Oaklands Ethanol Production Facility
Traffic Impact Assessment Report

Final Report

for Agri Energy Limited

June 2007

0056132

www.erm.com

AGRI ENERGY
LIMITED

ERM

Delivering sustainable solutions in a more competitive world

Prepared by:	*Tim Hosking*
Position:	Traffic Consultant
Signed:	
Date:	*June, 2007*
Approved by:	*Murray Curtis*
Position:	Partner
Signed:	
Date:	*June, 2007*

Environmental Resources Management Australia Pty Ltd Quality System

www.erm.com

FINAL REPORT

Agri Energy Limited

Oaklands Ethanol Production Facility

Traffic Impact Assessment

June 2007

Environmental Resources Management Australia
Building C, 33 Saunders Street
Pyrmont, NSW 2009
Telephone +61 2 8584 8888
Facsimile +61 2 8584 8800
www.erm.com

CONTENTS

CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 INTRODUCTION

1.1 PURPOSE OF THE REPORT

Agri Energy Limited (AEL) commissioned Environmental Resources Management Australia (ERM) to prepare a Traffic Impact Assessment for the construction and operation of an ethanol production facility at Lot 2 of Deposited Plan (DP) 861032, Coreen Street, Oaklands, New South Wales (NSW).

The proposed ethanol production facility will process a range of cereal grains (such as corn, wheat, barley and sorghum), grown in nearby rural areas. Grains and ethanol will be transported by heavy vehicles, with the option potentially available to utilise the site rail access in later operations.

This report has been prepared in accordance with the NSW Roads & Traffic Authority (RTA) (2002) *Guide to Traffic Generating Developments* to accompany an application under Part 3A of the *Environmental Planning and Assessment Act 1979 (*EP&A Act).

1.2 SITE DESCRIPTION

The site is located off Coreen Street, on the outskirts of Oaklands, NSW and is approximately 130 hectares in size. It is bounded by Daysdale Street, Coreen Street, Urana Oaklands Road (SR 2) and the Ray Brooks & Co. bulk grain storage and terminal to the west and by agricultural land to the north, east and south. Coreen Street and Daysdale Street are the major north south roads through Oaklands. Coreen Street extends north from Milthorpe Street (MR 323) in Oaklands to the 'Oaklands-The Rock' Railway Line, adjacent to the site, where it becomes the Urana Oaklands Road (SR 2). Urana Oaklands Road is the major road to Urana to the north. The external road network is illustrated in *Figure 1.1*. The site and surrounding area is relatively flat.

Oaklands is a town in the Murray region of NSW, with a population of approximately 350 residents. The main agricultural contributors to the local economy are wheat and rice with other significant contributors being dairy, sheep, beef, barley, vegetables, pastures (for hay), oats and potatoes.

Within a 150 kilometre (km) catchment, Oaklands produced an average of 2.6 million tonnes of grain annually between 1998 and 2006 (Neil Clark and Associates, 2006). The estimated feed grain demand from the region between 1998 and 2004 was 1.5 million tonnes, leaving an average grain surplus of over one million tonnes. Yearly surpluses would be available for use in the ethanol production process which at full capacity, requires approximately 600,000 tonnes of grain per annum.

