Sutton Forest Quarries Pty Ltd

ABN 66 158 999 994

Traffic Impact Assessment

Specialist Consultant Studies Compendium

Volume 1, Part 1

Prepared by

Transport and Urban Planning Pty Limited

February 2018

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Quarries Pty Ltd
ABN 66 158 999 994

Traffic Impact Assessment

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EXECUTIVE SUMMARY

This report documents an assessment of the road transport and traffic impacts of the proposed Sutton Forest Sand Quarry (the “Proposal”) which Sutton Forest Quarries Pty Ltd (the “Applicant”) proposes to develop and operate at 13302 Hume Highway, Sutton Forest (the “Site”). The Site is located south of the Sallys Corner Interchange with the Hume Highway at Sutton Forest in the Southern Highlands.

The Proposal would ultimately to supply up to 860,000 tonnes per annum of sand products to the Sydney Metropolitan, Illawarra, Southern Highlands and Canberra construction markets over the next 30 years and beyond.

The maximum traffic generation of the proposal will be 50 two way product trucks per hour (i.e. 25 in/25 out) which is expected to occur between 4.00am and 6.00am on a weekday.

Daily traffic generation at full production on an average day is estimated to be a total of 234 two way trips (117 in/117 out) consisting of 56 two way light vehicle trips (28 in/28 out) and 178 two way heavy vehicle trips (89 in/89 out). Product sales will represent 83 inbound heavy vehicle trips and 83 outbound heavy vehicle trips.

Daily traffic generation on maximum days will be higher, but these represent a small number of days per year.

As part of the Proposal a new Quarry Interchange will be built approximately 1.7 kilometres south of the Sallys Corner Interchange Overbridge. This will include a Southbound Off Ramp and deceleration lane, a single lane bridge over the Hume Highway and a Northbound On Ramp and acceleration lane.

The Quarry Interchange will provide safe interaction between vehicles using the Hume Highway and trucks generated by the Quarry leaving and joining the Hume Highway.

It is anticipated that further negotiations with the NSW Roads and Maritime Services (RMS), concerning the design of the Quarry Interchange and the development of final design plans will be required prior to final approval of the design by the RMS.

The assessment has found that the traffic impacts on the Hume Highway and the road network from the Proposal during the operational phase will be relatively minor.

The site establishment and construction phase of the Proposal is expected to occur over a period of 12 months. The traffic generation of construction traffic during this period will be well within the capacity of the existing road network. The Applicant’s road works contractors will prepare a Construction Traffic Management Plan (CTMP) for these works in consultation with the RMS and Wingecarribee Shire Council. The CTMP will manage the impacts of the construction traffic on the adjacent public road network during the construction stage, including the construction of the Quarry Interchange and the Quarry Access Road.

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1. INTRODUCTION

1.1 INTRODUCTION

Transport and Urban Planning Pty Ltd was commissioned by RW Corkery & Co Pty Ltd on behalf of Sutton Forest Quarries Pty Ltd (the "Applicant") to prepare a Traffic Impact Report Assessment to accompany an Environmental Impact Statement (EIS) relating to the proposed Sutton Forest Sand Quarry (the "Proposal") on Lot 4 DP 253435, 13302 Hume Highway (the "Site"). The Site is located south of the Sallys Corner Interchange with the Hume Highway at Sutton Forest in the Southern Highlands (refer **Figure 1**).

The Proposal would ultimately to supply up to 860,000 tonnes per annum (tpa) of sand products to the Sydney Metropolitan, Illawarra, Southern Highlands and Canberra construction markets over the next 30 years and beyond.

1.2 AUTHORITY REQUIREMENTS

The Director General's Requirements and issues raised by other NSW Government Agencies for traffic and road transport are summarised in **Table 1.1**, together where each issue is addressed in this report, or elsewhere in the EIS documentation.

1.3 STRUCTURE OF THIS REPORT

This report has been prepared to support the EIS and assess the road transport and traffic impacts associated with the Proposal.

The assessment has been undertaken in accordance with the requirements of the former Roads and Traffic Authority's (now RMS) Guide to Traffic Generating Developments October 2002, addressing those matters identified in the Director General Requirements and by other Government Agencies as identified in **Table 1.1**.

Other technical standards/publications referenced in this assessment include:

- Austroads Guide to Road Design (2008 - 2014) and RMS supplements (various dates from 2009).
- Austroads Guide to Traffic Management (2008 - 2014) and RMS supplements (various dates from 2009).

The remaining sections of this report address the following;

- Section 2 – describes the Proposal;
- Section 3 – examines the existing traffic conditions on the road network;
- Section 4 – evaluates the traffic impacts of the Proposal;
- Section 5 – presents conclusions.

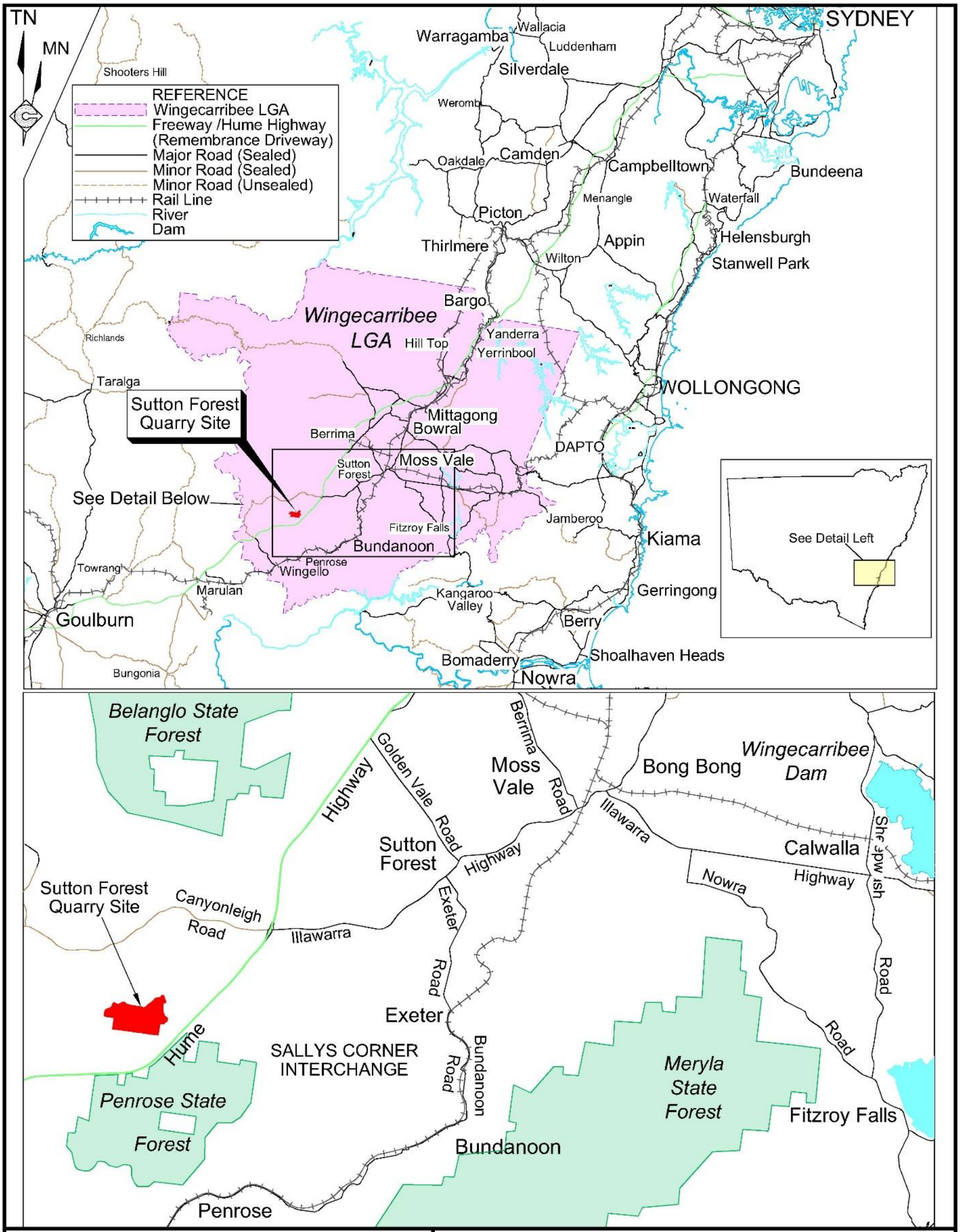

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FIGURE 1
SUTTON FOREST SAND QUARRY

LOCATION

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Table 1.1
Agency Requirements for Traffic and Road Transport

Stakeholder	Requirement/Issue	Comments
DIRECTOR-GENERAL'S REQUIREMENTS		
	(i) accurate predictions of project-related traffic and a detailed assessment of the potential impacts of project-related traffic on the capacity, safety and efficiency of road networks, including modelling to predict queue lengths and intersection performance; and	Section 4
	(ii) a detailed description of the measures that would be implemented to upgrade and/or maintain the capacity, efficiency and safety of effected roads and intersections over the life of the project, including concept plans for any proposed works;	Sections 2.2 and 4.1
ISSUES RAISED BY OTHER GOVERNMENT AGENCIES		
TRAFFIC AND TRANSPORT		
RMS (29/01/14)	i. Describe existing access arrangements and traffic conditions	Section 3
	ii. Identify likely traffic generation rates and distributions associated with the development to determine likely peak hour movements.	Section 4.2
	iii. Estimate expected traffic composition including the percentage of light and heavy vehicles. Identify whether oversized or over mass vehicles will be used.	Sections 4.2
	iv. Identify suitable infrastructure required to ameliorate any traffic and safety impacts associated with the development. Provide concept plans for any works proposed including access arrangements at and around the interchange, including swept path diagrams.	Sections 2.2 and 4.1, And Figure 4
	v. Demonstrate that the Proposal will not compromise the safe operation of the Hume Motorway.	Sections 4.3 and 4.4
	vi. Consider the environmental impacts of any works within the road reserve including traffic and road safety impacts as well as noise, heritage, socio-economic issues and biodiversity.	Sections 4.5 and EIS document
DTIRIS – DRE (07/02/14)	i. Document route(s) used to transport quarry products to market.	Section 2.1
RMS (08/02/2018)	i. A number of issues were raised concerning the concept design of the Quarry Interchange during consultation with the RMS	These issues will be subject to further consultation with the RMS

2. PROPOSAL

2.1 OVERVIEW OF PROPOSAL

A full description of the Proposal is provided in Section 2 of the EIS and **Figure 2** shows the proposed site layout. The main features of the Proposal include;

- Vehicle access to the Site will be from a new grade separated Quarry Interchange with the Hume Highway. The proposed Quarry Interchange is outlined below in Section 2.2 and detailed in Section 4.1 of this report.

- Construction of the Quarry Access Road between the Quarry Operations area and the Quarry Interchange.

