Department of **Agriculture, Fisheries and Forestry**

Evaluating the commercial viability of a northern outback Queensland meat processing facility

Queensland Government

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MITEZ Mount Isa to Townsville Economic Development Zone Inc.

NorthBEEF

GULF SAVANNAH DEVELOPMENT

Queensland Government

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Executive Summary

Introduction

This study has been commissioned by the Queensland Department of Agriculture, Fisheries and Forestry with funding assistance from the Australian government, and supported by a management group comprising representatives from the producer group Northbeef, Mount Isa to Townsville Economic Zone Inc (MITEZ) and Gulf Savannah Development (GSD). This report constitutes Stage 1 of the overall study.

The scope of the study was to conduct a preliminary investigation into the viability of a new meat processing facility in northern outback Queensland and to analyse and compare alternative potential locations within the study zone. In the absence of a regional abattoir, slaughter ready cattle from this region are transported long distances to coastal and SE Queensland abattoirs. High associated costs place the local beef industry at a global competitive disadvantage. Recent volatility in the live export trade has also negatively affected the outlook for regional producers. A local abattoir would potentially improve the trading position of regional producers.

Stage 2 of the study, should it proceed, is envisaged to develop a form of prospectus or investment platform to be issued by the Queensland government (in partnership with Commonwealth and local agencies) to attract investor interest in such a development.

Background

Northern Queensland cattle production is oriented towards breeding. Many corporate pastoral companies and larger private producers have a semi-integrated supply chain involving multiple properties from the north to the south of the state, where most processing capacity is concentrated.

The cattle herd in the study area is a conservatively estimated 3.4 million, based on recent ABS survey figures. Assuming a turnoff rate of 30%, approximately 1 million cattle leave properties in this region each year. Of this number, about 100,000 are exported live, 213,000 are taken direct to slaughter while the remaining 700,000 are presumably transferred to other properties for finishing.

An estimated 21% of cattle turnoff from northern outback Queensland is slaughter-ready. Of the 213,000 annual slaughter number in 2009 and 2010, 75% were destined for coastal abattoirs between Townsville and the Rockhampton area, with the remaining 25% driven the longer distance to abattoirs in SE Queensland (NLIS data 2009 and 2010). It is assumed that cattle movements of this type generally occur from the region in most years.

Regional producers bear substantial live cattle transport costs and carcass shrink losses resulting in significantly reduced net returns. In some cases, cattle are left to die on the property rather than transported at a loss for slaughter.

There is some potential for developing finishing operations in some areas within the region in support of a local abattoir. The proposed development of irrigation areas on the Flinders and Gilbert Rivers enhances this opportunity.

The prime efficiency driver for a local abattoir is the difference between the cost of transporting live animals versus freight of processed product in refrigerated containers. The high cost of shrink losses, tick line treatments, and regulations governing truck driver fatigue and animal welfare contribute to this differential. Reducing live transport distances in a supply chain are an important means to reduce costs faced by producers in selling their cattle into the global meat markets. Reduced live transport distances also enhance meat quality and the possibility of producers qualifying for Meat Standards Australia (MSA) premiums.

Viability of a North West Queensland Processor

There is no shortage of processing capacity in the Queensland beef cattle industry, with around 4 million head of capacity available to handle an annual 'kill' of about 3.3 million head. For many producers in northern outback Queensland however, this processing capacity is arguably too distant from production areas and cattle prices net of transport and shrink costs do not generate sufficient returns.

There is evidence of a shift in the global market for beef consumption, with demand stagnating in traditional northern hemisphere markets (such as the US, Europe and Japan), and growing rapidly in parts of Asia and the Middle East. Northern Australia is in an excellent position to capitalise on this trend, and new supply chain options will become increasingly viable in coming decades. The potential for the future success of a local processor is therefore greater than at any time in the past 20 to 30 years.

The establishment of a new abattoir in northwest Queensland drawing slaughter ready cattle from adjacent areas would significantly reduce live transport and shrink costs currently borne by producers, and would improve the supply chain efficiency for cattle in this area.

Comparative Cost Analysis

Analysis of NLIS data on slaughter turn-off numbers for the study region was used to model the supply chain costs that could be expected from the operation of a local abattoir, versus the current lowest cost supply chain option currently available to producers. The analysis compares the property to market supply chain cost for cattle in all shires within the region, using a hypothetical new abattoir located in a range of 10 centres throughout the region.

Modelled supply chain costs for each shire are compared with those for the least cost supply chain using existing processors, to derive an estimate of potential slaughter cattle catchment for each potential abattoir location. The overall supply chain saving is then expressed as an annual total, and as a figure per head of catchment cattle.

A summary of the potential catchment numbers and estimated value generated by a new facility in each location appears below:

Max Potential Cattle Supply	Potential Abattoir Location									
Based on comparison with:	Charters Towers	Hughenden	Richmond	Julia Creek	Cloncurry	Mt Isa	Normanton	Winton	Longreach	Georgetown
All currently used abattoirs	236,706	167,902	139,687	116,766	96,666	96,116	83,932	167,352	167,352	65,084
Townsville only	167,902	167,352	139,687	116,766	116,766	69,705	47,653	167,352	128,977	40,480
Rockhampton only	225,526	246,176	225,526	134,462	133,264	124,891	103,168	191,049	182,777	130,607
Brisbane only	273,841	273,841	273,841	246,176	246,176	246,176	134,360	273,841	273,841	225,526
Least cost	119,586	139,687	119,037	96,116	96,116	69,705	47,653	167,352	128,977	40,480
Total Financial Benefit (K pa)	$2,073	$3,462	$3,233	$3,497	$3,950	$2,687	$1,498	$4,077	$3,348	$1,151
Benefit/Head	$17.33	$24.78	$27.16	$36.38	$41.10	$38.55	$31.45	$24.36	$25.96	$28.44

Based on this analysis, an abattoir located in the Cloncurry area would offer the greatest benefit per head at $41.10. This location could be expected to attract in the order of 96,000 slaughter ready cattle per year based on existing regional turnoff rates. This throughput is the minimum required to support an operationally efficient abattoir with sufficient scale to be productive and cost efficient. Other sites, especially Winton offer significant modelled benefits in terms of value and cattle supply. However, when a range of other practical factors such as road access, labour availability, service availability and market proximity are taken into account, the Cloncurry area appears to be the prime, practical candidate for location of a facility.

The Cloncurry area enjoys the following advantages:

- Good major road access to all northwest Queensland and eastern Northern Territory production areas, all triple road train approved.
- Relative proximity to future potential export locations at Townsville and Darwin
- Reasonable population and public services, and within 120 km of Mount Isa with 30,000 population and more expansive public and social amenities.
- Significant labour catchment.
- Water, power and suitable land available. Fuel available either tanker LPG or tanker CNG ex Mount Isa pipeline.
- Suitable finishing areas and future irrigated fodder production areas nearby.
- Located in tick infected area hence no producer tick clearance costs.

The model cannot predict pricing behaviour by a new abattoir operator or its competitors, however it is likely that the benefits would be shared between the processor and producers. The new operator would need to set prices to attract a steady supply of cattle while generating a return on the substantial capital involved. Producers could expect to see somewhat reduced cattle grid prices but improved net returns through savings in livestock transport costs, shrink losses and MSA premiums.

The model suggests that of the $41 per head estimated supply chain cost saving, approximately 40%-60% would be retained by the processor in the form of a reduced grid price versus the coastal and southern processors. This reduced price must cover the additional expenses of operating in a remote location as well as provide a return on the invested funds. The remaining 40%-60% would be the average benefit to producers in the form of increased net return (grid price net of transport, shrink and MSA). This benefit will not be evenly distributed across the catchment with producers located very close to the abattoir receiving a more substantial benefit, while producers near the “break even arc” located some 400-500 km towards the existing processors would see only a marginal net benefit. Producers would also benefit from greater proximity to the processor, and a consequently stronger relationship.

Challenges

There is excess processing capacity in Queensland at present, although it is not all located in the most appropriate or efficient locations from a producer standpoint. Any new abattoir will, at least in the short term, result in a small reduction in throughput at all Queensland abattoirs, with Townsville being most affected.

Operating costs for a Cloncurry area abattoir would be greater than for a coastal or south Queensland operation. This is due to the additional costs of operating in a remote location including the cost of freight of consumables to site, cost of skilled labour, higher energy costs and lack of scale compared with existing operations. Operating cost and therefore business earnings are very sensitive to variations in exchange rate, seasonality, drought, cattle available for purchase, products marketed and business model used. A new abattoir for northern outback Queensland would be likely to generate improved net return outcomes for local producers, but could only expect to generate a marginal return on its investment.

Any potential abattoir site would need to be at least five kilometres from any town and at least one kilometre from any residence or sensitive odour receptor. In addition, the site should located a sufficient distance away from any mine site (whether active or shutdown), to avoid the perception of being "tainted". Other factors such as proximity to services, road access and suitable land for irrigation using effluent will also affect location.

Seasonality will affect a Cloncurry area abattoir more than existing abattoirs. Historically, turnoff of slaughter ready cattle from the GSD and MITEZ shires is minimal during December to February, with stronger turnoff March to October. The development of a northern outback Queensland abattoir would provide incentives for changes in producer practices including providing all-weather load-out facilities and improved fodder production to reduce the seasonal supply shortfall.

Recruiting suitably skilled labour for a northwest Queensland abattoir will be challenging. The population of the area is relatively low and the mining and resources industries compete for skilled labour. The nomination of the Cloncurry area as a suitable location enables the abattoir to draw from Mount Isa, some 120 km away, the biggest population centre (at approximately 30,000 residents) in the northwest of the state. An abattoir offers an alternative employment opportunity for many local people unable to find suitable work in the mining sector.

Potential to Change Producer Behaviour

Producers would have the incentive to change their practices to maximize returns. These changes could include:

- Retaining cattle on finishing properties near the new abattoir and not sending them south 'out of economic range'.
- Use of better properties with finishing potential exclusively for finishing young cattle from the breeder-only properties in the far north.
- Expansion of wet season supply capability (use of fodder and all-weather load-out) to capitalise on wet season premium prices.
- Improved breeds and genetics to take advantage of MSA quality premiums and improve productivity.
- Use of local irrigated fodder to improve slaughter weight for age.

All of these changes would develop over time, with the increased number of cattle ready for slaughter and increased carcass weight being to the advantage of both the new abattoir and producers.

Cost estimates

The estimated capital cost of a 400 head per day, 100,000 head per annum abattoir is of the order of $49 million. This does not include the cost of suitable land and provision of the services (water, electric power, gas, and road access) which might be considered the role of government. Even with these exclusions, the return on such an investment is likely to be marginal.

Therefore, conditions likely to make this proposed abattoir attractive to an investor include assistance with:

- Provision of all weather road access to site
- Provision of sufficient and reliable power, water and gas to site
- Provision of land
- Support with statutory approvals and Development Applications
- Support with training
- Financial support via tax concessions, AQIS charges.

The cost of providing services (utilities and roads) to a potential abattoir site is highly dependent on the site selected, but is broadly estimated at between $10.5 million and $28 million. Public support of this nature might be justified to facilitate strategic regional economic development. Reduced road damage due to road trains, and less demand on subsidised rail may also be considerations. Federal, state and local government would need to agree in principle and make known the level of support infrastructure available to a prospective investor together with any applicable conditions.

Some strategic considerations which might affect a prospective operator's acceptance of the expected level of risk/return are:

- Improved level of integration in the supply chain (eg corporate producer with established cattle supply and/or marketing network)
- Opportunity for an existing processor seeking to expand
- New entrant with existing marketing network, or vision for capturing new markets
- Existing processor subject to urban encroachment pressure, environmental issues
- Producer cooperative.

Contents

1 Introduction and Background

The beef cattle industry in Queensland and Australia generally is going through a period of considerable change due to global economic trading conditions, supply chain reforms as well as community concerns over animal welfare. The focus of change is particularly evident in Northern Australia, where the recent announcement of reduced quotas for live cattle export and boxed beef into Indonesia has led to concerns over the future viability of the industry in some regions.

Current economic trading conditions including high A$ exchange rate, high production costs, slow demand growth and international competitiveness are presenting challenges to producers and processors alike.

This study focuses on the particular challenges faced by Northern Queensland producers and their communities, particularly in the Gulf Savannah and Mt Isa to Townsville Economic Zone areas, who are seeking to understand the options available for the development of local processing capability in view of the long distances and increasing cost of getting their slaughter cattle to processors located on the east coast and in the Brisbane region.

The task is to review all aspects of north Queensland cattle production and the transfer of product to market, and to assess whether new processing capacity would improve returns and income reliability for local producers. In the course of the study, the nature of a new processing operation and the range of potential locations is also reviewed, as well as the product mix that should be taken into account in the design of a facility.

At the commencement of the project, the Project Team embarked on a 10 day tour through the MITEZ and Gulf - Savannah regions, meeting with producers and community leaders in order to understand local production and development issues.

2 Framework of Analysis

This analysis has been both qualitative and quantitative. Qualitative research has taken the form of:

- review of available studies and reports into the Queensland beef cattle industry.
- discussions with key industry stakeholders and service providers.
- research into the practicalities of abattoir development at localities throughout the study area.

Quantitative research has been based on the provision to the team of National Livestock Identification System (NLIS) data covering cattle movements for slaughter from shires in the study area to abattoirs throughout Queensland in the years 2009 and 2010, and data on movements of cattle from the Northern Territory into Queensland. This data has formed the basis of research into the numbers of cattle being turned off for slaughter in the region, and the comparative costs of getting these cattle to end markets via different existing and hypothetical processing options at various potential locations.

The model developed for this purpose is used to calculate the differences in overall supply chain costs from producer to abattoir and then on to export market, based on the location of existing and potential abattoirs.

On the basis of this modelling, the variable cost saving impacts of a new abattoir on producers and processors in each of the subject shires are estimated. The model provides estimates of the number of cattle that could be attracted into a new abattoir in each region based on this supply chain cost comparison, and this offers a guide to the scale of cattle supply into a new facility and, consequently, its chances of commercial success.

From this combination of qualitative research supplemented by modelling, the team has produced a commentary on the overall viability of a new facility, and a ranking of potential locations. The report also considers the various options that exist for the management and governance of a new facility in order to respond to the current market circumstances in which abattoirs must compete.

3 Cattle Available for Slaughter

The Queensland cattle population is approximately 12 million, and has been consistently at a level of between 11.5 and 12 million since 2004 (DEEDI 2010). Herd size estimates published by the ABS show slightly smaller numbers, with a meat cattle population of 11.2m, and a dairy cattle herd of 162,000.

The meat cattle population in the three statistical divisions most directly covered in this study are as follows:

Cattle type	Northern	Far North	North West	Study area	Queensland
heifers + cows > 1 y.o.	355,298	478,996	1,224,988	2,059,282	5,953,306
other	246,433	306,048	798,570	1,351,051	5,240,041
total meat cattle	601,730	785,044	2,023,558	3,410,332	11,193,348
percentage of Qld herd	5%	7%	18%	30%	

Table No. 1 – Meat Cattle Herd in Study Area (2011)
Source: ABS Agricultural Commodities 2011

Of the 3.4m cattle on properties in the three statistical areas representing the study area, an estimated average 30% are turned off per annum, suggesting that about 1 million cattle are turned off from the study region each year. NLIS data sourced for this study suggests that of this figure, about 213,000 head are turned off for slaughter, an average 100,000 are taken to local ports for live export, with the remaining 700,000 moving south for finishing on Central Queensland grasslands or in feedlots.

The Northern Region currently contains about 5% of the state's cattle herd and includes coastal and inland grazing zones. The Region is centred on Charters Towers and includes the coastal region around Townsville. The inland region feature native pastures with production systems involving breeding, selling weaners, store steers and Japanese ox. Coastal lands include some sown pastures, some irrigated pastures and similar cattle products.

The North-West Region extends west from Hughenden through Mount Isa to the Northern Territory border. It hosts about 18% of the state's herd on a range of pasture types. To the north, large properties on the Gulf plains breed weaners for finishing on Mitchell Grass areas further south. Smaller properties turn off steers for live export or slaughter. The Gulf Savannah country of the far north is known as the 'calf factory' and most of the cattle are moved south after reaching a weight of 300 to 350 kg.

The Far-North Region includes Cape York, Gulf Country and the Atherton Tableland. Northern properties are mostly breeding enterprises, while Tableland properties can turn off finished cattle for slaughter in Townsville.

In addition to these cattle turned off from properties within the region, an estimated 150,000 head per year are moved through the region from Northern Territory properties en route to slaughter via the Queensland finishing supply chain.

The figure below is a stylised representation of the basic supply chain options utilised by producers and other industry participants, and reflects the general north-south and west-east movements of cattle towards markets.

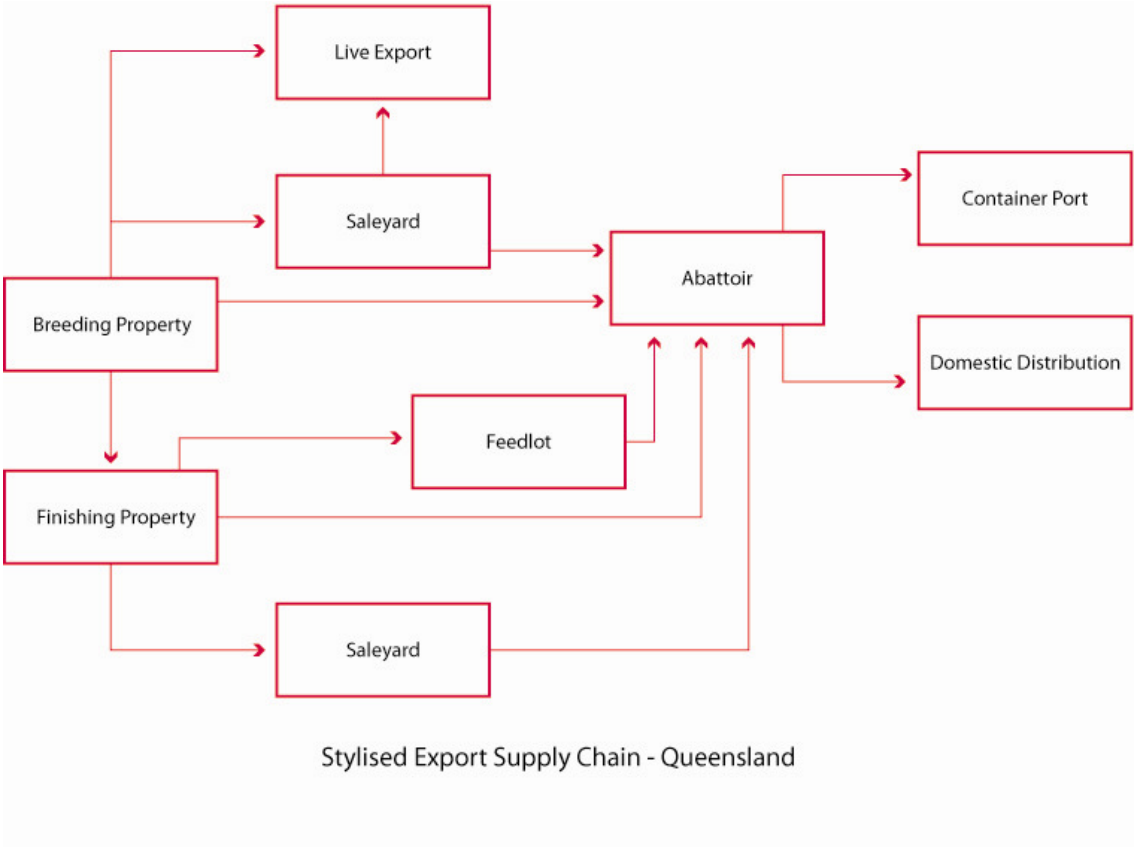

Figure No. 1 – Stylised Queensland Beef Supply chain

Numbers of cattle sold for live export vary significantly from year to year as shown in Table No. 2 below, but average around 100,000. The most significant export port is Townsville, though some cattle from the North-west region are exported through Karumba and Darwin.

	1999	2000	2001	2002	2003	2004
Townsville	73,189	107,835	71,251	166,409	62,050	11,179
Weipa	4,026	5,211	5,966	2,716	2,362	1,200
Karumba	45,503	46,588	34,591	34,797	36,330	8,292
Mackay						
Innisfail	4,391	1,991	2,287	2,895	850	
Gladstone						
Cairns	7,347	2,193	2,493		970	3,252
Total Nth Qld	**134,456**	**163,818**	**116,588**	**206,817**	**102,562**	**23,923**
Darwin	285,520	305,081	262,313	324,144	263,698	216,894

	2005	2006	2007	2008	2009	2010	average
Townsville		12,739	51,202	75,953	124,365	63,123	68,275
Weipa					1,701		1,932
Karumba	8,157	2,500	14,713	10,538	18,007	20,697	23,393
Mackay					2,907		242
Innisfail		970	1,504	6,905	7,840	6,578	3,018
Gladstone						2,709	226
Cairns	980		980				1,518
Total Nth Qld	**9,137**	**16,209**	**68,399**	**93,396**	**154,820**	**93,107**	**98,603**
Darwin	209,274	239,948	288,787	359,307	353,278	299,438	283,974

Table No.2 – Live Cattle Exports through Queensland Ports and Darwin

Note that the reduction in cattle sold for live export between 2009 and 2010 was primarily due to the application of a reduced live weight limit by the Indonesian government.

