/Beresfield, Steel River, and Tomago. There are limited vacancies in these areas: Cardiff industrial estate has no vacant land, Cameron Park 4ha, Steel River 11ha, and Tomago 6ha. In Lake Macquarie 85% of all industrial land is occupied, 15% is vacant.

Good quality, affordable and unconstrained industrial land is in relatively short supply, especially in Lake Macquarie and Newcastle. In the total Cardiff area for example only 1.9ha of land is vacant.

The Lower Hunter Region industrial land supply will increase significantly in the next 2-5 years. The Hunter Economic Zone (HEZ) in Cessnock has a stock of 340ha, RMLC has released 240ha of its holdings at Tomago, and Hunterland is offering 100ha at Rutherford Business Park.

Yearly take-up in the region is 10-20 lots/year or 20-40ha/year, prices range between \$150-200/sqm.

Industrial land close to arterial roads (New England Highway and F3) as well as the port is in highest demand. Areas such as Thornton Industrial Estate in Maitland are currently the most sought after. All of the new release areas are located next to highways. Most of the land is serviced land and is sold in 'land plus construction' packages.

Prospects for Pasminco land Development

Excellent prospects for industrial use due to its proximity to the existing Cardiff Industrial Estate. The subject site is a natural extension to the existing industrial area. Cardiff/Glendale is part of the future growth area in the Lower Hunter Strategy.

Vital to the site's success will be good road access in and out of the industrial area. Hence, much of the site's potential to attract industry depends on the construction of a second road to provide a east and west entry and exit point. The proposed Glendale Interchange would further increase the prospects site, but this is not as vital as the road access.

Overall, it is suggested that the highest and best employment uses on the site would be for light industrial purposes, manufacturing, transport and logistics as well as warehousing. This reflects the current usage in the Cardiff Industrial estate, where the largest sectors by employment are road freight transport, manufacturing, as well as wholesaling. Further, wholesale trade as well as transport and storage are forecasted to have the highest demand for land in the next 25 years.

In regards to commercial land use, the largest land take-up will come from retail trade, accommodation, cafes and property and business services over the next 25 years. Those sectors are also associated with high employment growth. Whereas it is preferable to pursue a high employment yield on the Pasminco site, the likelihood of attracting a large demand from commercial users on the site is limited. Retail and property businesses tend to locate in established centres; further an attraction of commercial activity would interfere with the strategic directions of the Lower Hunter Regional Strategy as well as the Lake Macquarie Council Vision 2020. Both documents stress the importance of concentrating commercial activity in existing centres. Nonetheless, it is suggested to zone the land 4(2) Industrial General Zone. The latter is a flexible zoning, that would enable the attraction of ancillary retail to service the site and it would further allow for a higher office component on the site.

The attraction of creative industries to the site is limited. As outlined in Section 3.1.4 of this study, creative industries employees place a high value on an area's lifestyle attributes and tend to cluster around existing vibrant urban areas. This trend can also be observed in Lake Macquarie LGA, where most of the creative businesses are located in Charlestown. The Pasminco site is yet not well connected with its neighbouring areas, neither is there a vibrant urban 'scene' close by, and there is doubt that the Stockland Shopping centre will satisfy the demands of creative industry workers.

In regards to land value, it is anticipated that the land would sell for \$180-200/sqm and that there would be a quick take-up of land. However, due to the relative high prices it is suggested that smaller lot sizes (from 1,500sqm) should be made available.

Due to the future release of major industrial land close to arterial roads and the port (HEZ, Rutherford), it is suggested that the land should be released within the next 12-18 month to avoid a simultaneous market release.

5 Summary and Recommendations

5.1 Summary

The key points emerging from this study are summarised below:

- **Current land market has moderate levels of supply and high levels of constrained land.** In 2007, the total stock of industrial land in Lake Macquarie LGA was 620 ha with around 516 ha occupied and a further 91 ha vacant, 106 ha is classified as 'constrained'.

The industrial land market is 'regional' and thus it is important to identify major future employment sites in the Lower Hunter Region. Currently there are several industrial estates on the market or schedules for imminent release. Newly released and future land combined covers an area of over 600 ha. In addition, a significant amount of the former BHP land is still held by the Regional Land Management Corporation (RMLC) and there is a high possibility that some of the land will be released in the next 10 to 20 years. The current supply of land is still less than the 825 ha forecasted by the Lower Hunter Strategy, but only if RMLC does not release any of its land in the next 25 years.