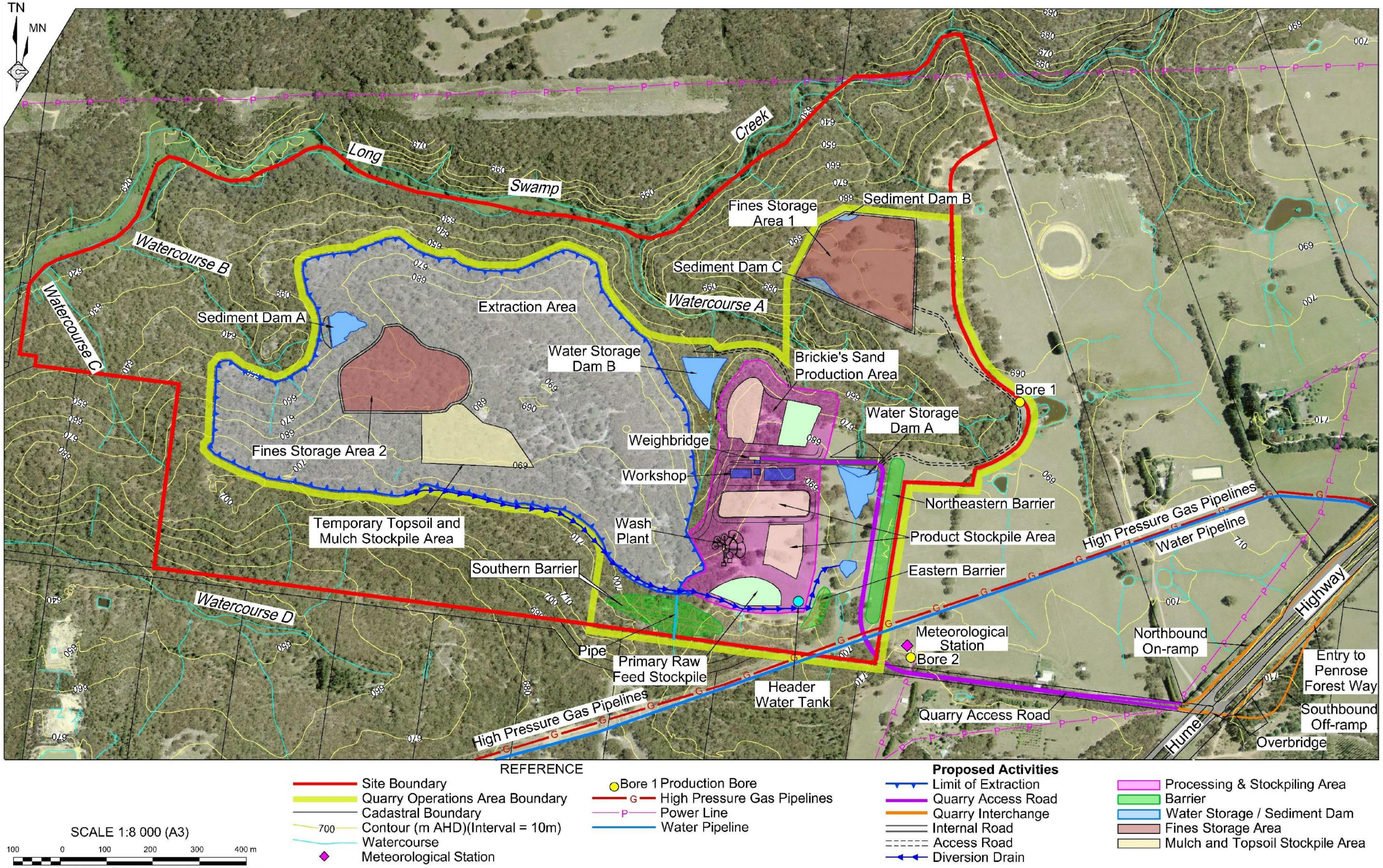
- Following the site establishment and construction phase, which is expected to take 12 months, sand production and sales will commence increasing to approximately 700,000tpa of sand products. During periods of high market demand, the proposed maximum extraction rate of 1,000,000tpa would yield approximately 860,000tpa of sand products.

- The proposed hours of operation throughout the life of the Proposal are shown in **Table 2.1** below. Product despatch (i.e. transportation) is proposed 24 hours, 7 days.

Table 2.1
Proposed Hours of Operation

Activity	**Monday to Friday**	**Saturday**	**Sundays or Public Holidays**
Site Establishment and Construction	6:00am to 10:00pm[1]	6:00am to 10:00pm[1]	Nil (unless required for external roadworks)
Extraction Operations	5:00am to 10:00pm	5:00am to 10:00pm	5:00am to 10:00pm
Processing Operations	24 hours/day	24 hour/day	24 hours/day
Product Despatch	24 hours/day	24 hours/day	24 hours/day
Maintenance	24 hours/day	24 hours/day	24 hours/day

1. Site establishment and construction activities beyond 6:00pm, Monday to Friday and 1:00pm Saturdays would be restricted to those activities that are not audible at surrounding residences.
2. Hours presented include contingency hours and operations of a Sunday or a Public Holiday which would generally be triggered by exceptional circumstances and/or specific customer requirements. These might include key infrastructure projects such as the Western Sydney Airport, West Connect project or other significant projects with high asphalt and concrete demands within a short timeframe.



Cadastral Boundary Source: © NSW Department of Finance and Services
Panorama Avenue Bathurst NSW 2795 www.lpi.nsw.gov.au
Base Photography Source: LPI - 13 December 2013

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FIGURE 2
SUTTON FOREST SAND QUARRY

PROPOSED SITE LAYOUT

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- Total employment of the Quarry is estimated to be:
  i. Site Establishment – 20 full time equivalent positions, plus construction works for the Quarry Interchange.
  ii. Operations – up to 22 persons full time on site at full production. Truck drivers will number between 22 and 30 persons at annual sales of 700,000t and 860,000t respectively.
- The product transport routes are shown in **Figure 3.** All laden trucks would depart via the new Quarry Interchange using the new Northbound On Ramp to the Hume Highway. Those trucks travelling to the Sydney Metropolitan Area would continue along the Hume Highway. Those trucks travelling to the Southern Highlands and Illawarra would use the Interchange at Illawarra Highway. Trucks with destinations to the south (i.e. Goulburn and Canberra) would use the Interchange at the Illawarra Highway to U turn and then re-join the southbound Hume Highway carriageway to travel south.

  Unladen trucks travelling to the Quarry from Sydney, the Illawarra and Southern Highlands would approach the new Quarry Interchange from the north via the new Southbound Off Ramp and cross the Hume Highway via the new overbridge and then along the Quarry Access Road. Unladen trucks travelling to the Quarry from Goulburn or Canberra would continue past the Quarry and use the Interchange at Illawarra Highway to U turn and then proceed south to the new Quarry Interchange.

  For product sales it is anticipated that 19 metre long truck and dog trailers, (tri and quad axle), rigid trucks and some higher mass limit (HML) will be used.

  Product sales (i.e. transportation) is expected to average 95% north to the Sydney Metropolitan market with 5% to the Southern Highlands, Illawarra or south to Goulburn and Canberra.

  As part of the Proposal, sufficient parking on the Site will be provided for light vehicles (i.e. employees and visitors), heavy vehicles and other equipment.

2.2 PROPOSED NEW QUARRY INTERCHANGE AND ACCESS ROAD

Vehicle access to the Site from the Hume Highway will be via the new Quarry Interchange and the Quarry Access Road. The Quarry Interchange and the Quarry Access Road will be constructed during the site establishment phase.

Quarry Access Road

The Quarry Access Road would be constructed from within the Quarry Operations Area advancing in a southerly direction towards the boundary of the Quarry Operations Area before turning east towards the Quarry Interchange and the Hume Highway. All construction would be undertaken by a contractor who would be required to undertake all activities in accordance with the approved Erosion and Sediment Control Plan.

The Quarry Access Road would be constructed with a 7.5m wide sealed pavement with 0.75m wide shoulders. Local widening would be used to accommodate the out-bound and in-bound lane separation and U-turn bay. Whilst all opportunity would be taken to utilise topography and where suitable, cut sections would be utilised to maximise natural attenuation of road traffic noise. Any cut and fill batters would typically be 1:4 (V:H).

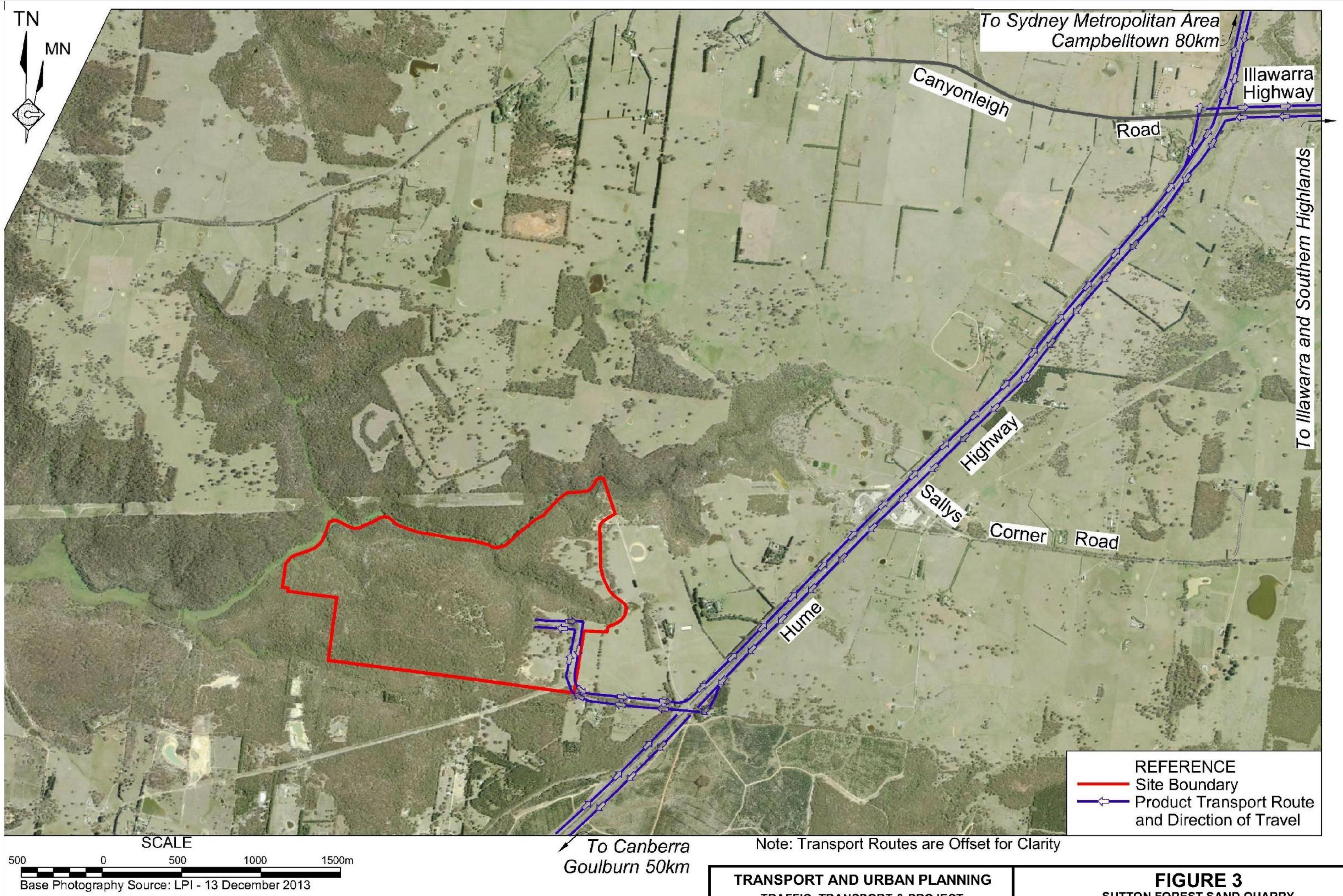
Quarry Interchange

The proposed Quarry Interchange and would involve the construction of the following components.

- The construction of the Southbound Off-Ramp and approach to the overbridge. This would also include modifications to the arrangements for southbound vehicles entering the Kingsbury VC Rest Area and Penrose Forest Way.
- The construction of a single lane, two span overbridge crossing the Hume Highway including piers and abutments.
- Construction of a Northbound On-Ramp to enable trucks exiting the Quarry Access Road to enter the northbound lanes of the Hume Highway at a suitable speed so as to merge safely with northbound traffic using the Highway. This would also include installation of signage on the Hume Highway south of the on-ramp warning of heavy vehicles entering the highway.

Figure 4 shows the conceptual layout of the Quarry Interchange.

The construction activities on the public road network would be undertaken in accordance with a Section 138 permit issued by either Wingecarribee Shire Council or RMS.



