

Ostwald Bros Rural Operations

Traffic Study for Cattle Feedlot, 1804-2033 Tarwoona Rd Inverell Shire LGA

TRAFFIC IMPACT ASSESSMENT

Prepared by



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1 INTRODUCTION

Local Government Engineering Services has been engaged by Ostwald Bros Rural Operations to undertake a Traffic Impact Assessment in recognition of the proposed Cattle Feedlot located on 1804-2033 Tarwoona Rd Camp Creek (DA-189/2015).

The proposed development encompasses adjoining land “Goondarin” and “Paisley” owned by Rabremo Pty Ltd ATF Ostwald Rural Trust and trading as Ostwald Bros Rural Operations. Both properties are currently used for beef cattle grazing and dryland and irrigated cropping.

The construction of a beef cattle feedlot is proposed on the property “Goondarin” which would consist of production pens with a capacity of about 25,500 head of cattle. The development would also come to include cattle processing facilities, feed storage and process facilities, cattle drinking water storage, access and feed roads, administration and workshop facilities and waste utilisation and sedimentation basins.

As a result of the location of the development and the potential impact upon the local road network a review of the proposal and provision of comment was provided for both Goondiwindi Regional Council, Inverell Shire Council and the Department of Primary Industries.

1.1 SCOPE OF REPORT

The scope of this report is to provide a Traffic Impact Assessment on the local road network to be affected by DA-189/2015 – Proposed Cattle Feedlot, 1804-2033 Tarwoona Rd Camp Creek. This Traffic Impact Assessment (TIA) addresses the Secretary’s Environmental Assessment Requirements (SEAR’s) in relation to traffic and transport providing;

- Details of road transport routes and access to the site;
- Road traffic predictions for the development during construction and operation; and
- An assessment of impacts to the safety and function of the road network including details of any road upgrades required for the development.

The report provides information but is not limited to the assessment of impacts in relation to the safety and function of the road network. It presents the design considerations with respect to any road upgrades to be completed as part of the development to ensure road user safety. This report aims to expand upon and support the information provided in the “DA and EIS – Proposed Beef Cattle Feedlot, Camp Creek” which has been submitted to the relevant regulatory bodies for review.

Initial consultation has been undertaken with Inverell Shire Council and Goondiwindi Regional Council, whose comments have been considered for this report.

1.2 PLANNING CONTEXT

In preparing this document, the following guides and publications were used.

- Austroads Guide to Road Design
- Austroads Guide to Road Safety
- Austroads Guide to Traffic Management
- NSW Road Noise Policy
- Queensland Government, Transport Noise Management Code of Practice

2 PROPOSED DEVELOPMENT

The proposed development is the construction of a beef cattle feedlot on the “Goondarin” property which will consist of production pens with a capacity of approx. 25,500 head of cattle. The Development will also include cattle processing facilities, feed storage and process facilities, cattle drinking water storage, access and feed roads, administration and workshop facilities and waste utilisation and sedimentation basins.

The proposed development encompasses adjoining land “Goondarin” and “Paisley” owned by Rabremo Pty Ltd ATF Ostwald Rural Trust, trading as Ostwald Bros Rural Operations. The subject property consists of some 3,188 ha across a number of parcels and currently supports farm infrastructure in the form of cattle handling yards, shearing shed, farm residences, machinery/storage sheds and silos in the northern portion of the property. Both properties are currently used for beef cattle grazing and dryland and irrigated cropping.

Through initial consultation and preliminary design development, a number of upgrades to public infrastructure along the principal haulage route have been identified. This is to include;

- Widening and resurfacing of the Cunningham Weir Rd including Dumaresq River crossing and approaches
- Intersection works into the new development access from Tarwoona Rd
- Upgrade of existing intersection at Tarwoona Rd onto Cunningham Weir Rd
- Upgrade of existing intersection at Cunningham Weir Rd onto Texas-Yelarbon Rd

This report aims to present the assessment of the proposed development in accordance with Austroads Guide to Traffic Management addressing the SEAR’s with particular attention to the ongoing safety and function of the road network.

2.1 ROAD AUTHORITY CONSULTATION

In preparation of the traffic impact statement and associated road designs, LGES requested of NSW Roads & Maritime Services (RMS) to confirm the extent of liaison required. Discussions were held with Matt Adams (RMS Development Assessment Officer, Land Use Management Northern Region) on the 10th October 2016 with respect to the planning and assessment, and spatial extent of the effected road network. The Development was advised that the only intersection that is of concern for RMS is the intersection of Tarwoona Rd and the Bruxner Highway and only if the development were to increase traffic volumes through this intersection.

All consultation in relation to Tarwoona Rd and Cunningham Weir Rd up to the river crossing is controlled by Inverell Shire Council (ISC) and north of the Dumaresq River is controlled by Queensland Authorities, Department of Transport and Main Roads (QLD) and Goondiwindi Regional Council (GRC). The bridge and causeway are understood to be jointly owned by ISC and GRC as the bridge was constructed in 1986 by ISC and the causeway was constructed by the organisation now known as GRC.