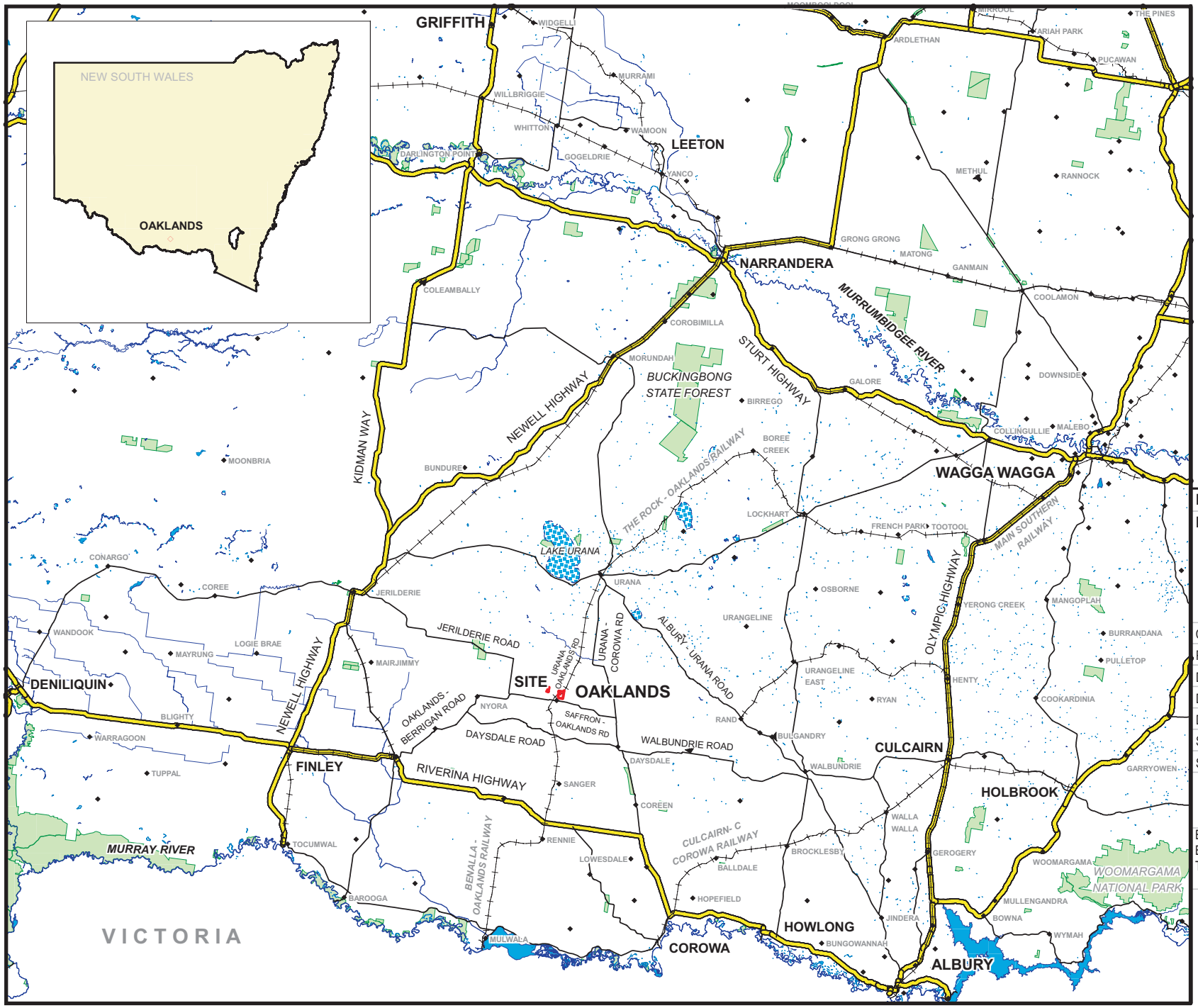


Figure 1.1

External Traffic Network

Client:	Agri Energy Limited	
Project:	Oaklands Ethanol Production Facility	
Drawing No:	0056132_OA_TT_03	
Date:	16.02.2007	Drawing Size: A4
Drawn By:	ML	Reviewed By: -
Source:	-	
Scale:	Refer to Scale Bar	

N

0 10 20 30km

Environmental Resources Management Australia Pty Ltd
Building C, 33 Saunders St, Pyrmont, NSW 2009
Telephone +61 2 8584 8888

ERM

1.3 CONSULTATION

The following consultation was undertaken to identify potential traffic issues relating to this assessment. Issues identified during this consultation have been incorporated into the scope of this assessment.

Director-General's Requirements

The Director – General's Requirements were issued by NSW Department of Planning (DoP) on 5 October 2006. In relation to traffic, they require:

- details of the traffic volumes likely to be generated during construction and operation, and an assessment of the predicted impacts of this traffic on the safety and capacity of the surrounding road network; and
- details of site access, internal roadways, infrastructure works and parking must also be provided.

NSW RTA Requirements

In a letter dated 13 September 2006, the RTA indicated that a Traffic Impact Study is required for the assessment of the Oaklands ethanol production plant proposal. It indicated that the following points should be included:

- types and volumes of vehicles to be used;
- the direction of travel of all vehicles entering and exiting the site;
- Annual Average Daily Traffic (AADT) on key roads;
- peak period traffic volumes and congestion levels at key adjacent intersections;
- safety and efficiency of the internal road layout;
- impact of generated traffic on key adjacent intersections, the environment and other major traffic generating developments in close proximity;
- accident history of the road network in the area;
- vehicular access location and width;
- sight distance at access location;
- safety and efficiency of access to site from adjacent road network; and
- assessment of traffic noise and dust effects.

Impacts to the environment, including traffic noise and dust effects, are considered in other reports relating to the proposal.

Urana Shire Council

In a letter dated 25 September 2006, Urana Shire Council indicated the following concerns in relation to traffic:

- **Road infrastructure:**
  - assessment of road capability leading to and from the site, particularly during wet conditions (ie winter); and
  - address proposed road contributions;
- **Traffic:**
  - assessment of impact to the surrounding community including road users, pedestrians, property owners and residents. Council is concerned for amenity of Milthorpe Street.

In further discussions with Council's engineering staff (L. Ashford), it was indicated:

- the greatest potential impact to road pavement occurs during winter when saturated pavements are more prone to impacts of loads;
- the Council has agreed in-principle with a 4.6 metre (m) vehicle height limit, although any route requires prior investigation to ensure Country Energy assets are maintained;
- any use of greater load limits (>40 tonnes), may require assessment of bridge structures for structural suitability;
- there has been a noticeable increase in traffic on MR 131 (Urana Corowa Road) since improvements were made to the Corowa crossing (Federation Bridge, constructed in 2005) over the Murray River. This road is being used as a north-south haulage route from Victoria; and
- the intersection of Daysdale Road and MR 323 (Saffron Oaklands Road) may require upgrading due to poor alignment of the Saffron Oaklands Road approach.

2 PROJECT DESCRIPTION

2.1 SITE LAYOUT

The proposal includes locating the main components of the ethanol production facility in the central portion of the site. Dams and an irrigation area will also be located on the site.