Base Photography Source: LPI - 13 December 2013

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FIGURE 3
SUTTON FOREST SAND QUARRY

PROPOSED TRANSPORT ROUTES

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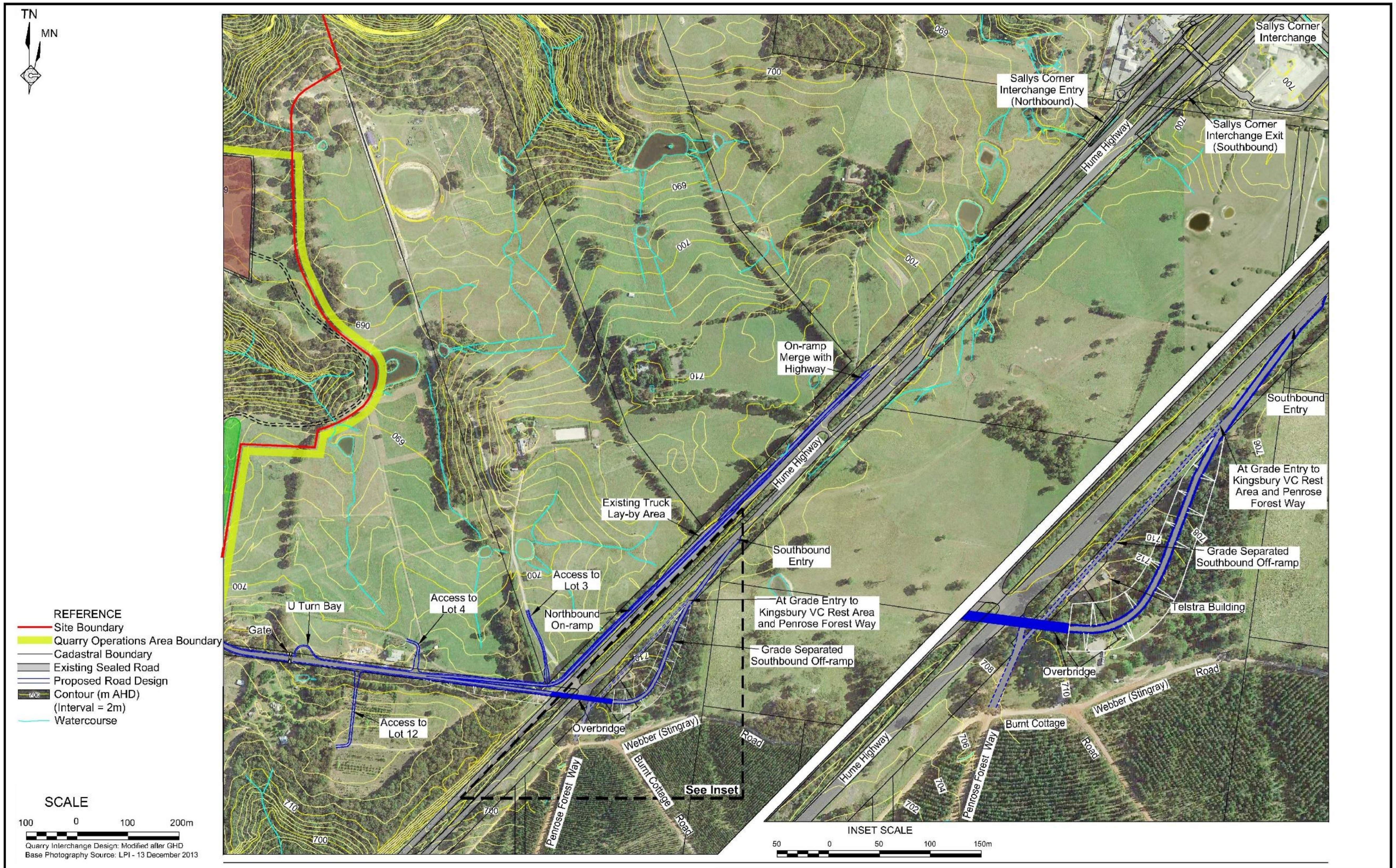

Quarry Interchange Design: Modified after GHD
Base Photography Source: LPI - 13 December 2013

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FIGURE 4
SUTTON FOREST SAND QUARRY
PROPOSED QUARRY INTERCHANGE LAYOUT

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3. EXISTING ROAD NETWORK AND TRAFFIC CONDITIONS

3.1 EXISTING ROAD NETWORK

The proposed Quarry Interchange will be located on the Hume Highway south of Sallys Corner Interchange in the Southern Highlands.

The Hume Highway is a high standard four lane divided road with dual carriageways. The Highway is the main road corridor between Sydney and Melbourne, as well as servicing those towns/communities in the Southern Highlands, south western NSW, and the ACT.

In the Sutton Forest area, the Hume Highway provides two through lanes in each direction plus additional turning and/or diverging/merging lanes at the at grade intersections for vehicles entering or leaving the Highway.

The speed limit on the section of the Hume Highway in the vicinity of the Proposal is 110km/h. A high level of traffic management is provided in the Hume Highway including separate carriageways with a wide median, wide shoulders, delineation and signage.

There are two grade separated interchanges at Sutton Forest which are the Sallys Corner Interchange and the Illawarra Highway Interchange.

An at grade priority controlled intersection is located approximately 1.7km south of Sallys Corner Interchange. This intersection provides vehicle access to Penrose Forest Way and the Kingsbury VC Rest Area.

Truck layover/stops are located just north of the Penrose Forest Way intersection in both the northbound and southbound carriageways. These truck stop areas are not provided with deceleration and acceleration lanes for trucks entering and exiting these areas.

3.2 SALLYS CORNER INTERCHANGE

Sallys Corner Interchange is located approximately 3.2km south of Illawarra Highway.

The Sallys Corner Interchange provides access to Sallys Corner Road as well as to the service centres (i.e. petrol and food outlets) which are located on both sides of the Hume Highway.

The eastern service centre (i.e. located on the eastern side of Hume Highway) incorporates a service station/Coles Express convenience store, the Coolibah Café, truck parking and a McDonalds outlet. The eastern service centre generally accommodates motorists arriving from the north and travelling south.

The western service centre (i.e. located on the western side of Hume Highway), which accommodates northbound motorists, incorporates a service station and Coles Express convenience store, a McDonalds outlet and truck parking.

The speed limit on the Interchange Road Network is 60km/h and parking on the Interchange Road network is prohibited. **Figure 5** shows the Interchange Road Network and traffic controls.

On the eastern side of the Sallys Corner Interchange, a roundabout is provided at the intersection of the Southbound Off Ramp/Sallys Corner Road/Eastern Service Road.

The Southbound Off Ramp and its deceleration lane is 400 metres in length to the roundabout.

The Eastern Service Road is 9.0 metres wide with a median and provides for two way traffic between Sallys Corner Road and its intersection with the Overbridge (over the Hume Highway) and the Southbound On Ramp.

The Southbound On Ramp and acceleration lane is approximately 530 metres long including taper, as measured from the Overbridge intersection.

The Overbridge is 8.0 metres wide between kerbs and provides for two way traffic. A footpath 1.2 metres wide is provided on the northern side of the Overbridge. The Overbridge is subject to priority control at its intersection with the Eastern Service Road and the Western Service Road.

On the western side of the Sallys Corner Interchange a roundabout is provided at the intersection of the Northbound Off Ramp/Western Service Road and the driveway to Lot 2 DP78846 and the truck parking area/service station.

The Northbound Off Ramp includes a deceleration lane and the total length is 380 metres, as measured to the roundabout.

The Western Service Road is 9.0 metres wide with a central median and provides for two way traffic between the roundabout and its intersection with the Overbridge and its intersection with the Northbound On Ramp.

The Northbound On Ramp and the associated acceleration lane is approximately 520 metres long including taper, as measured from the Overbridge intersection.

3.3 ILLAWARRA HIGHWAY INTERCHANGE

The Illawarra Highway Interchange is located to the north of Sallys Corner Road. The Illawarra Highway Interchange, which is constructed to a high standard, provides for vehicles travelling between the Hume Highway and Illawarra Highway (to the east) and Canyonleigh Road (to the west). The Illawarra Highway and Canyonleigh Road are grade separated, with a bridge structure over Hume Highway.

The Illawarra Highway Interchange provides;

- Northbound and Southbound Off and On Ramps with associated deceleration and acceleration lanes from/to the Hume Highway.
- Through and right turn lanes together with a median in the Illawarra Highway at the Northbound and Southbound On Ramps.

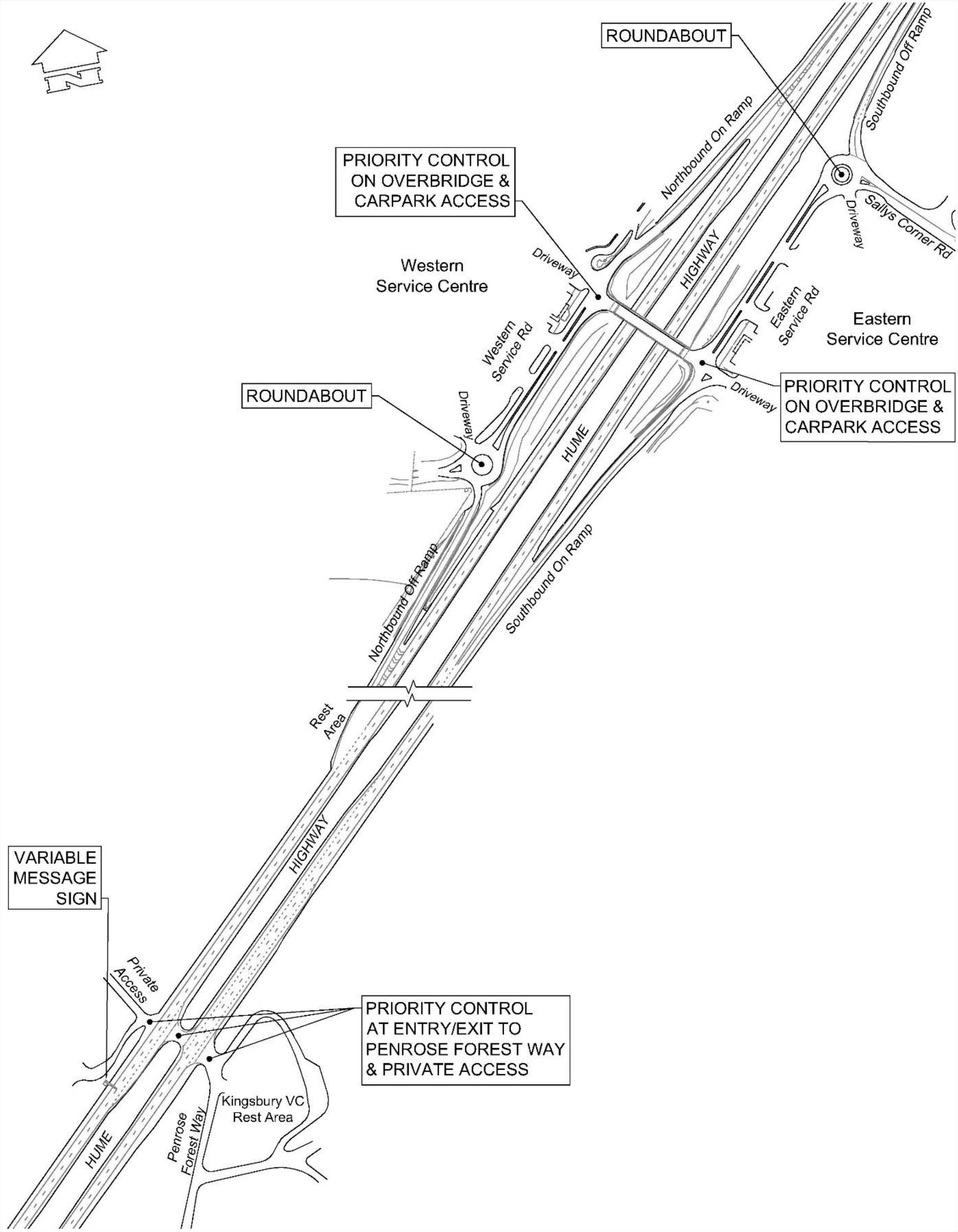

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FIGURE 5

SUTTON FOREST SAND QUARRY

ROAD NETWORK & TRAFFIC CONTROLS

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- The Northbound and Southbound Off Ramps form T junction intersections with the Illawarra Highway. The right turn movements in the Off Ramps are subject to Stop Sign Control at the Illawarra Highway. The left turn movements from the Off Ramps are under Give Way/Priority Control.