Cattle Production

A proportion of the cattle available for slaughter from this region are exhausted breeding stocks that are culled each year as part of the normal production cycle. The net income to producers may be so marginal in some instances that some of these cattle may be left to die on the property.

The young heifer and steer turn off are sold to re-stockers and travel south into the central and southern regions of Queensland, where they are intensively raised on pasture and/or in a feedlot facility for another six months or so reaching a live weight of 550 kgs.

These cattle are then slaughtered in an abattoir in southeast Queensland, and the products sold to international markets via the port of Brisbane or into the major domestic markets centred on Brisbane, Sydney and Melbourne.

Based on the NLIS data on slaughter ready cattle (SRC) movements for 2009 and 2010, and cattle populations by shires (ABARE 2006 census), a model of cattle movements across the subject area has been developed. The data illustrate the high significance of the northern coastal abattoirs to the eastern shires, while the western areas show a higher proportion 'freight-advantaged' into Brisbane abattoirs, using the Landsborough Highway in preference over the Flinders Highway to Townsville and the coast.

Of total cattle turned off for slaughter from the GSD and MITEZ regions, 75% are slaughtered in coastal abattoirs between Townsville and the Rockhampton area, and 25% in abattoirs in southeast Queensland (NLIS data 2009 + 2010).

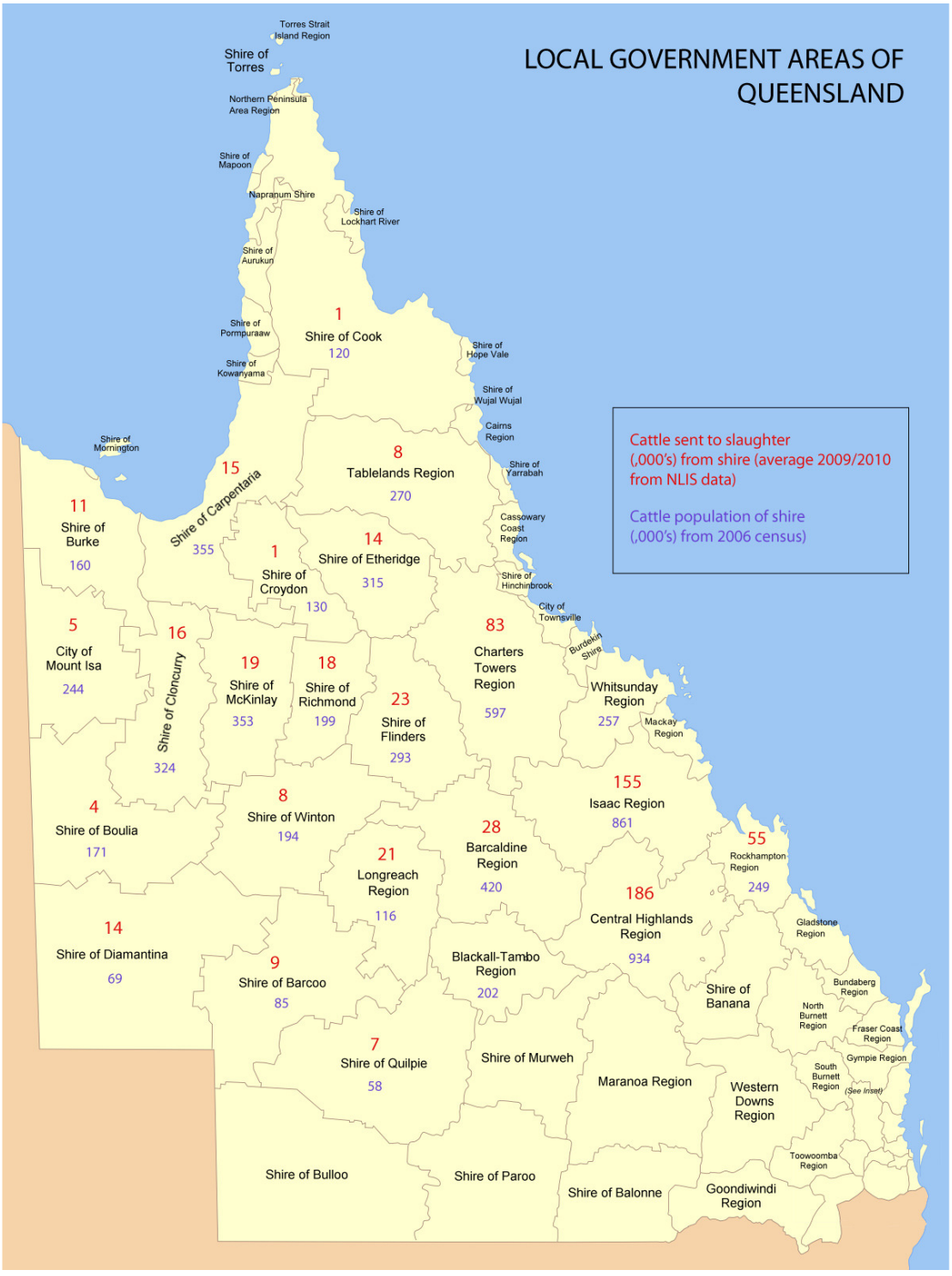

Figure No. 2: Slaughter Ready Cattle and Population by Shire

	Originating GSD and MITEZ Shire												
Abattoir Location	Cook	Tablelands	Burke	Carpentaria	Croydon	Etheridge	Mount Isa	Cloncurry	McKinlay	Richmond	Flinders	Charters Towers	Total
Slaughter numbers													
North-east Qld	1,198	8,272	4,178	10,657	490	13,678	2,364	4,900	11,691	12,745	21,561	67,873	**159,605**
Brisbane environs	-	-	6,620	4,798	60	-	2,392	11,196	7,158	5,293	1,360	14,920	**53,794**
Total	1,198	8,272	10,798	15,455	550	13,678	4,755	16,096	18,848	18,038	22,921	82,792	**213,399**
% of region total	0.6%	3.9%	5.1%	7.2%	0.3%	6.4%	2.2%	7.5%	8.8%	8.5%	10.7%	38.8%	**100%**
Proportion													
North-east Qld	100%	100%	39%	69%	89%	100%	50%	30%	62%	71%	94%	82%	**75%**
Brisbane environs	0%	0%	61%	31%	11%	0%	50%	70%	38%	29%	6%	18%	**25%**
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	**100%**

	Originating Non GSD or MITEZ Shires												
Abattoir Location	Boulia	Diamantina	Winton	Barcoo	Longreach	Quilpie	Barcaldine	Central Highlands	Isaac	Rockhampton			**Total**
Slaughter numbers													
North-east Qld	1,188	25	4,832	39	8,120	-	15,421	76,639	80,980	31,025			**218,268**
Brisbane environs	2,566	14,000	3,542	9,171	12,531	7,307	12,245	109,162	74,287	24,481			**269,289**
Total	3,754	14,025	8,374	9,210	20,650	7,307	27,666	185,801	155,267	55,506			**487,556**
% of region total	0.8%	2.9%	1.7%	1.9%	4.2%	1.5%	5.7%	38.1%	31.8%	11.4%			**100.0%**
Proportion													
North-east Qld	32%	0%	58%	0%	39%	0%	56%	41%	52%	56%			**45%**
Brisbane environs	68%	100%	42%	100%	61%	100%	44%	59%	48%	44%			**55%**
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%			**100%**

Table No. 3: Slaughter Ready Cattle Numbers by Originating Shire and Destination Abattoir (Average 2009/2010)

Source: NLIS data provided by DAFF 17/11/2011

Table No.3 above shows the number of cattle turned off for slaughter from the GSD and MITEZ shires on average over the two calendar years 2009 and 2010 was 213,000. With an estimated one million cattle turned off from the area and 100,000 to live export, the remaining 700,000 represent a significant number of cattle being sent from the region to be finished in the south of the state. These cattle represent a substantial latent pool of supply that could be captured in part by a local processor if other aspects of the supply chain can be developed.

In addition, a significant number of cattle (of the order of 150,000) enter Queensland from the Northern Territory along the Barkly Highway to Mount Isa and Cloncurry. It is believed that nearly all these cattle are bound for finishing properties in the centre and south of the state. A proportion of these would be cattle from large, multi property corporate beef producers with an established supply chain ending at one of the coastal or southeast Queensland processors. A new northwest Queensland processor might expect to receive some slaughter ready cattle direct from the Northern Territory, with the potential for more to be finished near the new abattoir and slaughtered locally.

4 Seasonality of Supply

Seasonality is a term used to describe the impact of breeding cycles and the wet season, which commences at the end of November and finishes in late March or April the following year.

The existing abattoir infrastructure is located along the east coast, and presently operates with a shut-down period of one to two months a year. On occasion, however, some of these plants have worked through the wet season by securing local cattle supply and operating at low throughputs thus covering some of their fixed expenses. The effect of the wet does vary from region to region and from year to year, but as a general rule is more debilitating the further west, due to limited infrastructure (sealed roads and low lying bridges) that become flood bound or damaged for weeks on end.

The properties themselves also have limited ability to operate in the wet so cattle movements are severely restricted. A general acceptance of a seasonal downturn in activity on these properties is part of the industry's culture in the tropics. However, the coastal and hinterland regions of the north are becoming more accessible following adverse weather, and the ability of a producer to move cattle to market in the wet is improving. The impact of seasonal conditions on down time in coastal abattoir operations is therefore probably gradually reducing.

The monthly NLIS data provided for this study was used to illustrate the impact of seasonality on slaughter turnoff for various regions. In this analysis, shires were grouped into regions which might be expected to suffer a similar seasonal impact. The Gulf region consists of the northern shires of Cook, Burke, Tablelands, Carpentaria, Croydon and Etheridge. The MITEZ region consists of Mount Isa, Cloncurry, McKinlay, Richmond, Flinders and Charters Towers. The Central region consists of Boulia, Diamantina, Winton, Barcoo, Longreach, Quilpie, Barcaldine, Blackall Tambo, Central Highlands, Isaac and Rockhampton.

Figure No. 3 below indicates the regions used in the seasonality analysis.

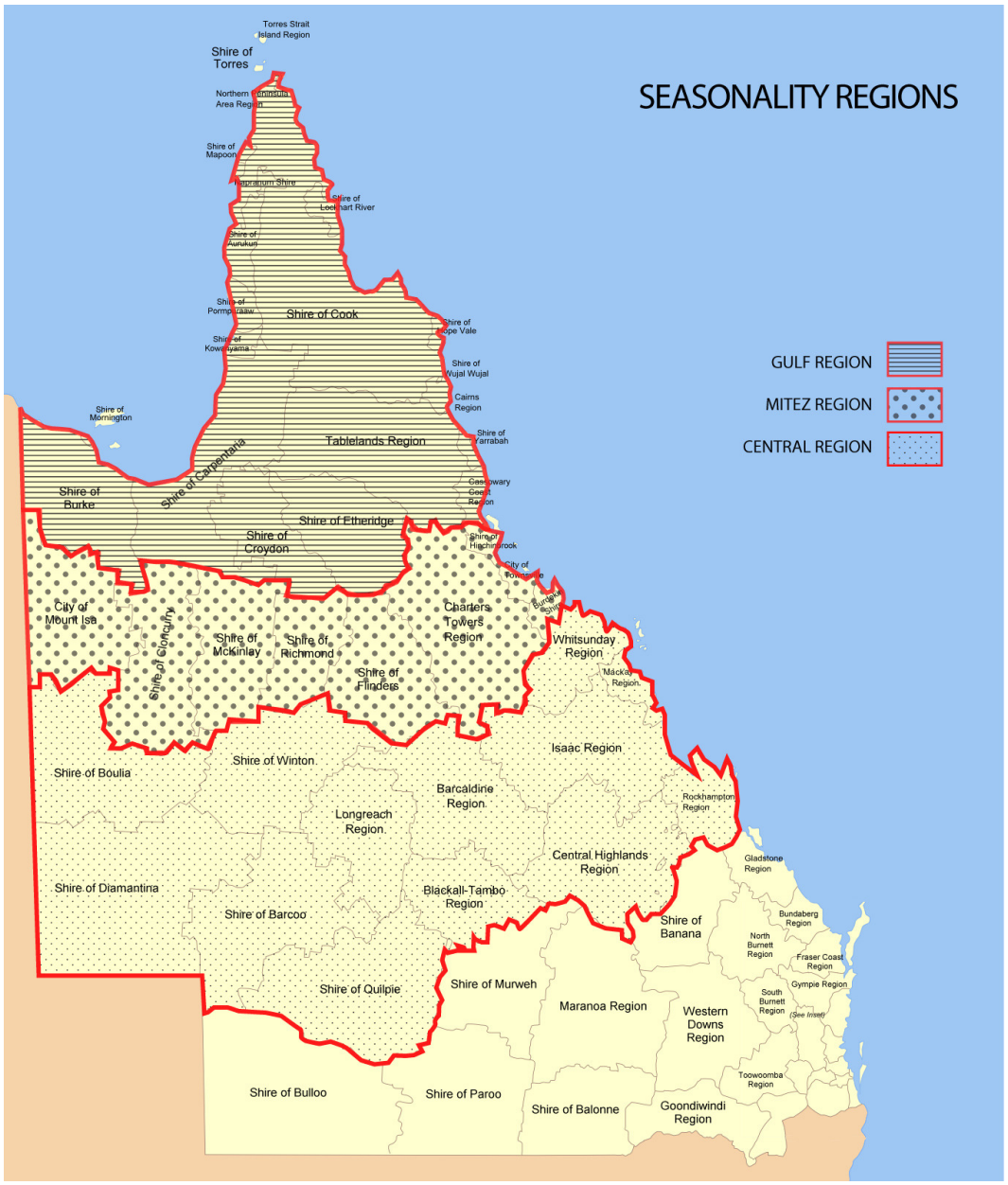

Figure No. 3: Seasonality Regions

The average (2009/2010) monthly breakdown of slaughter cattle turn-off from the three separate regions in the study area is shown in Table No. 4 and Figure No 4 below:

	2009			2010		
Month	GULF	MITEZ	CENTRAL	GULF	MITEZ	CENTRAL
January	-	-	16,624	-	265	9,595
February	-	230	30,331	1,241	2,432	14,419
March	1,621	7,420	40,350	2,069	11,492	28,772
April	4,398	11,992	34,142	2,533	15,021	36,160
May	6,189	17,234	37,233	5,102	19,590	37,228
June	7,641	19,201	23,583	8,510	19,056	50,524
July	6,473	14,260	45,077	7,976	18,752	54,263
August	7,695	21,662	41,755	8,154	19,919	41,746
September	4,979	14,783	36,842	8,173	12,458	26,161
October	3,283	15,905	37,790	4,397	9,561	42,859
November	4,091	6,783	23,946	3,907	9,170	40,612
December	70	1,685	17,092	1,396	6,720	31,498
TOTAL	**46,440**	**131,155**	**384,765**	**53,458**	**144,436**	**413,837**

	2009			2010		
Month	GULF	MITEZ	CENTRAL	GULF	MITEZ	CENTRAL
January	0.0%	0.0%	4.3%	0.0%	0.2%	2.3%
February	0.0%	0.2%	7.9%	2.3%	1.7%	3.5%
March	3.5%	5.7%	10.5%	3.9%	8.0%	7.0%
April	9.5%	9.1%	8.9%	4.7%	10.4%	8.7%
May	13.3%	13.1%	9.7%	9.5%	13.6%	9.0%
June	16.5%	14.6%	6.1%	15.9%	13.2%	12.2%
July	13.9%	10.9%	11.7%	14.9%	13.0%	13.1%
August	16.6%	16.5%	10.9%	15.3%	13.8%	10.1%
September	10.7%	11.3%	9.6%	15.3%	8.6%	6.3%
October	7.1%	12.1%	9.8%	8.2%	6.6%	10.4%
November	8.8%	5.2%	6.2%	7.3%	6.3%	9.8%
December	0.2%	1.3%	4.4%	2.6%	4.7%	7.6%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table No. 4: Slaughter Ready Cattle Numbers by Region by Month (2009/2010)
Source: NLIS data provided by DAFF 17/11/2011

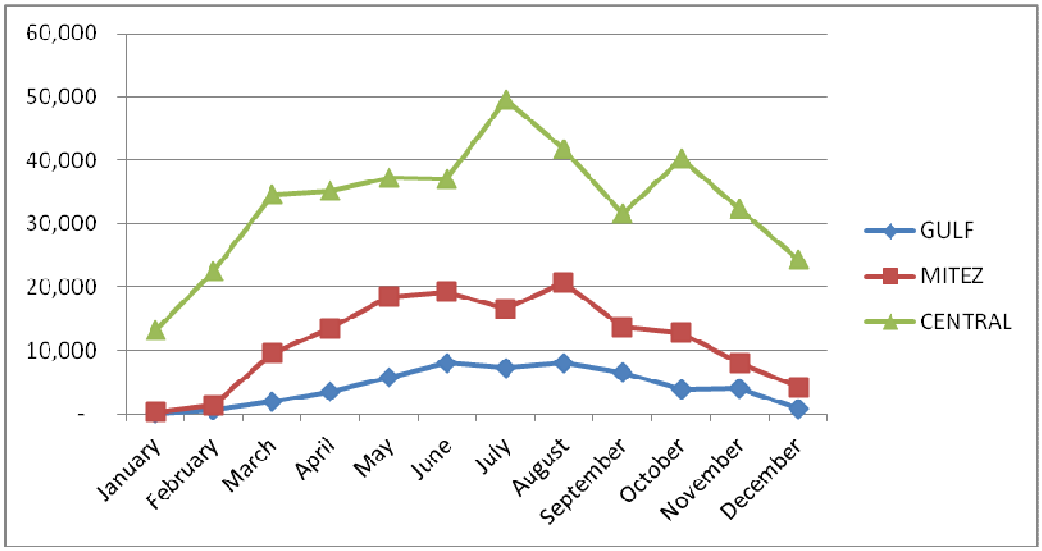

Figure No. 4: Slaughter Ready Cattle Numbers by Region by Month (Average 2009/2010)
Source: NLIS data provided by DAFF 17/11/2011

The impact differs from region to region, with northern areas more susceptible to downturn due to road conditions, severity of rainfall events and the general ability to work cattle.

5 Supply Chain Cost Analysis

A model has been created for this study to estimate the cost differentials between the property to market costs for producers in each shire, for a range of different existing and potential abattoir locations.

NLIS data for slaughter movements in the years 2009 and 2010 has been used to create a differential supply chain cost analysis to determine the theoretical best cost path to market for producers in various areas throughout the study region.

To do this, distances for live cattle transport into abattoirs and for containerised freight to ports from abattoirs have been calculated, along with indicative freight cost estimates for each leg of the journey.

Comparative costs have been estimated for all the abattoir locations currently used by producers, in Townsville, Mackay, Rockhampton (and environs) and Brisbane (and environs). The notional costs of supplying cattle to each potential new abattoir are calculated and compared to the least cost pathway of the existing abattoir choices.

Where a cost saving is indicated for a particular location, the annual slaughter 'population' is attributed to that hypothetical abattoir. A separate page in the model performs these cost calculations and comparisons for each originating shire, and then the total slaughter 'populations' and total estimates of cost savings are added up in summary tables.

The model is designed so that some variables can be altered readily to test different commercial scenarios. In particular, a 'switching cost' is used to indicate the risk that a producer may not immediately choose the lowest cost operator, unless the cost saving is sufficiently significant as to make a difference to his return on the sale.

A sample model page (for Richmond Shire) is shown below as Table No. 5 to illustrate the basic methodology. Switching cost has been set at $5 per head.

The Supply Chain Analysis considers all significant costs and benefits related to location relative to the existing abattoir sites. Costs and benefits considered are:

- Cost of live cattle transport to abattoir site
- Cost of carcase shrink in transport to abattoir site
- Cost of transport of meat products, hides, offal, tallow and meat meal from abattoir to Brisbane or other alternative port
- MSA price premium available to producers able to have their cattle slaughtered within the 24 hour period required
- Energy and gas costs (relative to coastal and Brisbane plants)
- Additional operating costs due to abattoir site being remote from coastal and Brisbane industrial infrastructure

The treatment of these issues in the model is discussed in the following section.