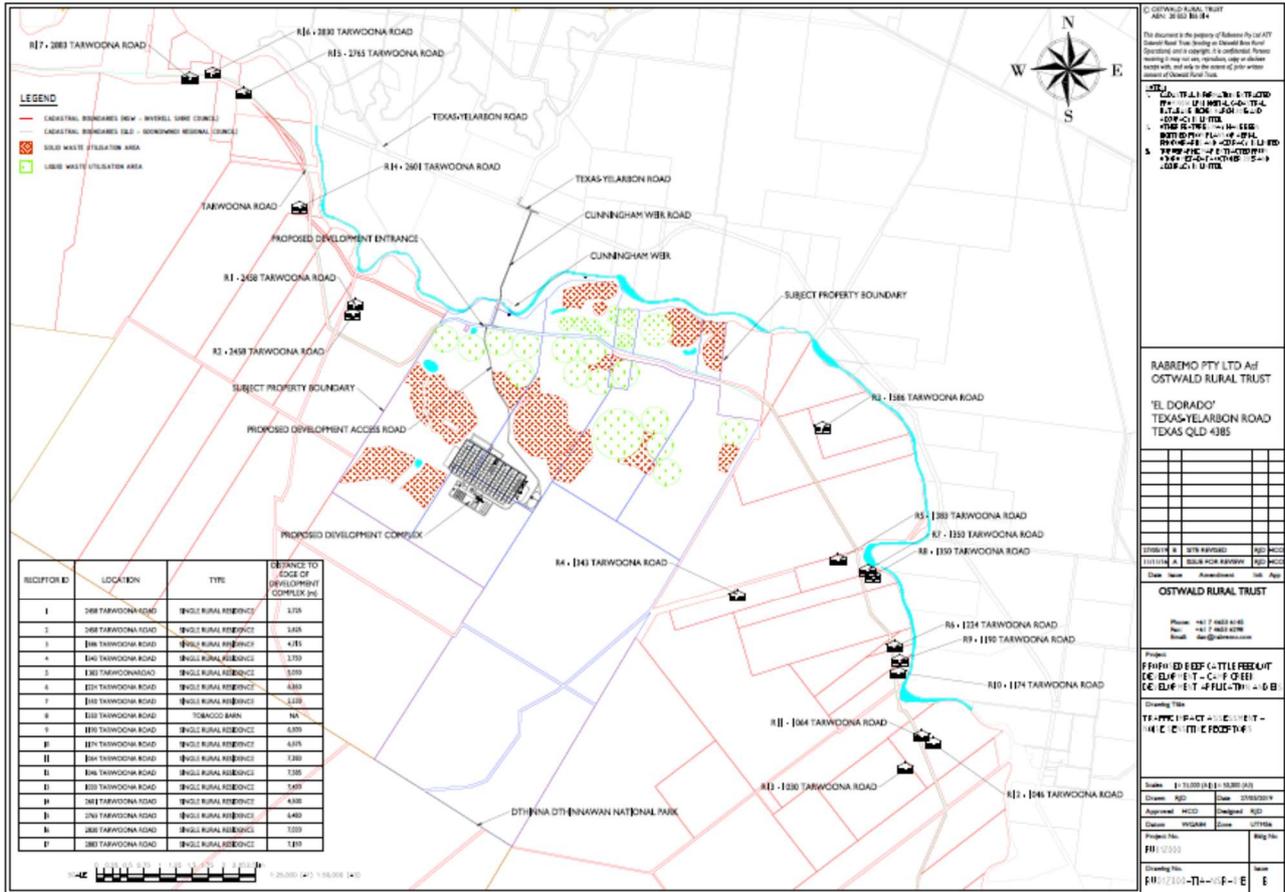
It has been recommended by RMS that traffic management and safety of the road network may be assisted by measures such as the introduction of a code of conduct for heavy vehicle operators. This will be included in a Site Traffic Management Plan via a specified Principal Haulage Route (PHR) to be taken by all incoming and outgoing light heavy vehicle traffic.

Inverell Shire Council and Goondiwindi Regional Council have been consulted throughout preparation of this report and the preliminary layouts with their comments integrated.

All alterations to the road network are designed for compliance with Austroads Guide to Road Design, requirements of all Road Authorities and the SEAR’s recommendations provided by the Department of Planning and Environment.

[Figure 1 provided on Page 9]

Figure 1: Inverell Shire Council LEP 2012 zoning map and local noise sensitive receptors.



3 EXISTING AREA CONDITIONS AND TRAFFIC ROUTE

The proposed development is located on Tarwoona Rd near the locality of Camp Creek approximately 1km south of the NSW/Queensland border which is defined by the Dumaresq River. An existing road network services property right along the Dumaresq River from both NSW and Queensland. The primary access to the proposed development is from Queensland to the north via Cunningham Weir Rd and can also be accessed from NSW via Bruxner Highway onto Tarwoona Rd. Cunningham Weir Rd connects Tarwoona Rd with the Texas-Yelarbon Rd and crosses the border (Dumaresq River) immediately downstream of the Cunningham Weir.

Tarwoona Rd is a sealed local road and comprises one lane in either direction with a speed limit of 100 kilometres per hour (km/h) in the vicinity of the proposed development site. Tarwoona Rd bisects the “Goondarin” and “Paisley” properties and generally travels north then north-west from its junction with the Bruxner Highway approximately following the direction of the Dumaresq River. Tarwoona Rd joins the Bruxner Highway some 23km south-east of the proposed development site. The proposed development site is currently accessed by the “Goondarin” property entry located on Tarwoona Rd.

The Bruxner Highway is an east-west highway in northern New South Wales, stretching some 420 km from the Pacific Highway, 7 km west of Ballina, to the Newell Highway at Boggabilla. West of the New England Highway, the Bruxner is under state control only as far as the Tenterfield Shire boundary where it becomes a regional road (administered by Local Government but funded by grants from the RMS).

The Texas-Yelarbon Rd is the primary route between the towns of Texas on the NSW/QLD border and Yelarbon in QLD and shall be the preferred route for heavy vehicles.

The proposed principal haulage route for all heavy vehicles associated with the operation of the development would be via Cunningham Weir Rd to Texas-Yelarbon Rd. This would apply for vehicles originating in both NSW and Queensland due to the shorter travel times and superior road quality. A small proportion of small vehicles being predominantly operational personnel would travel along Tarwoona Rd to its intersection with the Bruxner Highway.



Figure 2 Locality Plan (source: Google Maps)

3.1 INTERSECTION OF BRUXNER HIGHWAY / TARWOONA ROAD

The Development shall have a principal haulage route for heavy vehicles via Cunningham Weir Road to Texas-Yelarbon Road, thereby not increasing the volume of heavy traffic on Tarwoona Road to the Bruxner Highway. Whilst recognising this intent, it is acknowledged that a level of traffic, including heavy vehicles, would utilise this road to service agricultural properties in the area of northern NSW. A desktop investigation has been conducted to assess the existing intersection layout of the Bruxner Highway and Tarwoona Road. The existing intersection layout, sight distances and pavement widths have been assessed in accordance with Austroads Guide to Road Design Part 3.

This intersection of road is not being upgraded as part of this Development.



Figure 3: Dimensions measures at site visit.

The Bruxner Highway is a rural undivided road with a local speed limit of 100km/h. The intersection is a rural basic intersection with carriageway widening for through traffic shown in figure 4 below.