The speed limit in the Illawarra Highway and Canyonleigh Road at the Interchange is 100km/h. The sight distance at Interchange intersections is satisfactory and meets Austroad requirements for the posted speed limit.

3.4 HUME HIGHWAY AND PENROSE FOREST WAY INTERSECTION

This intersection, subject to Give way/Priority Control, is located approximately 1.7km south of Sallys Corner Interchange Overbridge and incorporates vehicle access to Penrose Forest Way and the Kingsbury VC Rest Area as well as other access for Penrose State Forest (Webber [Stingray] Road and Burnt Cottage Road).

The traffic management at this intersection (**Figure 5**) includes a short right turn lane in the northbound carriageway of the Hume Highway some 60 metres long with taper and a left turn deceleration lane in the southbound carriageway, approximately 130 metres long, including taper.

South of this intersection, an approximately 240m long auxiliary lane in the southbound carriageway is provided for the right turn into Hanging Rock Road and the private properties which are located on this road on the western side of the Hume Highway.

The speed limit in the Hume Highway at the intersection is 110km/h.

3.5 EXISTING TRAFFIC CONDITIONS ON THE ROAD NETWORK

3.5.1 Existing Traffic Volumes

Traffic counts on the Hume Highway and at the Sallys Corner Interchange road network as well as at the intersection of the Hume Highway/Penrose Forest Way were undertaken as part of this assessment to establish current traffic volumes using the Hume Highway and associated road network.

This included;

- Hourly volume and vehicle classification counts in the Hume Highway at Sallys Corner Interchange which were undertaken on Thursday 12 May 2016 over a 24 hour period;
- Daily volume and vehicle classification counts in the Northbound and Southbound Off Ramps from the Hume Highway to Sallys Corner Interchange which were undertaken in week 12-18 May 2016; and

- Intersection and turning volume counts at the intersections of Sallys Corner Road Interchange which were undertaken on Thursday 12 May 2016 between 4am and 9am, at the following intersections:
  - Eastern Service Road/Overbridge/Southbound On Ramp and Driveway from Service Centre (priority control); NB: an additional count was also undertaken between 2.00pm and 6.00pm on Wednesday 28 February, 2018;
  - Northbound Off Ramp/Western Service Road and Driveway to Service Centre and private access to Lot 2 (roundabout control);
  - Western Service Road/Overbridge and Driveway from Service Centre (priority control).

In addition, an intersection and turning volume count in Hume Highway at Penrose Forest Way was undertaken Tuesday 27 February 2018 between 5.30am and 9.30am and 3.30pm and 6.30pm.

The traffic count locations are shown in **Figure 6.**

Tables 3.1 and **3.2** show the hourly traffic volumes on Thursday 12 May 2016 using the Hume Highway at Sallys Corner Road Interchange as recorded between the Off Ramps and On Ramps for both directions of travel (i.e. does not include vehicles using the Service Centre).

Reference to **Table 3.1** which shows the northbound through volumes in the Hume Highway shows that the peak hour for the northbound direction generally occurs between 4pm and 5pm with a total of 756 vehicles per hour (vph) using the two lanes.

For the weekday AM period, that will coincide with the peak despatch hours and shoulder period from the Proposal which are between 4am and 9am, the total hourly northbound through volumes in the Hume Highway range between 155vph to 440vph. Heavy vehicles (i.e. Austroad Class 3-12) number between 116vph to 135vph during these hours. As would be expected, the kerbside lane carries the higher volumes of the two lanes and most heavy vehicles use the kerbside lane.

Reference to **Table 3.2** which shows the southbound through volumes in the Hume Highway shows that the peak hour for the southbound direction occurs between 3pm and 4pm with a total of 568vph using the two lanes.

For the weekday AM period between 4am and 9am the total hourly southbound through volumes in the Hume Highway range between 106vph and 488vph. Heavy vehicles (Austroad Class 3-12) number between 68vph and 118vph. The kerbside lane carries the higher volumes and the majority of heavy vehicles use the kerbside lane.

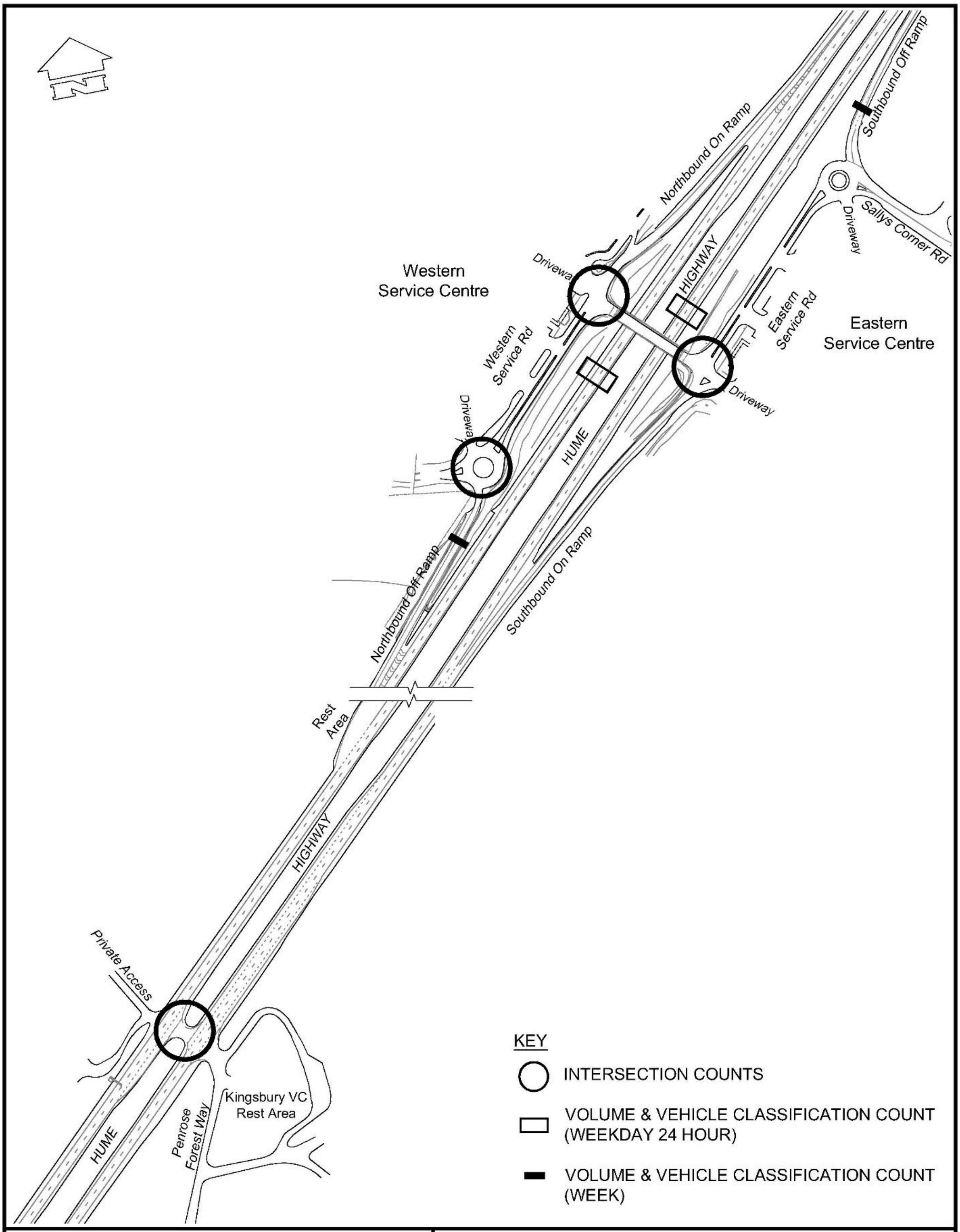

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FIGURE 6
SUTTON FOREST SAND QUARRY

TRAFFIC COUNT LOCATIONS

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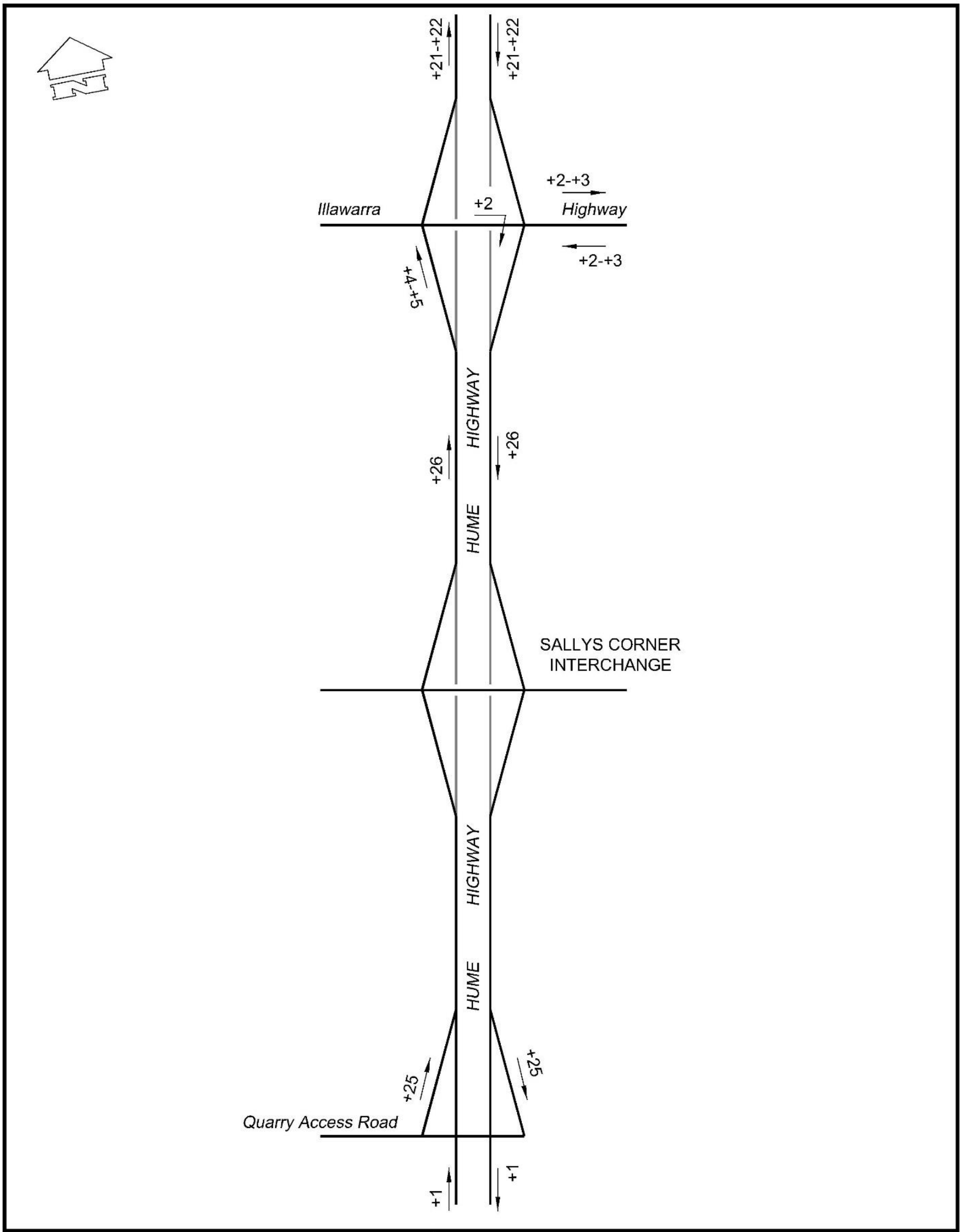