- **Timing of development at the subject site is critical.** If the Pasminco site comes onto the market in the next 18 months it is likely to be particularly attractive to industry (in a high demand-low supply land market). However, timing of development at the subject site with respect to planned land release elsewhere is critical. In this respect, a development scheme which implies a slow land take-up is considered relatively high risk.
- **High current sub-regional industrial land demand.** Demand for industrial land in the Lower Hunter Area and especially in the Newcastle and Lake Macquarie LGA is very strong and the trend is likely to continue over the next 3 to 5 years due to a regional economic boom which is driven by a high demand for primary resources.
- **Strong forecast industrial land demand.** Future Demand for industrial land will be strong and Lake Macquarie LGA will need approximately 126 ha of additional land to cater for this growth, especially in the wholesale, transport and storage sectors and basic metal manufacturing until 2031.

The Lower Hunter Regional Strategy is forecasting a need for 825 ha of land to accommodate a further 66,000 jobs. If global economy and the Asian markets will continue to grow, the Lower Hunter Region will benefit from this growth and a further increase in land demand is likely.

- **Proximity to existing industrial area and emerging major centres are key drivers.** The subject site is located next to established Cardiff Industrial Estate which hosts mostly light manufacturing, food processing, wholesaling and transport industries. The site is situated in a defined emerging major regional centre.
- **Second road access is important for some industry sectors.** The lack of a second major road access to the subject site is considered a weakness. This will discourage some industry sectors from locating at the site and may affect the nature and rate of land take up. Industry

sectors most affected will be those requiring high frequency vehicular movement and especially 'time-dependent industries such as logistics and freight-forwarding.

- **Position within an established area is a market advantage.** The broad industrial property market in Lake Macquarie benefits from its location close to the Pacific Highway, and Newcastle Port. The site's position next to Cardiff centre with an established infrastructure is a considerable advantage and may override the access concerns for many industry sectors. Cardiff is one of the oldest and biggest established industrial estates in the Lower Hunter Region and as such a major pull factor.

5.2 Recommendations

The highest and best use of the site for employment is use for light industrial purposes. Target industry sectors are given in Table 18. This would build on Cardiff's existing strength in wholesaling and manufacturing (as identified by location quotient analysis). The latter indicated a Location Quotient (LQ) of around 6 for manufacturing (scientific equipment, electrical equipment, pump manufacturing) and an LQ of 6.57 for poultry wholesaling and 4.50 for electrical equipment wholesaling.

Table 18. Industry Summary

Industry	Floorspace Requirements (sqm)		Land Requirements (ha)		Employment Growth		Other Indicators
	2006-2016	2006-2031	2006-2016	2006-2031	2006-2021	2006-2031	
Basic metals and products	19,798	48,398	3.96	9.68	166	408	Relative specialisation of Cardiff
Fabricated metal products	2,394	5,922	0.48	1.18	80	199	Relative specialisation of Cardiff
Other machinery and equipment	12,086	29,814	2.42	5.96	202	500	Relative specialisation of Cardiff
Wholesale trade	55,629	140,887	18.54	46.96	53	638	Relative specialisation of Cardiff
Repairs	10,483	26,186	1.75	4.36	191	477	Car Retailers one of the biggest employer in Cardiff
Transport and storage	33,083	82,805	11.03	27.60	151	377	Industry experienced 15% employment growth from 96-2006
Property and business services	10,641	27,359	1.06	2.74	426	1,087	Industry experienced 29% employment growth from 96-2006

Source: SGS 2007

Wholesale trade as well as transport and storage have the highest forecast land demand, (around 30 ha in the next 10 years and 75 ha by 2031). However, these sectors have a relatively low employment yield (Table 18). Warehousing, storage and logistics (freight forwarders) should also be considered a target but as discussed above, some firms will require more direct highway access.

To ensure competitiveness and marketability the site should also offer smaller lot sizes (around 1,500 sqm). This would mean that the land has to be zoned as 4(2) (Industrial General Zone) - excluding heavy manufacturing from the site. Smaller lot sizes would obviously appeal to smaller owner occupiers. Highest employment yields could be achieved by targeting operations with a higher office component and attracting ancillary retail to the site.

