ANNEXURE 7

Traffic Impact Assessment

prepared by

ARC Traffic & Transport

Lot 1 DP 838753 (No. 160), Lot 241 DP 1130535 (No. 171) and Lot 143 DP 1069758 (220), Bolong Road, Bomaderry

Proposed CO_2 Plant

Bolong Road, Bomaderry

Traffic Impact Assessment

December 2017

prepared for

Supagas

prepared by

ARC Traffic + Transport

Anton Reisch Consulting Pty Ltd
19 Canoon Road Turramurra NSW 2074
Mob 0427 995160
antonreisch@optusnet.com.au
ACN: 150 259 493

Introduction

Supagas Australia (Supagas) proposes a Modification to the existing Shoalhaven Starches Project Approval MP06_0228 to provide for the establishment of a CO_2 Plant (the Plant) on the former Dairy Farmers Site, Bolong Road Bomaderry (the Dairy Site). The Plant would take CO_2 generated through the approved Shoalhaven Starches (Starches) operations and then process the CO_2 to food grade quality for the food and beverage market. The CO_2 would be extracted directly from the Starches CO_2 flue, and once operating at capacity would reduce CO_2 emissions by some 100 tonnes per day.

Once appropriately processed to food grade standard, CO_2 would then be transported from the Dairy Site by truck to internal customers in NSW, Victoria, South Australia and Queensland by truck.

ARC Traffic + Transport (ARC) has been commissioned to examine the access, traffic and parking issues associated with the operation of the Plant, and the broader Modification. This assessment also necessarily includes a review of the broader Starches operations, particularly as a number of additional modifications have recently been approved by the Department of Planning & Environment (DP&E) which will result in changes to the (existing) access, traffic and parking environment along Bolong Road.

In determining the scope of this assessment, ARC has referenced the past (general) requirements of both the DP&E and Shoalhaven City Council (Council) in regard to earlier Modification proposals, and particularly the issues identified by both the DP&E and Council in regard to the recently approved Modification 12 (Beverage Grade Ethanol Plant), noting that the recent (September 2017) Modification 12 approval specifically conditions a number of upgrades to the road network providing access to the Dairy Site. It is noted that in response to this Modification, Council's only assessment requirement submitted to the DP&E (3rd November 2017) stated that a *Traffic Impact Assessment is Required*.

This assessment also references a number of past reports prepared by ARC in regard to the operations of the Dairy Site and broader Starches Sites; specifically, ARC has referenced the following past reports: -

- Shoalhaven Starches Boilers Modification TIA May 2017 (MOD 13 TIA)
- Shoalhaven Starches Access & Parking Assessment April 2017 (APA 2017)
- Dairy Farmers Reuse Proposal TIA March 2014 (Meat Plant TIA)
- Shoalhaven Starches Ethanol Upgrade & Packaging Plant TIA 2008 (Ethanol Upgrade TIA)

The recent APA 2017 – which was provided to the DP&E as (essentially) an addendum to the recent Modification 12 application - is a key reference in this assessment. The APA 2017 was prepared to respond to specific issues raised by the DP&E, Council and the Roads & Maritime Service (RMS) not only in regard to Modification 12, but moreover in regard to a number of outstanding issues relating to earlier Modifications and consent conditions. The recommendations of the APA 2017 have now effectively been agreed by the DP&E (and Council), and as such the access, traffic and parking environment available further to the implementation of those recommendations – as specifically required as conditions of the Modification 12 approval – has been adopted as the 'base conditions' by which to assess this Modification.

Based on our discussions with Manildra, upgrade plans relating to works along Bolong Road are currently being finalised for approval by Council.

Finally, ARC has also referenced the key standards and guidelines relevant to the assessment of the access, traffic and parking characteristics of the Modification, including: -

- AustRoads Guide to Road Design Part 4A Unsignalised and Signalised Intersections (GRD 4A)
- Australian Standard 2890.1: Parking Facilities – Off Street Car Parking (AS 2890.1)
- Australian Standard 2890.2: Parking Facilities – Off Street Commercial Vehicle Facilities (AS 2890.1)
- Council's Development Control Plan 2014 (DCP 2014)