Figure 4: Intersection of Bruxner Hwy and Tarwoona Rd approaching from the east. Unsealed shoulder evident on the left of photo.

At the time of first revision of this assessment (15/11/2016), there had been no survey information made available at this intersection, therefore approach grades on Bruxner Hwy were estimated to calculate the required sight distances. An approach grade from the east of 3.5% was used and 1% from the west to confirm safe approach sight distance (ASD) and safe intersection site distance (SISD). A detailed survey has since been conducted at the intersection by RSA Contractors and is provided in Addendum A of this report. The potential conflict of westbound traffic with right turning traffic from Tarwoona Rd is considered in this section.

ASD for trucks should be provided at intersections to ensure that trucks approaching the intersection, at 85th percentile operating speed of trucks, are able to stop safely. Measured from truck driver eye height 2.4m to pavement level at the stop or holding line (0.0m). Approach site distances for trucks are numerically the same as the SSD values for trucks provided in the Guide to Road Design – Part 3: Geometric Design (Austroads, 2009a).

SISD is measured from driver eye height of 1.1m above the road to 1.25m above the road which represents drivers seeing the upper part of cars¹ to provide sufficient distance for a driver of a vehicle on the major road to observe a vehicle on a minor road approach moving into a collision situation and to decelerate to a stop before reaching the collision point at the intersecting road.

Equations 1 and 2, Austroads Part 4A are used calculate the ASD and SISD.

Via onsite assessment, adequate sight distance is available looking to and from the west for left turning traffic entering from Tarwoona Rd. For right turning traffic entering the westbound lane on the Bruxner Hwy, a safe distance of approx. 260m is required based on estimates of approach grades. An onsite indicator for this is Camp Creek Camp Creek Rd which is approximately 260m from Tarwoona Rd to the east.



Figure 5: Aerial photo representing 260m sight line from Tarwoona Rd to the east.

The aerial photo (figure 5) paired with the photo below (figure 6) indicate that adequate sight distance may be available. This would require a level of ground survey pick up of the road detail and road side

¹ Extract from Austroads Guide to Road Design - Part 4A: Unsignalised and Signalised Intersections

environment to confirm. If this is found to be inadequate and impeded by the embankment highlighted below, there is potential for this to be reduced to improve the available sight distance.



Figure 6: Embankment on the north east of the intersection. Photo taken from the westbound lane looking back towards Camp Creek Rd.

The existing signage on the Bruxner Highway approaching this location are staggered side road intersection (W2-8) on both directions. Possible improvements to increase driver awareness would be the installation of additional advanced side street signage warning road users of traffic entering from Tarwoona Rd. This would assist with increasing awareness of the possibility of entering traffic and reduce the risk of collision. This signage should be compliant with AS1742 and AS1906.

No traffic accidents have been recorded for this location via roadsafety.transport.nsw.gov.au at intersection.

3.2 DUMARESQ RIVER CROSSING

The Cunningham Weir Rd connects Tarwoona Rd with the Texas-Yelarbon Rd and crosses the Dumaresq River immediately downstream of the Cunningham Weir. The Dumaresq River is the border between the states of New South Wales and Queensland.

The existing waterway crossing is shown in figure 2 and is a current limitation for heavy vehicle access across the waterway. It comprises of a single lane 2 span concrete bridge 20m long and a concrete causeway 60m long at overflow river bed level, approximately 1m lower than the bridge deck. The 1m drop from the bridge to the causeway is very steep (approx. 1:12). The poor vertical alignment combined with the single lane bridge and poor sight distance to the north creates a significant safety risk.

Further, the height differential means that during higher river flows the road is impassable poses a heightened safety risk despite the bridge being above water level. Therefore, it is considered necessary to upgrade the bridge to a 2-lane structure and extend its length to include the full river width to provide a greater flood immunity. The road alignment on the northern approach would require widening which will improve sight distance. Concept designs of the upgrade are expanded upon in Section 5 and the drawings provided in Attachment A.



Figure 7: Dumaresq River crossing from the NSW side looking north.

4 TRANSPORTATION ANALYSIS

Increased traffic volume raises concerns around road maintenance, road safety, noise and dust. The construction phase of the proposed development requires the transport of equipment to site and general construction traffic. During operation, transport of cattle to and from the site, transport of feed commodities to the site and transport of staff, suppliers, representatives and service contractors will be necessary.

The main sources of traffic generation for the proposed development are:

- Mobilisation of plant and equipment such as bulldozers, scrapers, excavators, rollers, trucks to the proposed development site for construction activities. Construction plant and equipment would be mobilised from the RSA Contractors plant and vehicle workshop facility in Dalby, QLD.
 - Demobilisation of construction equipment from the site on completion of the construction phase.
 - Delivery of feeder cattle. Feeder cattle would be sourced from various locations around NSW, Southern Qld and properties owned and operated by Rabremo Pty Ltd ATF Ostwald Rural Trust.
 - Transport of cattle off-site for processing. The cattle would be transported to one or more beef processing facilities located in Northern NSW (Bindaree Beef, Inverell) or Southern Queensland (John Dee, Warwick and Oakey Exports, Oakey).
 - Delivery of feed commodities such as grain, roughage (hay, straw), silage, supplements to the site. Where practical, feed commodities shall be sourced from local producers in Northern NSW and Southern Queensland including some production onsite and adjoining properties owned by Rabremo Pty Ltd ATF Ostwald Rural Trust.
 - Transport of solid wastes from the site. Solid waste not utilised on-site shall be transported to adjoining properties associated with Ostwald Rural Operations or to properties owned by Rabremo Pty Ltd ATF Ostwald Rural Trust on the northern side of the Dumaresq River in Queensland.
 - Staff vehicle movements to and from the site during operation.
1. Miscellaneous vehicle movements such as Suppliers, Representatives and Service Contractors.

The principal haulage route for the development would be via the route from Texas-Yelarbon Rd onto Cunningham Weir Rd onto Tarwoona Rd. The existing Dumaresq River crossing has been identified as necessary for upgrade to a two-lane sealed standard. Direct access into the proposed development site during construction and operation would be from Tarwoona Rd primarily from the east however potentially catering for a small volume from the west. Although the low likelihood of development traffic entering from the west the intersection has been designed to cater for this movement to maximise road safety for users.