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FIGURE 7
SUTTON FOREST SAND QUARRY
MAXIMUM HOURLY TRUCK VOLUMES FOR PROPOSAL
JOB NO.17194
02/03/18

Table 3.1
Northbound Hourly Through Volumes and Vehicle Classifications using Hume Highway at Sallys Corner Interchange on a Weekday

TIME PERIOD	Northbound Volumes				
	Lane 1 (Kerbside Lane)		Lane 2 (Median Lane)		Total Volumes (both lanes)
	Light[1] Vehicles	Heavy[2] Vehicles	Light[1] Vehicles	Heavy[2] Vehicles	
0:00 - 1:00	0	0	0	0	0
1:00 - 2:00	0	0	0	0	0
2:00 - 3:00	10	54	4	17	85
3:00 - 4:00	23	107	1	3	134
4:00 - 5:00	31	114	7	3	155
5:00 - 6:00	71	112	22	4	209
6:00 - 7:00	136	116	28	8	288
7:00 - 8:00	197	123	44	3	367
8:00 - 9:00	228	131	77	4	440
9:00 - 10:00	248	133	86	6	473
10:00 - 11:00	269	130	125	7	531
11:00 - 12:00	304	138	130	8	580
12:00 - 13:00	307	118	99	6	530
13:00 - 14:00	356	135	138	6	635
14:00 - 15:00	376	114	128	3	621
15:00 - 16:00	426	113	200	4	743
16:00 - 17:00	477	86	192	1	756
17:00 - 18:00	366	103	146	12	627
18:00 - 19:00	269	94	96	5	464
19:00 - 20:00	190	89	62	2	343
20:00 - 21:00	151	93	47	0	291
21:00 - 22:00	88	107	30	3	228
22:00 - 23:00	51	116	31	11	209
23:00 - 0:00	36	109	22	4	171
Total	**4610**	**2435**	**1715**	**120**	**8880**

Source: Traffic Count undertaken Thursday 12 May 2016

[1] *Light vehicles – Austroads 1 and 2 vehicle classification and motorbikes*

[2] *Heavy vehicles – Austroads 3-12 vehicle classification*

Table 3.2
Southbound Hourly Volumes and Vehicle Classifications Using Hume Highway at Sallys Corner Interchange on a Weekday

TIME PERIOD	Southbound Volumes				
	Lane 1 (Kerbside Lane)		Lane 2 (Median Lane)		Total Volumes (both lanes)
	Light[1] Vehicles	Heavy[2] Vehicles	Light[1] Vehicles	Heavy[2] Vehicles	
0:00 - 1:00	0	0	0	0	0
1:00 - 2:00	2	13	0	2	17
2:00 - 3:00	15	36	1	0	52
3:00 - 4:00	19	44	0	0	63
4:00 - 5:00	35	64	3	4	106
5:00 - 6:00	79	94	20	3	196
6:00 - 7:00	188	106	56	3	353
7:00 - 8:00	267	115	103	3	488
8:00 - 9:00	256	110	88	3	457
9:00 - 10:00	288	121	110	7	526
10:00 - 11:00	254	127	90	9	480
11:00 - 12:00	268	140	110	14	532
12:00 - 13:00	236	155	96	12	499
13:00 - 14:00	260	126	94	7	487
14:00 - 15:00	274	141	136	9	560
15:00 - 16:00	322	115	120	11	568
16:00 - 17:00	302	116	130	7	555
17:00 - 18:00	239	135	95	3	472
18:00 - 19:00	152	102	55	6	315
19:00 - 20:00	101	134	48	10	293
20:00 - 21:00	72	121	34	6	233
21:00 - 22:00	54	98	15	4	171
22:00 - 23:00	50	88	4	1	143
23.00 - 0.00	50	87	11	0	148
Total	**3783**	**2388**	**1419**	**124**	**7714**

Source: Traffic Count undertaken Thursday 12 May 2016

[1] *Light vehicles – Austroads 1 and 2 vehicle classification and motorbikes*

[2] *Heavy vehicles – Austroads 3-12 vehicle classification*

Northbound Off Ramp

Tables 3.3 and **3.4** show the hourly volumes and vehicle classifications for vehicles using the Northbound Off Ramp to Sallys Corner Interchange for an average weekday (5 day average) and average day (7 day average).

Hourly traffic volumes on a weekday range between 13vph to 136vph, over the 24 hour period. Heavy vehicles (i.e. Austroad Class 3-12) number between 8vph up to 19vph.

The hourly volumes as averaged over a full week (7 day average, **Table 3.4**) are marginally higher ranging between 11vph to 147vph.

For the weekday AM period between 4am – 9am that will coincide with the peak despatch hours and the shoulder period from the Proposal, hourly volumes using the Northbound Off Ramp range between 22vph and 104vph.

Table 3.3
Hourly Traffic Volumes and Vehicle Classification for Vehicles Using Northbound Off Ramp at Sallys Corner Interchange on Average Weekday (5 day average)

Time Period	Light Vehicles[1]	Small & Medium Heavy Vehicles[2]	Large Heavy Vehicles[3]	Unclassified	Total Volume
0:00-1:00	6	2	9	0	16
1:00-2:00	4	2	10	1	16
2:00-3:00	4	1	7	1	13
3:00-4:00	6	3	13	1	23
4:00-5:00	10	2	9	1	22
5:00-6:00	35	4	9	1	48
6:00-7:00	71	5	13	1	90
7:00-8:00	82	8	11	0	101
8:00-9:00	89	5	10	0	104
9:00-10:00	88	7	10	0	106
10:00-11:00	102	4	14	1	121
11:00-12:00	106	5	9	1	121
12:00-13:00	99	6	12	1	116
13:00-14:00	106	9	9	0	123
14:00-15:00	99	9	7	1	117
15:00-16:00	122	7	5	0	134
16:00-17:00	120	8	7	0	136
17:00-18:00	120	4	6	0	132
18:00-19:00	89	4	10	1	104
19:00-20:00	65	3	7	1	77
20:00-21:00	40	2	7	0	49
21:00-22:00	18	3	11	1	32
22:00-23:00	15	1	10	1	27
23:00-0:00	13	1	7	1	23
Total	**1511**	**105**	**221**	**16**	**1853**
%	81.6%	5.6%	11.9%	0.9%	100%

Source: Traffic Counts undertaken 12-18 May 2016.

[1] *Light vehicles – Austroads 1 and 2 vehicle classification and motorbikes*
[2] *Small to Medium Heavy Vehicles – Austroad 3, 4, & 5 vehicle classification*
[3] *Large Heavy vehicles – Austroads 6-12 vehicle classification*

Table 3.4
Hourly Traffic Volumes and Vehicle Classifications for Vehicles Using Northbound Off Ramp at Sallys Corner Interchange on Average Day (7 day average)

Time Period	Light Vehicles[1]	Small & Medium Heavy Vehicles[2]	Large Heavy Vehicles[3]	Unclassified	Total Volume
0:00-1:00	7	2	7	0	16
1:00-2:00	4	2	7	1	14
2:00-3:00	4	1	6	1	11
3:00-4:00	6	2	10	1	19
4:00-5:00	10	1	8	0	20
5:00-6:00	31	4	7	1	42
6:00-7:00	64	4	10	1	79
7:00-8:00	86	6	9	0	101
8:00-9:00	98	4	8	0	110
9:00-10:00	104	7	8	0	119
10:00-11:00	122	3	11	0	138
11:00-12:00	126	5	7	0	138
12:00-13:00	118	4	9	0	133
13:00-14:00	122	7	7	0	136
14:00-15:00	126	8	6	1	141
15:00-16:00	136	5	5	0	147
16:00-17:00	135	7	5	0	147
17:00-18:00	132	4	6	0	143
18:00-19:00	94	4	8	1	106
19:00-20:00	68	3	7	1	78
20:00-21:00	44	1	6	1	52
21:00-22:00	21	2	10	1	34
22:00-23:00	17	0	10	1	29
23:00-0:00	13	1	7	1	22
Total	**1689**	**88**	**183**	**14**	**1973**
%	85.6%	4.4%	9.3%	0.7%	100%

Source: Traffic Counts undertaken 12-18 May 2016.

[1] *Light vehicles – Austroads 1 and 2 vehicle classification and motorbikes*
[2] *Small to Medium Heavy Vehicles – Austroad 3, 4, & 5 vehicle classification*
[3] *Large Heavy vehicles – Austroads 6-12 vehicle classification*

<ins>Southbound Off Ramp</ins>

Whilst not critical to the transport of quarry product, **Tables 3.5** and **3.6** show the hourly volumes and vehicle classifications for vehicles using the Southbound Off Ramp to Sallys Corner Interchange for an average weekday (5 day average) and average day (7 day average) which have been included for completeness.

Hourly traffic volumes on a weekday range between 13vph to 213vph, over the 24 hour period. Heavy vehicles (i.e. Austroad Class 3-12) number between 5vph up to 27vph.

The hourly volumes as averaged over a full week (7 day average, **Table 3.6**) are similar to the 5 day average and range between 12vph to 207vph.

For the weekday AM period between 4am – 9am that will coincide with the peak despatch hours and therefore would subsequently represent the peak and shoulder periods in which unladen vehicles would be travelling to the Proposal, hourly volumes using the Southbound Off Ramp range between 30vph and 213vph.

Table 3.5
Hourly Traffic Volumes and Vehicle Classifications for Vehicles Using Southbound Off Ramp at Sallys Corner Interchange on Average Weekday (5 day average)

Time Period	Light Vehicles[1]	Small & Medium Heavy Vehicles[2]	Large Heavy Vehicles[3]	Unclassified	Total Volume
0:00-1:00	13	2	4	0	19
1:00-2:00	10	2	3	0	15
2:00-3:00	6	1	5	0	13
3:00-4:00	11	1	5	0	17
4:00-5:00	21	2	6	0	30
5:00-6:00	56	11	9	0	75
6:00-7:00	121	12	10	0	143
7:00-8:00	191	13	9	1	213
8:00-9:00	172	13	14	0	199
9:00-10:00	148	15	11	0	175
10:00-11:00	147	10	14	0	171
11:00-12:00	142	8	16	0	167
12:00-13:00	154	5	18	0	177
13:00-14:00	146	9	16	1	173
14:00-15:00	149	7	17	0	173
15:00-16:00	157	5	15	0	178
16:00-17:00	141	5	15	1	161
17:00-18:00	136	5	16	0	158
18:00-19:00	126	5	12	0	144
19:00-20:00	102	3	13	1	119
20:00-21:00	76	3	10	1	90
21:00-22:00	46	2	7	0	55
22:00-23:00	33	3	7	0	43
23:00-0:00	24	2	7	0	33
Total	**2329**	**141**	**259**	**8**	**2738**
%	85.1%	5.1%	9.5%	0.3%	100%

Source: Traffic Counts undertaken 12-18 May 2016.