1 Background

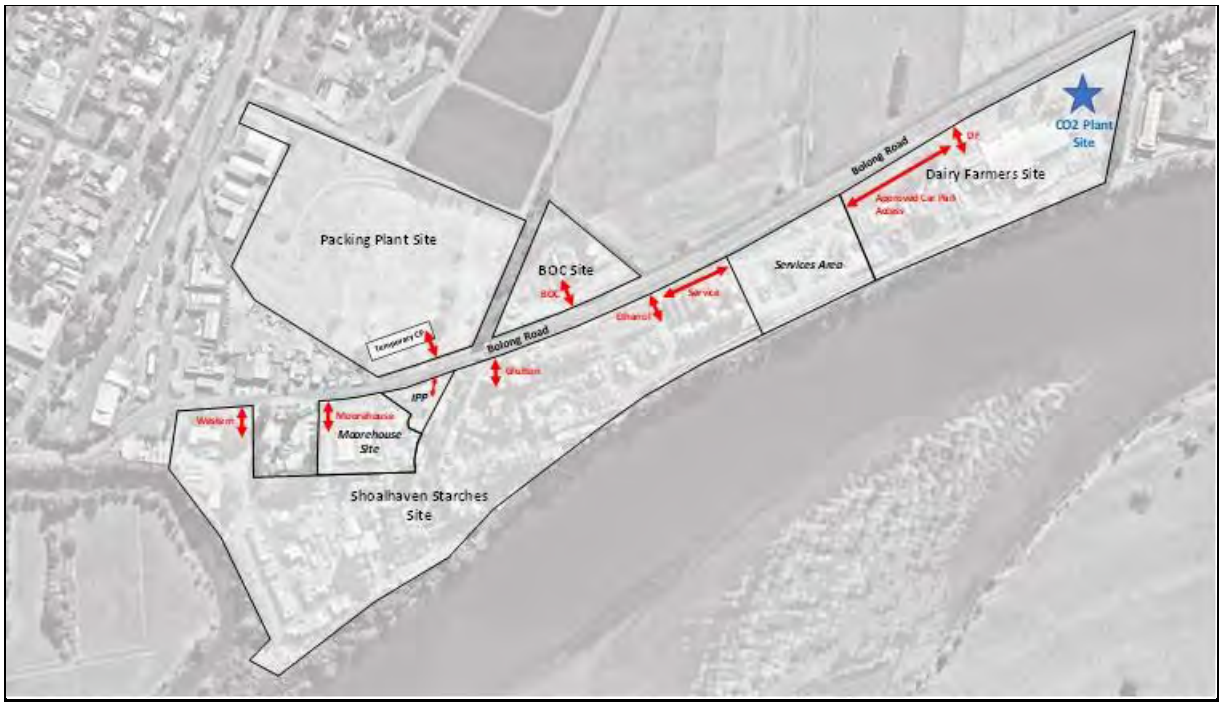
1.1 Manildra Shoalhaven Starches

Manildra Shoalhaven Starches operates a number of distinct 'sites' north and south of Bolong Road, Bomaderry. The primary Starches Site and immediately adjacent Dairy Farmers Site (Dairy Site) are located south of Bolong Road. The Moorehouse Site sits within the SS Site east of the railway spur; the Interim Packing Plant (IPP) sits within the SS Site west of railway spur; and the Services Area occupies the eastern portion of the SS Site.

The approved Packing Plant Site (PP Site) is located on the northern side of Bolong Road opposite the primary SS Site, and currently accommodates a Temporary Car Park accessed from Bolong Road per Modification 6 (Moorehouse Demolition) and Modification 7 (Starch Dryer 5) Approvals. The BOC Site is located on the northern side of Bolong Road east of Abernathy's Creek.

These key Starches Sites, as well as their access points to Bolong Road, are shown in **Figure 1.1**.

Figure 1.1 Shoalhaven Starches Sites, Bolong Road Bomaderry



Source: Nearmap

Finally, the former Australian Paper Mill site (the Mill Site) is located to the east of the Dairy Site, also south of Bolong Road. With reference to **Section 1.2.2** below, a modification is currently being prepared by Manildra for the adaptive reuse of the Mill Site, and as such the potential trip generation of the Mill Site (further to a modification approval) has also been considered in this assessment.

1.2 Past Approvals

1.2.1 Shoalhaven Starches Expansion Project Approval MP06-0228

The Shoalhaven Starches Expansion Project (SSEP) Approval was granted by the Minister for Planning on the 28th January 2009, and encapsulated previous approvals into one overall approval. The SSEP is a 'transitional Part 3A Project' for the purposes of Schedule 6A of the Environmental Planning & Assessment Act.