4.1 EXISTING TRAFFIC

Inverell Shire Council have historical traffic data on the surrounding local roads. The data was collected by ISC over two-week periods preceding the dates indicated below and was provided for the following locations.

Tarwoona Rd

- Segment 010, approx. 1km north of the Bruxner Hwy intersection, 23km SE of the site, 15/9/06
- Segment 200, just east of Cunningham Weir Rd intersection, 27/11/15

- Segment 210, just west of Cunningham Weir Rd intersection, 24/3/00
- Segment 320, at the end of the sealed road, 27/11/15

Cunningham Weir Rd

- Segment 010, just north of the Tarwoona Rd intersection, 31/3/11



Figure 8: Traffic count locations provided by Inverell Shire Council.

Table 1: Available traffic count data. (ISC)

AADT	Tarwoona Rd	Tarwoona Rd	Tarwoona Rd	Tarwoona Rd	Cunningham Weir Rd
	Segment 010	Segment 200	Segment 210 *	Segment 320	Segment 010 *
	15/09/2006	27/11/2015	24/03/2000	27/11/2015	31/03/2011
Average daily (vpd)	17.0	51.3	43.9	17.2	63.9
Peak hour	unknown	unknown	unknown	unknown	unknown
Peak hour traffic (vph)³	1.4	4.3	3.7	1.4	5.3
Percent Heavy Vehicle	34.5%	32.1%	13.1%	30.4%	33.9%
No. Heavy Vehicle	0.1	0.2	0.1	0.1	0.2
85th % Speed	91.4	90.4	88.9	97.9	56.2
Average Speed	78.0	70.4	72.1	81.2	45.2

AADT data available from QLD Department of Main Roads for Texas-Yelarbon Rd at two counting stations was also used in the analysis of existing traffic. The two stations being 6 km south of the intersection with the Cunningham Highway (approx. 20km west of Cunningham Weir Rd) and 5 km west of the Texas-Inglewood Rd (approx. 20km east of Cunningham Weir Rd).

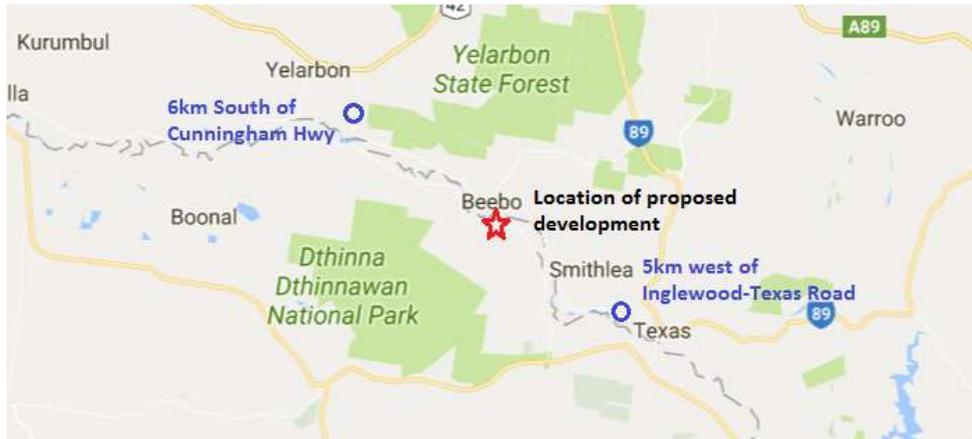


Figure 9: Traffic count data locations available from QLD Dept. of Transport and Main Roads

The AADT for the Texas-Yelarbon Rd at both counting stations is demonstrated in table 2 below.

Table 2: Available traffic count data. (QLD Roads)

	AADT Texas-Yelarbon Road	
	6km South of Cunningham Hwy	5km west of Inglewood-Texas Road
Average daily (vpd)	131	233
Peak hour	unknown	unknown
Peak hour traffic (vph) ³	11	19

The existing Whyalla feedlot is located between these two counting stations with heavy vehicles predominantly delivering feed commodities and cattle from the Cunningham Highway. In comparison, Whyalla has a licensed capacity up to 75000 Standard Cattle Units (SCU), with a current pen capacity 50000 SCU. The proposed feedlot development “Goondarin” has a licensed pen capacity of 25000 SCU. A direct comparison on licensed head vs feed commodity transport has not been acknowledged during the traffic generation calculations as both operations own substantial property in close vicinity which supply various commodities.

4.2 CONSTRUCTION TRAFFIC GENERATION

All traffic associated with the construction of the proposed development would utilise the principal haulage route via Cunningham Weir Rd and Texas Yelarbon Rd from Queensland as this is the most efficient route to the towns of Boggabilla to the west and Texas to the east. Other routes do exist to both of these towns via travel along the southern side of the Dumaresq River however this can be cut in wet weather. All-weather access is to be upgraded along the principal haulage route, in particular the Dumaresq Crossing. The civil construction is to be undertaken by a suitably qualified contractor experienced in the construction of beef cattle feedlots of the scale of the proposed development.

Minimal construction traffic would originate from NSW. It is envisaged that materials and equipment originating from nearby major centres would follow the following routes;

- Goondiwindi via Cunningham Hwy – Texas Yelarbon Rd
- Toowoomba from the north via PHR
- Moree via Newell Hwy – Cunningham Hwy -Texas Yelarbon Rd
- Inverell via Texas and PHR

For any traffic originating from Moree and Inverell, the travel time saved via Tarwoona Rd is 8 minutes and 4 minutes respectively against using the PHR. Provision of this instruction will be included in the Code of Conduct for Heavy Vehicle Drivers which will form part of all transport related contracts with the construction or ongoing operation of the feedlot.

Estimated traffic movements associated with the proposed development are described and assessed in Section 4.2.2, however Table 4 summarises the number of movements expected during construction.