		Existing abattoirs					Potential new abattoir sites									
Originating shire		TOWNSVILLE	MACKAY	ROCKHAMPTON	BRISBANE	Current avge	Charters Towers	Hughenden	Richmond	Julia Creek	Cloncurry	Mt Isa	Normanton	Winton	Longreach	Georgetown
Richmond	Current abattoir proportion	64%	3%	4%	29%											
	Annual slaughter	11,474	566	705	5,293	18,038										
	Freight costs (live transport)															
	distance to abattoir	501	827	1100	1585	853	364	115	50	149	286	406	586	229	408	559
	animals/deck	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	decks/truck	6	4	4	5	5.6	6	6	6	6	6	6	6	6	6	6
	animals/truck	120	80	80	100	111	120	120	120	120	120	120	120	120	120	120
	origin - kg/animal	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
	load/truck (kg)	60000	40000	40000	50000	55656	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000
	transit speed (km/hour)	80	90	90	75	79	90	90	90	90	90	90	85	90	90	85
	transit time (hrs)	6.26	9.19	12.22	21.13	10.76	4.04	1.28	0.56	1.66	3.18	4.51	6.89	2.54	4.53	6.58
	loading time (hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	unloading time (hrs)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	cycle time	14.53	20.38	26.44	44.27	23.52	10.09	4.56	3.11	5.31	8.36	11.02	15.79	7.09	11.07	15.15
	rate/deck/km	$ 1.50	$ 1.65	$ 1.65	$ 1.75	$ 1.58	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25
	total cost/truck move	$ 4,509	$ 5,458	$ 7,260	$ 13,869	$ 7,517	$ 2,730	$ 863	$ 375	$ 1,118	$ 2,145	$ 3,045	$ 4,395	$ 1,718	$ 3,060	$ 4,193
	cost/hr	$ 310	$ 268	$ 275	$ 313	$ 320	$ 271	$ 189	$ 121	$ 210	$ 257	$ 276	$ 278	$ 242	$ 277	$ 277
	cost/ head	**$ 37.58**	**$ 68.23**	**$ 90.75**	**$ 138.69**	**$ 67.53**	**$ 22.75**	**$ 7.19**	**$ 3.13**	**$ 9.31**	**$ 17.88**	**$ 25.38**	**$ 36.63**	**$ 14.31**	**$ 25.50**	**$ 34.94**
	MSA	**11.00**	**11.00**	**11.00**	**11.00**	**11.00**	**-**	**-**	**-**	**-**	**-**	**11.00**	**11.00**	**-**	**11.00**	**11.00**
	shrink cost (per km)	$ 0.011	$ 0.011	$ 0.011	$ 0.011	$ 0.011	$ 0.011	$ 0.011	$ 0.011	$ 0.011	$ 0.011	$ 0.011	$ 0.011	$ 0.011	$ 0.011	$ 0.011
	shrink cost (total)	**$ 5.51**	**$ 9.10**	**$ 12.10**	**$ 17.44**	**$ 9.38**	**$ 4.00**	**$ 1.27**	**$ 0.55**	**$ 1.64**	**$ 3.15**	**$ 4.47**	**$ 6.45**	**$ 2.52**	**$ 4.49**	**$ 6.15**
	processing cost penalty (per head)	50%	50%	25%	0%		75%	100%	100%	100%	75%	75%	100%	100%	100%	100%
	$20	**$ 10**	**$ 10**	**$ 5**	**$ -**	**$ 7**	**$ 15**	**$ 20**	**$ 20**	**$ 20**	**$ 15**	**$ 15**	**$ 20**	**$ 20**	**$ 20**	**$ 20**
	Containerised freight (per head/km)	$ 0.027	$ 0.027	$ 0.027	$ 0.027	$ 0.027	$ 0.027	$ 0.027	$ 0.027	$ 0.027	$ 0.027	$ 0.027	$ 0.027	$ 0.027	$ 0.027	$ 0.027
	distance to port															
	Brisbane	1363	969	635	50	937	1353	1432	1585	1629	1700	1821	2086	1353	1174	1800
	Container freight cost	**$ 36.80**	**$ 26.16**	**$ 17.15**	**$ 1.35**	**$ 25.30**	**$ 36.53**	**$ 38.66**	**$ 42.80**	**$ 43.98**	**$ 45.90**	**$ 49.17**	**$ 56.32**	**$ 36.53**	**$ 31.70**	**$ 48.60**
	Total supply chain cost to port	**$ 100.89**	**$ 124.49**	**$ 136.00**	**$ 168.47**	**$ 120.08**	**$ 78.29**	**$ 67.12**	**$ 66.47**	**$ 74.93**	**$ 81.92**	**$ 105.01**	**$ 130.39**	**$ 73.36**	**$ 92.69**	**$ 120.69**
	Sea freight cost ex -															
	Brisbane	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30	$ 30
	Total supply chain cost to market	**$ 130.89**	**$ 154.49**	**$ 166.00**	**$ 198.47**	**$ 150.08**	**$ 108.29**	**$ 97.12**	**$ 96.47**	**$ 104.93**	**$ 111.92**	**$ 135.01**	**$ 160.39**	**$ 103.36**	**$ 122.69**	**$ 150.69**
	Change to current cost of using all existing abattoirs						$41.79	$52.96	$53.61	$45.14	$38.16	$15.07	-$10.31	$46.72	$27.39	-$0.61
	Change to costs of using Townsville abattoir						$22.60	$33.77	$34.42	$25.95	$18.97	-$4.12	-$29.51	$27.52	$8.20	-$19.80
	Change to costs of using Rockhampton abattors						$57.71	$68.88	$69.53	$61.06	$54.07	$30.99	$5.60	$62.63	$43.31	$15.31
	Change to cost of using Brisbane abattoirs						$90.19	$101.36	$102.00	$93.54	$86.55	$63.46	$38.08	$95.11	$75.79	$47.79
	Change of cost of using least cost current abattoir					130.89	$22.60	$33.77	$34.42	$25.95	$18.97	-$4.12	-$29.51	$27.52	$8.20	-$19.80
	Potential annual throughput compared with:	1	All existing				18,038	18,038	18,038	18,038	18,038	18,038	-	18,038	18,038	18,038
		2	Townsville				18,038	18,038	18,038	18,038	18,038	18,038	-	18,038	18,038	-
		3	Rockhampton				18,038	18,038	18,038	18,038	18,038	18,038	18,038	18,038	18,038	18,038
Switching cost:	$5	4	Brisbane				18,038	18,038	18,038	18,038	18,038	18,038	18,038	18,038	18,038	18,038
		5	Least cost				18,038	18,038	18,038	18,038	18,038	18,038	-	18,038	18,038	-
			Cost saving total (against least cost existing path)				$407,695	$609,152	$620,814	$468,131	$342,109	$0	$0	$496,487	$147,930	$0

Table No. 5: Sample Supply Chain Model Page -Richmond Shire

Source: NLIS data provided by DAFF 17/11/2011

5.1 Transport costs

Live Transport

The transport of live cattle is a significant cost item in the supply chain and a major issue for producers in remote areas. Many producers in northern Queensland are located over 1500 km from the major Brisbane abattoirs and western Mount Isa producers are at least 800 km from Townsville. The cost of transporting cattle over distances of this scale is very high, particularly in comparison to other forms of freight transport.

Live cattle transport requires the use of specifically designed trailers, and is subject to a range of regulatory requirements regarding animal welfare and driver fatigue provisions. These requirements restrict maximum travel times before rest breaks for drivers as well as spelling, watering, and feeding of cattle, all of which adds to the cost of transporting live cattle. These regulations have become more stringent over time and can be expected to become more restrictive in the future as community expectations with respect to animal welfare become higher, further increasing the cost of live cattle transport. There are frequently difficulties in achieving both driver fatigue and animal welfare requirements within the constraints of an efficient freight movement over a long distance. The provision of transport to remote areas also usually involves a limited market of providers, which can increase prices over those to be found in urban markets and the main long distance intercapital corridors. In general, however, there is a reasonably competitive market for livestock freight throughout Queensland.

For the model, unit costs for livestock transport were derived from discussions with representatives of the Livestock Transporters Association of Queensland. Based on these discussions, a unit rate between $1.65 and $1.75 per deck per km has been applied to generate cost estimates. A deck is a floor of a double-deck trailer with capacity to carry around 20 animals of slaughter weight. A standard B-Double vehicle can carry 3 decks (including 2 half-size decks on the smaller trailer), while a Type 2 road train carries 6 decks.

At present, road trains cannot access any coastal abattoirs, and must be broken into smaller units at various points dictated by the Multi-Combination Vehicle access regulations for Queensland highways. For shorter journeys, B-Doubles are used by transporters for the whole journey, rather than break road train combinations. For the purposes of the model we have simplified the number of decks permissible to a trucking operation on journeys of short and long length, taking into account the Queensland road network heavy vehicle combination access regulations.

A new port access road into the Port of Townsville linking it to the Flinders Highway is likely to allow for the operation of Type A Road trains into the JBS abattoir south of Townsville. Our model therefore assumes that this type of transport is available, increasing the number of decks per vehicle trip and reducing the freight rates that will apply.

A new abattoir in the western part of the study area would have the advantage of road train access for producers in its catchment zone, assuming it was located adjacent to a main highway. This would provide producers with the capacity to significantly reduce the cost of transporting livestock for slaughter, since the road transport operator could defray some costs (prime mover purchase and maintenance, driver costs etc) over a longer vehicle capable of carrying larger numbers of cattle.

The ability to carry animals over shorter rather than longer distances to slaughter also reduces costs, on both a point to point and per-kilometre basis. Shorter distances allow for lower driver costs, particularly in relation to fatigue breaks, and living allowances. The model uses lower unit costs for the shorter moves, and for the use of road trains over B-Doubles. In modelling future freight movement costs, these assumptions have been built into the analysis.

Containerised Road Freight

The cost of moving containerised meat from a processor to a port or market is much less than the cost of transporting live animals, when calculated on a cost per kg of meat. The model here uses benchmark container freight costs, based on rail freight costs on the Townsville-Brisbane journey, which are also a good proxy for road freight rates.

Containerised meat freight costs are lower due to the simplicity of the task by comparison with carriage of live animals, and the carriage of the higher value meat products only rather than the unusable and lower value products. An assumed 18 tonnes per 20 foot container provides an average rate of 2.7c per head per km, as compared to 8c per head per km for live animals. For the long distances involved in Queensland beef supply chains, these cost differences are very significant.

While real world freight costs will vary from route to route according to the availability of freight providers, the differential between the costs of live and containerised freight is the main determinant of the supply chain cost advantage gained by regional abattoirs over those in more distant coastal locations.

Shipping

The model also takes into account the costs of transporting containers of meat product to markets in the US and Asia, at a high level, for the purposes of determining how the choice of port affects the overall property-market cost. The base case for the model is the use of Brisbane for all export products, as per current practice. There are some shipping services into Asia from Townsville, but the monthly frequency is unsuitable for any sustained product delivery, and consequently Brisbane is the default export location for all of Queensland and northern NSW.

Theoretically, Darwin and Townsville provide alternative export locations for new abattoir developments in northern Queensland. Darwin is a closer port than Brisbane for Mount Isa, and Townsville is the local port for most of the MITEZ region, but services into Asia from both these ports are limited, and the cost of freight into Asian and northern hemisphere markets from established capital city ports such as Brisbane is much lower than current prices at the other ports.

These ports, however, do offer a vision for improved access into Asia as northern Australian exports (of all varieties of product) into this market grow in coming decades. Darwin is already growing as a bulk port, with its proximity to Singapore and Indonesia, and exploiting the recently built rail corridor. With continued growth will come greater opportunity for container freight, and this will eventually result in increased service frequency and drive down costs. Townsville is on the same shipping schedule as Darwin and will also benefit from overall growth in the northern Australian economy.

The base case in the model, however, is for the use of Brisbane for the export of containerised meat into the US (75% of output) and Asia (25%). Scenarios for the use of the other ports and a more Asia-oriented trade are outlined in Section 6.5.

Rail

This analysis does not seek to model rail freight costs for live cattle, as rail is a niche player in the transport supply chain with a diminishing role. Rail was historically an important link in the transport chain for the producers in the far north and west of the state, but over the last decade its role has been reduced. Rail services are appreciated by processors with operational sidings, since the arrival of large numbers of cattle in a single consignment is more cost-effective than handling the equivalent number of cattle arriving in trucks at different times. Rail services are popular also in the originating towns, and the provision of fixed rail freight rates would tend to have a capping effect on more volatile road freight prices.

From the rail operator's perspective, the costs of providing the service far outweighs the revenue that can be earned, and the opportunity cost of not deploying locomotives in more lucrative minerals haulage tasks is great.

The state continues to support the provision of limited cattle transport services on the Mount Isa and Winton lines, but loadings have reduced and prices are being pushed up to the point where road transport is more competitive in any case.

The development of a local abattoir would have an impact on demand for rail services, along with long haul road freight services, and would probably bring about the demise of the cattle service on the Mount Isa line if it was still available at that time.

5.2 Carcass Shrink

In making these modelled calculations, the issue of shrink has been given significant consideration. Carcass shrink is not only caused by lack of food and water, but also elevated levels of stress which occur when the animal is subject to continued handling and movement outside its normal grazing and raising environment.

Live weight loss or shrink in cattle during transport and prior to slaughter has two elements:

- Gut shrink is the live weight loss that occurs substantially within the first 4 to 8 hours of animal handling. The loss of weight takes the form of urine and excreta from the urinal and alimentary tracts. This loss can be quickly recovered and does not impact on the carcass weight or quality

- Tissue shrink is the loss in carcass and organ weight caused by dehydration and catabolism (tissue breakdown). This is minimal initially but increases with time off food and water. This type of loss generally takes between several days to some weeks to recover. It affects carcass weight and meat quality, and so reduces return to producers.

Reducing the time from muster to slaughter will reduce carcass shrink. As a result, direct sales from paddock to slaughter have become more common than sale yard transactions, however the tyranny of distance is still an issue. In addition to direct sales, locating an abattoir closer to the cattle population would reduce the withholding and stress period for cattle and improve the industry's productivity.

Carcass shrink will vary according to the amount of water and feed (if any) consumed during the journey from property to slaughter. Due to time required for mustering cattle on property and any withholding period prior to transport, cattle travelling even the shortest distance would be subject to some carcass shrink. The dynamics of carcass shrink are complex and so the magnitude can vary significantly depending on handling. Carcass shrink is not linear with time but increases progressively over time. For this model however, it has been assumed that carcass shrink loss is linearly proportional to distance travelled. To ensure that the supply chain model does not overestimate the effect on carcass yields, very conservative values have been used.

Information from various sources including published literature and northwest Queensland producers estimate carcass shrink versus distance travelled to be:

0-500 km	1.5%
500-1000 km	2.5%
1000-1500 km	3.5%
1500 km plus	4%

Additional information from a study by the Oklahoma Cooperative Extensions Service (Barnes et al, 2009) measured 3.59% carcass shrink in a 24 hour trip. Assuming an average speed of 80 kph, this equates to a distance of 1920 km. The Figure 5 below shows these data points as well as a "line of best fit" which is the assumed estimated shrink loss used in the supply chain model. This estimates carcass shrink loss at 1.43% per 1000 km travelled.

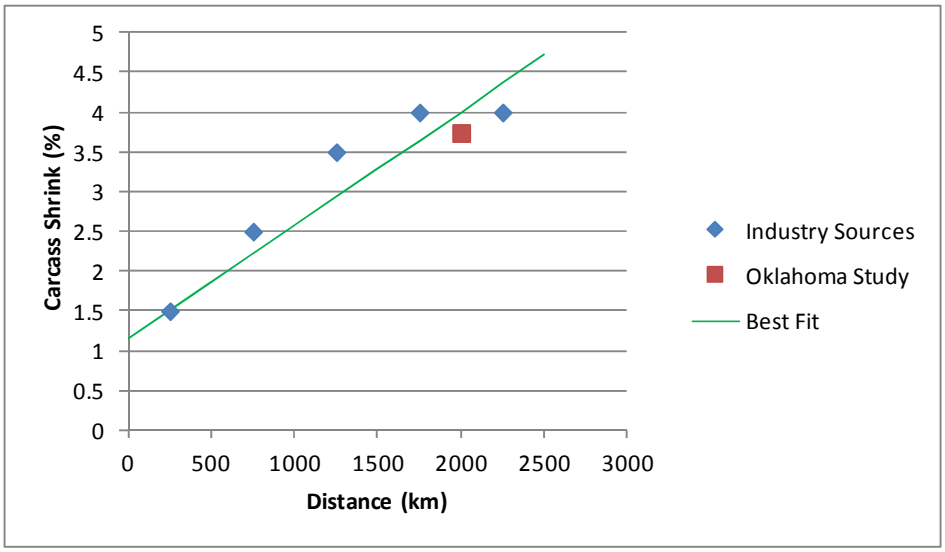

Figure No. 5: Estimated Carcass Shrink versus Distance Travelled
Source: See notes above

Table No.6 below shows estimated carcass shrink loss in kilograms and carcass shrink cost versus live cattle transport distance travelled. The table is based on an estimated 1.43% carcass weight loss per 1000 km travelled, 256 kg average HSCW and $3.00 per kg value of HSCW.

Distance (km)	Est. Shrink Loss per Head (kg)	Est. Shrink Loss per Head ($)
250	0.9	$ 2.75
500	1.8	$ 5.49
750	2.7	$ 8.24
1000	3.7	$10.98
1250	4.6	$13.73
1500	5.5	$16.47
1750	6.4	$19.22
2000	7.3	$21.96

Table No 6: Estimated Shrink Loss versus Live Travel Distance

The shrink loss factor used in the Supply Chain Model is therefore $0.011 per live kilometre travelled.

Distances travelled to market will vary according to property location so an abattoir in the far northwest could significantly reduce shrink loss costs, thus improving the overall productivity for the region.

5.3 Tick Line issues

The tick line is a boundary established in Queensland legislation to protect non tick-infested areas from the introduction of ticks via the movement of cattle from zone to zone. As shown in Figure No 6, the line passes virtually along the route of the Flinders Highway before turning south along the Great Dividing Range. The areas to the north and east of the line are tick-infested. There is also a narrow Control zone adjacent to parts of the boundary within the infested zone.

Cattle crossing the line from a tick-infested area must be subjected to an established protocol for inspection and treatment, offered at a range of sites along the line. The locations being assessed in this study are all on or near the tick line.

Tick line clearance costs are not included in the comparative analysis as they will be negligible should the proposed site be in the tick infected area. All existing coastal abattoirs are in the tick infected area. Should an abattoir be developed in a tick free area, the cost impact on the producer would be an estimated $8 per head (total pre-treatment and tick clearance costs) for a proportion of the throughput, which has been estimated at 15%. This low 15% is based on the expectation that a significant proportion of cattle from the tick-infected area would cross over to the tick-free area for finishing before slaughter and so the tick clearance costs would be incurred regardless of abattoir location. The 15% would only represent the cattle from the tick-infected area going direct to slaughter at an abattoir in a tick-free area.