The SSEP provides for an increase in ethanol production at Shoalhaven Starches in a staged manner from 126 million litres per year to 300 million litres per year. To accomplish the increase in ethanol production, the SSEP required a series of plant upgrades and increases in throughput of raw materials, principally flour and grain. The SSEP included the following primary alterations and additions: -

- The provision of an additional product dryer;
- Additional equipment and storage vessels for the ethanol plant including additional fermenters, additional cooling towers and molecular sieves;
- Upgrades to the Stillage Recovery Plant, including additional DDG Dryers, Decanters, chemical storage, evaporators and the installation of a DDG Pellet Plant; and
- The establishment of a new Packing Plant, container loading area and rail spur line on the northern side of Bolong road.

As outlined, the SSEP Approval also consolidates all previous approvals (up to that time) into a single Project Approval.

1.2.2 SSEP Modifications

Following the SSEP Approval, Manildra acquired the Dairy Site, and commenced investigations into relocating the Packing Plant from the approved PP Site north of Bolong Road to the Dairy Site; as an interim measure during these investigations, approval was provided in 2012 for the Interim Packing Plant operations at their current location. Modification 3 (Dairy Site Car Park) was also approved at this time, providing for additional Starches staff parking to be provided in the Services Area (between the Ethanol Plant and Dairy Site) to be accessed via the Dairy Site (and in turn the intersection of Bolong Road & Dairy Site).

In 2015, Manildra submitted modification proposals to the DP&E in regard to the demolition of an industrial building on the Moorehouse Site (Modification 6) and for the construction of the No.5 Starch Dryer on the Moorehouse Site (Modification 7); for minor design amendments to the Packing Plant (Modification 9); and for construction and operation of a new Flour Mill (Modification 10). These Modifications have all been approved by the DP&E.

More recently (2016) Manildra submitted additional Modification proposals, including for a reduction in the number of DDG dryers on the SS Site and associated works (Modification 11); and for the construction of an Ethanol Distillation Plant to provide beverage grade alcohol (Modification 12). As discussed, these Modifications have been recently approved by the DP&E.

The only other modification currently before the DP&E relates to the conversion of on-site Boilers from gas fired to coal fired (Modification 13), noting that Modification 13 would have little if any impact on the local access, traffic or parking environment, and moreover in no way alter the primary recommendations of the APA 2017, the implementation of which has now been conditioned in the Modification 12 approval (see further below).

Finally, a modification is currently being prepared on behalf of Manildra which would allow for the adaptive reuse of the former Mill Site; the Mill Site modification would provide for product and equipment storage at the Mill Site, as well as accommodating workshops and a (small number of) office staff. ARC is currently preparing a traffic assessment supporting the Mill Site modification, and as stated has therefore considered the potential traffic generation and distribution of the Mill Site (further to Mill Site modification approval) in this assessment.

1.2.3 SSEP Modification Upgrades

As discussed in the **Introduction**, the recent APA 2017 provided a number of recommendations to address issues raised by the DP&E, Council and the RMS in regard to areas of non-compliance (from earlier Modification conditions) and more specifically in regard to Modification 12. Key recommendations, which have been adopted by Manildra and now form Conditions of Consent in regard to Modification 12, include: -

- The extension of the Bolong Road median and barrier fence across Ethanol Driveway, thereby requiring vehicle movements from the west to utilise the Dairy Site turn facility in an identical manner to movements to the Glutton Driveway (for which the Dairy Site turn facility was designed). This would also eliminate observed U-Turn concerns at the intersection of Bolong Road & Ethanol Driveway.

- The provision of additional car parking to be accessed via the Dairy Site, generally consistent with the Modification 3 (Dairy Site Car Park) approval.

- The provision of all access to the Services Area via the Dairy Site, allowing for the closure (to all but emergency vehicles) of the existing Service Driveway which provides an internal link between Ethanol Driveway and the Services Area.

- Further to the above, the upgrade of the Bolong Road & Dairy Site intersection to provide full compliance with the approved Modification 3 (Dairy Site Car Park) design plans, and specifically in regard to geometric design deficiencies. It is also noted that the reinstatement of car parking accessed via the Dairy Site requires the provision of a left turn auxiliary lane, Bolong Road to Dairy Driveway, as originally proposed in the approved Modification 3 (Dairy Site Car Park) design plans.

- The continued use of the Temporary Car Park located on the PP Site through to the end of construction of the Modification (Flour Mill B) infrastructure.

- Upgrades of existing staff car parks across the Starches Sites to provide compliance with Australian Standard in regard to aisle and space dimensions.