Table 3: Construction Phase - Expected traffic movements

Activity	Vehicle Type	No of Units		Movements	
				per day	per week
Earthworks / Road Construction / Drainage / Infrastructure	Bulldozer (CAT D6/D8)	1	2	-	-
	Open bowl scraper (CAT 637)	6	12	-	-
	Elevating scraper (CAT 623)	2	4	-	-
	Excavator (CAT 325)	1	2	-	-
	Graders (CAT 140M)	2	4	-	-
	Water cart (Moxy 740 40,000L)	2	4	-	-
	Water truck (13,000L)	1	2	-	-
	Roller – compactor 825H	2	4	-	-
	Roller – smooth drum C56	1	2	-	-
	Roller – pneumatic multi-tyred	1	2	-	-
	Backhoe (CAT 580)	1	2	-	-
	Bobcat trencher (CAT T9B)	1	2	-	-
	Fuel/service truck - medium rigid	1	2	-	-
	Fuel supply – B-Double	1	-	-	1
	Concrete batch plant	1	2	-	-
	Bunk forming machine	1	2	-	-
	Concrete agitator trucks	4	8	-	-
	Service vehicles	2	4	-	-
	Site Office (Donga)	1	4	-	-
	Material supply (B-Double) (Cement)	3	-	1	6*
Material supply (semi-trailer) (Steel)	-	-	1	-	
Fuel Storage (Transtank TN68)	1	2	-	-	
Employees	Light Vehicles (Landcruiser/Hilux)	20	-	40	-

*For duration of concrete works period being a period of some 10 weeks.

It is anticipated that construction of the proposed development shall involve a construction workforce of some 30 personnel. The construction workforce shall be accommodated in existing dwellings on the subject property and/or adjoining properties owned by Rabremo Pty Ltd ATF Ostwald Rural Trust. These properties include “El Dorado” and “Carinya” located some 2 km away on Cunningham Weir Rd in Queensland. Any construction personnel not able to be accommodated for onsite will be housed at Texas for the duration of works and would access the site via the principal haulage route.

4.3 OPERATIONAL TRAFFIC GENERATION

Due to seasonal variation of the agricultural industry, interpretation of the existing count data can be sensitive when estimating growth and consistent traffic flow patterns. No population growth factor has been applied to the data collected between 2000 (segment 210), 2011 (segment 010) and 2015 (segment 2015).

LGES have conducted a review of the mass balance calculations provided by Rabremo Pty Ltd for the proposed feedlot to estimate traffic volumes. The quantity of cattle and feed commodities expected to maintain ongoing operation of the feedlot facility. This extended to a review of total estimated traffic movement throughout both the construction and operation of the proposed development.

The estimated vehicles and equipment required during operation of the proposed development are shown in Table 4. The make and model of vehicles and equipment is based on those typically used at other similar sized beef cattle feedlots and could be subject to change based on availability.

Table 4: Typical vehicles and equipment

Activity	Vehicles / Equipment
Livestock transport	Heavy vehicle - B-Double
Incoming feed commodities	Semi-trailer/B-Double
Solid waste processing/removal off-site	Front-end loader/vibrating screen/truck & dog 24t
Pen Cleaning	Bobcat / 4wd tractor / front-end loader /excavator
Feed Processing/Ration Delivery	Front-end loader/Body truck 12t
Dust Suppression	Medium vehicle – Rigid (16t)
Personnel	Light vehicle

When fully developed, the proposed development would provide employment for approximately 45 full-time equivalent (FTE) personnel. The proposed development would employ full time and part time staff. This includes administrative, livestock handling, feed storage, preparation and delivery, machinery maintenance, waste management and general farm staff.

Table 5: Estimated cattle turned off.

Market Type	Units	Domestic	Mid Fed	Long Fed	Total
Days on feed	Days	60	220-240	300+	
Entry weight	kg	335	380	415	
Exit weight	kg	447	666	715	
Dressing percent	%	55	57	57	
Days on fed	Days	70	210	300	
Mortality rate (No in/No out)	%	1	1	1	
Percent in lot	%	25	50	25	
Incoming cattle	No per year	41006	19349	6727	67082
Outgoing cattle	No per year	40595	19155	6659	66409
Outgoing live weight of cattle	tonne / year	18146	12757	4761	35664

Table 6: Estimated traffic movements.

Activity	Vehicle Type	Traffic Movements		
		Per year	Per week	ADT
Incoming Cattle	B Double	1554	30	5
Outgoing Cattle	B-Double	2344	45	8
Incoming feed commodities	Semi-trailer / B-Double	5160	99	18
Outgoing solid waste	Body truck 12t	1334	26	5
Employees	Light Vehicles	16640	320	58
			Total	95

Table 7: Typical ration composition.

Parameter	Type	Units	Market Type		
			Domestic	Mid Fed	Long Fed
Grain	Summer	%	25	25	20
	Winter	%	50	50	37
Protein	Cottonseed	%	10	10	0
	Sunflower	%	0	0	8
Roughage	Straw / Hay	%	3.5	3.5	5
	Silage	%	5	5	15
Liquids	Molasses	%	1.5	1.5	10
Supplements	Finisher	%	5	5	5

Mass balance information provided and relevant results of this review were used to confirm the increase in traffic volume as represented in Table 8 below.

A summary of the traffic movements associated with the operation of the proposed development is shown in Table 7. The data is based on estimated throughput of cattle and quantity of feed commodities required on an annual basis as shown in Table 6 and 7 respectively. It is expected that cattle will be delivered to site in B-Doubles and feed commodities in either semi-trailers or B-Double vehicles as per figure 10. RMS livestock calculators were used to generate the volume of livestock traffic for the development.