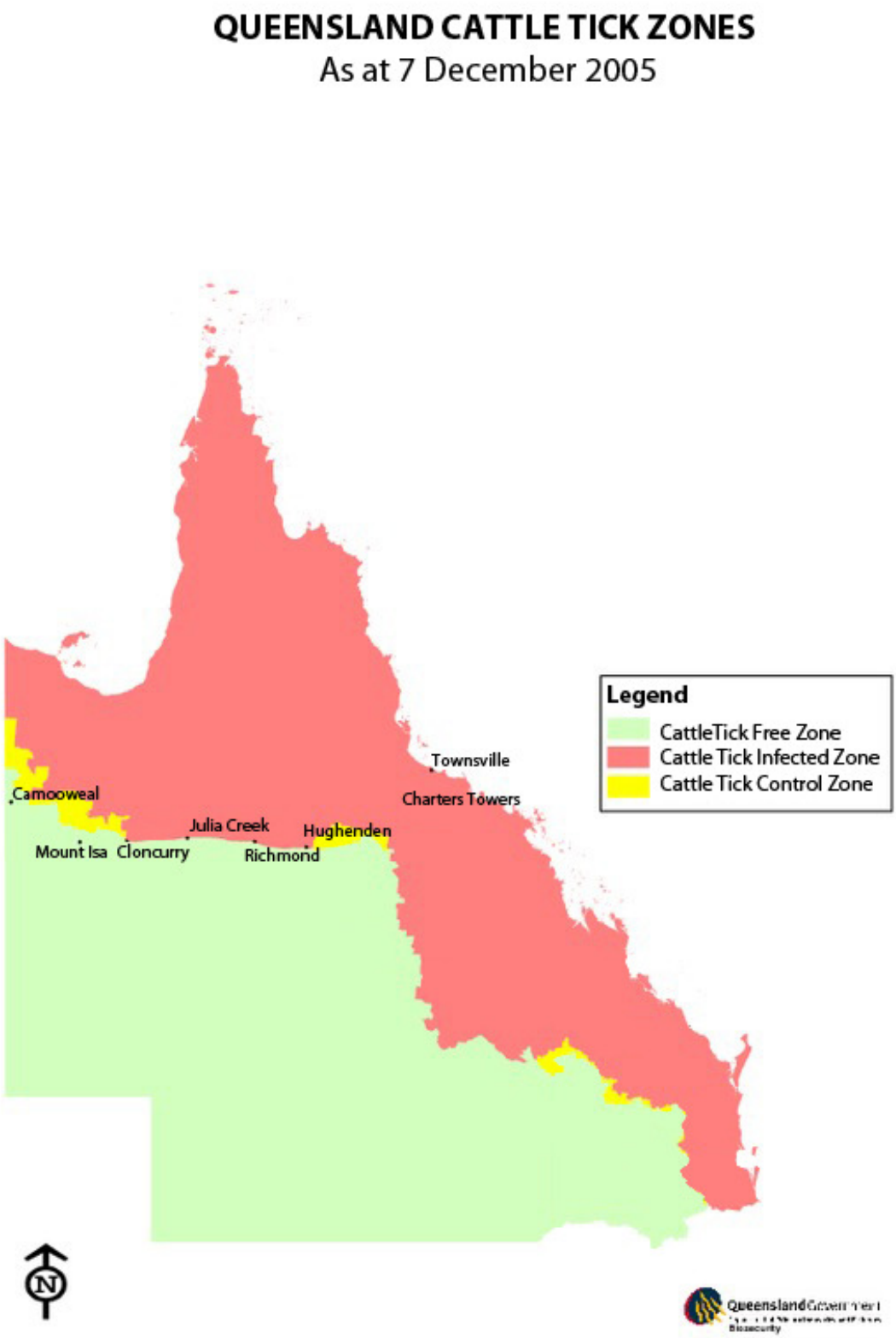

Figure No. 6: Queensland Tickline Location
Source: www.dpi.qld.gov.au

5.4 Meat Standards Australia (MSA) Premiums

Meat Standards Australia is a meat quality program that provides the opportunity to differentiate product in the market. The complex series of factors which determine the eating quality of a beef meal are taken into account in the MSA production and grading process.

For a meat product to qualify for MSA labelling, a range of criteria must be met by producers, agents, saleyards and processors involved in the chain. MSA has strict transportation and management protocols that start with the mustering and selection of cattle for the MSA grading system. One such requirement is that the time from despatch to slaughter must be within a 24 hour period. Many northwest Queensland producers cannot currently offer their cattle for sale under the MSA standard as the transportation time excludes them from the extra value offered by MSA.

In addition to the influence of transport on eating quality, factors such as cattle breed, type, category, age, and feeding regime will impact on the MSA score.

Not all cattle will qualify for MSA. Indeed of the 9 million cattle slaughtered every year in Australia, just over 1 million are graded MSA which reflects the strict criteria under which the grading system operates. To estimate the benefit to producers of the additional MSA product that could be harvested from the existing cattle profile in the northwest, bovine categories and muscle groups have been selected as noted below.

Of the total available cattle presented for slaughter only 30% are assumed to meet MSA grading criteria. In terms of muscle groups available from the carcass, the revenue benefit has been limited to the loin cuts (Tenderloin, Cube Roll, Striploin) and one 'butt cut', namely the Rump. For the prime steer (PR) and OX bovine categories, the Striploin and Rump would have to be aged 21 and 35 days respectively.

The main reason for selecting only the loin cuts and one butt cut is that they are more likely to be graded MSA than any other muscle group within the carcass. However, it is likely that more muscle groups (primal cuts) would achieve MSA grading in reality. Potential exists to increase the volume of MSA products with time, but this depends greatly on the producer's capacity to present cattle meeting the MSA criteria and so attract a higher return.

Item	Yield %	Weight KGS	Premium kg	Value $
Tenderloin 2150	1.6	4.4	$2.00	$8.80
Cube roll (8 r) 2244	2.8	7.7	$1.50	$11.55
Striploin (1r) 2142	3.0	8.3	$1.50	$12.38
D Rump 2100	3.8	10.5	$0.40	$4.18
	11.2	30.8	$1.20	**$36.91**

The tabulation above estimates the yield and price premium for prime cuts expected to meet MSA requirements. As shown, the total estimated MSA premium per head is $36.91. Assuming only 30% of the cattle sent to a new abattoir meet MSA and achieve this premium, then the average MSA premium is assumed to be $11.00 per head (approximately 30% of $36.91). This premium is assumed to be available for cattle from shires within 400 km of the new abattoir. This enables producers to get their cattle to the abattoir to be slaughtered within the 24 hour limit required for MSA. No MSA premium benefit is assumed to apply to shires which already have assess to an MSA premium, these being shires already within 400 km of an existing abattoir site.

6 Discussion of Modelling Results

6.1 Cost Savings versus Abattoir Pricing

The modelled supply chain costs illustrate the fundamental cost differences between live and containerised meat transport over long distances. These costs give an indication of how prices might differ between abattoirs, but in the real world, there are many commercial and practical factors in operation.

The prices offered by an abattoir on any given day for a particular cattle type vary according to the specific need of that processor and the supply of suitable cattle available over a wide geographical area. Processors have their own buyers and operate through a network of agents assisting in the process of acquiring the number of cattle required each day to keep the plant operating at the optimal level and to meet the specific customer orders on hand.

Prices offered by the processors (through the preparation and circulation of price 'grids') are 'at the gate', which means that the producer or his agent must provide the transport from the property to the abattoir gate.

The logistics effort involved is sizable and complex, and cattle can be moved large distances in order to meet demand. It is quite common for cattle to be moved from the NSW/Victorian border for sale to a Brisbane abattoir. In order for this to occur, the Brisbane buyer needs to outbid other processors much closer to the producer's property, as the additional transport cost involved is considerable.

Similarly, producers in northwest Queensland sell cattle to Brisbane processors as well as to those at the northern coastal locations, depending on the prices offered by each buyer at any given time.

The daily prices offered by the processors do not necessarily reflect an average cost per head as modelled here - they will vary significantly according to the operation of an effective market, marrying the quirks of supply with changing customer demand through the mechanism of an efficient processing operation.

An issue often mentioned by producers in the study area is the lower grid price offered and the extended wet season shutdown of Townsville and the other coastal sites versus the Brisbane based processors . An explanation may be the higher variable costs of these smaller coastal sites and the need to keep the massive Brisbane based sites at full capacity during the wet period when slaughter ready cattle are scarce. For a multi site processor faced with limited supply, it may be better to extend the shutdown of the smaller coastal site and "direct" all available cattle to the larger sites. This however, causes disadvantage to the producers who bear the transport and shrink loss costs.

We have not attempted to verify this reading of events, but if true, it provides a good example of how the overall market functions on an 'east coast' if not 'national' geographical basis. It also illustrates how the concentration of ownership of processing operations could lead to particular pricing outcomes that would be different if each processor was an independent operation.

6.2 Modelling Results

The supply chain model results provide an indication of potential current slaughter cattle numbers and average savings per head relative to the existing coastal and Brisbane abattoir sites for various alternative new abattoir locations.

Table No.7 below shows the summary results with potential slaughter cattle attracted to each alternative location, plus the overall financial benefit to the total supply chain, expressed in total dollars and in dollars/head.

The model works by calculating an estimated property to market supply chain cost incorporating the live and containerised meat transport cost components, for each existing and potential abattoir, relative to the producing areas in each shire of the region. Where a potential abattoir location generates a theoretical cost saving for producers in a given shire, over the lowest cost chain through an existing abattoir (in Townsville, Mackay, Rockhampton or the Brisbane area), then the cattle slaughter turnoff number for that shire is aggregated into the calculation of a 'catchment' population to be processed by the hypothetical abattoir.

The total value of the supply chain savings for the aggregated cattle catchment is also calculated and expressed both in total and as a value per head.

To make the analysis closer to a real world situation, a 'switching premium' has been applied to reflect that cost savings may have to be significant to warrant the choice of a new abattoir over a traditional one. The switching premium is the additional value per head available to a producer and processor by sending cattle to the new abattoir versus the lowest (best) alternative cost existing abattoir (between those in Townsville, Mackay, Rockhampton and Brisbane). Table No. 7 uses a switching premium set at $5 per head.

Positive value figures in black indicate average calculated cost benefits for a new abattoir in each potential location in relation to each shire from which slaughter cattle are transported. Negative value figures in red indicate average calculated cost disadvantage for a new abattoir in each potential location in relation to each shire from which slaughter cattle are transported.

The benefit/head is the measure that best illustrates the value of an abattoir at any given site, combined with the population of cattle which are theoretically attracted to the abattoir.

Max Potential Cattle Supply	Potential Abattoir Location									
Based on comparison with:	Charters Towers	Hughenden	Richmond	Julia Creek	Cloncurry	Mt Isa	Normanton	Winton	Longreach	Georgetown
All currently used abattoirs	236,706	167,902	139,687	116,766	96,666	96,116	83,932	167,352	167,352	65,084
Townsville only	167,902	167,352	139,687	116,766	116,766	69,705	47,653	167,352	128,977	40,480
Rockhampton only	225,526	246,176	225,526	134,462	133,264	124,891	103,168	191,049	182,777	130,607
Brisbane only	273,841	273,841	273,841	246,176	246,176	246,176	134,360	273,841	273,841	225,526
Least cost	119,586	139,687	119,037	96,116	96,116	69,705	47,653	167,352	128,977	40,480
	-	-	-	-	-	-	-	-	-	-
Total Financial Benefit (K pa)	$ 2,073	$ 3,462	$ 3,233	$ 3,497	$ 3,950	$ 2,687	$ 1,498	$ 4,077	$ 3,348	$ 1,151
Benefit/Head	$ 17.33	$ 24.78	$ 27.16	$ 36.38	$ 41.10	$ 38.55	$ 31.45	$ 24.36	$ 25.96	$ 28.44

Comparison to least cost existing abattoir use

	Potential abattoir location									
Originating Shire	Charters Towers	Hughenden	Richmond	Julia Creek	Cloncurry	Mt Isa	Normanton	Winton	Longreach	Georgetown
Cook	-$6.38	-$15.42	-$28.01	-$40.07	-$47.06	-$59.22	-$39.69	-$29.16	-$37.34	-$9.78
Tablelands	-$21.19	-$30.16	-$42.74	-$54.81	-$61.87	-$73.96	-$54.43	-$43.90	-$52.08	-$13.51
Burke	$16.66	$27.82	$32.07	$41.84	$48.89	$47.39	$32.36	$27.75	$19.43	$18.99
Etheridge	$4.74	-$2.62	-$15.20	-$27.26	-$21.46	-$33.26	$1.16	-$16.28	-$24.46	$27.41
Carpentaria	$9.46	$5.49	$9.74	$19.50	$37.55	$14.76	$46.60	$5.42	-$2.98	$35.80
Croydon	$6.58	-$0.78	-$13.36	-$5.07	$1.98	-$9.81	$24.54	-$14.45	-$22.62	$32.92
Charters Towers	$3.46	-$18.30	-$30.88	-$53.95	-$60.93	-$73.02	-$83.26	-$42.97	-$51.07	-$53.34
Richmond	$22.60	$33.77	$34.42	$25.95	$18.97	-$4.12	-$29.51	$27.52	$8.20	-$19.80
Flinders	$10.16	$17.66	$8.75	-$3.32	-$10.30	-$33.46	-$58.78	$7.59	-$0.51	-$32.24
McKinlay	$13.54	$35.71	$39.95	$46.04	$42.73	$30.64	-$5.74	$37.10	$17.78	-$17.86
Cloncurry	$15.25	$37.42	$41.67	$51.43	$60.91	$52.42	$21.01	$43.37	$24.05	-$3.36
Mount Isa	$16.84	$27.93	$32.18	$52.94	$66.10	$68.05	$11.89	$33.96	$25.64	-$1.48
Isaac	-$21.35	-$56.97	-$69.55	-$81.62	-$86.84	-$100.69	-$111.75	-$54.47	-$36.41	-$81.83
Barcaldine	-$11.71	$2.01	-$24.37	-$28.79	-$31.22	-$43.30	-$74.72	$9.73	$27.72	-$51.49
Longreach	-$12.29	$9.81	-$6.50	-$10.92	-$13.35	-$25.44	-$56.92	$27.60	$41.91	-$43.76
Winton	$12.59	$34.69	$29.60	$25.18	$22.75	-$0.34	-$31.75	$49.02	$44.37	-$18.81
Boulia	$17.21	$28.30	$24.02	$31.36	$55.51	$53.94	$1.23	$57.31	$37.91	-$14.27

Table No. 7: Processing Site Comparison Model-$5 Switching Premium

The following tables show how the outcomes vary with different switching premiums. In Table No. 8 below there is no premium, and the assumption is that the producers will use the abattoir where there is a positive benefit, no matter how small.

Max Potential Cattle Supply	Potential Abattoir Location									
Based on comparison with:	Charters Towers	Hughenden	Richmond	Julia Creek	Cloncurry	Mt Isa	Normanton	Winton	Longreach	Georgetown
All currently used abattoirs	264,372	264,372	139,687	140,236	117,316	96,116	83,932	167,352	167,352	83,932
Townsville only	264,372	167,352	167,352	116,766	117,316	90,355	65,084	167,352	128,977	40,480
Rockhampton only	225,526	273,841	225,526	142,734	134,462	133,264	111,440	273,841	191,049	130,607
Brisbane only	273,841	273,841	273,841	273,841	246,176	246,176	225,526	273,841	273,841	225,526
Least cost	216,056	167,352	119,037	96,116	96,666	69,705	65,084	167,352	128,977	40,480
	-	-	-	-	-	-	-	-	-	-
Total Financial Benefit (K pa)	$ 2,073	$ 3,462	$ 3,233	$ 3,497	$ 3,950	$ 2,687	$ 1,498	$ 4,077	$ 3,348	$ 1,151
Benefit/Head	$ 9.59	$ 20.69	$ 27.16	$ 36.38	$ 40.87	$ 38.55	$ 23.02	$ 24.36	$ 25.96	$ 28.44

Table No. 8: Processing Site Comparison Model-Zero Switching Premium

Table No. 9 below applies a switching premium of $15, the assumption being that a $15/head advantage is required to make the producers in any shire switch their slaughter cattle supply to the new abattoir.

Max Potential Cattle Supply	Potential Abattoir Location									
Based on comparison with:	Charters Towers	Hughenden	Richmond	Julia Creek	Cloncurry	Mt Isa	Normanton	Winton	Longreach	Georgetown
All currently used abattoirs	201,829	167,352	119,037	96,116	96,116	96,116	51,406	167,352	144,432	61,331
Townsville only	53,440	151,897	101,311	116,766	96,116	54,250	42,898	128,977	110,939	40,480
Rockhampton only	225,526	225,526	134,462	133,264	133,264	88,292	80,179	155,112	181,580	88,838
Brisbane only	273,841	273,841	246,176	246,176	246,176	142,734	111,440	273,841	273,841	225,526
Least cost	53,440	103,582	80,661	96,116	96,116	54,250	42,898	101,311	110,939	40,480
	-	-	-	-	-	-	-	-	-	-
Total Financial Benefit (K pa)	$ 2,073	$ 3,462	$ 3,233	$ 3,497	$ 3,950	$ 2,687	$ 1,498	$ 4,077	$ 3,348	$ 1,151
Benefit/Head	$ 38.78	$ 33.42	$ 40.08	$ 36.38	$ 41.10	$ 49.53	$ 34.93	$ 40.25	$ 30.18	$ 28.44

Table No. 9: Processing Site Comparison Model-$15 Switching Premium

In Table 9, the attractiveness of the Charters Towers location is reduced with a higher switching premium, reflecting the relatively low benefits that an abattoir in that location delivers to local producers.

6.3 Favoured Locations and Capacity

The analysis suggests that significant value could be delivered to producers through the development and successful operation of an abattoir in several areas, especially the Cloncurry and Winton districts within the study region. In each of these centres, catchment populations and value per head of cattle are significant.

On these numbers, even with a switching premium of $15 per head, the Cloncurry cattle volume remains stable at above 96,000 head pa, and show a high benefit per head and total financial benefit. This reflects the substantial distance which producers in this region (and to the north and west) must send their cattle to one of the existing coastal abattoirs. Similarly, with a switching premium of $15 per head, Winton achieves cattle numbers of 100,000, and very high benefit per head and total financial benefit. The next most advantaged regions are Julia Creek, Hughenden and Longreach, all with high cattle numbers but slightly less benefit per head and total financial benefit.

While this report nominates a particular area, any potential abattoir site would need to be at least five kilometres from any town and at least one kilometre from any residence or sensitive odour receptor. In addition, the site should be located a sufficient distance away from any mine site (whether active or shutdown), to avoid even the perception of being "tainted".

Many sites show significant benefits, but the number of cattle attracted to each location remain generally at or under 100,000 head. To achieve acceptable economies of scale, an abattoir is generally considered to need a minimum nominal capacity of 100,000 head per annum. To cope with the peak season and still achieve 100,000 capacity with the wet shoulder and shutdown period, its operating capacity would need to be flexible. This might be achieved by increased daily throughout or working additional shifts.

The largest cattle populations are attracted to the Charters Towers location (at zero switching premium), reflecting the higher density of ready for slaughter production in eastern areas, but the benefit per head is much less due to the proximity of the existing coastal abattoirs, of which the closest is only 135 km away in Townsville.

The locations demonstrating the highest benefit as determined by the model are the Cloncurry and Winton regions. The model shows that these locations can attract cattle numbers of about 100,000 head per annum (the generally accepted minimum for a productive abattoir) with the highest supply chain benefits.

Of these two options, the Cloncurry area is nominated as the preferred location. In addition to high modelled supply chain benefits, it offers many operating cost, logistical and qualitative advantages. These include the following:

- Confluence of major arterial roads-all triple trailer road train approved. This will reduce cattle transport times and costs as well as employee commute times.
- Access to adequate power and water.
- Gas supply options are LPG or compressed natural gas delivered by tanker from the Mount Isa pipeline. Potential for piped natural gas in future.
- Cloncurry has a reasonable population (2,380 persons at 2006 census and currently in the order of 3,000) compared with many other towns in the area of less than one thousand. It has reasonable existing public services and should be able to expand to accommodate a larger population.

- Mount Isa (120 km away) has a very large population (21,200 at 2006 census and currently in the order of 30,000) relative to all the towns away from the coast, and has extensive public and social amenities reasonably accessible by residents of Cloncurry.
- Cloncurry airport has a daily service, and Mount Isa airport 120 km away has multiple flights each day including daily direct flights from Brisbane.
- Cloncurry has a significant labour catchment. Cloncurry and particularly Mount Isa are large population centres housing significant numbers of potential employees. In addition, good all weather roads together with an attractive shift system would facilitate employees being drawn from a wide radius.
- Cloncurry is within 120 km of Mount Isa which has a significant industrial infrastructure base to support the Xstrata mine. This industrial infrastructure would be available with minimal travel costs for construction and maintenance in Cloncurry.
- Has existing cattle infrastructure such as transfer yards.
- Has rail freight yard for transport of containerised freight to Townsville and Brisbane if required.
- On the main stock road from the NT and able to access a significant proportion of eastern NT cattle within a spell free transport leg.
- Equidistant from Brisbane and Darwin ports.
- Some suitable areas where cattle from the gulf could be finished before slaughter.
- Some existing fodder production (Lorraine Station) and possibilities of future expanded fodder production (Flinders Agricultural Precinct and Gilbert River Irrigation Area) within its economic cattle catchment area. This may allow extended operation during the shoulder periods of the wet.
- Located within the tick infected area so tick clearance costs are eliminated with respect to abattoir location.
- Council is amenable to development of this nature.

Compared with Cloncurry, Winton potentially offers the advantage of reduced exposure to seasonal supply variation, but a number of significant factors adversely affect Winton's viability as an abattoir location. These include:

- Inadequate electrical power available. Ergon Energy assessed Winton as needing major system reinforcement to supply a potential abattoir
- Inadequate potential labour supply. Winton had a population of only 980 at the 2006 census and has no large population centres nearby
- Remote from any significant industrial infrastructure
- Remote from piped natural gas supply and the possibility of reduced gas cost
- Remote from potentially lucrative Northern Territory cattle supply
- Located in the tick free area requiring slaughter ready cattle for the tick infected area to bear processing and clearance costs.