The subject site has the best prospects for industry take up if it comes onto the market within the next 18 months – ahead of large volumes of potential 'competitor' land. While new land releases have close proximity to arterial roads and some of it close to Newcastle port (e.g. Steel River Eco-Industrial Park in Newcastle), the Pasminco site has the distinct market advantage of being adjacent not only to an established industrial area but also an emerging major commercial centre. This is the site's principal competitive advantage.

Appendix A - Forecasting Industrial Land Demand

This section presents the results from our analysis of estimated industrial land demand for the Lake Macquarie LGA up to 2031. Future demand for industrial land in Lake Macquarie can be estimated by forecasting employment numbers for the LGA and applying industry land per employee ratios. This analysis is based on the following three stages:

- 1.) Calculating forecast employment by industry sector over the 2006-2031 period in the Lake Macquarie LGA using the SGS employment growth model;
- 2.) Converting forecast employment growth into floorspace requirements; and
- 3.) Converting floorspace requirements into demand for industrial land.

Forecasting Employment Growth

SGS has developed an employment growth model for the purposes of this study, which is based on the following two key components:

- Firstly, the model takes employment effects of industry growth. A regional Input-Output model is generated for the region, which is a common form of economic impact analysis. The method used here is similar to that used by the Queensland Treasury and various other statistical agencies. As part of the Input-Output model, the total value of inter-regional exports for each industry is estimated. Assuming that exports grow in proportion to NSW Gross State Product (GSP) levels noted above, and applying regional employment multipliers, it is possible to project the amount of employment that will be generated by a region as industry sectors change their production levels to service export demand.
- Secondly, the model takes employment effects of population growth, the resultant increased consumer spending, and the multiplier effect thereof into account. This approach examines economic growth due to population increase by looking at the consumer spending in the region (based on population growth forecasts). This growth in consumer spending will need to be supported by the labour force that would be earning wages and salaries. In other words, any increase in demand due to growth in consumer spending would in turn require an increase in wages (for this new population). Hence, the population in an area can be treated as an industry with both supply (wages) and demand streams (consumer spending). The effect of this pseudo industry will not only provide its own economic stimulus but also magnify the economic stimulus that is provided due to export growth.

Hence, the SGS Employment Yield Model combines export based industry forecasts with a population yield model to project employment forecasts.

However, it should be noted that forecasts based on this method are expected to be conservative, because change in export and population growth are the only stimuli to the economic system in question. The approach does not take into account surplus investment by firms in the region (i.e. investments due to reasons other than export demand). Nevertheless, the results provide another way of looking at change in the economy.

Figure 12 illustrates forecast employment growth based on Journey-to-Work data for all industry sectors within the LGA, based on the methodology outlined above.

Figure 12. Employment Growth over Time in Lake Macquarie LGA, 2006-2031

	Cumulative Employment Growth 2006-2031 (No. of Jobs)				
	2006-2011	2006-2016	2006-2021	2006-2026	2006-2031
Agriculture; hunting and trapping	13	26	39	51	65
Forestry and fishing	2	3	5	6	8
Mining	111	220	329	437	576
Meat and dairy products	19	39	58	77	96
Other food products	50	101	151	200	249
Beverages, tobacco products	2	3	5	6	8
Textiles	8	15	23	30	37
Clothing and footwear	5	9	14	19	23
Wood and wood products	22	44	66	88	110
Paper, printing and publishing	12	24	35	47	59
Petroleum and coal products	1	3	4	6	7
Chemicals	15	30	44	59	74
Rubber and plastic products	9	18	26	35	44
Non-metallic mineral products	10	20	31	41	51
Basic metals and products	84	166	248	329	408
Fabricated metal products	40	80	120	159	199
Transport equipment	21	42	63	84	104
Other machinery and equipment	101	202	302	401	500
Miscellaneous manufacturing	15	30	45	60	75
Electricity, gas and water	1	1	0	(1)	9
Construction	52	104	156	209	261
Wholesale trade	127	253	380	505	638
Retail trade	630	1,259	1,890	2,515	3,143
Repairs	96	191	286	381	477
Accommodation, cafes and restaurants	133	265	399	531	677
Transport and storage	76	151	226	300	377
Communication services	30	60	91	121	152
Finance and insurance	62	124	186	248	315
Ownership of dwellings	-	-	-	-	-
Property and business services	213	426	639	851	1,087
Government administration	17	35	52	69	87
Education	184	369	554	738	957
Health and community services	326	654	984	1,311	1,715
Cultural and recreational services	44	88	132	176	225
Personal and other services	81	163	245	326	410
Total	2,611	5,216	7,826	10,414	13,222