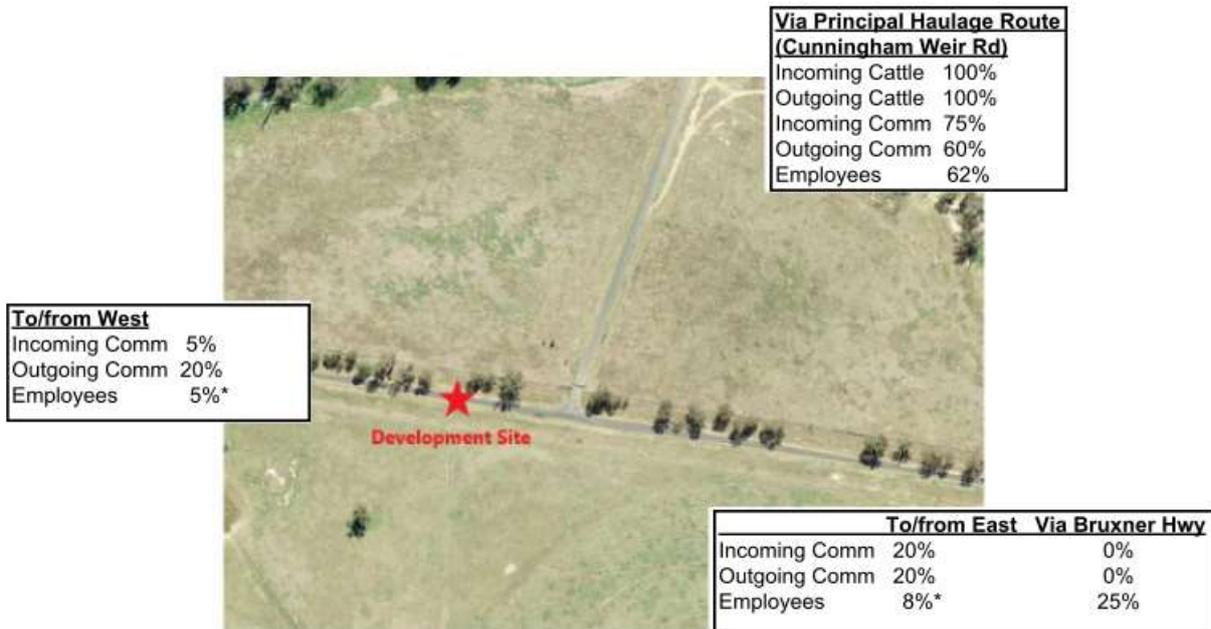


Figure 10: Predicted directional split of traffic from development entrance.

* Employees travelling from local properties within 14km of the development entrance

Table 8: Proposed development traffic generation data.

AAADT	Tarwoona Rd	Tarwoona Rd	Tarwoona Rd (Proposed Feedlot site entrance)	Tarwoona Rd	Tarwoona Rd	Cunningham Weir Rd	Bruxner Hwy Int.
	Segment 010	Segment 200 ***	Segment 210 *	Segment 210 **	Segment 320	Segment 010 *	No Exist Traffic Data
Collection Date	15/09/2006	27/11/2015	24/03/2000	24/03/2000	27/11/2015	31/03/2011	-
Average daily (vpd)	17.00	51.3	43.9	43.9	17.2	63.9	-
Peak hour	unknown	unknown	unknown	unknown	unknown	unknown	-
Avg peak hour traffic (vph) ³	1.4	4.3	3.7	3.7	1.4	5.3	-
Percent Heavy Vehicle	34.5%	32.1%	13.1%	13.1%	30.4%	33.9%	-
No. Heavy Vehicle	5.9	16.5	5.8	5.8	5.2	21.7	-
85th % Speed	91.4	90.4	88.9	88.9	97.9	56.2	-
Average Speed	78.0	70.4	72.1	72.1	81.2	45.2	-
Increase in ADT	4.8	23.7	66.0	4.7	1.8	66.0	4.8
Percent Heavy Vehicle	0%	19.1%	45.4%	38.7%	100.0%	45.4%	0%
No. Heavy Vehicle	0.0	4.5	30.0	1.8	1.8	30.0	0.0
Peak hour traffic (vph) ⁴	2.4	10.0	20.5	1.6	0.2	20.5	2.4
Expected Growth	0%	0%	0%	0%	0%	0%	0%
Incr. Avg Peak Hour Traffic (vph) ³	2.4	14.3	24.2	5.3	1.6	25.9	2.4
Generated Total ADT	21.8	75.0	109.9	48.7	19.1	129.9	4.8
Generated Percent Heavy Vehicle	26.9%	28.0%	32.5%	15.6%	37.1%	39.7%	0.0%
Percent Heavy Vehicle difference over previous traffic count data	-7.6%	-4.1%	19.4%	2.5%	6.7%	5.8%	0.0%
Notes:							
* Principal Haulage Route							
** Traffic travelling to/from the west along Tarwoona Rd , past Segment 210 Tarwoona Rd							
*** Traffic travelling to/from the east to/from adjacent properties Lochiel & Tarwoona (within 11km of development site entrance)							
1. Figures obtained from QLD Dept of Transport and Main Roads and extrapolated to current year							
2. Values shown are vpd.							
3. Assumed value over 12hr period as traffic information supplied does not contain breakdown over time.							
4. Peak hour traffic is half the daily light vehicle traffic for employees coming and going and heavy vehicles divided by 12 hour period.							

5 IMPROVEMENT ANALYSIS

5.1 EFFECT OF THE DEVELOPMENT ON INTERSECTIONS

The intersections that would be affected by the construction and ongoing operation of the development are:

- Entrance to proposed development from Tarwoona Rd (new intersection)
- Tarwoona Rd to Cunningham Weir Rd (upgraded)
- Cunningham Weir Rd to Texas-Yelarbon Rd (upgraded)
- Tarwoona Rd to Bruxner Highway (existing, not upgraded)

Each intersection was individually assessed using the guidance of Section 3.3 of the Guide to Traffic Management Part 6; Intersection Performance.

The proposed development entrance would be sited some 50m west of the Cunningham Weir Rd/Tarwoona Rd intersection and some 800m west of the existing “Goondarin” property entrance. The proposed access offers safe sight distance due to the relatively flat topography and large horizontal curves in the road which provides safe access in and out of the development site.

An assessment of the local road network utilising the direction provided in Austroads Guide to Traffic Management Pt12 (2009): Traffic Impacts of Development, was undertaken throughout the design of the development entrance. The location of the entrance into the new development will comprise a staggered T intersection with a right-left configuration intersecting Tarwoona Rd.

It is estimated from the data gathered in the area from 2006 to 2015 and the generated increase during construction and operational periods that the traffic volume of Tarwoona Rd will still remain less than 150

vehicles per day. In the Guide to Road Design Part 3: Geometric Design, it states that for this traffic volume, single carriageways may be used with a road width of at least 3.7m so as not to result in increased shoulder wear. Therefore, the geometric design of the intersection will be the governing factor for maintaining road user safety. All intersections are being upgraded to accommodate the requirement of a rural basic left turn and basic right turn treatments geometrically designed to safely accommodate a B-Double turn path.