Figure No. 7 below illustrates the estimated economic catchment area in Queensland for an abattoir in the Cloncurry area where producers would determine that the net of all their proceeds and costs including cattle price, live transport to abattoir gate, MSA premium and shrink would be greater than for alternative processors. This economic catchment area extends about 400 km towards Townsville, Mackay and Rockhampton, and about 525 km towards Brisbane. The catchment will also extend into the Northern Territory.

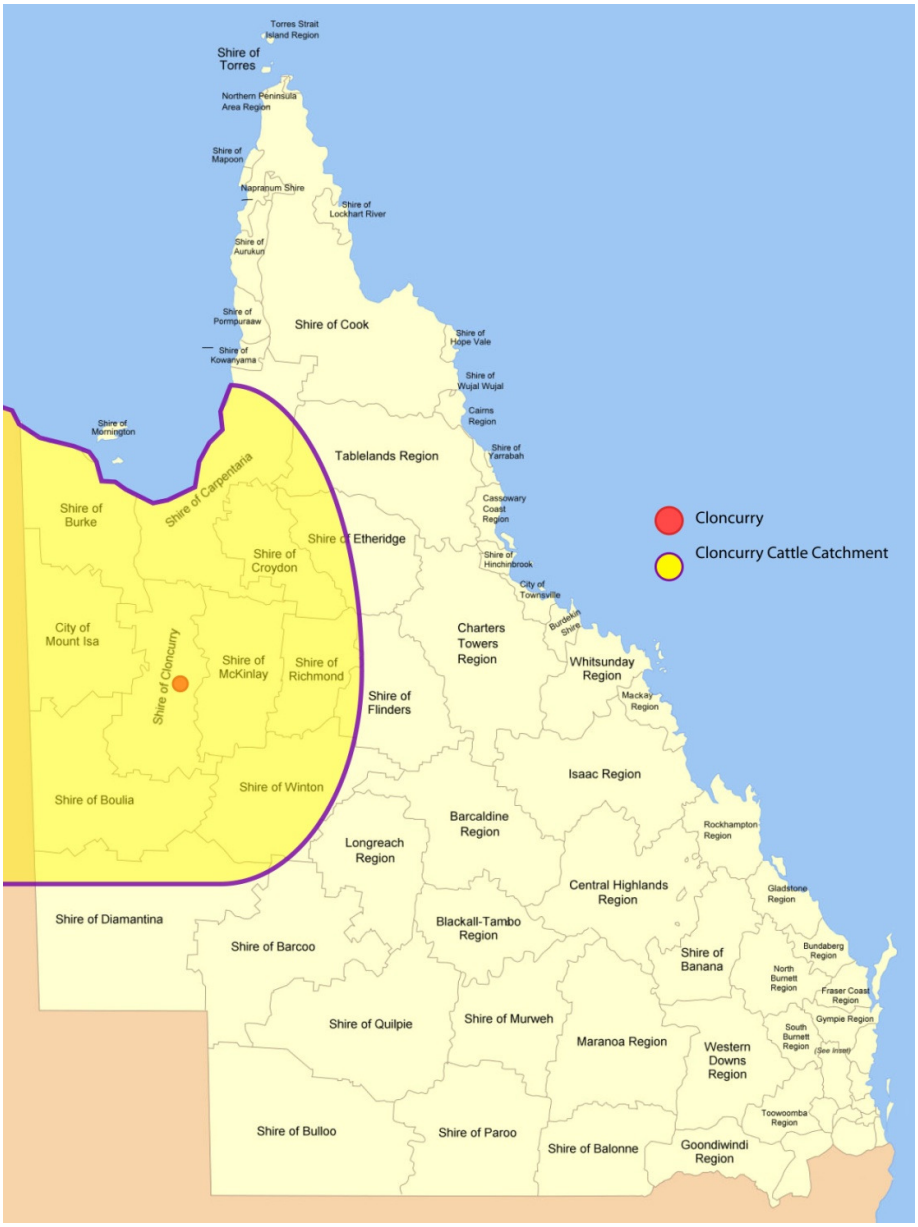

Figure No. 7: Economic Cattle Catchment Shires for Cloncurry Abattoir

6.4 How Producers Will Be Advantaged

The supply chain model demonstrates that a proposed new abattoir located in the Cloncurry area would attract approximately 96,000 cattle per year and result in net supply chain savings or benefits of $41 per head. These savings arise from reduced live cattle transport costs, reduced shrink losses and the achievement of some MSA premium net of some extra processor costs such as freight of product to port/distribution centre. It is assumed that both processors and producers act rationally and will sell and buy cattle in a manner that will maximize their net profit or return.

While not being able to predict the pricing behaviour of a new abattoir or its competitors, the model suggests that of the estimated $41 per head supply chain savings, approximately 40-60% would be retained by the processor in the form of a reduced grid price compared with the coastal processors. This grid price would be adequate to attract the 96,000 head per annum expected capacity. Any lower grid price would result in insufficient supply with producers choosing to send cattle elsewhere. This reduced grid price must cover the additional expenses of operating in a remote location as well as provide a commercial return on investment. The remaining saving, of approximately 40-60% of the total estimated supply chain benefit, would benefit the producers. Even though the grid price would be lower than the competitive coastal processors, the producer's net return (grid price net of transport, shrink and MSA) would be more. Note that this benefit will not be evenly distributed, with producers located very close to the abattoir (or to the west and north) receiving a more substantial benefit, while producers near the "break even arc" located some 400-500 km towards an existing abattoir will only see a marginal net benefit.

6.5 Alternative ports

One of the most positive sources of value for a local processor is the growing potential of Townsville as an export point into Asia.

At present, nearly all of the export output from the coastal abattoirs is sent to Brisbane for export via container shipping or domestic distribution. All major shipping lines make frequent calls to Brisbane and sea-freight rates from there are competitive into Asia and the northern hemisphere. There is very little shipping activity from Townsville that could provide a meaningful alternative to Brisbane at this stage, though local abattoirs have on occasion made use of Townsville to load small volumes of meat and other processed products, such as offals.

One of the aims of this report is to consider how the trading environment is changing for Northern Australia, as Asia continues to grow as our prime export destination. Research into this is ongoing, but it is clear that there is enormous potential for Townsville to grow as an export port for northern beef products, and that growing demand will result in improved supply of shipping, which will in turn lead to more competitive pricing and sailing frequency.

There are currently two shipping lines offering container services into Asia from Townsville.

Mariana Shipping offers fortnightly services from Townsville and Darwin into Hong Kong and five other Chinese ports with a fleet of three ships. Transhipment into Japan, Korea and SE Asia is also available via China.

Swire Shipping provides monthly services into Indonesia and several SE Asian ports on a schedule including Darwin and Townsville.

Cold stores at Townsville are available for the packing and storage of chilled product. At present, however, the shipping schedules are not likely to attract chilled meat export activity due to lack of frequency, and shipping lines may not be attracted to add more export capacity from Australia into Asia unless there is balancing import growth. Townsville and Darwin are not large import destinations, compared to capital cities.

However, the global economic situation is leading to increasingly close trade ties between Australia and most of Asia, and export growth will eventually lead to additional shipping capacity. Increased frequency of ship calls may finally result in the two competing port options becoming viable as alternatives to Brisbane at some stage in the future.

The model developed for this study contemplates this development and offers some insight into how a northern abattoir could become more attractive if or when this occurs. Table No. 10 below shows the impact of development of Townsville as export port

Max Potential Cattle Supply	Potential Abattoir Location									
Based on comparison with:	Charters Towers	Hughenden	Richmond	Julia Creek	Cloncurry	Mt Isa	Normanton	Winton	Longreach	Georgetown
All currently used abattoirs	264,372	250,144	167,352	144,432	144,432	116,766	92,306	144,432	144,432	130,994
Townsville only	167,352	151,897	101,311	116,766	96,116	54,250	47,653	128,977	60,443	40,480
Rockhampton only	273,841	273,841	273,841	246,176	246,176	142,734	142,734	273,841	273,841	225,526
Brisbane only	273,841	273,841	273,841	273,841	273,841	246,176	225,526	273,841	273,841	225,526
Least cost	167,352	151,897	101,311	116,766	96,116	54,250	47,653	128,977	60,443	40,480
	-	-	-	-	-	-	-	-	-	-
Total Financial Benefit (K pa)	$ 1,801	$ 3,404	$ 2,694	$ 2,694	$ 2,888	$ 1,883	$ 1,392	$ 3,009	$ 2,036	$ 1,093
Benefit/Head	$ 10.76	$ 22.41	$ 26.59	$ 23.08	$ 30.05	$ 34.72	$ 29.21	$ 23.33	$ 33.69	$ 27.01

Comparison to least cost existing abattoir use

	Potential abattoir location									
Originating Shire	Charters Towers	Hughenden	Richmond	Julia Creek	Cloncurry	Mt Isa	Normanton	Winton	Longreach	Georgetown
Cook	-$9.97	-$23.44	-$34.92	-$49.82	-$58.59	-$70.75	-$41.50	-$45.09	-$60.26	-$11.21
Tablelands	-$24.78	-$38.18	-$49.65	-$64.56	-$73.40	-$85.48	-$56.24	-$59.83	-$75.00	-$14.94
Burke	$13.07	$19.81	$25.16	$32.09	$37.36	$35.86	$30.55	$11.82	-$3.49	$17.56
Etheridge	$1.15	-$10.63	-$22.11	-$37.01	-$32.99	-$44.78	-$0.64	-$32.21	-$47.38	$25.98
Carpentaria	$5.87	-$2.53	$2.82	$9.75	$26.02	$3.23	$44.80	-$10.52	-$25.91	$34.37
Croydon	$2.99	-$8.80	-$20.27	-$14.81	-$9.54	-$21.34	$22.73	-$30.38	-$45.55	$31.49
Charters Towers	-$0.13	-$26.32	-$37.79	-$63.69	-$72.46	-$84.55	-$85.07	-$58.90	-$73.99	-$54.78
Richmond	$19.01	$25.75	$27.51	$16.21	$7.44	-$15.65	-$31.32	$11.59	-$14.72	-$21.23
Flinders	$6.57	$9.64	$1.84	-$13.06	-$21.83	-$44.99	-$60.58	-$8.34	-$23.44	-$33.67
McKinlay	$9.95	$27.69	$33.04	$36.30	$31.20	$19.12	-$7.55	$21.17	-$5.14	-$19.29
Cloncurry	$11.66	$29.40	$34.76	$41.68	$49.38	$40.89	$19.20	$27.44	$1.13	-$4.79
Mount Isa	$13.25	$19.91	$25.27	$43.20	$54.57	$56.52	$10.08	$18.03	$2.71	-$2.91
Isaac	-$1.54	-$41.60	-$53.08	-$67.98	-$74.98	-$88.83	-$90.16	-$47.01	-$35.94	-$59.87
Barcaldine	$9.40	$18.69	-$6.58	-$13.84	-$18.05	-$30.13	-$51.83	$18.50	$29.50	-$28.22
Longreach	$11.29	$28.96	$13.76	$6.50	$2.29	-$9.80	-$31.57	$38.83	$46.16	-$18.03
Winton	$9.00	$26.67	$22.69	$15.43	$11.22	-$11.87	-$33.56	$33.09	$21.45	-$20.24
Boulia	$13.61	$20.28	$17.11	$21.61	$43.98	$42.41	-$0.57	$41.38	$14.99	-$15.70

Table No. 10: Processing Site Selection Model-Townsville Export Port

In this scenario, the competitiveness of the existing Townsville abattoir is improved relative to Brisbane abattoirs and relative to all the potential abattoir sites as well. The total supply chain benefit decreases with distance west of Hughenden. Total supply chain benefit for Hughenden decreases $0.06 m with Townsville as the export port, while Julia Creek is $0.8 m down with Cloncurry $1.06 m down. This tends to slightly weaken the justification for a northwestern area abattoir in terms of total supply chain benefits. In relative terms, while Cloncurry and Winton still maintain strong cattle numbers and supply chain benefits, Hughenden is particularly advantaged, being closer to Townsville but still attracting all cattle from shires to the west. The model demonstrates that the relative attractiveness of Cloncurry is not significantly diminished should Townsville port become viable for export of beef.

Other ports

The Port of Darwin is also worthy of consideration as a gateway to Asia. It currently offers the same service levels into China and SE Asia as available at Townsville through Mariana Lines and Swires Shipping, as well as a 10 day frequency service into Dili and Singapore through Toll (Perkins Shipping). The logistics chain favoured by the proposed AACo abattoir near Darwin will be instructive regarding the viability of a Darwin export gateway. If Darwin were to develop into a viable beef export port into Asia, a Cloncurry location would be significantly advantaged versus other potential locations with short rail and road routes.

If it is determined that Darwin is not suitable as an export port for the AACo operation (due to lack of direct connection to US markets), an alternative channel may well be the rail connection to Adelaide and Melbourne, which might provide attractive backload rates into southern ports with better sea freight options than are currently available from Darwin.

If this is the case, rail to the south may well be an option for a Cloncurry abattoir, accessing the rail service at Tennant Creek. The cost of this option may be comparable to the cost of a rail service into Brisbane, depending on the commercial interest of QR National and FreightLink (on the respective corridors).

The Port of Karumba in the Gulf currently has no container ship calls and is not set up for refrigerated services.

7 Local Supply Chain Development

7.1 General

While the modelling suggests that an abattoir in the northwest of Queensland would result in significant supply chain cost savings and improve the efficiency of beef production in the region, there are some supply chain enhancements that would reduce risk and maximise the outcome for both government agencies and commercial investors.

7.2 Seasonality

Seasonality is a major issue for any potential investor as an extended shut-down period will detract from the viability of the investment. The effect of seasonality on a potential abattoir site located in the far west could be minimised by some of the following strategies:

- Targeted infrastructure development by local and state governments to prevent road and bridge closures that would limit the supply of livestock during the wet season.
- Change in property management strategies from shutting down farming activity over the wet season towards maintaining cattle supply all year round.
- More intensive beef production programmes such as all-weather feedlot and cattle growing facilities.
- Cattle holding yards next to sealed roads for all weather loading access.
- Finishing country close to the abattoir site where cattle can be moved prior to the onset of the wet.
- Supply agreements between producer and processor that would pay a premium (wet money) based on out of season cattle supply.

7.3 Regional Finishing and Feedlotting

The development of finishing and feedlotting near a potential northwest Queensland abattoir site would have the following advantages:

- Potential to reduce seasonality by providing slaughter ready cattle through the wet.
- Potential for improved 'quality' of slaughter ready stock (heavier cattle at younger age).
- Longer term increased cattle supply due to the local area being able to support an increased cattle population to slaughter weight

Within the catchment area of a Cloncurry abattoir there are numerous finishing properties. Use of these properties for finishing young cattle from the breeding properties in the far north, pasture improvement programmes, provision of all weather loading facilities, and more intensive feeding practices would enhance the quality, seasonality and output of these properties. All these outcomes would be the expected outcome of an abattoir in the region, and would provide benefit to both the producer and the processor.

There are few large feedlots operating in the region and limited fodder production. Expansion of feedlotting and more extensive fodder production in this area is typically dependent on access to a reliable water supply for irrigation. Within the cattle catchment of a Cloncurry area abattoir there are two major irrigated agriculture projects being proposed. These are the Flinders River Agricultural Precinct and the Gilbert River Irrigation Area. If either of these developments progress to any significant scale, fodder production (whether

purpose grown or as a by-product of another crop) would expand making feedlotting and more intensive cattle production feasible and profitable.

8 Practical and Technical Considerations

8.1 Availability of Labour

Recruiting and retaining reliable and suitably skilled labour for a remote or regional area abattoir is likely to be difficult. Inability to access labour was cited, in part, as one of the reasons for the closure of the Innisfail, Qld and Katherine, NT abattoirs. Issues affecting availability of labour for a remote or regional abattoir include:

- Local population and the availability of suitable staff within a reasonable commute radius.
- Social infrastructure of the region and the ability to attract suitable personnel (with families) to relocate to the area.
- Seasonality of work and consequent difficulty in attracting and retaining employees if full time employment can only be guaranteed for 9-11 months of the year.
- Available remuneration structure for such a competitive and relatively low margin industry.
- Competition for skilled labour from other more lucrative industries such as mining and its industrial support infrastructure.

No potential site addressed all these issues and so factors affecting labour availability must be balanced with other factors in determining the viability of a new abattoir or selecting the most suitable location.

Options to assist in attracting labour for a new remote/regional abattoir site are:

Shift Structure
Independent of pay rate offered, some employees would find a non-traditional shift system that suited their personal circumstances an attractive option. A possible shift system involves 2 shifts; the first working 12 hour days Monday to Wednesday, and the second working 12 hour days Thursday to Saturday. Such an arrangement which provides a four day "long weekend" every week might be attractive to some of the following groups of prospective employees:

- Small property owners for whom running the property is not a full time job or does not provide an adequate, reliable income
- Small business people who can run their small business on their "off" days
- Personnel who can do a second job on their "off" days
- Personnel with family commitments aided by this type of shift system (child minding, school run, etc)
- Partners of Mount Isa mine and mine industrial support employees
- Family of sports oriented personnel who value the extra days off

An attractive shift structure can be a significant, non salary benefit and the fact of having to commute to work only 3 times per week lends itself to another opportunity to expand the labour "catchment" area. This shift structure has been used with success at Rockdale abattoir in NSW.

Drive In/Drive Out

With the non-traditional shift system proposed above, with only three return trips to work each week, employees may be prepared to drive from a greater distance to any new abattoir, expanding the labour catchment area. With basic accommodation available close to the new abattoir site, employees from even further afield could drive to the abattoir site to work three shifts, staying overnight locally between shifts before driving home. Car pooling and sharing accommodation with fellow shift workers could make travel and accommodation expenses acceptable. This arrangement would further expand the labour catchment, potentially up to 400 km radius. Fred Pascoe (Mayor of Carpentaria Shire) suggested that personnel from Normanton would find this arrangement attractive should an abattoir be located in the Cloncurry area-some 376 km away. This drive in/drive out model has been used with success at Rockdale abattoir in NSW.

Seasonality

Obviously standing down employees for extended periods around the December to February period will make recruitment and retention of staff more difficult. For many other reasons (capital utilisation, etc) seasonality should be reduced as much as possible. Efforts to minimise the impact of the seasonal reduction in throughput and shutdown need to be made. These might include a negotiated leave "bank" where extra shifts worked during the peak production times were accrued to allow extended paid leave during the wet, and staggered annual leave to allow for the reduced throughput shoulder periods.

Social Infrastructure

Over time, it would be expected that a reasonable proportion of the employees of any new regional abattoir would relocate and live in the local area. To facilitate this, any proposed abattoir location must provide (or be able to provide) the basic public amenities (schools, health, shops, etc) plus reasonable social amenities (sports, entertainment) adequate to attract employees and their families to settle in the area.

Indigenous labour

Various sources including mayors, councillors, and representatives of DAFF, MITEZ and GSD have indicated that a significant pool of available indigenous workers exists in the area of the proposed abattoir, and represent possibly the most significant source of employees for the facility. Some of the factors affecting the ability of the proposed abattoir to attract and retain some of the available indigenous workforce are:

- Training
- Work preferences
- Skill level
- Pay expectations
- Facilitating services/expectations
- Social factors

Training:
It is likely that nearly all local slaughter floor and boning room employees of a new NW Queensland abattoir will have no prior experience and will need to be trained to the required level of proficiency. All shire and DAFF staff in the area of the proposed abattoir indicated that various federal and state government departments would very probably provide funding for indigenous employees to be trained for roles within the abattoir. These organisations are the Australian Government Department of Education, Employment and Workplace Relation (DEEWR), and the Queensland.

Work Preference:
Despite an abundance of employment available in NW Queensland in the resources sector, the participation rate of indigenous workers is relatively low. This is due to a range of factors including a preference for outside employment on the land with cattle in favour of mine/resources type work. While an abattoir provides some employment opportunities of the preferred type (stock handling and farm work), it is difficult to assess how attractive the bulk of general abattoir work on the slaughter floor or in the boning room will be to indigenous employees.

Pay Expectations:
Some semi-skilled and skilled indigenous workers are (or have been) employed in the resources sector (Xstrata at Mount Isa and MMG Century zinc mine west of Gregory Downs). These employees receive or have received a very high pay rate and very generous benefits creating a certain pay expectation. On the other hand, some indigenous workers are employed as outside staff by councils or shires, or on cattle properties earning a relatively low wage. Expected pay rates available to abattoir workers are above council/grazing property rates but well below those offered by the resources companies. It is assumed that there will be a group for whom abattoir employment would offer an attractive rate of pay.