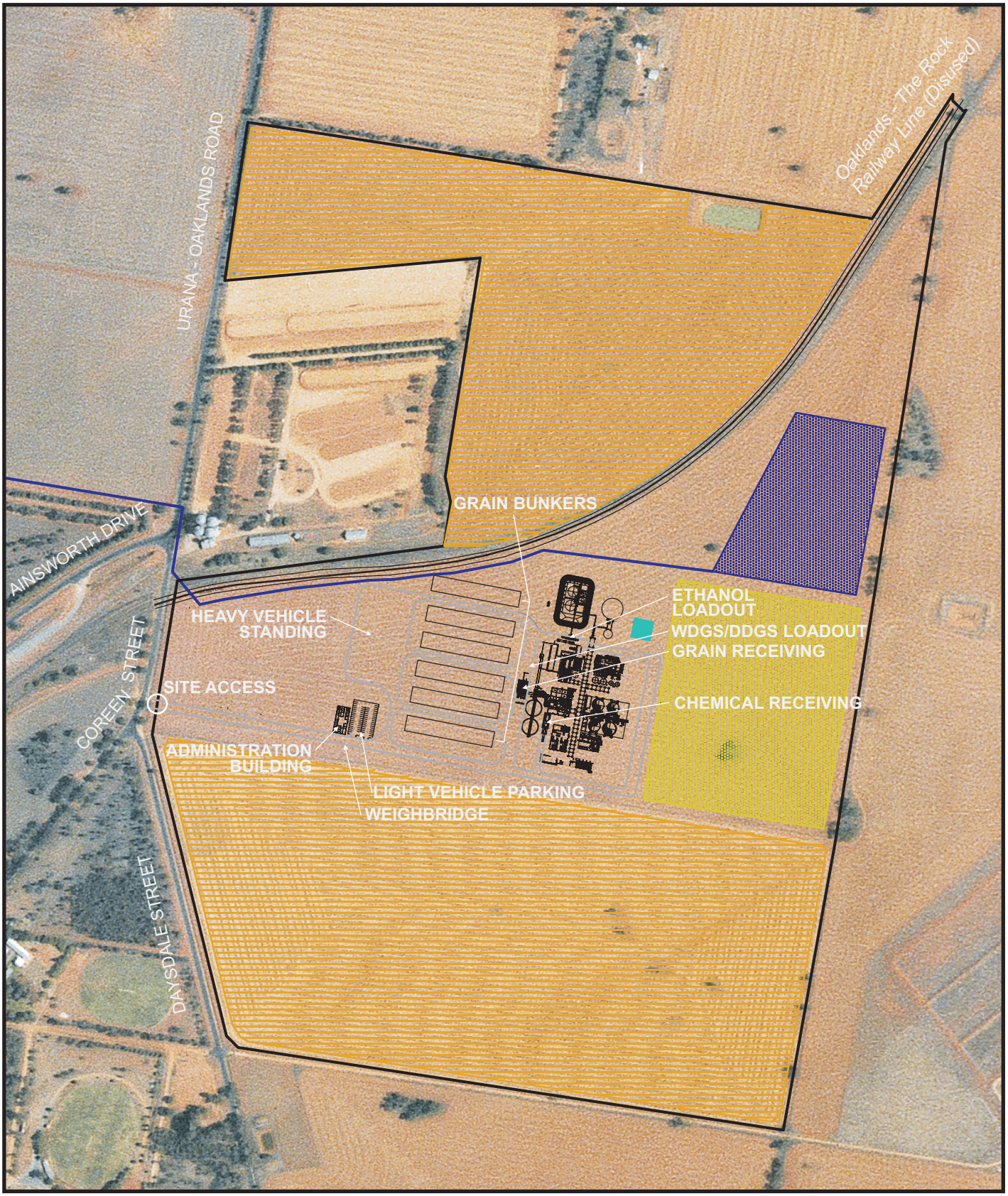
In relation to traffic, the facility will include the following:

- an office/administration area comprising a reception area, offices, meeting room areas, bathroom facilities and a first aid room;
- a grain receipt and storage buildings/ bunkers;
- a maintenance workshop and store;
- liquefied natural gas (LNG) storage;
- wet and dry materials dispatch;
- car parking for 40 light vehicles on-site;
- sealed circulation roads for key movements of heavy vehicles through the site;
- weigh bridge; and
- a heavy vehicle standing area.

Figure 2.1 provides the proposed layout for the production facility overlaid on an aerial photograph of the site and surrounding area.

2.2 SITE ACCESS

Access to the site will be provided at the existing entry point from Coreen Street, located approximately midway between the Daysdale Road/ Saffron Oaklands Road intersection and the railway crossing (refer *Figure 2.1*). The access road into the site will be sealed to minimise dust and will be wide enough to accommodate passing B-Doubles, in accordance with AS2890.2.



Legend

- 200Ml Raw Water Dam
- 2Ml Stormwater Dam
- 40Ml Effluent Dam
- Irrigation Area
- Water Pipeline
- Site Boundary
- Internal Access Road

Figure 2.1

Internal Site Network

Client:	Agri Energy Limited		
Project:	Oaklands Ethanol Production Facility		
Drawing No:	0056132_OA_TT_02		
Date:	05.02.2007	Drawing Size:	A4
Drawn By:	ML	Reviewed By:	-
Source:	-		
Scale:	Refer to Scale Bar		

N

0 100 200m

Environmental Resources Management Australia Pty Ltd
Building C, 33 Saunders St, Pyrmont, NSW 2009
Telephone +61 2 8584 8888

ERM

2.3 *CONSTRUCTION TRAFFIC GENERATION*

It is estimated that construction activities would take place over approximately 14 to 16 months, and require light and heavy vehicles associated with importing materials, plant and contractors.