The DP&I has conditioned that these works be completed to be completed prior to the commencement of construction of the Modification 12 infrastructure. As stated, plans for all upgrades are currently being finalised for approval by Council, and it is anticipated that all works would be completed prior to the construction of the Plant.

1.2.4 DF Site Meat Processing Plant

In 2014, a Meat Processing Plant, utilising some of the existing on-site buildings generally occupying the eastern portion of the Dairy Site, was approved by Council. The Meat Plant TIA prepared by ARC estimated that the Meat Plant would have a daily staff total of 50, and generate approximately 3 - 4 trucks per day (or 6 – 8 truck trips per day). However, the Meat Plant is currently operating below capacity, such that while truck trips remain in line with these original estimates, up to 40 staff only are currently employed at the Meat Plant. Importantly, the operating hours of the Meat Plant mean that staff trips are primarily generated well outside of the AM and PM commuter peak periods.

It is noted that the transport operations of the Meat Plant – and moreover access to the Dairy Site, and truck movements within the Dairy Site – would be essentially unchanged further to the implementation of the broader Starches Site access, traffic and parking recommendations detailed in **Section 1.2. 3** above. Moreover – and with reference to **Section 2** – it is our opinion that the Modification would similarly have no impact on, or be impacted by, the implementation of these recommendations.

1.3 Dairy Site Access

1.3.1 Intersection of Bolong Road & Dairy Site

All access to the Dairy Site is provided via the intersection of Bolong Road & Dairy Site. The intersection currently provides priority control (Stop to Dairy Site departures) and significant ancillary infrastructure, including a Channelised Right Turn lane, Bolong Road to Dairy Site; and a Left Turn acceleration lane, Dairy Site to Bolong Road.

With reference to **Section 1.2.3** above it is again noted that additional (design) upgrades are to be provided at the intersection as part of the Modification 12 approval. Notwithstanding the need for the implementation of all of the conditioned upgrades at the intersection, of key importance in this assessment is the conditioned provision of a Left Turn deceleration lane, Bolong Road to DF Site, which would provide compliance with regard to GRD 4A warrants given the potential for additional trips to be generated from Bolong Road east to the Dairy Site, specifically associated with Starches staff and construction staff accessing the proposed new car park within the Services Area.

1.3.2 Internal Access

Internal movements immediately within the DF Site access driveway are controlled by a turn facility previously described as the 'hockey stick' or 'lollipop', which provides controlled priorities for vehicles travelling to and from the numerous on-site access roads in essentially the same manner as a roundabout. Moreover, the turn facility – which was developed further to detailed consultation with Council through the Modification 3 assessment – has also been designed to provide for the additional access road to be constructed to provide to the new Starches staff car park within the Services Area.

1.4 Existing Traffic Flows

With reference to **Section 2**, the Modification is expected to generate only very minor levels of additional traffic, and more specifically less than 2 additional light vehicle trips, and no more than 2 additional truck trips, in the commuter peak hours. The only location at which such a level of additional trip generation could have any potential to impact intersection operations would be at the intersection of Bolong Road & Dairy Site; elsewhere in the local network, these additional trips would be generated as through trips in Bolong Road (for example past the Starches Site intersections) and would not in our opinion have any potential to affect levels of service.

As such, the review of traffic flows below focuses on the intersection of Bolong Road & Dairy Site.

1.4.1 Bolong Road Through Flows

The APA 2017 provides a detailed assessment of future traffic flows to Bolong Road further to the redistribution of trips arising from the detailed access recommendations, and further to the (short term) potential for the simultaneous construction of the Modification 10 (Flour Mill B) and Modification 12 (Beverage Grade Ethanol Plant) infrastructure. The resulting through flows in Bolong Road have been referenced to provide base through flows in Bolong Road for this assessment, though it is noted that once these construction projects are completed the trip generation of the Starches Sites (both to the primary Starches Site and car park accessed via the Dairy Site) to/from Bolong Road would be significantly reduced.

These through flows represent '120th Highest Hour' recreational peak flows, and have been developed by ARC in consultation with Council over time and through numerous survey projects across the Starches Sites.