Facilitating Services/Expectations:
A successful example of indigenous employment in NW Queensland is the MMG Century zinc mine west of Gregory Downs. This facility has consistently obtained 200+ of their 1000 person workforce from local Gulf indigenous communities such as Normanton and Domadgee. Elements of their program to obtain and retain these indigenous staff are facilitating services such as transport to and from the worksite, and some times local accommodation. For some employees, these types of services, transport to site in particular, are expectations. An added benefit to the abattoir of the provision of transport is the improved attendance and timekeeping offered by reliable “communal” transport. The additional costs of these facilitating services would need to be borne by either the abattoir or passed on to the employee.

Social Factors:
Various commentators have suggested that many indigenous employees prefer to work in groups consisting of other indigenous workers and to work close to their home and family. In the context of a NW Queensland abattoir, this preference would be accommodated for significant numbers of potential indigenous employees from Mount Isa and Cloncurry for a Cloncurry abattoir location.

Skill Level:

Regardless of work preference, a number of indigenous workers do not have sufficient literacy and numeracy skills for employment in the resources sector. With appropriate vocational training, this group would be capable of securing semi skilled or skilled work in a new abattoir at a potentially higher wage than they would be currently receiving.

Visa 457

A 457 Visa can be used by an employer to sponsor overseas workers to fill nominated skilled positions in Australia on a temporary basis for up to 4 years. The process for the employer involves:

- Applying and being approved to recruit overseas employees
- Nominating occupations needing to be filled and employees required
- Recruiting overseas employees to fill positions
- Acting as sponsors for employees applying for visas
- Cooperating with government monitoring and meeting obligations of the scheme

All sponsoring employers are required to pay market salaries to their overseas employees. In addition, to be approved as a sponsoring employer, organisations must have a strong record and demonstrated commitment to:

- Employing local labour
- Non discriminatory employment practices
- Training of Australian employees

There is a list of approved occupations to which the 457 Visa applies. Abattoir work is not on this list and so employers would need to directly negotiate with the Department of Immigration and Citizenship (DIAC). To be successful, an employer would need to demonstrate or prove the following:

- Need for overseas workers
- Overseas employees are skilled (either a certified skill/trade or work experience of a type or level to be negotiated with the DIAC)

While use of the 457 Visa is certainly an option, it is not an easy way out. It involves additional expense and requires that the employer demonstrate that all possible efforts have been made to employ and train Australian workers.

Labour Pool

The estimated total workforce for the proposed abattoir is 220 persons including plant and all administration employees. To obtain an estimate of labour available for a new abattoir in the Cloncurry area, data from the most recent census (2006) were used. For the Cloncurry and Mount Isa area, employment status of residents within the range 20-50 years old (both male and female) was analysed. Summary results are:

- Looking for full time employment — 215 persons (42% indigenous)
- Looking for part time employment — 56 persons (43% indigenous)
- Not in labour force — 1297 persons (33% indigenous)

The classification “Not in labour force” includes people not registered as seeking employment, perhaps due to the limited number of opportunities available. In addition, 1187 persons (13% indigenous) were recorded as in part time employment. A proportion of these may be seeking a full time job.

Although these figures are some years old, they still indicate the order of magnitude of unemployed and underemployed people in the area. These figures are not inconsistent with information from the Mount Isa training organization, Isaskills, which advised that is has approximately 1200 clients on its books, these being people seeking employment through occupational training schemes.

In addition, there will be potential employees prepared to drive in to a proposed abattoir from surrounding towns and properties. Taken together, these sources represent a substantial labour pool from which a new abattoir could draw.

8.2 Availability of Services

The availability of key site services was assessed for a number of possible abattoir locations. The results are summarized in Table No.11 below.

Location	Population (2006 Census)	Water (225-450 ML pa)	Electricity (6.8-13.6 GWhr pa) (approx 3-6 MVA)	Fuel/Gas (49-98 TJ pa)
Charters Towers	7,980	Supply OK (some upgrading reqd)	Capacity OK 6 MVA plus available $1.2-$2.4 million pa	Tanker LPG $1.35-$2.7 million pa
Hughenden	1,150	Supply OK	Partial 4 MVA limit $1.2-$2.4 million pa	Tanker LPG $1.35-$2.7 million pa
Richmond	550	Supply OK (some upgrading reqd)	Partial 2 MVA limit $1.2-$2.4 million pa	Tanker LPG $1.35-$2.7 million pa
Julia Creek	368	Supply OK (upgrading reqd)	Partial 2 MVA limit $1.2-$2.4 million pa	Tanker LPG $1.35-$2.7 million pa
Cloncurry	2,380	Supply OK	Capacity OK 6 MVA plus available $1.2-$2.4 million pa	Tanker CNG $887-$1,775K pa
Mount Isa	21,200	Supply OK	Capacity currently inadequate Req new Sub planned for 2017 $1.2-$2.4 million pa	Piped Natural Gas $370-$740K pa
Winton	980	Supply OK	Capacity inadequate Major network reinforcement $1.2-$2.4 million pa	Tanker LPG $1.27-$2.54 million pa
Longreach	2,970	Supply OK	Partial 3 MVA limit $1.2-$2.4 million pa	Tanker LPG $1.21-$2.42 million pa
Normanton	1,100	Supply OK (upgrading reqd)	Partial 4 MVA limit $1.2-$2.4 million pa	Tanker LPG (TBC)

Table No. 11: Potential Site-Services Availability Summary

Services were estimated based on a capacity range of 100,000 to 200,000 head per annum expecting that the capacity of any new processing facility would be within this range. This range allows for some future capacity expansion. This capacity equates to a throughput range of 400 to 800 head per day.

Water usage was estimated to be 2.22 KL/head based on 8.7 KL per tHSCW (MLA/AMPC, 2011) and 256 kg mean HSCW, resulting in 225-450 ML pa consumption. Electrical power demand and consumption was estimated to be a nominal 2.4 MW supply for 400 head per annum with a 1900 KW peak demand and 68 KWhr per head based on 267 KWhr per tHSCW (MLA, 2009) and 256 kg HSCW giving 6.8 GWhr pa consumption. Therefore, for the capacity range proposed, the supply requirement would be 2.4-4.8 MW with 6.8-13.6 GWhr pa consumption. Gas usage (or other suitable fuel source) was estimated to be 0.493 GJ per head based on 1926 MJ/tHSCW for cattle only and gas fuel-not coal (MLA, 2009 and 256 kg HSCW resulting in a fuel requirement of 49-98 TJ pa.

Water

Adequate water supply has been confirmed as available at most potential sites including Cloncurry and Mount Isa. Some sites indicate the need for upgrading of supply facilities to provide capacity or improve water quality.

Electric Power

Ergon Energy was requested to advise on power availability at a number of potential abattoir locations. The response for each of the requested locations appears below. Please note that the reference to N-1 security relates to the reliability of supply. The N-1 criterion expresses the ability of the transmission system to lose a single linkage without causing an overload failure elsewhere.

Mt Isa:

The existing substation at Mt Isa has no free 11 kV feeder bays and there is no room to expand the 11 kV bus. To address capacity constraints at Mt Isa the SNAP report has identified a project to develop a new substation north of Mt Isa, known as Sunset substation. The Sunset substation is planned for commissioning in December 2017. For the abattoir to connect to the proposed Sunset substation a dedicated 11 kV feeder will need to be constructed. The capacity available will be subject to generation constraints at Mica Creek. There may be potential to bring forward the commissioning date in support of abattoir demand.

Cloncurry:

Cloncurry has two 66/11 kV zone substations, neither of which has the transformer capacity to supply the abattoir. These substations are supplied by the Chumvale 220/66 kV substation. The Chumvale substation has a single 40 MVA transformer. The abattoir would need to connect at 66 kV at the Cloncurry North substation. A feeder will need to be constructed to the abattoir. A transformer can be installed at the substation or at the abattoir. As the Chumvale substation only has a single transformer the abattoir will not receive N-1 security. The capacity available will be subject to generation constraints at Mica Creek.

Richmond:

Richmond is supplied by a radial 66 kV feeder out of Hughenden. The Julia Creek substation is supplied out of Richmond. Although the local load is only about 3 MVA there are capacity constraints due to the voltage drop. The highest load the abattoir could take is 2 MVA on the 33 kV network. Due to the constraints of the Cape River 66 kV regulators N-1 security cannot be provided to the Abattoir.

Hughenden:

The Hughenden substation is supplied out of Charters Towers via two 66 kV feeders. These feeders have regulators installed at Cape River. Richmond and Winton are supplied out of Hughenden. There is 6.6 and 33 kV distribution at Hughenden. Due to voltage drop constraints the largest load the abattoir could take would be 4 MVA on the 33 kV network. Due to the constraints of the Cape River 66 kV regulators N-1 security cannot be provided to the Abattoir.

Winton:

Winton is supplied by a radial 66 kV feeder out of Hughenden and has two 4 MVA 66/11 kV transformers. The existing load at Winton is around 3 MVA. There is very little capacity available. Major network reinforcements would be required to supply the abattoir's 6 MVA load.

Charters Towers:

There is a zone substation and a bulk supply point at Charters Towers. Both supply the 11 kV distribution network. Due to the capacity of the 66/11 kV transformers at Charters Towers and Millchester substations no load is available to the abattoir on the 11 kV network. To supply the abattoir a 66/11 kV transformer will need to be installed at the Millchester substation. This will also require the construction of an 11 kV feeder to the abattoir. Although Charters Towers is supplied via the 66 kV network from the east the main injection is from the 132 kV feeder supplied from Ross. This means that the abattoir will not have N-1 security until the 132 kV reinforcements from Clair are complete.

Longreach:

The Longreach 66/22 kV substation is supplied by a radial 66 kV feeder out of Barcaldine. The network is constrained during peak demand due to the 66 kV voltage drop at Longreach. 22 kV capacitor banks can be installed to increase the capacity however because of the voltage step on the 22 kV bus capacitor bank size is limited to 2 MVAr per bank. With 2 x 2 MVAr 22 kV capacitor banks installed at Longreach the maximum load the abattoir could take would be around 3 MVA. Depending on the locality the abattoir may be able to connect to the existing 22 kV distribution network. If the abattoir is not suitably located a dedicated feeder will need to be constructed. This will also require a new 22 kV feeder bay and expanding the 22 kV bus. Depending on the load the abattoir may be curtailed in the event of a transformer failure.

Normanton:

Normanton is supplied by a radial feeder which originates in Townville. There are substations at Kidston, Georgetown and Croydon. There are SVCs at Normanton and Georgetown. The local load at Normanton is about 5 MVA. The substation has two 5 MVA transformers installed. This means any load the abattoir takes may be curtailable in the event of a transformer failure. Depending on the loads the abattoir may have up to 4 MVA of load. There is another enquiry for a connection at Karumba so the load available to the abattoir will be subject to this connection. Depending on the locality the abattoir may be able to connect to the existing 22 kV distribution network. If the abattoir is not suitably located a dedicated feeder will need to be constructed.

Summary:

When the power availability is compared with the required supply (2.4 to 4.8 MW), only Charters Towers and Cloncurry have adequate supply to support a 200,000 pa capacity. Hughenden, Longreach and Normanton have adequate capacity to support something over 100,000 pa while Richmond and Julia Creek have insufficient even for the base 100,000 pa capacity. Winton's network has no spare capacity. Mt Isa's current infrastructure was assessed as inadequate, however, a new substation planned for 2017 would address this shortfall. If Mount Isa were the preferred site, presumably this upgrade could be brought forward as needed.

Ergon have advised that the recommended tariff for an abattoir facility with this expected load and profile is Ergon Energy Tariff #43 with charges shown below:

Ergon Energy	Tariff #43	For day/afternoon
Peak (7-11, Mon-Fri)	14.58	C/KWhr (excl GST)
Offpeak	5.84	C/KWhr (excl GST)
Max Demand	14.79	$ per mth per KW excl GST)

Note that peak time is 7.00 am to 11.00 pm weekdays, with off peak all other times. Max demand is maximum load for the month or 60% of the maximum demand in the previous 11 months.
Based on the following estimated demand and consumption figures, expected annual electrical power costs would be:

	For Capacity (head pa)	100,000
	Consumption (GWhr pa)	6.8
Assume 75% peak	Peak	$743,673
	Offpeak	$99,280
Assume 1900 KW MD	MD	$337,233
	Total (incl GST)	**$1,180,185**

	For Capacity (head pa)	200,000
	Consumption (GWhr pa)	13.6
Assume 75% peak	Peak	$1,487,345
	Offpeak	$198,560
Assume 3800 KW MD	MD	$674,465
	Total (incl GST)	**$2,360,371**

Gas

Piped natural gas in the northwest Queensland region is only available from the Carpentaria pipeline which runs from the South Australian gas fields northward to Mount Isa. All other possible locations within the region rely on tanker supplied LPG. An alternative to piped natural gas is tanker delivered compressed natural gas which is only economic within a limited radius of an existing pipeline. Other options not considered are:

- Coal
- Bio-diesel
- Methane from effluent/manure/paunch contents

The estimated cost of piped natural gas (NG) to Mount Isa is about $7-$8 per GJ including gas, compression and pipeline facilities costs. Tanker supplied LPG costs about $27.50 per GJ (quoted by Elgas-27/10/2011) and only varies slightly within the region based on delivery from Townsville.

Based on the capacity range quoted, piped NG (at say $7.50 per GJ) would cost $370K to $740 pa. Alternatively, tanker supplied LPG would cost $1,360 to $2,720 pa. The cost difference between LPG and piped gas represents a significant $9.80 per head. An alternative to piped NG is the option of trucking tankers of compressed natural gas (CNG) to the abattoir site. Estimated cost to deliver CNG to a Cloncurry site would equate to an additional $10.50 per GJ. This cost includes transport and lease/finance/depreciation costs of equipment including compressors, tankers and letdown gear. Overall delivered cost is estimated at $18/GJ or $9.00 per head for a Cloncurry abattoir receiving gas transferred via tanker from the Mount Isa pipeline. This cost is lower than LPG and a preferred option for a Cloncurry location. The economics of this system of supply become marginal at about 200 km radius.

For supply of LPG, the setup costs are very low. The installation cost is approximately $30,000 for civil works with LPG vessels rented from the supplier at a nominal $1500 pa (quoted by Elgas 27/10/2011). Deliveries would be approximately weekly.
Piped NG would require a pipeline and letdown station. Depending on the location of the facility relative to the existing gas pipeline, the cost of the pipeline and letdown station could be considerable depending on route and distance.
The equipment required for tanker supplied CNG includes metering and compression facilities at the pipeline, tankers for transport and on site storage, and letdown equipment at the abattoir site. Estimated equipment cost is about $1,850K (Alan Tom-CNGI Pty Ltd).

Summary of Services to Site

Estimating capital costs for delivery of services to site is highly dependent on specific site selection, which is not the intent of this study. However, it is useful to give a low-high indication of the quantum so that governments can make an in-principle decision on what level of support they may offer. The following estimates are made based on previous experience, but are likely to vary considerably based on specific location, distance to supply, and supply conditions.

Service	Low $m	High $m
Road – All weather intersection and road to gate	1.0	3.0
Power – High voltage supply and infrastructure upgrade to boundary	2.0	8.0
Water – Pipeline extension to boundary	0.5	2.0
Gas – pipeline and pressure reduction station	5.0	10.0
Effluent treatment – may be joint development with local community	2.0	5.0
Total	10.5	28.0

The high range total begs further clarification and therefore nomination of a specific site to minimise and optimise these cost estimates. This is unlikely to occur until a specific investor is identified, and they concur with the proposed Cloncurry region. In turn, they need to look at the cost and suitability of land in the balance of the costs of services to site. There is also the option that tenure of land may be 'gifted' to them.

Providing reticulated gas to site may be foregone in considering the balance of capital and operational costs. But given the availability of the gas pipeline to Mt. Isa, it should be considered and may have future potential.

Most importantly, for the project viability to be properly assessed by a prospective investor, the three levels of government need to meet and form an in-principle position on the level of support they would be prepared to provide, and any conditions attached to that support.

8.3 Site Selection Criteria

The requirements for delivery of services to the site have been described in the proceeding section.

Typical guidelines for the location of an abattoir are 0.5km from sensitive odour and noise receptors such as housing, and 1.0km buffer distance for a render plant. The plant may have a nominal footprint of 200m x 200m. As a minimum, this prescribes a circular parcel of land of 1.1km radius, or 380Ha; or a square block 2.2km by 2.2km, 480Ha. Other proportions and geometries are suitable as long as they satisfy the buffer distance requirements. It is not necessary to own all this land, but it is important to establish that there are no sensitive receptor sites present, nor likely to be present in the future, for the required buffer distance. Hence any site should be several kilometres clear of existing townships and houses.

Other important attributes of the land are:

- Ideally a ground slope of 2-4%. Slope assists drainage of sheet flow across a site. Excessive slope can be subject to erosion, and can add significantly to civil works for cut and fill, and retaining walls.
- The site should be clear of waterways and wetlands.
- The soil type should be suitable for irrigation of treated waste water, which is high in nitrogen and phosphorus, and suitable for fodder crop production.
- The site should be suitable for catchment of stormwater runoff to dilute the concentration of treated waste water to the optimal level for balanced crop growth.
- It is beneficial if the site has bore water suitable for treatment to potable water quality with between 225-450ML pa required.
- The subsoil should ideally have a clay content of 30%. This minimises the likelihood of long term leaching to aquifers. The clay is also required for the base of cattle yards and lining of waste water treatment ponds and dams. Hauling clay long distances can be expensive.
- The site should be reviewed for indigenous or historical significance, and ecological sensitivity.

9 Changed Producer Practices

With an abattoir in close proximity, producers would change their production cycles and practices to maximise their net return. These changed practices may include:

Herd Productivity

The current average age of the northern herd is much older than the national average. In the remote northwest of the state and the Gulf region in particular, cull breeding stock are often left on the property as their value is less that the high cost of transport to a processor. A local abattoir will enable old cull breeding stock to be disposed of with some net return. This facilitates earlier disposal of exhausted breeding stock, so improving the productive capacity of the property, and the rate of change of bloodlines.

Finishing and Feedlotting

The presence of a local abattoir would make the finishing of cattle in the northwest of the state a more attractive proposition and challenge the traditional movement of cattle south for finishing prior to slaughter. The better arable land might increasingly focus on finishing cattle from properties that are more breeder dominant. In addition, more intensive growing strategies might be employed. These might include pasture improvement and use of fodder, either produced on property or from nearby irrigated agriculture.

Seasonality

Beef operations in northwest Queensland virtually shutdown over the wet season. Reasons for this include inability to work stock on property, inability to load cattle (no all weather loading facilities), restricted truck access due to flooding and road damage, and a general shortage of slaughter ready cattle. This is aggravated by the extent of shutdown of the coastal abattoirs. Producers may see the opportunity to use fodder or other means to be able to supply cattle counter to the normal production cycles and receive a premium price (wet money).

MSA

For those producers more than about 400 km from an existing processor, the opportunity of receiving a premium for MSA is not available. The strict MSA protocol requiring that the animal be slaughtered within 24 hours of leaving the property is difficult to achieve outside this transport radius. With a local processor, the option of receiving additional value from the livestock offered through MSA would be available to more producers. This will encourage a change in the genetic conformation of the herd and other cattle management practices with the aim of maximising this potential.

Breeding

With an abattoir in close proximity, cattle breeding and genetic selection will be refined to provide better and more targeted product quality outcomes including maximising MSA premiums.

10 Irrigated Fodder Supplies

The availability of irrigated fodder supplies within the cattle catchment area of a proposed abattoir provides the following advantages:

- Potential to reduce seasonality by providing slaughter ready cattle during the lean dry season when suitable cattle are in short supply in northern Queensland.
- Potential for improved 'quality' of slaughter ready stock (heavier cattle at younger age).
- Longer term, potentially increased cattle supply due to the local area being able to support an increased cattle population to slaughter weight versus being sent further south (out of range) for finishing.

There are currently very few properties in the GSD and MITEZ regions producing fodder for cattle. One notable example is Lorraine Station near Gregory Downs which produces various fodder crops using irrigation water from the Leichhardt River.

There is considerable interest and discussion amongst local government representatives and property owners across the GSD and MITEZ regions regarding the potential for significantly increasing the levels of irrigated crop and fodder production in the area. Notable among those are the proposals for the Flinders River Agricultural Precinct and the Gilbert River Irrigation Area. Development of these and other irrigation projects is tempered by environmental, economic and infrastructure concerns.
In December 2011, the Federal and State governments jointly committed $9.7 million to progress the development of a sustainable irrigation industry on the Flinders and Gilbert Rivers.

The presence of irrigated agricultural land near a potential abattoir site does not guarantee that this land will be used to produce cattle fodder. Investors will invariably choose to grow the most lucrative crop. However, some land types within the precinct may be only suitable for cattle fodder crops, and some cash crops produce by-products suitable for cattle fodder (cotton seed).