[1] *Light vehicles – Austroads 1 and 2 vehicle classification and motorbikes*
[2] *Small to Medium Heavy Vehicles – Austroad 3, 4, & 5 vehicle classification*
[3] *Large Heavy vehicles – Austroads 6-12 vehicle classification*

Table 3.6
Hourly Traffic Volumes and Vehicle Classifications for Vehicles Using Southbound Off Ramp at Sallys Corner Interchange on Average Day (7 day average)

Time Period	Light Vehicles[1]	Small & Medium Heavy Vehicles[2]	Large Heavy Vehicles[3]	Unclassified	Total Volume
0:00-1:00	15	2	3	0	20
1:00-2:00	11	1	2	0	15
2:00-3:00	7	1	4	0	12
3:00-4:00	11	2	4	0	16
4:00-5:00	19	2	5	0	26
5:00-6:00	49	8	7	0	64
6:00-7:00	110	10	8	0	127
7:00-8:00	167	10	7	0	185
8:00-9:00	171	11	11	0	192
9:00-10:00	171	13	9	0	194
10:00-11:00	176	8	12	0	196
11:00-12:00	181	7	13	0	200
12:00-13:00	185	5	14	0	204
13:00-14:00	178	8	12	1	200
14:00-15:00	185	6	13	0	205
15:00-16:00	190	4	12	0	207
16:00-17:00	167	4	11	0	183
17:00-18:00	165	4	13	0	182
18:00-19:00	145	5	9	0	160
19:00-20:00	110	3	10	1	123
20:00-21:00	76	2	8	0	87
21:00-22:00	51	2	5	0	59
22:00-23:00	35	3	6	0	43
23:00-0:00	24	2	5	0	31
Total	**2599**	**122**	**204**	**6**	**2930**
%	88.7%	4.1%	7.0%	0.2%	100%

Source: Traffic Counts undertaken 12-18 May 2016.

[1] *Light vehicles – Austroads 1 and 2 vehicle classification and motorbikes*
[2] *Small to Medium Heavy Vehicles – Austroad 3, 4, & 5 vehicle classification*
[3] *Large Heavy vehicles – Austroads 6-12 vehicle classification*

Sallys Corner Interchange Intersections

The weekday hourly volumes using the Sallys Corner Interchange intersections between 4am and 9am are shown in **Appendix 1** for each one hour period (**Figures A – E**).

The intersections on the eastern side of the Sallys Corner Interchange, which generally accommodates southbound vehicle movements entering from the Hume Highway as well as Sallys Corner Road has the higher traffic volumes, as compared to the intersections on the western side of the Sallys Corner Interchange, which accommodates the northbound vehicle movements in the Hume Highway.

The overall traffic volumes using the Sallys Corner Interchange intersections between 4am and 6am are very low and increase between 6am to 9am.

All of the Sallys Corner Interchange intersections operate with relatively low through and turning volumes and the majority of the vehicles are cars or light vehicles.

Observations undertaken at the Sallys Corner Interchange intersections during the weekday AM period indicate that they operate at a very good level of service (equivalent to Level of Service A operation) with low vehicle delays for all movements. RMS Guidelines indicate that a Level of Service D or better (i.e. A, B, C or D) represents a satisfactory operation.

Hume Highway/Penrose Forest Way Intersection

As noted in Section 3.4, this intersection provides access to Penrose Forest Way (and other roads) and also the Kingsbury VC Rest Area.

Traffic volumes using the Kingsbury VC Rest Area and Penrose Forest Way are very small during the AM and PM periods on a weekday ranging between 1vph to 8vph (refer **Appendix 2**). Nearly all of these vehicles were southbound vehicles in the Hume Highway which turned left into Penrose Forest Way and the Kingsbury VC Rest Area. **Table 3.7** shows the traffic volumes turning into and out of Penrose Forest Way/Kingsbury VC Rest Area during the periods 6.30am to 9.30am and 3.30pm to 6.30pm on a weekday (Tuesday 27 February 2018).

Table 3.7
Weekly AM and PM Traffic Volumes Turning into or out of Penrose Forest Way/Kingsbury VC Rest Area at Hume Highway

Time Period	Total Hume Highway Southbound Left turn into Penrose Forest Way/Rest Area	Total Hume Highway Northbound Right turn into Penrose Forest Way/Rest Area	Total Penrose Forest Way/Rest Area Left turn into Hume Highway	Total Penrose Forest Way/Rest Area Right turn into Hume Highway
AM				
5.30-6:00	2	0	0	0
6:00-7.00	1	0	0	3
7:00-8:00	8	0	5	1
8:00-9:00	7	0	3	2
9:00-9:30	4	0	1	1
PM				
15:30-16:00	4	0	2	0
16:00-17:00	7	1	3	12
17:00-18:00	7	1	4	0
18:00-18:30	6	0	1	1

Source: Traffic Counts Tuesday 27 February 2018

3.6 ROAD CRASHES

Road crash statistics for the 5 year period between 1 July 2010 and 30 June 2015 for the section of Hume Highway 1km north and south of Sallys Corner Interchange and including the Interchange were obtained from the RMS.

During this period there were a total of 18 crashes including, 1 fatal crash, 7 injury crashes (either minor or uncategorised injury) and 10 non casualty crashes.

Nine (9) of the crashes occurred within the Sallys Corner Interchange road network. Five (5) of the crashes occurred at/adjacent to the roundabout intersection at the end of Northbound Off Ramp, one (1) of which was an injury crash and four (4) non-casualty crashes. All of these were single vehicle crashes, with the vehicles crashing into objects on the side of the road or within the roundabout. Speed was a contributing factor in these crashes.

There was one (1) non-casualty crash at the intersection of the Overbridge/Western Side Interchange Road, which was a right angle type crash.

There were three (3) crashes at/near the roundabout at the intersection of the Southbound Off Ramp/Sallys Corner Road, two (2) of which were injury crashes. Two (2) of these crashes were single vehicle crashes involving a southbound vehicle running off the road with speed and fatigue identified as contributing factors. The other crash occurred just east of the roundabout in Sallys Corner Road and was an injury crash involving two vehicles travelling in unknown directions.

The fatal crash occurred in the Hume Highway 1km south of Sallys Corner Interchange in September 2010 and involved a northbound vehicle running off the road and rolling over. Speed was a contributing factor in this single vehicle crash.

In the northbound direction in the Hume Highway there were two (2) other single vehicle, run off the road crashes south of the Sallys Corner Interchange, both of which were non-casualty crashes. North of the Sallys Corner Interchange there was one (1) single vehicle, run off the road crash (injury crash) and one (1) rear end crash (injury crash).

In the southbound direction in the Hume Highway, north of the Sallys Corner Interchange, there was a lane change crash which was a non-injury crash. South of the Sallys Corner Interchange there were three (3) crashes, two (2) of which were injury crashes. These included two (2) rear end crashes and one (1) lane change crash.

4. ASSESSMENT OF TRAFFIC IMPACTS OF PROPOSAL

4.1 PROPOSED IMPROVEMENT WORKS

As noted in Section 2.2 the Proposal includes a new Quarry Interchange in the Hume Highway located approximately 1.7kms south of the Sallys Corner Interchange Overpass Bridge, near the Penrose Forest Way/Kingsbury VC Rest Area Intersection.

The Quarry Interchange includes:

- A Southbound Off Ramp and deceleration lane;
- A single lane bridge over the Hume Highway for southbound vehicles to access the proposed Quarry Access Road; and
- A Northbound On Ramp and acceleration lane in the Hume Highway which connects to the proposed Quarry Access Road.

The preliminary conceptual design is shown in **Figure 4**.

The Quarry Interchange will link to the Quarry Access Road which will provide vehicle access to the Quarry.

4.2 TRAFFIC GENERATION IN OPERATIONAL STAGE

The Applicant anticipates that at least 70% of the sand products would ultimately be despatched from the Site using 19m truck and dog trailers (4-axle, 37 tonne capacity). A further 25% would be transported using 19m truck and dog trailers (3-axle, 33 tonne capacity) with the remaining 5% of product being transported by either rigid trucks (12 to 18 tonne capacity) or higher mass limit (HML) vehicles (e.g. 26.5m B-Double). For the purposes of calculating daily truck movements, an average of 35t has been used and occurring on an average of 300 days per year.

Table 4.1 presents the forecast daily truck traffic generation arising from the despatch of sand products for average and maximum scenarios i.e. for the average and maximum sales. In addition to the truck movements presented in both tables, the Applicant anticipates that an additional 12 truck movements per day (6 return trips) would be required for the delivery of consumables (e.g. fuel) and maintenance equipment to facilitate production.

Table 4.1
Forecast Daily Truck Traffic Generation from Product Sales*

Traffic Scenario	**Product Sales**	
	700 000 tpa	**860 000 tpa**
Average	67 laden trucks	83 laden trucks
	134 truck movements	166 truck movements
Maximum	134 laden trucks	166 laden trucks
	268 truck movements	332 truck movements
* Note: An additional 12 truck movements per day could occur arising from the delivery of quarry consumables and for maintenance activities.		

The majority of truck movements would occur during periods aimed at avoiding the Sydney Metropolitan Area peak traffic periods. From an hourly perspective, it is envisaged the busiest period would be between 4:00am and 6:00am with up to 50 truck movements (25 loads) per hour when the maximum production level of 860 000tpa is achieved. It is recognised that, throughout the latter stages of the day, the number of trucks would have generally lesser numbers departing in line with industry practice. However, it is proposed that the maximum rate of laden trucks departing the Site would be kept at 25 per hour throughout any hour of the day, to account for large scale local deliveries.

The Applicant proposes to import VENM/ENM for use as backfill to create the final landform within the extraction area. All VENM/ENM would be imported in trucks travelling to the Site to collect a load of sand products. The practice of backloading would therefore not result in any additional truck movements for the Proposal.

Light vehicle trips (i.e. Austroads Class 1 and 2 vehicles) are expected to number 56 two way trips per day (i.e. 28 in/28 out).

4.3 TRAFFIC IMPACTS IN OPERATIONAL STAGE

Impact on Northbound Traffic

The largest impact associated with the Proposal will occur between 4.00am – 6.00am when up to 25 trucks per hour will be despatched from the Site and join the Hume Highway via the Quarry Interchange to travel north.

At other times of the day these truck numbers are likely to be less than 25, however the maximum hourly volume of 25 per hour would be kept at this rate to account for large local deliveries.

All vehicle and trucks leaving the Site will use the Northbound On Ramp and acceleration lane of the Quarry Interchange to merge into the northbound kerbside lane, with existing traffic using the Hume Highway. Each of the Hume Highway northbound lanes has a theoretical capacity of 1,800vph, with a total capacity for the highway of 3,600vph.

Table 4.2 shows the weekday hourly traffic volumes travelling northbound in the Hume Highway for the 4.00 to 9.00 (AM) and 14.00 to 18.00 (PM) periods.

Table 4.2
Northbound Weekday Hourly Through Volumes Using Hume Highway South of Sallys Corner Interchange

Time Period	Lane 1 (Kerbside Lane)	Lane 2 (Median Lane)	Total
AM			
4.00 – 5.00	167 (22)	10	177
5.00 – 6.00	231 (48)	26	257
6.00 – 7.00	342 (90)	36	378
7.00 – 8.00	421 (101)	47	468
8.00 – 9.00	463 (104)	81	544
PM			
14.00 – 15.00	607 (117)	131	738
15.00 – 16.00	673 (134)	204	877
16.00 – 17.00	699 (136)	193	892
17.00 – 18.00	601 (132)	158	759

Where: 167 total volume in lane
(22) number of northbound vehicles that will exit at Sallys Corner

During the AM period when the truck numbers generated by the Proposal are higher, (i.e. 25 trucks per hour) the traffic volumes in both lanes of the Hume Highway are lower, ranging between 177vph to 544vph.

During the PM period, the northbound traffic volumes in both lanes of the Hume Highway are higher, ranging between 738vph to 892vph.

The 25 trucks per hour generated by the Proposal will easily merge with the northbound highway traffic. While the northbound kerbside lane carries the higher traffic volumes, there is a large amount of spare capacity in both the kerbside and median lanes, to easily accommodate the merging product transport vehicles from the Proposal.

Northbound vehicles in the Hume Highway exiting at Sallys Corner Interchange, which would be using the northbound kerbside lane, number between 22vph to 104vph in the AM period (refer **Table 3.3**) and between 117vph to 136vph in the PM period. (refer **Table 3.3**)

Impact on Southbound Traffic

All trucks and other vehicles returning to the Site will use the Southbound Off Ramp at the Quarry Interchange. These vehicles will typically travel in the kerbside lane in the Hume Highway and diverge into the Southbound Off Ramp of the Quarry Interchange, south of the Sallys Corner Interchange.