Importantly, the through flows used in this assessment (and in the APA 2017) do not include any reduction in future through movements (in Bolong Road) further to the Princes Highway Upgrade; it is the opinion of Council that the current proportional distribution of north-south sub-regional trips between the Princes Highway and the 'Sandtrack'/Bolong Road will not change further to the Upgrades (currently well advanced). We note that it is the RMS position (recently confirmed as part of the APA 2017 assessment) that there will be a very significant redistribution of trips; estimated provided in the technical appendices supporting the Princes Highway Upgrade suggest that the 2019 AADT in Bolong Road will represent less than 60% of the 2013 AADT. Even with background growth continuing after 2019, the 2029 AADT is estimated to represent only 70% of the 2013 AADT; and the 2039 AADT still only some 87% of 2013 AADT.

To this end, ARC commissioned surveys in Bolong Road immediately east of Dairy Site between the 19th September and 3rd October 2017; these survey dates include both school holiday and non-school holiday periods, and also the flows on Monday 1st October – the Queen's Birthday Public Holiday – which in our opinion would represent a high recreation peak flow, particularly in the PM peak as people return from holidays. What the survey indicates is that even the very highest surveyed hour was some 30% lower than the recreational peak flows (120th highest hour) which has previously been used by ARC. In our opinion, this certainly supports the contention that the Princes Highway Upgrade has led to a reduction in trips using the Sandtrack route.

Notwithstanding, and as per previous assessments, ARC has used the higher (Council forecast) through flows to provide what would be in our opinion an (absolute) worst case assessment. We have also factored these base flows by 1.5% per year (in line with modelling completed by the RMS for the Princes Highway Upgrade) to provide forecast base year flows to 2027. It is again noted that in our opinion (and in the opinion of the RMS) through flows in Bolong Road in 2027 will be significantly lower than 2017 flows.

1.4.2 DF Site Trips

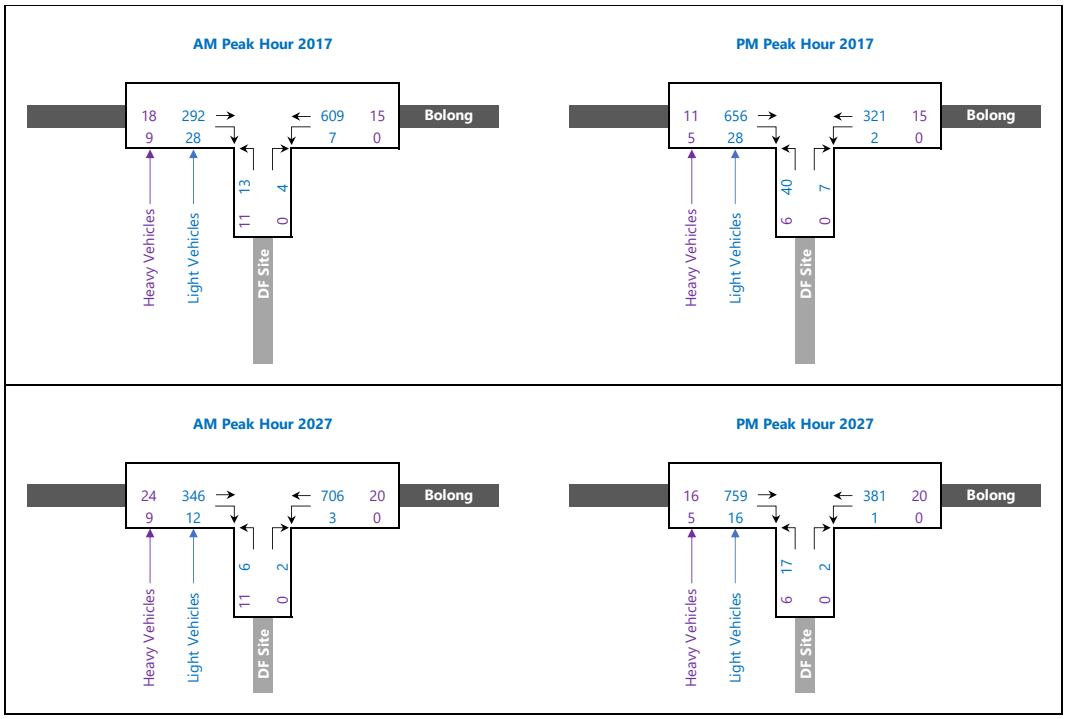
APA 2017 also provides a detailed assignment of trips to the Dairy Site, again based on a period of peak construction activity (Modification 10 and Modification 12 construction), as well as the generation of the Meat Plant. In addition to these trips, the MOD 13 TIA submitted as part of the Modification 13 application identified the generation of a small number of additional trips during the construction works for Modification 13; these trips – being exclusively construction staff trips given that all construction truck trips would be to and from the west of the Modification 13 construction site (within the SS Site) - have also been added to the peak flows determined in APA 2017.