The potential of this region to produce cattle fodder to support a processor in northwest Queensland is significant, but is likely to develop over time depending on government environmental policy, provision of infrastructure and private investment.

Due to the high cost of transporting cattle fodder (versus its value), it is most economically used close to its area of production. The proposed Flinders River Agricultural Precinct extends across Flinders, Richmond and McKinlay Shires, all of which are in the economic catchment zone of a possible Cloncurry abattoir. The proposed Gilbert River Irrigation Area is located between Croydon and Georgetown and near the limits of the economic catchment zone of a possible Cloncurry abattoir.

When (or if) any of these irrigated agriculture developments progress to any significant scale, benefits as previously stated, especially a reduction in seasonality of supply, might be expected. These developments are however very uncertain in terms of scope and timing, and could not be relied upon in assessing the feasibility of any new northwest Queensland abattoir.

11 Innovative Approaches to Processing Capacity

The increasing cost of labour relative to other meat exporting countries, innovations in processing technologies and integration of value adding processing to reduce supply chain costs are leading to changes in the meat processing industry. The level of implementation of new technologies and value adding is at the discretion of the abattoir operator, depending on their market place connections, the type of cattle available to be processed, and the type of products to be produced. These also require an increased level of capital expenditure and potentially business risk.

The following lists of innovative approaches to processing capacity have not been included in capital cost estimates, but are provided for consideration by an investor, along with some further commentary on a few topics.

Production efficiency and yield improvement:
- Automated materials handling including palletising, load out and stock control – labour efficiency
- Meat recovery systems and mechanically deboned meat – yield efficiency
- Refrigeration systems to reduce carcass shrink and improve yield efficiency
- Production control such as Marel slicing systems to improve product yield-see below
- Carnie boning systems to reduce OHS issues for boners

Energy efficiency systems:
- Bio energy generation-see below
- Heat recovery systems

Value adding options:
- Products for the south east Asian market -see below
- Commodity to Food-see below
- Bioactives-see below
- Further processing to manufacture patties for the south east Asian markets

It has been suggested that there may be advantages in slaughtering cattle in a remote location and transporting carcasses to existing eastern boning rooms. While this may be a useful transitional start-up option, some export markets require complete processing at the one site to maximise hygiene and cold chain outcomes. Hence, separated processing is not a recommended long term approach. It also requires dedicated or customised refrigerated transport vehicles.

Some further commentary on some of these options appears below.

Bio Energy Generation

Over recent years there has been a lot of interest in the concept of using naturally occurring substances (bio mass) to generate energy thus moving away from oil as the primary energy source. The meat and livestock industry has a huge capacity to move in this direction given that it is a primary industry located in the country and produces a range of renewable

products, all sourced from the land. There are two specific products and processes that lend themselves to an abattoir environment, namely bio diesel and bio gas.

Like most new industries, bio energy struggles to compete in the market place given the unit price, limited distribution and current legislation that does not encourage or promote change. In the context of a new abattoir in northwest Queensland, there could be an opportunity to include a bio energy system that will add value to the business, be sustainable and used within the business to reduce cost and create a carbon 'free' enterprise. The concept of a carbon neutral abattoir is potentially achievable and would have huge commercial appeal to a carbon conscious consumer.

Bio diesel can be produced from tallow, a by product of the rendering process. New continuous flow production technologies have a small footprint and low capital and operating costs. Bio diesel would be best used as a transport fuel where it has a higher value.

Bio mass involves using the solid and liquid waste streams for the abattoir to generate methane gas that could be used to fuel boilers or drive generators to produce electricity. This is an emerging technology and used in specific applications within the industry. The issue of cost verses conventional energy sources and government attitudes to encouraging these technologies needs consideration.

Production Control

Micro management or so called virtual control of the boning room and other value adding production systems is a concept that is relatively new to the meat industry in Australia. It is the next big step in production systems that will allow the industry to introduce new features that will lead to new products that are more consumer ready, and or more suited to further processing techniques, all produced at least cost with maximum returns to the owner. An example of this sort of technology is the Marel stream line systems that offer full virtual control of the boning and slicing processes to the extent that particular muscle groups can be directed to specific outcomes, (even grinding outcomes) with optimum yield. These concepts and systems are not new and are already employed in other food related businesses that are directly competing with the Australian meat industry.

Bioactives

Bioactives are products that are not readily available in the normal abattoir environment given the complexity and cost of extraction. Blood is an example of a missed opportunity as the disposal of this product is usually to render as a dried product used in animal feed production. To maximise returns and extract extra value from these lower valued waste and product streams, new technologies such as Plasma fractionation can be considered. In simple terms these products can be used in the Food industry as food additives, nutraceuticals for human health treatments, and in bio technology industry for cell media cultures. The markets for these products are small and very specialised, but the returns are high with the right technology and marketing practices in place.

Value Adding for South East Asian Market

The waste streams that are generated from a traditional western abattoir present a huge opportunity to add more value, and there is no greater example than the collection of items such as fat and bone. Traditionally in western culture these items are seen as non-edible therefore a waste that needs to be converted to another more saleable product. However, as we move away from the western markets and sell our products into the Asian markets; such items are valued and consumed along with all of the other animal parts. Therefore to

catch this extra value the abattoir design could take into consideration the collection of these additional products and add as much value as possible in house.

Commodity to Food

The concept of moving the product from a commodity to a food is now beginning to be embraced by the meat industry with many processors understanding the need to add value and create uniqueness in the product offer. The definition of an abattoir and how it integrates into the supply chain is under challenge and has been precipitated by the retail giants and globalisation. The ownership of the product gives that entity control and a capacity to take the product direct to the consumer thus extracting the ultimate return and maximising profits. This concept suggests that processors must focus on food based products and not the old concept of trading commodities.

12 Processing of Other Species

Some abattoirs process alternative species at those times of the year when there is short supply of the primary processing stream, or a seasonal abundance of a secondary species. This requires either a similarity in carcass size, or dedicated processing lines and chillers where carcass size is significantly different. For example, some sheep processing lines will run calves for one to two hours/day and sometimes goats are processed on sheep processing lines.

Clearly the feasibility and viability of a beef abattoir is the main focus of this project. Small stock such as goats and sheep do not suit the processing equipment of a beef processing line. With a minor level of adaption, buffalo and camel could be processed on a beef line.

However, the very difficulties of rainfall, heat, and transport access that generate the seasonality cycle in the cattle supply chain, arguably apply to other species as well. In this situation, little advantage is achieved, while suffering the disadvantage of distracting the businesses focus away from the principal business of beef. Other issues to manage are species separation, packaging, marketing and training.

During the course of this study, other than one request to process sheep from the Hughenden district, there was no declared interest in processing other species. Queensland's sheep population was in the order of 3.6 million in 2010, well down on the peak of 25.6 million in 1942. With greater numbers towards the New South Wales border, it is difficult to imagine any significant numbers in the areas of the Gulf Savannah and MITEZ that could justify the incremental capital alongside a beef abattoir.

Overall, the proposition of processing alternative species is generally offered as a solution to the seasonality issues of the supply chain of the principal species, in this case cattle. Unless the alternative species is counter-cyclic in supply availability, there is no real advantage, and the additional capital requirement and management attention can become a significant disadvantage. While a watching brief was maintained throughout this study for significant alternative species numbers or market interest, there has been nothing forthcoming that attracts attention for processing alternative species.

13 Federal, State and Local Government Regulations

An abattoir of this nature will have to comply with food production and meat export requirements and obtain the following accreditations:

- Local shire Development Application approval.
- DERM approval which relates to the environmental sustainability of the enterprise and usually will have approval conditions under which the business will operate.
- Building codes of Australia - relate to the standards of construction and occupant safety.
- Certificates of occupancy.
- State food regulation approval - to carry on a food related business.
- Federal government approval - AQIS (Australian Quarantine & Inspection Service) for export.
- Tick line legislation.

14 Governance and Management Models

The following governance models need to be considered in balance with:

- Strategic development of processing capability and the cattle industry
- Global competitiveness for the meat industry
- Regional economic stimulus

Most Australian beef abattoirs are run on standard commercial lines, being fully integrated slaughtering, chilling and boning activities on a centralised site under the ownership and management of a specialist beef production company. However the issues of scale, remote location and risk profile in this instance suggest that alternative models could be considered. A range of models is available for consideration in the event that state, commonwealth and/or local governments were to become involved in providing support for the development of an abattoir for northwest Queensland.

PUBLIC-PRIVATE PARTNERSHIP

The most commercially feasible means of establishing a standard integrated abattoir may be through a partnership between government and a private processor company. Under such an arrangement, the company would design, build and operate the facility, but government would provide land and services, and would underwrite the improvements to transport and other infrastructure required, which could be considerable. This kind of model makes the investment more palatable to the processor and improves the commercial rate of return. However, both parties remain exposed to operating risk and the potential for low overall economic returns. The government agency may also have difficulty in justifying support for a private investor operating with the aim of serving shareholders rather than provide a general community benefit.

CO-OPERATIVE MODEL

The Northern Meats Co-operative (NMC) in Casino, NSW, is the only significant example of an abattoir run on co-operative lines in Australia. Its model is a historic one, having been in operation over 70 years. Over 1600 local and more distant producers (including from Queensland and NT) are members of the co-operative, and pay only a small annual fee, levied at $0.25/share, of which each member owns only 250.

The facility provides a full service of slaughter, chilling, boning and packaging on behalf of up to 40 different ‘operators’. These operators are companies who purchase cattle from co-op members and then pay fixed rates for the NMC to process them to fill operator orders. NMC will then manage transport and logistics if required into the operator’s domestic markets or to the ports of Sydney or Brisbane.

The co-operative nature of the business has some benefits in terms of tax treatments and producer loyalty, but has some downsides in relation to the ability of management to pursue long term development plans and raise capital. Board members serve short terms, so management continuity can become compromised. The structure, however, does suit the local environment of many small livestock producers who are committed to the ongoing survival of the facility and the ‘service kill’ model appears to work well to achieve competitive prices from the various ‘operators’.

On balance, it would seem unlikely that any new co-operative based facility would set up as a formal co-operative, given its management challenges. The co-operative structure is a rarity in the commercial world now. However, there is some appeal to this model for remote environments, given the advantage of having disparate pastoral leaseholders demonstrate a commitment to a processor stream in enabling it to survive in that environment.

While some form of producer commitment might be important to a new abattoir, the formal co-operative model is not likely to offer the best form of governance in this instance.

PUBLIC OWNERSHIP, LEASED TO OPERATOR

In view of the isolation and risks, a facility fully funded from public sources would remove one of the key problems for investors. If this commitment were made, there would be a range of operators expressing interest in the management of the facility, albeit essentially in their own corporate interest, rather than on the basis of providing some form of community or industry benefit.

A genuine return on investment of this scale by state or local government would be very small and would probably not meet state investment business case criteria.

PUBLIC OWNERSHIP, WITH LEASED BONING ROOMS

As a variation on the model above, a slaughter facility with more than one boning room would provide the level of competition missing from the previous model. Separate boning rooms would be leased to, and managed by, different processors, offering competing prices to producers. The slaughter function could be operated by the primary lessee or the public authority itself.

The main difficulty with this approach is likely to be scale, with the staff and facilities needed to operate two boning rooms likely to exceed the overall demand for services.

PUBLIC OWNERSHIP, WITH CO-OPERATIVE MANAGEMENT

A hybrid model of the co-operative approach combined with public capital has some potential appeal. The local authority would develop and maintain the building and basic facilities, but lease it to a co-operative representing the interests of local pastoral producers. This co-operative would then manage the services provided on the slaughter floor on orders from competing beef marketing companies, somewhat similar to the operating model used in the Northern Meat Co-operative but without the formal co-operative structure.

The co-operative company would manage the operating risk but without the financial burden (essentially depreciation). Its lease costs would not provide the constructing authorities with a guaranteed return on investment, but a repayment structure could be arranged based on contributions in good seasons rather than poor. The co-operative might appoint a commercial operator to physically run the facility, but would manage the relationships with marketers and logistics providers directly.

This model still exposes the public sector to capital risk and low direct returns on investment, but does offer greater potential for general returns and benefits to the producer group as a whole, rather than an individual company. This management model might appeal to the community and also suit the difficult commercial circumstances better than the others.

On balance, in this instance, there is no compelling reason for the state to consider any model other than a standalone fully commercial operation, supported through normal regional investment support mechanisms as necessary to facilitate investment. Governments should be wary of becoming involved in the funding of private assets in this highly competitive industry and should concentrate on simply providing a platform for private investment and the operation of the free market so that efficiencies and opportunities can be found and developed by commercially motivated parties.

15 Contracting Arrangements for the Supply of Cattle

Cattle purchase transaction strategies that could be used to encourage out of season delivery of livestock to counter seasonality are:

- A public offer spot market price through a pricing grid system that provides premiums or discounts based on the HSCW as determined at the abattoir weigh scale. These pricing grids are offered to producers based on predetermined delivery periods. A premium could be offered to attract cattle during the wet season.

- Forward private predetermined price based on cattle specifications that are agreed to by both parties. This form of contract (paddock sale) is not used on a regular basis and if used it is usually for cattle that have specific carcase specifications for specialised markets such as EU or Japan. The price offered will be an over the hooks price based on an agreed pricing grid with carcase quality definitions on which premiums or discounts are offered. This trading method would become more popular with an abattoir that has a table meat capacity as growers will be encouraged to improve their herd genetics and production strategies to catch the premiums in serving other markets.

- Forward private price premium margin (in cents per kg HSCW over the hooks) above the market price on the day based on agreed published market indices that reflects price movements across the cattle livestock market taking into account all international and domestic influences. This price premium margin offered by the processor on delivery is in addition to the market price on the day. The processor is willing to pay this premium as it guarantees supply at a predetermined time, and from the sellers perspective it provides forward price security and sales that otherwise would not be offered under a normal market environment. The difficulty in this form of transaction is establishing what the market price is on the settlement day. The National Livestock Report Service (NLRS) would have numerous cattle prices and indices that could provide the basis for this option.

16 Effect on Existing Processors

It has been estimated that the annual turn off of slaughter ready cattle for Queensland is in the order of 3.3 million or approximately 65,000 cattle per week. These cattle are processed in abattoir facilities located mainly in the south east corner and coastal regions of the state.

Table No. 10 below lists the major abattoirs within the state, their locations and estimated processing capacities while Figure No 8 below illustrates these features graphically. When the Nolan and John Dee abattoirs (for which no data was publicly available) as well as numerous smaller processors are included, estimated total processing capacity for the state is approximately 4,000,000 pa or 20% over existing throughput. Clearly, the existing processors are not operating at full capacity.

Company	**Site**	**Capacity (Head pa)**	**Source**
JBS Swift	Dinmore-Brisbane	885,000	1,2
	Townsville	304,000	1,2
	Rockhampton	195,000	1,2
	Beef City-Toowoomba	264,000	1
Teys Bros	Beenleigh	343,000	1
	Rockhampton	416,000	1
	Biloela	169,000	1
Nippon	Oakey-Toowoomba	288,000	1
	Borthwick-Mackay	180,000	1
John Dee	Warwick	-	Not avail
Kilcoy Pastoral	Kilcoy	173,000	2
ACC	Cannon Hill	240,000	2
Stanbroke Beef	Gatton	120,000	2
Nolan Meats	Gympie	-	Not avail
		3,574,000	

Table No 12: Queensland Processing Capacity (> 500/shift)

Sources: 1-Company websites, 2-MLA 'Top 25 Processors' publication 9/2008, where no information is available, 5 day per week, 48 week per year operation has been assumed.

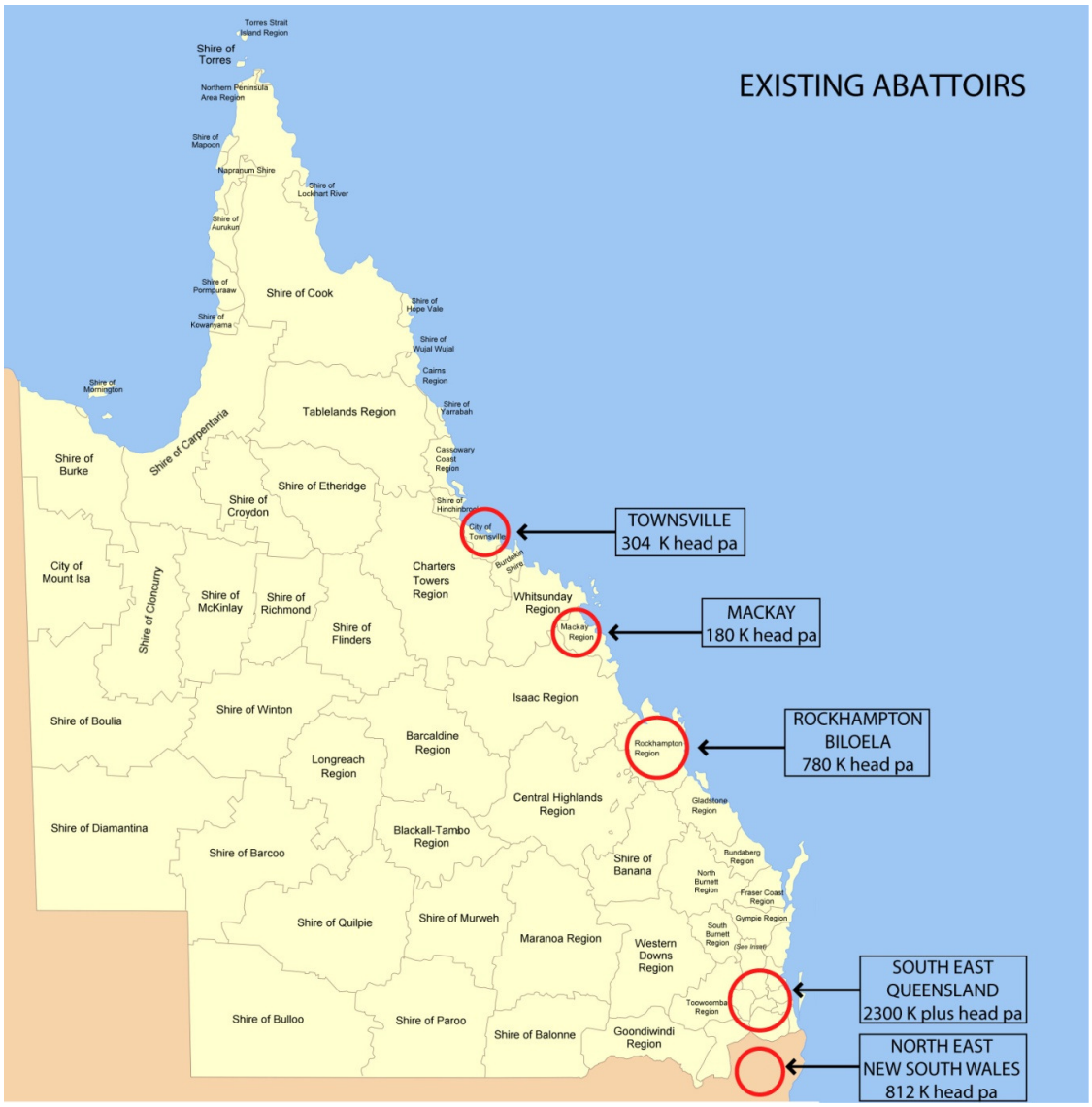

Figure No 8: Existing Abattoir Locations and Estimated Capacities

The north western regions of Queensland are estimated to turn off a total of about 1.0 million cattle per year of which 700,000 are ready for slaughter. The supply chain model based on NLIS data for 2009 and 2010, demonstrates that a Cloncurry abattoir would attract approximately 96,000 cattle per annum. With some short term changes in producer practices and additional supply from eastern Northern Territory, this number is expected to be closer to 115,000 per annum. This number represents 3.5% of the total number of slaughter ready cattle processed every year in the state of Queensland.

The NLIS data also show that of the 700,000 slaughter ready cattle produced in the region 378,000 cattle or 54% are sold and processed through the coastal abattoir locations (Townsville, Mackay and Rockhampton) while the remaining 322,000 or 46% are transported to abattoirs in the Brisbane area. If we only include the shires constituting the catchment area for the Cloncurry abattoir as determined by the supply chain model, then about 52,500 or 55% are being sent to one of the coastal abattoirs while the remaining 43,600 or 45% are being sent to one of the Brisbane area abattoirs.

This suggests that a Cloncurry abattoir would take cattle from all Queensland processors, obviously more as a proportion of total capacity for the coastal sites. The 52,500 cattle potentially lost to the coastal sites represents approximately 4% of their estimated capacity, whereas the 43,600 lost to the Brisbane area sites represents approximately 1.6% of their estimated capacity.