5.2 SAFETY CONSIDERATIONS

Intersection safety has been assessed throughout the development of the proposed layout design in accordance with Austroads Guides to Road Design and Traffic Management. The development has moderate influence on two existing intersections at each end of Cunningham Weir Rd and the new intersection into the development site from Tarwoona Rd.

The terrain approaching both intersections to be upgraded is relatively flat with safe intersection site distance in all directions. There is no significant change to the current layout of either intersection with respect to horizontal or vertical geometry. The concept intersection layouts allow for a rural basic right and basic left turn modelled for a B-Double turn path. Extension of the road seal and shoulder creating a widened through lane at both intersections is incorporated to minimise any impact to the through traffic flow or safety.



Figure 11: Looking west along Tarwoona Rd from Cunningham Weir Rd.



Figure 12: Looking east from Tarwoona Rd.

5.3 ROAD NETWORK IMPROVEMENTS

Direction has been provided by Goondiwindi Regional Council and Inverell Shire Council with regards to seal and formation widths required within the respective local government areas for road improvement works associated with the proposed development.

In addition to the upgrade of the intersections described in the section below, Cunningham Weir Rd will be upgraded for all weather access including the Dumaresq River crossing which will be upgraded along its length to cater for the type and volume of traffic expected into the proposed development. A concept design has been provided to both ISC and GRC (issued 1st November, 2011) for review as it is on the border of the two Councils however the bridge crossing Dumaresq River is formally controlled by ISC for ongoing development purposes.

The proposed development has been assessed using section 3.3 of the Guide to Traffic Management Part 3; ‘Factors which Affect Capacity, Level of Service and Degree of Saturation’.

RMS have been consulted for comment on the development and proposed works (refer Section 2.1). Early consultation indicated RMS are only concerned with the opportunity to review with regards to network safety with minimal input to the review of designs. Local Government Authorities would be relied upon for critical review at concept and detail design stages of the project.

Inverell Shire Council provided the minimum design standards for all works within their Shire.

- Development Entrance to Tarwoona Rd: 7m Seal, 9.4m Formation
- Tarwoona Rd to Dumaresq River on Cunningham Weir Rd: 7m Seal, 9.4m Formation.

Sufficient road width already exists on Cunningham Weir Rd to meet ISC requirements, with minor realignment of the southern bridge approach to be reconstructed.

Goondiwindi Regional Council provided the minimum design standards for all works within their Shire.

- Cunningham Weir Rd to Texas-Yelarbon Rd: 8m Seal, 9m Formation max. (alternatively adopt the existing lane and formation widths of Texas-Yelarbon Rd)

The existing lane width was adopted beyond the extents of the rural basic right and rural basic left turn geometrical requirements as set out in Austroads Guide to Road Design Part 4A; Unsignalised and Signalised Intersections.

Each intersection has been surveyed and assessed geometrically for the design traffic and the highlighted scope of works which is presented in the detail plans provided in Attachment A. The terrain at all intersection locations is level with adequate sight distance, >100m in all directions from the minor road approaches.

5.4 EFFECT OF THE DEVELOPMENT ON ROAD PAVEMENTS

A dilapidation assessment of the existing pavement at each of the intersections before mentioned in this report will be undertaken including the approaches likely to see an increase in traffic volume before the commencement of any development associated works.

This assessment will be conducted in accordance with “RTA (RMS) NSW Rocond 90: Road Condition Manual” and provide a baseline assessment for any future pavement assessments.

5.5 EFFECT OF FLOODING ON DEVELOPMENT OPERATION

The existing bridge deck height is to remain at the same level, however extended to join both approaches as described in Section 4.1.1. This will improve all-weather access to the property from the north under flood conditions enabling access across the Dumaresq River under a larger ARI event. It has been identified that sufficient feed commodities (silage, grain, roughages) will need to be stored onsite if the site were to be temporarily cut off by flooding of the Dumaresq River.

5.6 PUBLIC TRANSPORT, PEDESTRIAN & CYCLISTS

The proposed development will have no adverse impact on public transport infrastructure as there is no existing infrastructure for public transport in this rural location. Consequently, safety and traffic interaction with public transport infrastructure, pedestrian and cyclists have not been considered in this assessment.

6 TRAFFIC NOISE & DUST GENERATION

6.1 TRAFFIC NOISE AND VIBRATION

Recognition and assessment of noise and vibration is presented in Section 13.12 of the “DA and EIS - Proposed Beef Cattle Feedlot, Camp Creek” which discusses the noise sources for the construction and ongoing operation of the proposed feedlot. It references the statutory framework for managing noise and vibration pollution in NSW, The Protection of the Environment Operations Act, 1997 (POEO Act), as well as mitigation strategies to address the potential impacts.

Noise and vibration sources, limits and mitigation approaches to be implemented for the construction and ongoing phase are set out in the EIS. This Traffic Impact Assessment aims to address this as a direct result of the increase in traffic volume due to the proposed development in consideration with the NSW Road Noise Policy. The criteria applicable are summarised in Table 9.

Table 9: NSW Environmental Criteria for Road Traffic Noise.

Type of Development	Day L _{Aeq,1hr} dB(A)	Night L _{Aeq,1hr} dB(A)	Where criteria are already exceeded
Land use developments with potential to create additional traffic on local roads	55	50	Where feasible and reasonable, existing noise levels should be mitigated to meet the noise criteria. Examples of applicable strategies include appropriate location of private access roads; regulating time of use; using clustering; using ‘quiet’ vehicles; and using barriers and acoustic treatments. In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB.

Notes: Day: 7.00 am – 10.00 pm / Night: 10.00 pm – 7.00 am.

Due to the relatively low increase in traffic volume and the rural location of the development, an increase in noise from the existing conditions is expected to be minimal given the current percentage of heavy vehicle traffic utilising Tarwoona Rd and Cunningham Weir Rd.