1.4.3 Forecast Flows

With reference to sections above, **Figure 1.4.3** provides a summary of 2017 and 2027 base flows at the intersection. The 2017 flows include the higher (Council forecast) through flows in Bolong Road as discussed above, and all trips associated with approved and proposed Modification construction works.

The 2027 flows include the higher through flows in Bolong Road factored annually, but not the trips associated with approved and proposed Modification construction works, which would be completed many years prior to this forecast year. These flows also include the potential trip generation of the Paper Mill site further to an approval of the proposed Paper Mill Modification.

Figure 1.4.3 2017 and 2027 'Base' Traffic Flows



1.5 Intersection Performance

1.5.1 SIDRA

The operations of the key intersections have been assessed using the SIDRA intersection model (Version 7.0). SIDRA reports key intersection performance indicators as detailed below.

1.5.1.1 Level of Service

Level of Service (LoS) is a basic performance indicator assigned to an intersection based on average delay. For signalised and roundabout intersections, LoS is based on the average delay to all vehicles, while at priority controlled intersections LoS is based on the worst approach delay. The RMS LoS parameters are detailed in **Table 1.5.1.1**.

Table 1.5.1.1 RMS Level of Service Parameters

Level of Service (RMS)	Control delay per vehicle in seconds (d) (including geometric delay)		
	Signals and Roundabouts	Rating	Stop and Give Way Signs
A	d < 14.5	Good	d < 14.5
B	14.5 < d < 28.5	Good with acceptable delay	14.5 < d < 28.5
C	28.5 < d < 42.5	Satisfactory	28.5 < d < 42.5
D	42.5 < d < 56.5	Near capacity	42.5 < d < 56.5
E	56.5 < d < 70.5	At capacity	56.5 < d < 70.5
F	70.5 < d	Over capacity	70.5 < d

Source: SIDRA

1.5.1.2 Degree of Saturation

Degree of Saturation (DoS) is defined as the ratio of demand (arrival) flow to capacity. DoS above 1.0 represent over-saturated conditions (demand flows exceed capacity) and degrees of saturation below 1.0 represent under-saturated conditions (demand flows are below capacity). The capacity of the movement with the highest DoS is reported.

1.5.1.3 Delay

Delay represents the difference between interrupted and uninterrupted travel times through and intersection, and is measured in seconds per vehicle in this assessment. Delays include queued vehicles accelerating and decelerating from/to the intersection stop, as well as general delays to all vehicles travelling through the intersection. With reference to the LoS criteria above, the average intersection delay for signals and roundabouts represents an average of delays to all vehicles on all approaches, while for priority intersections the average delay for the worst approach is used.

1.5.1.4 Queue Length

Queue length (QL) is the number of vehicles waiting at the stop line, and in this assessment is based on the 95th percentile back of queue length. It is measured as the number of queued vehicles per traffic lane at the start of the green period (signals) or queued vehicles in each 'gap acceptance cycle' for roundabouts and priority intersections (i.e. the longest period in which no vehicles from the minor movement can enter the opposing primary flow).

1.5.2 2017 and 2027 Base Intersection Operations

The 2017 and 2027 base operations of the Bolong Road & Dairy Site intersection are reported in **Table 1.5.2**.

Table 1.5.2 2017 and 2027 Base Intersection Operations

Assessment Base Flows Intersection Operations	Level of Service		Average Delay (s)		Minor Approach Average Delay (s)		Degree of Saturation		95%ile Queue Length (m)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Bolong Road & Dairy Site 2017	B	B	0.6	0.5	21.7	24.7	0.325	0.346	2.0	1.1
Bolong Road & Dairy Site 2027	C	C	0.4	0.3	29.6	35.0	0.379	0.403	1.8	0.8

With reference to **Table 1.5.2**, the intersection of Bolong Road & Dairy Site will operate at good Levels of Service, with very moderate average delays and significant spare capacity, under both the 2017 and 2027 base conditions. Of particular interest in the assessment is that queue length for the right turn Dairy Site to Bolong Road is well maintained with the existing queue length available such that vehicle using the turning facility are not impeded by the right turn queue; moreover, it is noted that the worst delay (being the right turn movement Dairy Site to Bolong Road) is experienced by only a handful of vehicles in both the AM and PM peak hours.