It is anticipated that construction-related traffic would travel to the site locally. Importing of some components from other areas will be required.

Construction-related traffic will generally be restricted to day-time hours (ie 6am-6pm) and volumes will vary depending on site construction activities at the time. It is assumed that construction traffic generated at any time over this short period will not exceed traffic volumes generated during operation of the facility, and as such construction traffic has not been assessed separately.

2.4 *OPERATIONAL TRAFFIC GENERATION OF THE PROPOSAL*

Ethanol production is planned to occur throughout the year. Traffic generation from the proposal will peak during grain and corn harvesting seasons (November to January, April to June). At these times the raw materials will be imported to the facility.

Peak operational traffic will include the following:

- light vehicles for staff and visitors;
- heavy vehicles for importing products, primarily grain;
- heavy vehicles for exporting products – ethanol, wet distillers grain and solubles (WDGS) and dried distillers grain with solubles (DDGS); and
- other vehicles for assorted deliveries/dispatch (eg ethanol denaturant).

Heavy vehicle traffic will be a mixture of semi-trailers and B-doubles. A summary of the primary traffic–generating components is provided below.

2.4.1 *Grain Receipt And Storage*

The ethanol production process requires a constant supply of grain. For the production of 200 million litres/year of ethanol the peak daily demand for grain is about 1,600 tonnes, equivalent to approximately 67 tonnes per hour. Grain will be preferentially sourced from the Murray region of NSW.

Grain will be received principally via semi-trailers and B-double trucks. Trucks will enter the site and drive onto a weighbridge, where the gross weight will be recorded and grain samples will be taken for quality control purposes. The vehicle will then proceed to one of two unloading areas (a grain receival platform from where the grain is conveyed to one of two storage silos or a grain storage area, which will consist of six separate grain bunkers) where the grain will be stored prior to processing. Grain from these storage areas will be fed to a 'shift silo' which will supply the ethanol plant.

Once the grain truck is unloaded it will return to the weighbridge and then exit the site via Coreen Street.

2.4.2 Products Storage And Dispatch

Ethanol product will be transported to market via B-double trucks. The co-products of the ethanol production process, namely WDGS and DDGS will also be dispatched by truck.

It is assumed in this assessment that there will be no accumulation of products on-site over extended periods (ie the dispatch volume is equivalent to the volume of products produced).

2.4.3 Receipt And Dispatch Of Other Materials

Assorted vehicles will be required to import other materials used in the processes at the ethanol production facility, such as LNG, gasoline, ethanol denaturant and other chemicals, to the site. Some traffic generation may occur in the future that is related to harvesting of crops from the irrigation area, however this is considered to be inconsequential to the volume of traffic generated by the operation over time and is not included in this assessment.

2.4.4 Staff Movements

The plant will operate 24 hours per day, seven days a week. It is anticipated that the onsite workforce will comprise 32 people, inclusive of six to eight administration staff who will be present during standard working hours. There will typically be three shifts, each staffed with eight persons. Shifts will nominally be 7am to 3pm, 3pm to 11pm and 11pm to 7am.

2.4.5 Traffic Generation And Timing

Estimates of traffic generation from the proposal have been based on a previously approved ethanol production facility currently being constructed by AEL at Swan Hill in Victoria. The expected peak traffic generation and timing is summarised in *Table 2.1*. Peak hour traffic generation was assumed to occur during the evening shift changeover period.

Table 2.1 Traffic Generation of the Proposed Facility

Component	Type and Capacity	Peak Period	Peak Traffic Generation (trips)		
			Annual	Daily	Worst Case Peak Hour
Wheat/Barley Deliveries	B-Double (40t) 70% Semi (20t) 30%	Nov-Jan, Mon-Sat	4,735 4,058	114 98	8 7
Corn/ Sorghum Deliveries	B-Double (40t) 70% Semi (20t) 30%	Apr-June, Mon-Sat	As for Wheat/Barley above As for Wheat/Barley above		
Denatured Ethanol Dispatch	B-Doubles 50,000L	Mon-Sat	4,200	30	2
WDGS Dispatch	B-Double (32t)	Mon-Sat	3,212	22	2
DDGS Dispatch	B-Double (32t)	Mon-Sat	10,325	72	5
Staff/Visitors/ Contractors	Light Vehicles	Mon-Sat	12,000	80	24
Assorted other vehicles eg LNG, Gasoline, Ethanol Denaturant, Other chemical deliveries	B-doubles and Heavy Rigid Vehicles	Mon-Sat	1,529	10	2
		Total	**48,852**	**426**	**50**
		Total Heavy Vehicles	**36,852**	**346**	**26**

Notes:

- One delivery is equivalent to two trips (access and egress from the facility).
- Wheat/Barley and Corn/ Sorghum deliveries will not occur concurrently.

Grain deliveries and ethanol dispatch would be staggered over a 16 hour daily period between 6am and 10pm to allow for efficient loading and weighbridge operations. Other deliveries such as ethanol denaturant will generally occur during day-time hours.