Table 4.3 shows the weekday hourly traffic volumes travelling southbound in the Hume Highway for the 4.00 to 9.00 (AM) period and the 14.00 to 18.00 (PM) period.

During the AM period total southbound traffic volumes numbered between 135vph to 654vph in both lanes of the Hume Highway.

During the PM period, total southbound traffic volumes in the Hume Highway numbered between 605vph and 740vph in both lanes of the Hume Highway.

Table 4.3
Southbound Weekday Hourly Through Volumes Using Hume Highway South of Sallys Corner Interchange

Time Period	Lane 1 (Kerbside Lane)	Lane 2 (Median Lane)	Total
AM			
4.00 – 5.00	128 (29)	7	135
5.00 – 6.00	219 (46)	23	242
6.00 – 7.00	405 (111)	59	464
7.00 – 8.00	548 (166)	106	654
8.00 – 9.00	555 (189)	91	646
PM			
14.00 – 15.00	572 (157)	145	717
15.00 – 16.00	609 (172)	131	740
16.00 – 17.00	588 (170)	137	725
17.00 – 18.00	507 (133)	98	605

Where: 128 total volume in lane
(29) number of southbound vehicles that will exit at Sallys Corner

As noted previously, the theoretical capacity of each of the Hume Highway lanes is 1,800vph, providing a total capacity of 3,600vph for the southbound movement.

Subsequently, the additional 25 trucks per hour returning to the Site will do so using the kerbside lane where there is sufficient spare capacity to accommodate the Proposal generated traffic.

The diverge movement by vehicles into the Southbound Off Ramp to the Quarry Interchange will not materially affect southbound vehicles joining the Hume Highway from the Sallys Corner Interchange which currently number between 20vph to 189vph in the AM period and 133vph to 172vph in the PM period.

Impacts on the Hume Highway

As noted from Section 4.2, the estimated daily traffic operation for the Proposal, at full production, will be as follows.

Average Day

(i) 28 inbound/28 outbound light vehicle trips;

(ii) 83 inbound product sales trucks/83 outbound product sales trucks;

(iii) 6 inbound delivery/maintenance trucks/6 outbound delivery/maintenance trucks.

Maximum Day

(i) 28 inbound/28 outbound light vehicle trips;

(ii) 166 inbound product sales trucks/166 outbound product sales trucks;

(iii) 6 inbound delivery/maintenance trucks/6 outbound delivery/maintenance trucks.

Using **Tables 3.1** and **3.3**, the 2016 northbound Hume Highway weekday volumes at Sallys Corner Interchange are calculated to be a total of 10,733vpd with 2,881 of these vehicles classified as heavy vehicles.

The 2016 southbound Hume Highway weekday volumes, at Sallys Corner Interchange are calculated to be a total of 10,452vpd with 2,912 of these vehicles, classified as heavy vehicles (refer **Tables 3.2** and **3.5**).

Based on the 2016 traffic volumes, the increase in traffic associated with the Proposal on an average day is calculated as representing 1.1% of the total weekday traffic travelling both north and south on the Hume Highway, at Sallys Corner Interchange. The increase in the number of heavy vehicles due to the Proposal on an average day is calculated to be in the order of 3.1% in the southbound and northbound directions respectively.

These increases are relatively small and will decrease proportionally with the future traffic growth in the Hume Highway.

Future Impacts

The projected future 2029 northbound traffic volumes using the Hume Highway during the weekday AM and PM periods are based on a 2.5% lineal increase per year and shown in **Table 4.4**

As previously noted, the two northbound lanes of the Hume Highway have a theoretical lane capacity of 1,800vph each, with a total northbound carriageway capacity of 3,600vph.

The projected 2029 traffic volumes using the kerbside lane, which will accommodate the merge movement of Proposal generated traffic from the Northbound On Ramp of the Quarry Interchange, will range from 222vph to 614vph in the AM period and 797vph-892vph in the PM period. Therefore, projected traffic volumes will remain well below the theoretical capacity of the kerbside lane, of 1,800vph.

Subsequently, the northbound kerbside lane in the Hume Highway has sufficient capacity to accommodate the merging traffic from the Northbound Quarry On Ramp, which at a maximum, is 25 trucks per hour.

In addition, the northbound median lane of the Hume Highway, which is estimated to carry relatively low traffic volumes, will also have considerable spare capacity. Spare capacity in this lane will allow northbound through traffic using the kerbside lane of the Hume Highway to change lanes, should a slower vehicle such as a truck joining the highway via the Quarry Interchange Northbound On Ramp be encountered.

Table 4.4

Projected Future 2029 Northbound Weekday Hourly Through Volumes Using Hume Highway South of Sallys Corner Interchange

Time Period	Lane 1 (Kerbside Lane)	Lane 2 (Median Lane)	Total
AM			
4.00 – 5.00	222 (29)	14	236
5.00 – 6.00	306 (64)	35	341
6.00 – 7.00	453 (119)	48	501
7.00 – 8.00	558 (134)	63	621
8.00 – 9.00	614 (138)	108	722
PM			
14.00 – 15.00	805 (155)	174	979
15.00 – 16.00	892 (178)	271	1163
16.00 – 17.00	926 (180)	256	1182
17.00 – 18.00	797 (175)	210	1007

Where: 167 total volume in lane
(22) number of northbound vehicles that will exit at Sallys Corner

Table 4.5 shows the future 2029 projected future southbound vehicles using the Hume Highway south of Sallys Corner during the weekday AM and PM period based on a lineal average increase of 2.5% per year.

Reference to **Table 4.5** shows that the southbound kerbside lane in the Hume Highway, which is the lane that vehicles travelling to the Site will be occupying, has sufficient capacity to accommodate the maximum number of unladen trucks returning to the Site, which will be 25 trucks per hour. Maximum hourly traffic volumes from the southbound kerbside lane of the Hume Highway are estimated to be 170vph to 736vph in the AM period and 672vph to 807vph in the PM period which are well below the theoretical 1,800vph capacity of this lane.

In concluding, the impacts on the Hume Highway from Proposal generated traffic are considered to be relatively minor and are not expected to result in the deterioration in current or future service safety levels in the Hume Highway in either direction of travel.

Table 4.5

Projected Future 2029 Southbound Weekday Hourly Through Volumes Using Hume Highway South of Sallys Corner Interchange

Time Period	Lane 1 (Kerbside Lane)	Lane 2 (Median Lane)	Total
AM			
4.00 – 5.00	170 (39)	10	180
5.00 – 6.00	291 (61)	31	322
6.00 – 7.00	537 (147)	79	616
7.00 – 8.00	726 (220)	141	867
8.00 – 9.00	736 (251)	121	857
PM			
14.00 – 15.00	758 (208)	193	951
15.00 – 16.00	807 (228)	174	981
16.00 – 17.00	779 (225)	182	961
17.00 – 18.00	672 (176)	130	302

Where: 167 total volume in lane
(22) number of northbound vehicles that will exit at Sallys Corner

4.4 GEOMETRIC CONSIDERATIONS OF THE PROPOSED QUARRY INTERCHANGE

The concept design for the Quarry Interchange has been designed in accordance with Austroads Guidelines and the RMS Road Design Guide.

Northbound On Ramp

The Northbound On Ramp to the Hume Highway and acceleration lane links to the Quarry Access Road. The design entry speed to the On Ramp from the Quarry Access Road is 35km/h and the On Ramp acceleration lane is 890 metres long. This distance would allow sufficient length for trucks and other vehicles to accelerate to a speed to allow a safe merge with other traffic using the northbound kerbside lane in the Hume Highway.

Sight lines of trucks using the acceleration lane for other northbound vehicles in the Hume Highway will be good and vehicles travelling at higher speeds in the kerbside lane will be able to easily change lanes given the low usage of the adjoining median lane (see **Table 4.2**).

The distance between the end of the Quarry Interchange Northbound On Ramp and the start of the Northbound Off Ramp at the Sallys Corner Interchange is 560 metres. For vehicles travelling at 100km/h this is the equivalent of 20 seconds of travel. A speed of 100km/h or less would be the desirable speed for exiting vehicles at Sallys Corner Interchange on the approach to the Off Ramp.

As noted in **Table 4.2**, vehicles using the Northbound Off Ramp at the Sallys Corner Interchange number between 22vph to 104vph in the 4.00am to 9.00am period and 117vph to 136vph in the 2.00pm to 6.00pm period on a weekday.

These traffic numbers are relatively low and would be spaced out over the one hour period, averaging one vehicle every 35 seconds in the AM period and one vehicle every 26 seconds in the PM period.

The construction of the Quarry Interchange Northbound On Ramp will require the relocation of the existing truck layover stop in the Highway and would be subject to further negotiations with the RMS.

Southbound Off Ramp and Bridge Over the Hume Highway

The Quarry Interchange Southbound Off Ramp is 400 metres long between the start of the Quarry Interchange Bridge and the diverge point from the Hume Highway. It will also incorporate the southbound vehicle access to the Kingsbury VC Rest Area and Penrose Forest Way as part of its design.

The start of the diverge for the Off Ramp is located 1.1km from the end of the acceleration lane of Southbound On Ramp from the Sallys Corner Interchange and approximately 350 metres south of the southbound truck layout stop in the Hume Highway. For a vehicle travelling at 110km/h, the diverge point is 36 seconds travel time from the end of the acceleration lane of the Southbound On Ramp from the Sallys Corner Interchange.

The diverge movement by trucks using the Quarry Interchange Southbound Off Ramp should not affect southbound vehicles using the southbound kerbside lane in the Hume Highway.

Heavy vehicles approaching the diverge point will reduce their speed from 110km/h to enter the Off Ramp, which is consistent with Austroad Guidelines.

Southbound vehicles using the kerbside lane in the Hume Highway, including those who have joined the Hume Highway via the Southbound On Ramp at the Sallys Corner Interchange (see **Table 4.3**) will be able to change lanes readily, given the low volumes using the southbound median lane at this location.

The Off Ramp grade to the Quarry Interchange Bridge is 3.5% and the design speed at the end of Off Ramp for vehicles entering the bridge is 40km/h.

The Quarry Interchange Bridge over the Hume Highway will be a single lane and a minimum clearance of 7.5 metres will be provided over the Hume Highway carriageways.

The final concept design and detailed design of the Quarry Interchange will require further negotiations and consultation with the RMS.

The location of the start of the diverge for the Southbound Off Ramp will not have any impact on the truck layover area which is located approximately 350 metres north of the diverge point.

The truck layover/stop does not have either a deceleration lane and or an acceleration lane for vehicles entering or exiting this facility. Trucks exiting the truck stop are therefore required to pick a gap in traffic flow when re-joining the Hume Highway.

Further Consultation with the RMS

The design of the proposed Quarry Interchange requires further consultation with the RMS concerning aspects of the design, including the relocation of the existing truck stop for northbound vehicles and other matters associated with the design and construction of the Quarry Interchange. In addition, both the final concept design and the detailed design would require approval of the RMS.

4.5 TRAFFIC IMPACTS IN THE SITE ESTABLISHMENT AND CONSTRUCTION STAGE

Following approval, the site establishment and the construction stage is expected to take approximately 12 months.

The following traffic levels are envisaged during the 12 month period of the site establishment/construction stage of the Quarry.

- Low loaders delivering earthmoving equipment and wash plant components – up to 2 per day on up to 5 days (up to 4 movements per day).
- Semi-trailers/truck and dog trailers delivering road pavement and hardstand materials – 3 to 15 per day on up to 5 days (6-30 movements per day).
- Concrete agitators – up to 10 per day on the days footings are poured, i.e. on approximately 5 days (0-20 movements per day).
- Light vehicles – 10 to 20 per day (20-40 movements per day).