Source: ABS JTW data, SGS Economics and Planning

Estimating Floorspace Requirements

The employment forecasts for Lake Macquarie LGA can be converted into floorspace requirements through applying current floorspace per employee ratios to the number of forecast employees in each industry sector. These ratios were calculated using the results from the NILES survey, and supplemented with data derived from the 'Perth Land Use Census' as collated by Planning WA (see Appendix B for further information).

The findings are illustrated in the tables to follow. Overall it is estimated that an additional 66.5 hectares of both commercial and industrial floorspace will be required by 2031 to cater for the additional employment growth in Lake Macquarie LGA. Key sectors demanding space include the basic retail trade, wholesale trade, basic metals manufacturing, transport and storage, health and community services, meat and dairy products, as well as property and business services.

Figure 13. Floorspace Requirements in Lake Macquarie LGA, 2006-2031

	Cumulative Floorspace Requirements Lake Macquarie LGA (ha)				
	2006-2011	2006-2016	2006-2021	2006-2026	2006-2031
Meat and dairy products	0.19	0.39	0.58	0.77	0.96
Other food products	0.40	0.81	1.21	1.61	1.99
Beverages, tobacco products	0.01	0.03	0.04	0.05	0.06
Textiles	0.04	0.09	0.13	0.18	0.22
Clothing and footwear	0.04	0.08	0.13	0.17	0.21
Wood and wood products	0.10	0.20	0.30	0.40	0.49
Paper, printing and publishing	0.08	0.16	0.25	0.33	0.41
Petroleum and coal products	0.03	0.06	0.09	0.12	0.15
Chemicals	0.30	0.59	0.88	1.17	1.48
Rubber and plastic products	0.13	0.26	0.39	0.52	0.65
Non-metallic mineral products	0.08	0.16	0.24	0.32	0.40
Basic metals and products	1.00	1.98	2.96	3.93	4.84
Fabricated metal products	0.12	0.24	0.36	0.48	0.59
Transport equipment	0.10	0.21	0.31	0.42	0.52
Other machinery and equipment	0.61	1.21	1.81	2.40	2.98
Miscellaneous manufacturing	0.10	0.20	0.29	0.39	0.49
Electricity, gas and water	0.01	0.00	-	0.01	0.14
Construction	0.78	1.57	2.35	3.13	3.91
Wholesale trade	2.78	5.56	8.35	11.09	14.09
Retail trade	2.30	4.60	6.90	9.18	11.44
Repairs	0.52	1.05	1.57	2.09	2.62
Accommodation, cafes and restaurants	0.38	0.77	1.16	1.54	1.97
Transport and storage	1.66	3.31	4.95	6.58	8.28
Communication services	0.36	0.72	1.09	1.44	1.84
Finance and insurance	0.15	0.31	0.47	0.62	0.79
Property and business services	0.53	1.06	1.60	2.13	2.74
Government administration	0.06	0.12	0.18	0.24	0.31
Cultural and recreational services	0.15	0.31	0.46	0.62	0.79
Personal and other services	0.24	0.47	0.71	0.94	1.19
TOTAL	13.27	26.52	39.75	52.84	66.55

Source: SGS 2007

Estimating Industrial Land Requirements

As can be seen from Figure 14, this floorspace requirement translates into 164.31 ha of industrial and commercial land between 2006 and 2031, when typical floorspace to land ratios are applied (see Appendix C for more detailed information on how these ratios have been derived).