2.5 *TRAFFIC DISTRIBUTION: HAULAGE ROUTES*

Traffic generated during operation of the proposed ethanol plant would be distributed on the surrounding road network in the following fashion:

- raw materials deliveries (B-Doubles, Semis):
  - 40% from the north, via the Urana Oaklands Road;
  - 40% from the west, via the Oaklands Berrigan Road (MR 323) and the Answerth Drive bypass of Oaklands; and
  - 20% from the east, via the Saffron Oaklands Road (MR 323) and Daydsale Street.
- ethanol, WDGS and DDGS dispatch (B-Doubles): all traffic would be heading east and south along Daysdale Street and the Saffron Oaklands Road (MR 323) towards Melbourne via Corowa;
- staff/visitors: primarily to and from the site from Oaklands and nearby towns including Urana, Saffron, Berrigan and Jerilderie; and
- chemical deliveries: primarily to and from the site via the Saffron Oaklands Road (MR 323) and Daysdale Street.

Heavy vehicle haulage routes are indicated on *Figure 2.2*. B-Doubles will be restricted to signposted heavy vehicle detour routes through Oaklands, including Answerth Drive and Daysdale Street (*Figure 2.2*). All roads in the Shire are approved B-double routes (L. Ashford pers comm.).

Milthorpe Street, within Oaklands, will not be used for haulage routes.

Legend

- 200Ml Raw Water Dam
- 2Ml Stormwater Dam
- 40Ml Effluent Dam
- Irrigation Area
- Water Pipeline and Pump Station
- Site Boundary
- Internal Access Road
- Haulage Routes to Site
- Haulage Route from Site

Figure 2.2

Proposed Haulage Routes

Client:	Agri Energy Limited	
Project:	Oaklands Ethanol Production Facility	
Drawing No:	0056132_OA_TT_01	
Date:	05.02.2007	Drawing Size: A4
Drawn By:	ML	Reviewed By: -
Source:	-	
Scale:	Refer to Scale Bar	

N

0 400 800m

Environmental Resources Management Australia Pty Ltd
Building C, 33 Saunders St, Pyrmont, NSW 2009
Telephone +61 2 8584 8888

ERM

3 CURRENT TRAFFIC CONDITIONS

3.1 REGIONAL TRANSPORT NETWORK

The Oaklands locality is serviced by the following regional roads and State Highways (*Figure 1.1*):

- Newell Highway (SH17), accessed via Urana/Morundah to the north and Jerilderie/Berrigan/Finley to the west and provides a major north-south road link to areas of NSW and Victoria;

- Riverina Highway (SH20), extends east-west between Albury and Deniliquin and located 35 to 40km south of Oaklands by road;

- MR 323, known regionally as the Saffron Jerilderie Road, and inclusive of Berrigan Oaklands Road, Milthorpe Street and Saffron Oaklands Road (as labelled on *Figure 2.2*). This road extends through Oaklands and provides road connections to the east (to Daysdale, Saffron and the Urana Corowa Road) and west (to Berrigan and Jerilderie);

- Urana Corowa Road (MR 131), located 10 to 12km east of Oaklands via MR 323, provides connectivity towards Corowa and the Riverina Highway to the south and to Urana, Narrandera and the Newell Highway to the north;

- Urana Oaklands Road (SR 2) extends northwards from Coreen Street, linking Oaklands to the MR 131 approximately 15km to the north and to Urana;

- MR 356 known regionally as the Berrigan Oaklands Road, extends from the MR 323 approximately nine kilometres west of Oaklands and provides connection to the SH 20 in Berrigan; and

- Albury Urana Road (MR 125), which links to the MR 131 just south of Urana and provides a direct link between Albury in the south to Urana in the north. .

3.2 LOCAL ROAD NETWORK

3.2.1 *Coreen Street*

The site has direct access to Coreen Street, which extends northwards from Milthorpe Street (MR 323) to the railway line. North of the railway line it becomes the Urana Oaklands Road. It is posted at 50 kilometres per hour (km/hr) north of Daysdale Street.

At the site access point, the carriageway has a straight alignment and flat grade. It is approximately 7.5m in width with gravel shoulders and linemarking is present. A disused rail crossing (Oaklands - The Rock Line) is present approximately 100m north of the proposed access point with 'Give Way' signs posted. The Coreen Street/Daysdale Street T-intersection is located 100m to the south of the proposed site access.

3.2.2 Daysdale Street

Daysdale Street is marked as a heavy vehicle bypass route around the eastern periphery of Oaklands. It has a recently sealed carriageway between Coreen Street and the Saffron Oaklands Road (MR 323), with a 7.5m sealed carriageway and gravel shoulders. It is posted at 60km/hr.

3.2.3 Answerth Drive

Answerth Drive was sealed in the year 2000 and provides a heavy vehicle bypass around the northern and western part of Oaklands. It links from the Urana Oaklands Road (SR 2) to Berrigan Oaklands Road (MR 323) to the southwest of the township. It is posted at 60km/hr.

This road meets the Urana Oaklands Road opposite the Ray Brook & Co grain silos, just north of the rail crossing on Coreen Street. The sealed carriageway is approximately seven metres with gravel shoulders of up to one metre.

3.3 SITE ROAD NETWORK

Currently the site comprises agricultural cropping land. A single access point to Coreen Street is currently provided on the western boundary.