Due to the Townsville abattoir being the closest to Cloncurry and being the “least cost” supply chain for most of the shires within a Cloncurry abattoir cattle supply catchment, it is reasonable to assume that the Townsville abattoir will experience the most substantial reduction in cattle supply. In the short term, the cattle supply market will reach a new equilibrium with Townsville drawing more cattle from areas previously dominated by Rockhampton processors, and likewise the other existing abattoirs drawing cattle from new areas, generally closer to their sites.

With Queensland processing capacity significantly in excess of demand, any new additional capacity will reduce utilisation of the existing plants. Some of the existing plants suffer from urban encroachment and continued regulatory pressures in terms of environmental sustainability. Depending on cattle supply and distribution, some of the existing capacity could scale down or even close in the future.

In the fullness of time the market will settle and each competing abattoir will secure its share of the available stock and adjust their purchases to fill their total requirements.

17 Contact with Processors

Several of the larger Queensland processors and pastoral companies were approached regarding the prospect of a new abattoir in the northwest of the state. Specific contact details and discussions remain confidential.

- Most readily responded to the opportunity and agreed to discuss the prospect.
- With one exception, all doubted that they would become involved, but wished to be kept aware of developments and the outcome of the study. The one exception was very interested in the prospect of an abattoir in western Queensland and wished to progress discussions with DAFF.
- Participants acknowledged that moving cattle long distances served neither producer nor processor, and placed Australia at a global competitive disadvantage.
- There was scepticism regarding the seasonality issue. Particularly during those cycles of prolonged drought and the consequent long distances that cattle would need to be transported if the abattoir were to remain open.
- There was scepticism that refrigerated containers out of Townsville port would be viable in the short term, but it would be welcomed if it were.
- It was acknowledged that cattle supply to Townsville abattoir would come under pressure if a north western abattoir came into operation.
- Recruiting, retaining and training labour would be difficult in competition with the mines.
- The prospect of irrigation development should enhance the issues of cattle weight and seasonality.
- Reduced road miles would reduce the carbon footprint of the total supply chain.

Overall, the participants displayed a protectionism of their existing plant locations and structures, while in balance recognising the supply chain costs over large distances were a disadvantage to the global competitiveness of the industry.

18 Capital Costs

The throughput and beef production capacity of the proposed abattoir is summarised in Table No. 13 below.

Element	
Plant operating hours per day	12
Plant operating days per week	6
Plant operating days per year	286
Cattle throughput per day	400
Cattle throughput per year	114,400
Average HSCW (kg)	256
Meat production (meat and offal) in kg per day	75,000
Meat production (meat and offal) in tonnes per year	21,450

Table No. 13: Proposed Abattoir Capacity Summary

Table No.14 below indicates the estimated capital cost of the proposed abattoir. Note that costs related to building, installation and other site works can vary depending on the level of construction work occurring concurrently in the resources sector in the Cloncurry and Mount Isa area. As a result, building and installation costs can be 15-20% greater than those shown below.

Description	Cost ($ Million)
Infrastructure -Mains electrical supply -Mains water supply -Natural gas supply -Roads to gate -Land	EXCLUDED
Site Works and Building Preliminaries -Building approvals -General site works -Temporary facilities -Fencing -Roads and car parking	1.4
Building Works -Main process plant, chillers, freezers, etc -Yards, holding pens and lairage -Boiler house and engine room -Render building -Admin and amenities -Workshop	15.4
Process Equipment -Main process equipment -Rendering equipment -Hot water boiler, heat exchangers -Plate freezers	14.9
Services -Refrigeration system -Ventilation -Effluent treatment and manure handling -Piped services -Fire services -Electrical distribution and control	13.6
SUBTOTAL	45.4
Project design and Management	3.6
Total Cost of Abattoir	49.0

Table No. 14: Proposed Abattoir Capital Cost

Major exclusions to this estimate include:

- Land
- Provision of all services to site boundary
- Commercial builder/manager
- Onsite hide processing
- PABX, Computers, office equipment

- Farm equipment
- Firewater tanks and sprinkler system
- Irrigation equipment

19 Operating Costs

An operating cost model was created to estimate the profitability of a potential northern outback abattoir in the Cloncurry area. Based on published figures and information from industry experts, parameters such as cattle prices, operating costs and expected prices for beef and offal products were estimated. These were used to calculate a "best estimate" of expected operating costs and revenues. This operating cost model assumes a range of market, economic and environmental factors, and the modelled profit outcome will be very sensitive to variables such as exchange rate, seasonality, drought, cattle available for purchase, products marketed and business model used.

Note that the annual throughput on which the operating cost model is based is 114,400 head per annum which is greater than the 96,000 head per annum generated by the supply chain model. The additional throughput is assumed to result from the following:

- Changes in cattle movement practices by northwest Queensland producers in the region of the abattoir. These would be practices able to be implemented in the short term, perhaps while the abattoir was in construction, and include arrangements to finish cattle on properties closer to the abattoir rather than sending further south
- Access to a proportion of slaughter ready cattle from the Northern Territory. It would be expected that Northern Territory producers would also change their cattle movement practices to maximise return by using a Cloncurry abattoir.

Table No. 15 below summarizes the main operating parameters on which the cost model is based. Table No. 16 below gives the assumed cattle profile used as the basis for the cost model.

Parameter	Per Day	Per Year
Cattle Throughput	400	114,400
Production Meat Products	102 tonnes	29,300 tonnes
No. Employees	approx 220	
Operating Shifts	286 by 12 hour shifts per annum	

Table No 15: Summary Abattoir Parameters

Cattle Type	HSCW	Annual Vol
Bull	272	15,000
Trade Cow	223	47,400
Boner Cow	180	47,000
Trade Steer	154	2,500
Heavy Steer	262	2,500
Ave/Total	**256**	**114,400**

Table No. 16: Assumed Cattle Types

Some more detailed comments on the methodology used and the source data on which the costing model is based appears below. All indices are kgs of hot standard carcass weight (HSCW) and Australian dollars.

Operating Model
The model is based on a six day week operating Monday to Saturday with one twelve hour shift each operating day. This shift configuration will allow afternoon and Sunday maintenance programs. The operating year will be 48 weeks less public holidays that fall during the operating period. All annual maintenance programs, production annual leave and any other annual events can be completed over the wet season shutdown.

Cattle Format
The product profile of the plant will be manufacturing and selected table meat products as dictated by the cattle supply which will be predominately cull cattle as indicated in Table No.16 above.

Labour
The enterprise must allow flexible work practices which facilitate meaningful productivity and flexible hours of work. All workers (except staff and external consultants) will be covered under a contract arrangement. All rates have the basic safety net provisions that are converted to dollars and paid in the rate. A total of 220 people will be engaged at the facility with 97 workers on the plant at any one time. Manning levels reflect the abattoir design, cattle types and products that would be handled by the plant.

Costs
Estimated costs take into consideration the premium associated with the remote location. These are:

- Repairs and Maintenance: 8.83 cents per kg or $22.61 dollar per head. This is higher than would be expected for a new facility. The main factors driving the costs are high labor rates for trade skills due to competition from the mining sector, cost of outside services, and cost of delivery of spare parts.
- Energy at 8.10 cents per kg or $20.73 dollars per head. This is higher than for a typical abattoir due to the cost of gas as tanker delivered compressed natural gas. If piped natural gas were supplied to the site boundary, energy cost would be reduced to 6.1c/kg HSCW or $15.56 per head. If tanker delivered LPG was the fuel source, energy costs would be increased to 9.93 c/kg or $25.42 per head.
- AQIS: Because of the proposed shift structure, the proposed abattoir business will have unique issues in terms of AQIS services that double the normal fees and charges applicable to a similar sized abattoir located on the east coast.

The total cost per head (based on the cattle format and cattle types) is $314.57 dollars per head or 122.88 cents per kg HSCW. This would be considered a reasonable competitive cost for a table meat business servicing the export and domestic markets. However, in this case a multipurpose grinding and table meat business is envisaged with cost structures that are high compared to similar businesses. This plant would not be competitive with the hot bone plants that operate under $1.00 per kg, but given that this plant will have the capacity to harvest a lot more value added primal cuts, it should be competitive.

These operating cost estimates have been based on historical industry benchmarking data taking into account variations in product outcomes. Final labour and operating costs would need to be matched with the final design and fit out of the proposed abattoir ensuring that new technologies are maximized to reduce labor and increase productivity.

Prices

The price "over the hooks "(HSCW price) of each cattle type is an average over a two year period at Cloncurry. The selling price of each product is an ex works price averaged over a two year period (same as the carcass price) plus or minus any premium or discount applicable to the product and market into which it is sold. All of the pricing data relating to the cattle and product has been sourced from MLA, and industry sources. The carcass yield and disposal is a generic representation of a market and will vary over the course of the two year period according to market demand.

A summary of the outcomes of the operating cost model appear below in Table No. 17. As previously stated, these results are based on assumptions derived from published historical data and industry expert opinion. Variations in assumptions, in particular factors such as exchange rate, seasonality, drought, cattle available for purchase, products marketed and business model used, could significantly alter the resulting expected profit.

Parameter	c/kg HSCW	$/head	$ MM
Revenue	134	342	39.1
Direct Costs	51	131	15.0
Fixed Cost (excl int & dep)	40	103	11.8
Interest	17	43	5.0
Depreciation	15	37	4.3
Profit	**11**	**27**	**3.1**
EBIT	**28**	**71**	**8.1**
EBITDA	**42**	**108**	**12.3**

Table No. 17: Summary Operating Cost Model Results

Model Sensitivity

Variations in economic, environmental and market factors which could be expected to have a significant impact on the profitability (both positively and negatively) of a northwestern Queensland abattoir are:

- Cattle numbers available for slaughter within the catchment area
- Australian dollar exchange rate and global beef demand/price
- Seasonality, drought, fodder from irrigated agriculture
- Fuel and energy costs
- Labour availability and unit rates
- Competitor investment or response
- Freight costs; road, rail, ports, road trains, reefers
- Capital and operating costs

20 Business Conditions to Attract Investment

An investor in an abattoir is likely to seek support from federal, state and local government for associated infrastructure. Because of the direct and indirect employment opportunities, an abattoir provides significant economic stimulus to a region which may justify infrastructure spending and other forms of support from either of the three levels of government.

If an abattoir was to be located in a suitable industrial estate of a large urban city, it could be expected that adequate roads, power, water, gas and sewerage would be provided at the property line. The provision of such infrastructure may be seen as the role of government in combination with property developers. Hence an investor is likely to have the expectation that governments would similarly fund such infrastructure in a more remote location.

The business conditions that are likely to attract an investor include:

1. Provision of all weather roads and turnoff suitable for road trains.
2. Provision of sufficient and reliable power, water and gas to the property boundary.
3. Provision of suitable trade waste capacity. Alternatively, co-investment in trade waste processing near the abattoir that also supports a local community.
4. Proactive support with Development Applications and statutory approvals.
5. Training support to develop new skill bases within a region.
6. Access to land under advantageous conditions.

The three levels of government (federal, state and local) need to meet and agree in-principle on the level of infrastructure and support that they would be prepared to provide. Section 8.2 of this report provides an indication of the level of cost that could be expected to provide site services. The range of $11.5m to $28.0m is quite large, and is driven by the lack of identification of a specific site. The site and service costs are unlikely to be confirmed until an investor is attracted. Governments may not show commitment until the quantum of costs is reduced and more realistically defined and estimated, and an investor is not likely to step forward with conviction until it understands what level of support might be forthcoming from governments. A ‘chicken and egg’ cycle.

To break this cycle, the three levels of government should convene to establish their in-principle level of support for infrastructure development and assistance, and any conditions attached to that support. Such an agreement needs to go beyond ministerial intent, but should identify the programs where funds can legitimately be drawn. It needs to be clear what level of support, if agreed, is available and to what the funds are to be applied.

Bibliography

Barnes K, Smith S, Lalman D, (2009), Managing Shrink and Weighing Conditions in Beef Cattle, Oklahoma Cooperative Extension Service, ANSI-3257

MLA/AMPC, (2011), Industry Environmental Sustainability Review 2010; A.ENV.0065

MLA, (2009), Red Meat Processing Industry Energy Efficiency Manual; A.ENV.0065

Addendum

Implications of the Proposed Darwin Abattoir on the cattle Supply and Viability of the Proposed Outback Northern Queensland Abattoir

The obvious impact of a new abattoir in Darwin on an outback northern Queensland abattoir would be the redirection of some slaughter ready cattle from the Cloncurry area abattoir to the Darwin processor. These cattle could be from either Australian Agricultural Company (AACo) affiliated properties or non affiliated properties, and from adjacent areas of the Northern Territory as well as Queensland.

The Northern Outback Queensland Abattoir Study (Feb, 2012) provided analysis to estimate the expected economic cattle catchment of a Cloncurry area abattoir. The economic catchment is the number of slaughter ready cattle which enjoy a supply chain cost advantage versus the existing coastal Queensland abattoirs. The analysis presented in the report considered only cattle sent directly to slaughter from Queensland shires and resulted in an expected catchment of 96,000 cattle per year. Other sources of cattle supply to a Cloncurry area abattoir are:

- culled breeders and older stock
- Slaughter ready cattle from the Northern Territory

Currently older cattle and culled breeding stock from northern and western properties have little commercial value as the cost of transporting the animal to an existing processor exceeds the price received. An abattoir in the Cloncurry area would make transporting and processing of these animals from many northern properties economically viable, lifting local productivity considerably, and provide a source of cattle not readily available to more remote processors. An abattoir in the Cloncurry area would make transporting and processing of these animals from many northern properties economically viable, lifting local productivity considerably.

While the Northern Territory has a substantial live cattle trade, a significant number of cattle are sent to the South Australian and coastal Queensland abattoirs for processing. Most of these are shipped to backgrounding or growing out properties in South Australia and southern Queensland before slaughter. An estimated 150,000 cattle move from the Northern Territory into Queensland, nearly all passing through Cloncurry. The number of slaughter ready cattle currently leaving the Northern Territory into Queensland is not known, but a Cloncurry area abattoir would be expected to attract nearly all.

To account for the additional slaughter ready cattle from the Northern Territory, culled breeders and older stock now able to economically processed, the original estimate of 96,000 slaughter ready cattle from Queensland shires expected to be attracted to a Cloncurry area abattoir was increased to a nominal 115,000 cattle per annum. The additional 19,000 cattle per annum is only an estimate in the absence of hard data, but is considered to be conservative.

Australian Agricultural Company (AACo) has numerous properties within Northern Territory and Queensland, many within the expected catchment area of a Cloncurry area abattoir. Figure 1 below indicates the locations of AACo properties, and Table 1 provides data on each of the properties potentially affecting a Cloncurry area abattoir (from the AACO web site). Should other property owners or operators join AACO in the Darwin abattoir, then other properties may be similarly aligned to preference the Darwin abattoir.

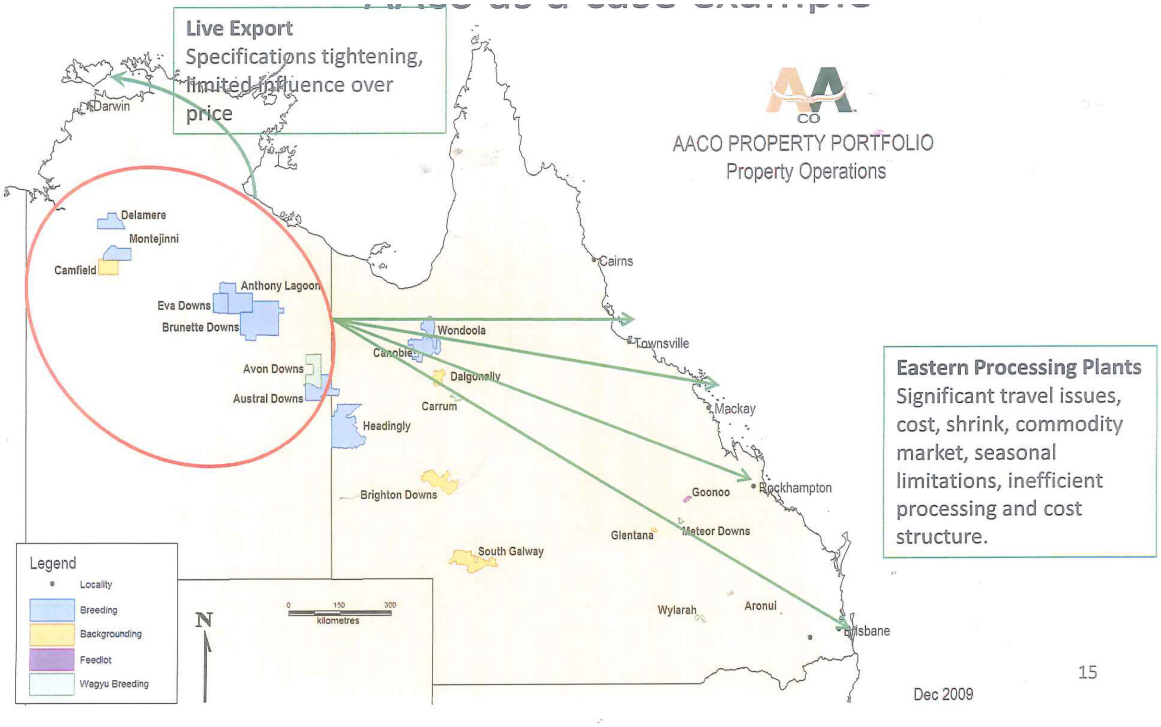

Figure 1. AACO Properties

Name	*Location*	*Area (hectares)*	*Capacity (head cattle)*	*Comments*
Canobia	200 km N of Cloncurry	429,000	40,000	Breeding station
Carrum	26 km N of Julia Creek	50,000	NA	Breeding bulls
Dalgonally	80 km N of Julia Creek	128,000	14,000	Growing out station for breeding stations
Headingly	200 km SW of Mount ISa	1,003,000	40,000	Breeding station
Wondoola	130 km S of Normanton	252,000	23,000	Breeding station
Avon Downs	250 km W of Mount Isa	394,000	NA	Breeding
Austral Downs	300 km W of Mount Isa	469,000	NA	Breeding
Anthony Lagoon	440 km NE of Tennant Creek	934,000	60,000	Breeding, backgrounding and trade. Predominantly for live export
Eva Downs	440 km NE of Tennant Creek			
Brunette Downs	350 km NE of Tennant Creek	1,221,000	111,000	Breeding and backgrounding
Benmara	350 km NE of Tennant Creek	450,000	7,500	Breeding and agistment

Table 1. AACO Properties Affecting Cloncurry Area Abattoir

Of the numerous AACo properties within the expected Cloncurry catchment area, most are breeding properties with only Dalgonally Station (80 km north of Julia Creek, Queensland) being used for growing out. As a result, the expected number of slaughter ready cattle included in the Queensland shires analysis would be minimal. Additionally, due to the significant road distance to Darwin, AACO may receive a higher net return by processing slaughter ready cattle from this and other properties within the economic catchment at a Cloncurry abattoir.

It can reasonably be expected that all slaughter ready cattle from northern areas of the Northern Territory, from both AACo and non-AACo properties, would be processed at a Darwin abattoir. Southern areas of the Northern Territory would be closer to Cloncurry than Darwin. It could be assumed that non-AACO properties would be attracted to a Cloncurry abattoir, while AACo properties might still send cattle the greater distance to Darwin to enhance the cost recovery of their abattoir.

Given that data for culled breeders and older stock and Northern Territory slaughter ready cattle are estimates only, Table 2 below indicates the expected change in cattle numbers resulting from a Darwin abattoir.

Area	***Source***	***Pre Darwin Abattoir***	***Post Darwin Abattoir***
North west Queensland	AACo properties	2,000	1,000
	Non AACo properties	94,000	94,000
	Spent breeders	5,000	5,000
Northern NT	AACo properties	2,000	0
	Non-AACo properties	5,000	0
Southern NT	AACo properties	2,000	0
	Non-AACo properties	5,000	5,000
TOTAL		**115,000**	**105,000**

Table 2. Expected Cloncurry Abattoir Catchment Change

Any reduction in cattle supply due to a Darwin abattoir will adversely affect the financial viability of a Cloncurry abattoir. While the supply reduction noted in Table 2 is not insignificant, the conservative nature of the estimates for spent breeders and slaughter ready cattle from the Northern Territory, as well as increased slaughter ready cattle numbers due to enhanced cattle management practices around a Cloncurry area abattoir would be expected to overtake this reduction.

A positive effect of a Darwin abattoir on a Cloncurry area abattoir would be the development of infrastructure for refrigerated beef export at the port of Darwin. This increases the viability of this supply chain route into Asian export destinations.