1.6 Parking

1.6.1 Available Parking

50 parking spaces are currently provided in a formal staff car park at the front of the Dairy Site. As discussed, additional parking will be accessed via the Dairy Site for Starches staff and construction staff, with the actual car park to be located to the west of the Dairy Site on the existing Services Area. Some 60 parking spaces are to be provided in this new car park.

1.6.2 Parking Demand

Existing demand for the Dairy Site staff car park is estimated at up to 40 spaces, i.e. being the peak staff demand of the Meat Plant, with an assumption that all staff drive to the Dairy Site and that there is no car sharing.

2 The Modification Proposal

2.1 The Proposal

As stated in the **Introduction**, the Modification would provide for the establishment of a CO_2 Plant on the Dairy Site, which would take CO_2 generated through the approved Shoalhaven Starches operations and then process the CO_2 to food grade quality for the food and beverage market. The CO_2 would be extracted directly from the Shoalhaven Starches CO_2 flue, proceed through a small scrubber and blower facility located in the south-eastern part of the Starches Site, and then be pumped to the Plant via an underground pipeline. Once appropriately processed to food grade standard, CO_2 would be transported from the Site to customers in NSW, Victoria, South Australia and Queensland exclusively by truck.

Once operating at capacity, the Plant would reduce CO_2 emissions by some 100 tonnes per day. The Plant will employ 2 full-time staff.

Full details of each of the components of the Modification are provided within the broader Environment Assessment that this assessment accompanies.

2.2 Access

2.2.1 Road Network Access

All access to the Plant will be via the existing intersection of Bolong Road & Dairy Site. Occasional maintenance access to the ancillary scrubber and blower facility would be provided via the existing Ethanol Driveway. Importantly, all trucks accessing the Plant will arrive from and depart to Bolong Road west of the Dairy Site; no truck trips would be generated to Bolong Road east of the Dairy Site.

2.2.2 Internal Staff Vehicle Access

Staff (and visitor) parking will be provided adjacent to the Plant, accessed via the existing Dairy Site staff car park. With reference to **Section 2.5**, an additional 4 spaces will be provided to accommodate the very minimal staff and occasional visitor demands.

2.2.3 Internal Truck Access

Truck access to and from the Plant will be generally via the same truck access paths as currently generated by Meat Plant vehicles. Trucks will enter the Site via Bolong Road and then proceed to the south via the central access aisle (i.e. through the existing buildings) and then turn left towards the access aisle running along the eastern side of the Dairy Site to reach the Plant. Trucks would then turn around the Plant via a new access road (to be constructed to provide for the largest truck accessing the Plant, i.e. a B-Double) and then park on the proposed new weighbridge and be loaded, such that the weighbridge reports the unloaded and loaded weight of the truck. Once trucks are loaded, they will depart via the access aisle that runs along the western side of the Dairy Site to return to Bolong Road.

The ancillary infrastructure on the Starches Site would not generate any trips other than very occasional maintenance vehicles, which as stated would use the existing Ethanol Driveway for access.

The key turn paths to/from Bolong Road and within the Dairy Site are shown in the figures below, noting that past satellite images over which these truck paths have been laid indicate past truck parking areas which are no longer used. Plans detailing the proposed new access road around the Facility are provided within the broader submission which this assessment accompanies.

Figure 2.2.3.1 CO_2 Plant Arrival Truck Movements

Source: Allen Price & Scarratts

Figure 2.2.3.1 CO_2 Plant Departure Truck Movements

Source: Allen Price & Scarratts

2.3 Trip Generation & Distribution

2.3.1 Truck Trip Generation

CO_2 will be transport using B-Doubles (General Access Vehicle standards) and single articulated trucks; these vehicles have a general capacity of 30 tonnes and 20 tonnes respectively. At full operation, it is anticipated that the Plant will generate up to 100 tonnes of CO_2 per day, and require 2 B-Doubles and 2 articulated trucks each day. In turn, the peak daily truck generation of the Plant is estimated at 8 truck trips per day.

It is estimated that no more than 2 truck trips (an arrival trip and a departure trip) would be generated in the commuter peak hours.

2.3.2 Staff Trip Generation

The Plant will employ 2 staff members. As a worst case, these staff would generate 2 arrival trips in the AM peak hour and 2 departure trips in the PM peak hour.

2.3.3 Total Peak Hour Trip Generation

With reference to sections above, the peak generation of the Plant operating at full capacity is estimated at a maximum of 4 vehicles trips in both the AM and PM peak hours.