3.4 INTERSECTIONS

The key intersections to be potentially affected by the development are:

- the Daysdale Street/Coreen Street T-intersection;
- the Daysdale Street/Saffron Oaklands Road (MR 323) T-intersection; and
- the Answerth Drive/Urana Oaklands Road (SR 2) T-intersection.

The potential impact of the proposal on these intersections is assessed in *Section 4.2.3*.

3.5 *RAIL NETWORK*

A disused rail line ('Oaklands – The Rock' line) extends through the site. The 'Oaklands – The Rock' branch line was opened in 1912, but has been closed since 1975 (NSW Railnet.com 2006).

The Victorian Railways 1600mm gauge line was extended from the south to Oaklands in 1938, creating a break-of-gauge. Rail transport still operates from Oaklands to the south, via the Benalla - Oaklands Line.

3.6 *ADJACENT DEVELOPMENTS*

Immediate surrounding areas include:

- agricultural cropping land, within and adjacent to the site;
- the Ray Brooks & Co Grain Silos adjacent to the western site boundary, with an access to Urana Oaklands Road;
- the AWB Grain Storage Centre on Answerth Drive and with access to the Benalla-Oaklands Railway Line, approximately 2.3km to the south-west of the site;
- Oaklands sewage treatment plant and settling ponds positioned approximately 300m to the east; and
- Oaklands urban areas, including a school, dwellings and commercial premises to the west and southwest of the site.

No other significant traffic-generating developments are known to be proposed.

3.7 *BASELINE TRAFFIC VOLUMES*

Traffic volume data for the nearby road network, collected by the NSW RTA and Urana Shire Council, are provided in *Table 3.1*. Additional data was added to represent the results of traffic surveys undertaken by ERM on 17 October 2006.

Table 3.1 ***Traffic Volumes (Vehicles or Axle Pairs/day, AADT) on the External Road Network, 1994 to 2006***

Road	Location	1994 AADT	2000 AADT	2003 AADT	2006 AADT[1]
MR 323 (Saffron Oaklands Road/ Milthorpe St/ Berrigan Oaklands Road)	0.5km east of Daysdale Street				278 (16%)
	0.1km west of Answerth Drive				292 (31%)
	0.5km east of MR 356	411			
	0.5km west of MR 131	182	200	236	
SR 2 (Urana Oaklands Road)	0.25km north of Coreen Street Rail Crossing				212 (10%)
MR 131 (Urana Corowa Road)	North of MR 323	279			
	South of MR 125 Albury Urana Road	443	496	583	-
Coreen Street	South of Daysdale Street				130 [2]

Notes:

Figures in brackets relate to heavy vehicle composition

1. Average of five recording periods in 2006, counting vehicles not axle pairs.
2. Based on peak hour data collected by ERM, assuming peak hour = 15% of daily traffic

The data presented in *Table 3.1* indicates that:

- measured traffic volumes on roads around Oaklands vary between 130 and 411 AADT, with a relatively high (10 to 31%) heavy vehicle composition; and
- RTA counts indicate there has been an increasing volume of traffic on MR 131 and MR 323 west of Oaklands since 1994.

3.8 TRAFFIC SAFETY

A search of the NSW RTA database indicated that there have been no reported traffic incidents along Daysdale Street in the last five years. Two incidents were recorded along MR 323 (Milthorpe Street, Berrigan Oaklands Road) in the last five years, being:

- a single vehicle run-off-road incident 4km east of Oaklands (non-casualty); and
- a two-vehicle incident within Oaklands near the intersection of Milthorpe Street (MR 323) and Gaffney Street.

Neither incident relates to the primary haulage routes to be utilised for the proposal.

3.9 PUBLIC TRANSPORT, PEDESTRIANS, CYCLISTS AND EMERGENCY ACCESS

There are currently no facilities for pedestrians or cyclists at the site. Apart from school buses, the nearest public bus services are in Urana. Emergency access is provided via the existing road network.

4 TRAFFIC IMPACT ASSESSMENT

4.1 CONSTRUCTION IMPACTS

The construction-related traffic would pose a short-term impact to the road network. Volume and nature of this traffic are unknown at this stage, however would not exceed traffic volumes generated under peak operational conditions.

To minimise impacts of construction traffic on the local road network, it is recommended that a *Traffic Management Plan*, potentially as part of a *Construction Management Plan,* be prepared prior to commencement of works. This should include:

- identification of routes and times of travel for heavy vehicles;
- specification of additional signage near the site along Coreen Street and the Urana Oaklands Road, warning of additional heavy vehicles;
- any special considerations required for oversized vehicles;
- consideration of resurfacing the site access and the on-site circulation roads, to minimise dust generation and improve all-weather access;
- minimum requirements for vehicle maintenance to address noise and exhaust emissions, and mitigation measures to ensure the relevant criteria are met; and
- speed limits to be observed along routes to and from the site and within the site.

4.2 OPERATIONAL IMPACTS TO THE EXTERNAL ROAD NETWORK

4.2.1 Access To Coreen Street

The road arrangement at the site access point off Coreen Street provides sight distance of over 500m to the north along the Urana Oaklands Road. This meets Austroads (2005) requirements (253m for 100km/hr zones). To the south, sight distance is limited to approximately 140m due to a bend in the alignment. This also meets the Safe Intersection Sight Distance for 60km/hr zones (121m) as specified in Austroads (2005). It is considered that this represents a suitable location for the site access.