Table 10: Recommended L_{Aeq} noise levels from industrial noise sources (EPA, 2000)

Type of Receptor	Indicative Noise Amenity Area	Time of Day	Recommended L _{Aeq} Noise Level dB(A)	
			Acceptable (ANL)	Recommended Maximum
Residence	Rural	Day	50	55
		Evening	45	50
		Night	40	45

Notes: Day: 7.00 am – 6.00 pm / Evening: 6.00 pm – 10.00 pm / Night: 10.00 pm – 7.00 am.

As shown in Table 11 the nearest residential noise sensitive receptor is approximately 2,860m to the north-west of the proposed development. The property on which R1 and R2 are sited is owned by a Rabremo Pty Ltd ATF Rural Trust related party with a long-term lease to the proponent. DUAP (1997) states that distance is one of the most effective mitigation measures against noise and vibration.

Table 11: Noise sensitive receptors

Receptor	Location	Distance to edge of Lot 23 on DP750070 M	Indicative Noise Amenity Area ¹	Nearest Site Boundary
R1	2458 Tarwoona Road, Camp Creek 4385	2,960	Rural Residence	NW
R2	2458 Tarwoona Road, Camp Creek 4385	2,860	Rural Residence	NW
R3	1586 Tarwoona Road, Camp Creek 4385	4,730	Rural Residence	NE
R4	1343 Tarwoona Road, Camp Creek 4385	3,485	Rural Residence	E
R5	1383 Tarwoona Road, Camp Creek 4385	4,855	Rural Residence	E
R14	2601 Tarwoona Road, Camp Creek 4385	4,750	Rural Residence	NW

Notes: 1. According to the NSW Industrial Noise Policy (EPA, 2000).

As there will be no variation in vehicle types and relatively low increase in traffic volumes using the existing road corridor compared to the volumes currently utilising the Texas-Yelarbon Rd, Cunningham Weir Rd and Tarwoona Rd, any local receptors on the route will not experience a significant increase in total traffic noise above that set out in the NSW Road Noise Policy.

There are also no rural residences along the principal haulage route south of Texas-Yelarbon Rd to the development site entrance on Tarwoona Rd.

A road noise assessment has since been undertaken by Matrix Acoustics in 2020 and further information can be found in the “Proposed Beef Cattle Feedlot Tarwoona Road - Road Traffic Noise Assessment” (Matrix Acoustics, 2020).

7 CARPARKING REQUIREMENTS

All car parking and storage will be managed onsite within the proposed development complex with appropriate site traffic management plan to be implemented. This will have no effect on the performance or safety of the entrance intersection with sufficient approach distances enabling safe sight distance.

8 CONCLUSIONS

All intersections have been designed in accordance with requirements set out in Austroads Guide to Road Design. All intersection works were governed by vehicle turn path and geometric guidelines set out in Austroads as all sight distances were deemed to be safe and acceptable assisted greatly by the rural flat terrain.

The minor increase in traffic volume, both light and heavy vehicles generated by the proposed development is not expected to have adverse impacts on the surrounding local road network with respect to capacity, level of services and road user safety.

Pavement performance and design life is to be discussed during the detail design phase when geotechnical investigations are to be undertaken.

ADDENDUM A

1.0 Assessment of ASD & SISD at Tarwoona Rd/BruXner Highway intersection

A survey was carried out at the Tarwoona Rd/BruXner Highway intersection on 11/04/2020 by RSA Contractors Pty Ltd (Ref Fig A.1). Upon review of this survey by Local Government Engineering Services, with reference to Austroads guidelines, the following findings have been determined:

1. The ASD requirement on Tarwoona Rd approaching the BruXner Highway has been calculated at 176m. This distance is exceeded and therefore the ASD is acceptable.
2. As previously stated herein in Section 3.1, “adequate sight distance is available looking to and from the west for left turning traffic entering from Tarwoona Rd”. Analysis of the survey based on actual grades has confirmed that there is in fact adequate sight distance looking to and from the west for left turning traffic entering the BruXner Highway from Tarwoona Rd.
3. Based on Austroads Guide to Road Design Part 4A, Table 3.2, a minimum 248m is required for SISD on a 100km/h road. Investigation of the current sightlines from Tarwoona Rd for right turning traffic entering the westbound lane on the BruXner Highway, a Safe Intersection Sight Distance (SISD) of 190m has been determined. This design therefore *does not currently meet* the above stated Austroads guidelines in its current condition, irrespective of the impact of future traffic generation.

This SISD is affected by two factors – the presence of the embankment on the north side of the highway, and the BruXner Highway eastbound rises from the Tarwoona Rd intersection at a grade of 1.1% to a crest approximately 65m east of the intersection.

2.0 Impact of generated future traffic on the Tarwoona Rd/BruXner Highway intersection

With reference to the rationalised traffic data generated for Table 8 of the TIS, the increase in traffic movements at the intersection is calculated at only 5 light vehicles daily. It is predicted that these traffic movements will mostly turn left from Tarwoona Rd eastbound towards Texas.

3.0 Heavy Vehicle traffic on Tarwoona Rd due to the proposed feedlot

With reference to the rationalised traffic data generated for Table 8 of the TIS, the pre-existing percentage of heavy vehicles at Segment 010 and Segment 200 Tarwoona Rd, was 34.5% and 32.1% respectively. The generated traffic data predicts zero additional heavy vehicles at Segment 10, with an increase of 4.8 light vehicles. It also predicts an increase of only 4.5 heavy vehicles per day at Segment 200, with an additional 19.2 light vehicles. Although the ADT increases, there is an effective *decrease* in percentage heavy vehicles of 7.6% at Segment 010 and 4.1% at Segment 200.

The developers will implement a Vehicle Movement Plan for all heavy vehicles accessing the feedlot to ensure that all heavy vehicles use the principal haulage route and enter the feedlot from the north via Cunnigham Weir Rd and the segment of Tarwoona Rd between Cunnigham Weir Rd and the development access. There will therefore be no increase in heavy vehicles using Tarwoona Rd apart from the proposed feedlot entrance (Segment 210 Tarwoona Rd).

Considering the above, it is contended that there is no requirement on the part of the developers to assess the existing sealed carriageway on Tarwoona Rd.

It is also noted that the percentage heavy vehicles *pre-development* is already in excess of 15% (refer traffic count data in Table 1, Clause 4.1). This would also currently require it to be upgraded to a 7.0m seal width in accordance with Austroads guidelines.