Figure 14. Land Requirements in Lake Macquarie LGA, 2006-2031 (ha)

	Cumulative Land Requirements Lake Macquarie LGA (ha)				
	2006-2011	2006-2016	2006-2021	2006-2026	2006-2031
Meat and dairy products	0.39	0.77	1.2	1.54	1.91
Other food products	0.81	1.62	2.4	3.22	3.97
Beverages, tobacco products	0.03	0.05	0.1	0.10	0.13
Textiles	0.09	0.18	0.3	0.36	0.44
Clothing and footwear	0.08	0.17	0.3	0.33	0.41
Wood and wood products	0.20	0.40	0.6	0.79	0.98
Paper, printing and publishing	0.16	0.33	0.5	0.66	0.82
Petroleum and coal products	0.06	0.12	0.2	0.23	0.29
Chemicals	0.59	1.18	1.8	2.35	2.96
Rubber and plastic products	0.26	0.52	0.8	1.04	1.31
Non-metallic mineral products	0.16	0.32	0.5	0.65	0.81
Basic metals and products	1.99	3.96	5.9	7.87	9.68
Fabricated metal products	0.24	0.48	0.7	0.95	1.18
Transport equipment	0.21	0.42	0.6	0.83	1.04
Other machinery and equipment	1.21	2.42	3.6	4.81	5.96
Miscellaneous manufacturing	0.20	0.39	0.6	0.78	0.98
Electricity, gas and water	0.02	0.01	(0.0)	0.10	0.46
Construction	1.56	3.13	4.7	6.27	7.82
Wholesale trade	9.26	18.54	27.8	36.98	46.96
Retail trade	5.75	11.50	17.3	22.95	28.61
Repairs	0.87	1.75	2.6	3.48	4.36
Accommodation, cafes and restaurants	0.55	1.10	1.7	2.20	2.82
Transport and storage	5.53	11.03	16.5	21.94	27.60
Communication services	1.20	2.41	3.6	4.81	6.12
Finance and insurance	0.15	0.31	0.5	0.62	0.79
Property and business services	0.53	1.06	1.6	2.13	2.74
Government administration	0.06	0.12	0.2	0.24	0.31
Cultural and recreational services	0.22	0.44	0.7	0.88	1.13
Personal and other services	0.34	0.67	1.0	1.35	1.70
Total	32.73	65.41	98.0	130.26	164.31

Source: SGS 2007

Appendix B - Floor space to Employee Ratios

Table 19. Floorspace to Employee Ratios for Lake Macquarie LGA

Industry	Floorspace Assumptions
Meat and dairy products	100.00
Other food products	80.48
Beverages, tobacco products	80.48
Textiles	60.00
Clothing and footwear	90.00
Wood and wood products	45.00
Paper, printing and publishing	70.00
Petroleum and coal products	200.00
Chemicals	200.00
Rubber and plastic products	150.00
Non-metallic mineral products	80.00
Basic metals and products	120.00
Fabricated metal products	30.00
Transport equipment	50.00
Other machinery and equipment	60.00
Miscellaneous manufacturing	65.00
Electricity, gas and water	120.00
Construction	150.00
Wholesale trade	220.00
Retail trade	36.50
Repairs	55.00
Accommodation, cafes and restaurants	29.00
Transport and storage	220.00
Communication services	120.00
Finance and insurance	25.00
Property and business services	25.00
Government administration	35.00
Cultural and recreational services	35.00
Personal and other services	29.00

Source: SGS 2007

Appendix C – Floorspace to Land Area Ratios

Table 20. Floorspace to Land Area Ratios for Lake Macquarie LGA

Industry	Industrial (I) / Commercial (C)	Floorspace / land area
Property and business services	C	100%
Finance and insurance	C	100%
Basic metals and products	I	50%
Accommodation, cafes and restaurants	C	70%
Transport and storage	I	30%
Government administration	C	100%
Meat and dairy products	I	50%
Wholesale trade	I	30%
Communication services	I	30%
Fabricated metal products	I	50%
Other machinery and equipment	I	50%
Retail trade	C	40%
Repairs	I	60%
Transport equipment	I	50%
Paper, printing and publishing	I	50%
Cultural and recreational services	C	70%
Chemicals	I	50%
Personal and other services	C	70%
Petroleum and coal products	I	50%
Other food products	I	50%
Clothing and footwear	I	50%
Rubber and plastic products	I	50%
Non-metallic mineral products	I	50%
Textiles	I	50%
Miscellaneous manufacturing	I	50%
Wood and wood products	I	50%
Construction	I	50%
Beverages, tobacco products	I	50%
Electricity, gas and water	I	30%
Sources:		
Tim Nott, "Selected Industrial Development Parameters for Dandenong South" 2004 SGS Economics and Planning		

Source: SGS 2007