The access should be sealed and constructed to dimensions that ensure the swept path of a B-Double entering or exiting the site does not cross the centre line of Coreen Street.

Given the light background traffic flows and sufficient sight distance, it is recommended that a basic intersection type be maintained at this location.

4.2.2 Roadway Capacity

Roads in the external network to be utilised by haulage and dispatch trucks are generally classified roads and have excess capacity. Potential daily traffic capacity of between 3,000 and 5,000 vehicles per day (Level of Service C, Austroads 1988) would be common in the locality. As shown on *Figure 2.2*, roads in the external network to be utilised by haulage trucks include:

- Urana Oaklands Road, primarily for grain import during harvesting seasons;
- Berrigan Oaklands Road and Answerth Drive, primarily for grain import during harvesting seasons; and
- Daysdale Street, MR 323 and MR 131 for some grain deliveries and for export of products to market.

Of the total peak traffic generation during operation of the facility (426 trips/day), 346 trips are predicted to be heavy vehicle movements and 80 trips to be light vehicle movements. The daily traffic volumes would be distributed on the nearby road network as shown in *Table 4.1*.

Table 4.1 Future Peak Traffic Flows with the Proposal

Road	Vehicles Generated by the Proposal (trips/day)		Total Estimated Traffic Volumes (trips/day), Peak Season
	Heavy	Light	
Urana Oaklands Road	+85	+ 20	320 (33% heavy vehicles)
Berrigan Oaklands Road (MR 323)/Answerth Drive	+85	-	377 (47% heavy vehicles)
Daysdale Street/Saffron Oaklands Road (MR 323)	+176	+20	474 (47% heavy vehicles)
Coreen Street	-	+60	170 (0% heavy vehicles)

This distribution assumes the light vehicle traffic will be distributed mostly towards Oaklands via Coreen Street (75%), with the remaining light vehicle traffic towards the north and east.

The potential daily mid-block capacity of these roads, as indicated in Austroads (1988), is approximately 3,000 to 5,000 vehicles per day (Level of Service 'C'). Due to the current relatively light traffic flows, the additional traffic generated by the proposal will not cause any affected road to exceed its potential roadway capacity as defined by Austroads (1988) and will not result in significant impacts to the operation of roads in the vicinity of the site.

4.2.3 Intersections

To assess the potential need for upgrading of the key intersections to be affected by the proposal, an assessment using Figure 6.41 of Austroads 2005 (from RTA 1999) for 'rural turning lane warrants' was undertaken. For the assessment, the following was assumed:

- **Base case flows and distribution:** background peak hour flows were approximated from ERM traffic counts undertaken on 17 October 2006. This was found to be, at worst, up to 33 vehicles/hour for Coreen Street/ Urana Oaklands Road, 13 vehicles/hour for Answerth Drive, 7 vehicles/hour for Daysdale Street and 26 vehicles/hour on MR 323 Saffron Oaklands Road; and

- **Peak hour generation from the proposal**: as indicated in *Section 2.4.5*, the worst case peak hour traffic associated with the proposed ethanol plant was estimated to coincide with the evening shift changeover time, with up to 50 vehicle trips occurring. This includes 26 heavy vehicles and 24 light vehicles. A 50%/50% north/south and access/egress directional split was utilised.

The results of the assessment are summarised below in *Table 4.2*.

Table 4.2 Turning Warrant Assessment, Key Intersections

Intersection	Turning Movement	Turning volume (veh/hr)	Total approaching volume (veh/hr)	Total opposing volume (veh/hr)	Austroads 2005 Require-ment
Site Access/ Coreen Street	**With Development:** Left into Site	8	25	-	Basic
	With Development: Right into Site	18	35	25	Basic
Daysdale Street/ Saffron Oaklands Road (MR 323)	**Base Case:** right turn into Daysdale Street	4	17	13	Basic
	With Development: right turn into Daysdale Street	13	26	13	Basic

The results in *Table 4.2* indicate that there is no requirement for auxiliary turning lane treatments at key intersections.

The Answerth Drive/Urana Oaklands Road intersection was not included in the 'turning warrant' assessment as heavy vehicles generated by the development would not approach from the north and so would not turn right into the road. However, as 40% of heavy vehicle haulage (85 trips per day) would utilise this intersection (that is, turn right from Answerth Drive into Urana Oaklands Road to access the site and returning by turning left into Answerth Drive from Urana Oaklands Road) it is considered that to maintain road safety it should be upgraded to cater for the turning heavy vehicles associated with the facility. Therefore the left turn apron into Answerth Drive should be upgraded to be consistent with Austroads (2005) standards.

The Daysdale Street/Coreen Street T-intersection was not included in the 'turning warrant' assessment as it was considered to be adequate, given that the angle of the intersection allows for B-double movements.

While the 'turning warrant' assessment for the Daysdale Street/ Saffron Oaklands Road intersection indicated no auxiliary lanes were required, it is considered that upgrade of the left turn from Daysdale Street is appropriate to maintain traffic safety at this intersection. Upgrade works should widen the left-turn apron to allow B-doubles to negotiate the turn without crossing the MR 323 centreline.