2.3.4 Trip Distribution

The CO_2 will be distributed to Supagas 'internal customers' across Australia, including customers in Beenleigh, Queensland; Ingleburn NSW; Adelaide, South Australia; and Dandenong, Victoria. Moreover therefore, all truck trips would be generated to/from the Princes Highway west of the DF Site. These trips would be distributed either directly via Bolong Road to/from Princes Highway, or via the alternative heavy vehicle route along Railway Street, Cambewarra Road and Meroo Road to/from Princes Highway. It is noted that any Restricted Access Vehicles (RAV's) are required to utilise the direct Bolong Road to/from Princes Highway route, as the alternative route via Meroo Road does not provide for RAV's; however, there is no expectation at this time that RAV's would be used for the transportation of CO_2.

Heavy vehicle restrictions are in parts of Bolong Road east of the DF Site, and as such no truck trips would be generated to/from Bolong Road east of the DF Site.

With regard to staff trips, these are expected to have the same general assignment as Starches trips, with approximately 25% of trips to/from the east, and 75% of trips to/from the west (though of course noting that the 2 staff will generate either 100% to the east or west, or 50% to each).

2.4 Traffic Impacts

Clearly, it is immediately apparent that the Modification will have little if any impact on the local road network simply as a factor of the very minimal trip generation of the Plant operations. Even if traffic flows in Bolong Road increased annually from the existing peak levels (again noting that the RMS forecasts flows to be significantly reduced), SIDRA modelling indicates that the additional of 3 – 4 vehicle trips in a peak hour would have no impact on the levels of service as reported under 2017 and 2027 base conditions in **Table 1.5.2**, with essentially no change to key indicators such as average delay, degree of saturation or queue lengths.

Similarly, the introduction of an additional 4 trips into the on-site traffic environment would have no impact on existing on-site operations, with the turning facility providing more than enough capacity to accommodate what would effectively be an average of 1 additional vehicle trip every 15 minutes in the peak hours.

2.5 Parking

As previously discussed, the Modification provides for an additional 4 parking spaces which would provide more than enough capacity for staff and the occasional visitor demands. These spaces will be provided immediately adjacent to the Plant (as shown in **Figure 2.2.3.1**) and will be designed to provide compliance with AS 2890.1.

2.6 Construction

It is expected that any Modification approval will condition the provision of a Construction Traffic Management Plan if further (construction management) details are required by Council. At this time, details of the construction requirement are not known, but it is expected that the construction will be significant lesser in scope than recent construction projects across the Starches Sites, and are scheduled to occur after the current approved construction projects (and specifically after the Modification 12 construction works).

Importantly, there is no information to suggest that a short construction period would in any way significantly impact the operation of the Bolong Road & Dairy Site intersection, and there are as previously described existing access paths through the Site which would be used by construction vehicles. It is also noted that there is significant area available in the vicinity of the Plant where construction staff parking could be provided through the construction period.

As previously stated, in addition to the Plant itself, the ancillary infrastructure (the scrubber and blower facility) will be constructed in the south-east corner of the Starches Site. Again, the construction requirements for this ancillary infrastructure, and for the pipeline connection to the Plant, may require further detailing, but there is no information to suggest that this construction could not be completed with minimal impacts, particularly in Bolong Road.

Moreover, construction is expected to adhere to the general requirements of Council as employed during past construction projects, including: -

- Limits on construction hours, and the hours in which construction vehicles can operate.
- Limits on routes to be used through the local road network, specifically in regard to Restricted Access Vehicles (which it is noted are not expected to be required for the construction works) and a restriction of truck movements to/from Bolong Road east of the Site.

3 Conclusions

Following a detailed and independent assessment of the access, traffic and parking characteristics of the proposed Modification, ARC has concluded that the Modification – and specifically the potential impacts of the Plant's operational traffic - would have no significant impacts on the local traffic environment. In summary: -

- The Modification will utilise the existing intersection of Bolong Road & Dairy Site, which, as recently conditioned, will be fully upgraded to provide design compliance with past conditioned upgrades, and additionally include new infrastructure as required further to the recent approval of Modification 12.

- The minimal additional trips generated by the Modification will utilise existing on-site access paths to and from the Plant.

- The Plant will generate only a very minor level of daily and peak hour traffic; these additional trips would have no impact on the operation of key local intersections or on the internal access network within the Dairy Site.

- Parking will be provided that meets the peak staff demand.

- There is no information to suggest that the construction of the Plant and ancillary infrastructure could not be carried out within minimal impact.