In summary, it is considered that some roadwork is appropriate to allow for the increased heavy vehicle movements and maintain traffic safety:

- the left turn apron into Answerth Drive at the Answerth Drive/Urana Oaklands Road (SR 2) T-intersection should be upgraded to be consistent with Austroads (2005) standards; and

- the left-turn apron from Daysdale Street into Saffron Oaklands Road (MR 323) at the Daysdale Street/ Saffron Oaklands Road (MR 323) intersection should be upgraded to allow for the swept path of a turning B-double without the need to cross the Saffron Oaklands Road centreline.

In addition, the upgrades to the site access should ensure B-doubles are able to turn left without crossing the centreline of Coreen Street.

4.3 IMPACTS TO URBAN AREAS

Heavy vehicles travelling to and from the site will not generally utilise roads through the residential area of Oaklands, thus minimising impacts to existing urban areas. They will generally use the designated heavy vehicle bypass routes around Oaklands, only potentially utilising Coreen Street within Oaklands from time to time to obtain fuel and access mechanical repair services.

The light vehicles travelling to and from the site will be dispersed and predicted volumes (80 trips per day during peak times) are not considered to pose a potential capacity or residential amenity issue.

4.4 IMPACTS TO OVERALL ROAD SAFETY

It is considered that the development does not pose a road safety issue to the external network as:

- there is sufficient sight distance at the site access point on Coreen Street;
- due to current spare capacity in the external road network, the traffic generated by the proposed facility does not pose unacceptable delays or known road safety impacts to nearby roads or at key intersections; and
- the site access intersection, and relevant components of the Answerth Drive/Urana Oaklands Road and Daysdale Street/ Saffron Oaklands Road (MR 323) intersections will be upgraded to cater for turning heavy vehicles in accordance with Austroads standards.

4.5 INTERNAL ROAD NETWORK AND PARKING

The proposed internal road network (refer *Figure 2.1*) caters for the proposed traffic generation, including wide heavy vehicle circulation roads and a large heavy vehicle standing area. The internal circulation roads do not cross the rail line. Internal roads will allow for the two-way flow of heavy vehicles along the site accessway.

The 40-space light vehicle carpark is located near the administration building and with the exception of sharing the main accessway, light vehicle traffic is separated from heavy vehicle circulation around the site.

It is anticipated that the proposed layout will not result in internal traffic safety issues.

4.6 PUBLIC TRANSPORT, PEDESTRIANS AND CYCLISTS

There are currently no plans to provide facilities for public transport, pedestrians or cyclists. Pedestrian and cyclist movements to and from Oaklands (typically expected to travel between 300m and one kilometre to the site) can be catered for on the existing road network.

5 CONCLUSION AND RECOMMENDATIONS

The assessment indicates that the proposed ethanol facility will not pose unacceptable impacts on the external road network. The proposed site circulation and parking network allows for the efficient and safe movement of operational traffic around the facility.

The following recommendations are made for inclusion in the Statement of Commitments:

- all internal access roads subject to heavy vehicle usage must be sealed;
- all heavy vehicles associated with the transport of grain and dispatch of materials to and from the site shall use approved B-Double routes (marked 'heavy vehicle bypass' only);
- a *Traffic Management Plan*, or a component of the *Construction Management Plan* which considers traffic, shall be prepared. This should be submitted to Urana Shire Council prior to commencement of works and include:
    - identification of routes and times of travel for heavy vehicles;
    - specification of additional signage at site access point warning of additional heavy vehicles;
    - any special considerations or routes required for oversized vehicles, including vehicles over 40 tonnes;
    - consideration of resurfacing the site access and the on-site circulation roads, to minimise dust generation and improve all-weather access;
    - minimum requirements for vehicle maintenance to address noise and exhaust emissions, and mitigation measures to ensure the relevant criteria are met; and
    - speed limits to be observed along routes to and from the site and within the site; and
- upgrading of the following intersections to allow for the safer movement of B-doubles:
    - the proposed site access intersection with Coreen Street to allow for the swept path of a left-turning B-double without the need to cross the Coreen Street centreline;
    - the left turning apron into Answerth Drive at the Answerth Drive/Urana Oaklands Road T-intersection to be consistent with Austroads (2005) standards; and

- the left-turn apron for vehicles turning left into Saffron Oaklands Road (MR 323) at the Daysdale Street/ Saffron Oaklands Road (MR 323) intersection to allow for the swept path of a turning B-double without the need to cross the Saffron Oaklands Road centreline.

REFERENCES

Austroads (2005) *Guide to Traffic Engineering Practice – Part 5: Intersections at Grade*, Austroads, Sydney.

Austroads (1988) *Guide to Traffic Engineering Practice – Part 1: Roadway Capacity*, Austroads, Sydney.

Neil Clark and Associates (2006) *Supply and Demand Analysis – Coleambally, Condobolin and Oaklands.* Prepared for Agri Energy Limited, June 2006.

NSW Railnet.com (2006) Main Southern Railway Line, New South Wales http://en.wikipedia.org/wiki/Main_Southern_railway_line,_New_South_Wales

RTA (2002) *Guide to Traffic Generating Developments*, Version 2.2, NSW Roads and Traffic Authority

RTA (1999) *Road Design Guide*, NSW Roads and Traffic Authority

ERM consulting services worldwide **www.erm.com**

Environmental Resources Management Australia
Building C, 33 Saunders Street
Pyrmont NSW 2009
Telephone (02) 8584 8888
Facsimile (02) 8584 8800