The construction of the Quarry Interchange would generate a range of additional traffic travelling to and from that area. The Applicant's appointed contractor would establish an off-road parking area for all earthmoving equipment near the current entrance to the Kingsbury VC Rest Area in accordance with the Section 138 Permit issued by the Wingecarribee Shire Council or RMS.

Access for all vehicles during the bulk of the site establishment and construction stage would be via the existing entrance to Lots 3 and 4 DP 253435 directly from the Hume Highway (see **Figure 8A**). From the entrance to Lot 4, all vehicles would travel via a new all-weather road to be constructed across Lot 4 to the proposed processing and stockpiling area. A suitably designed concrete slab would be required to armour this route where it crosses the easement containing two high pressure gas pipelines (Moomba – Wilton and Moomba – Sydney) and water pipeline (Wingecarribee – Goulburn).

The construction access location for construction vehicles entering and exiting the Construction Access Road has good sight distance in both directions of the Hume Highway. The majority of the construction traffic is expected to arrive and depart from/to the north, along the Hume Highway.

A long auxiliary lane is provided in the southbound carriageway for right turn vehicles from the highway into the Construction Access Road. The holding area between the northbound and southbound carriageways in Hume Highway can accommodate heavy vehicles, without impacting on the through lanes.

The swept path analysis for long heavy vehicles turning right into the Construction Access Road and left out into Hume Highway are shown in **Figures 8A** and **8B** respectively.

The Applicant's roadworks contractor will prepare a Construction Traffic Management Plan (CTMP) for all works on the public road network including the construction of the Quarry Interchange. The RMS and Wingecarribee Shire Council will be consulted during the preparation of the CTMP. It is expected that the CTMP will require the approval of the RMS.

The CTMP would include details of construction staging, Traffic Control Plans and other relevant information including warning signage (i.e. variable message signs) and devices to manage the construction activities, so as to minimise the impacts of the works that will affect the public road network.

The traffic generation, during construction, will be for a temporary period of 12 months and the impacts including any safety considerations will be managed by the CTMP.

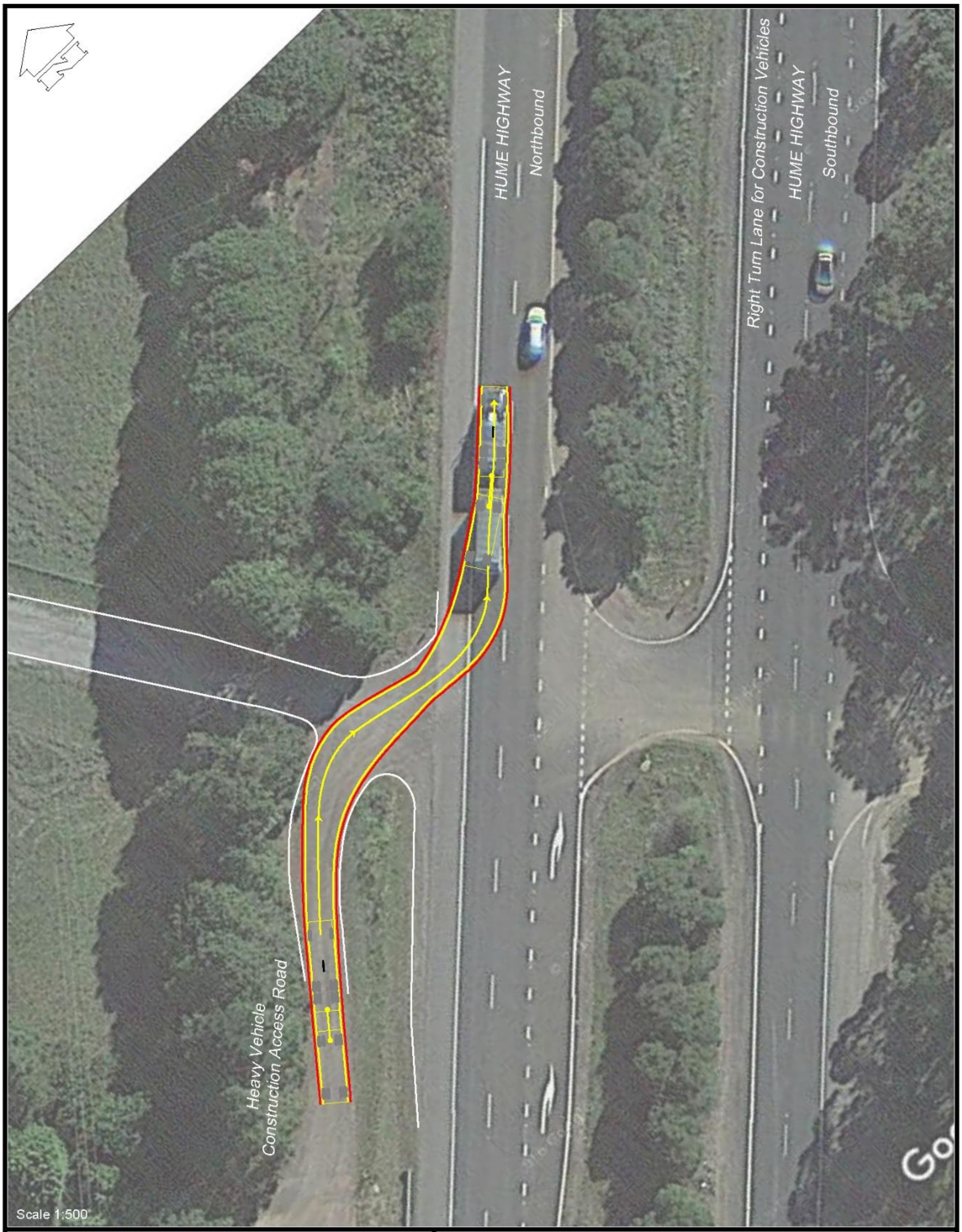

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FIGURE 8A

SUTTON FOREST SAND QUARRY

TURNPATH - 19m TRUCK & DOG - LEFT TURN OUT
Intersection of Construction Access Road & Hume Highway

JOB NO.17194 07/03/18

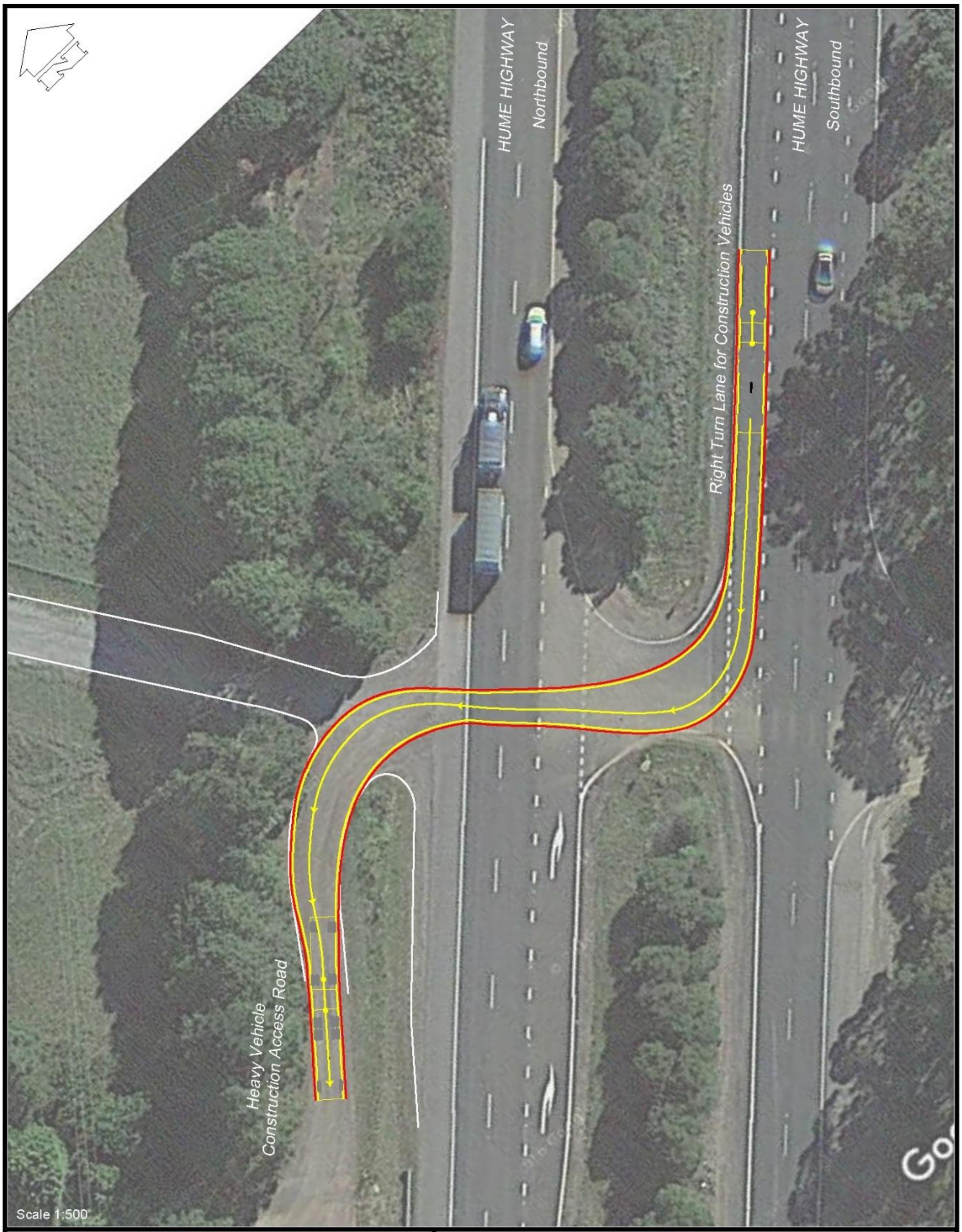

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FIGURE 8B
SUTTON FOREST SAND QUARRY
TURNPATH - 19m TRUCK & DOG - RIGHT TURN IN
Intersection of Construction Access Road & Hume Highway
JOB NO.17194 07/03/18

5. CONCLUSIONS

This report documents an assessment of the road transport and traffic impacts of the proposed Sutton Forest Sand Quarry, which will be located southwest of the Sallys Corner Interchange with the Hume Highway at Sutton Forest in the Southern Highlands.

The Proposal would ultimately to supply up to 860,000 tonnes per annum (tpa) of sand products to the Sydney Metropolitan, Illawarra, Southern Highlands and Canberra construction markets over the next 30 years and beyond.

A Quarry Interchange and Quarry Access Road will be constructed as part of the Proposal to provide access to the quarry.

The design of the Quarry Interchange will be undertaken in consultation with the RMS and the final design approved by the RMS.

The assessment has found that the road and traffic impacts of the Proposal from Proposal generated traffic are considered to be relatively minor and are not expected to result in the deterioration in current or future service safety levels in the Hume Highway in either direction of travel.

REFERENCES

1. Austroads Guide to Road Design (2008 – 2014)

2. Austroads Guide to Road Safety – Version 1 Dec 2010

3. Austroads Guide to Traffic Management (2008 – 2014)

4. RTA (now RMS) Austroads Guide Supplements – Austroads Guide to Traffic Management – (Various dates from 2009 onwards)

5. RTA (now RMS) Supplement to Austroads Guide to Road Design Parts 1-5, 6 and 8 (various dates from 2009 onwards)

6. RMS Supplements to Austroads Guide to Road Safety

7. RTA (now RMS) Guide to Traffic Generating Developments October 2012

Appendices

Appendix 1 **Traffic Counts – Sallys Corner Interchange**

Appendix 2* **Traffic Counts – Penrose Forest Way / Kingsbury VC Rest Area Intersection**

* A colour version of this Appendix is available on the digital version of this document

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Appendix 1

Traffic Counts – Sallys Corner Interchange

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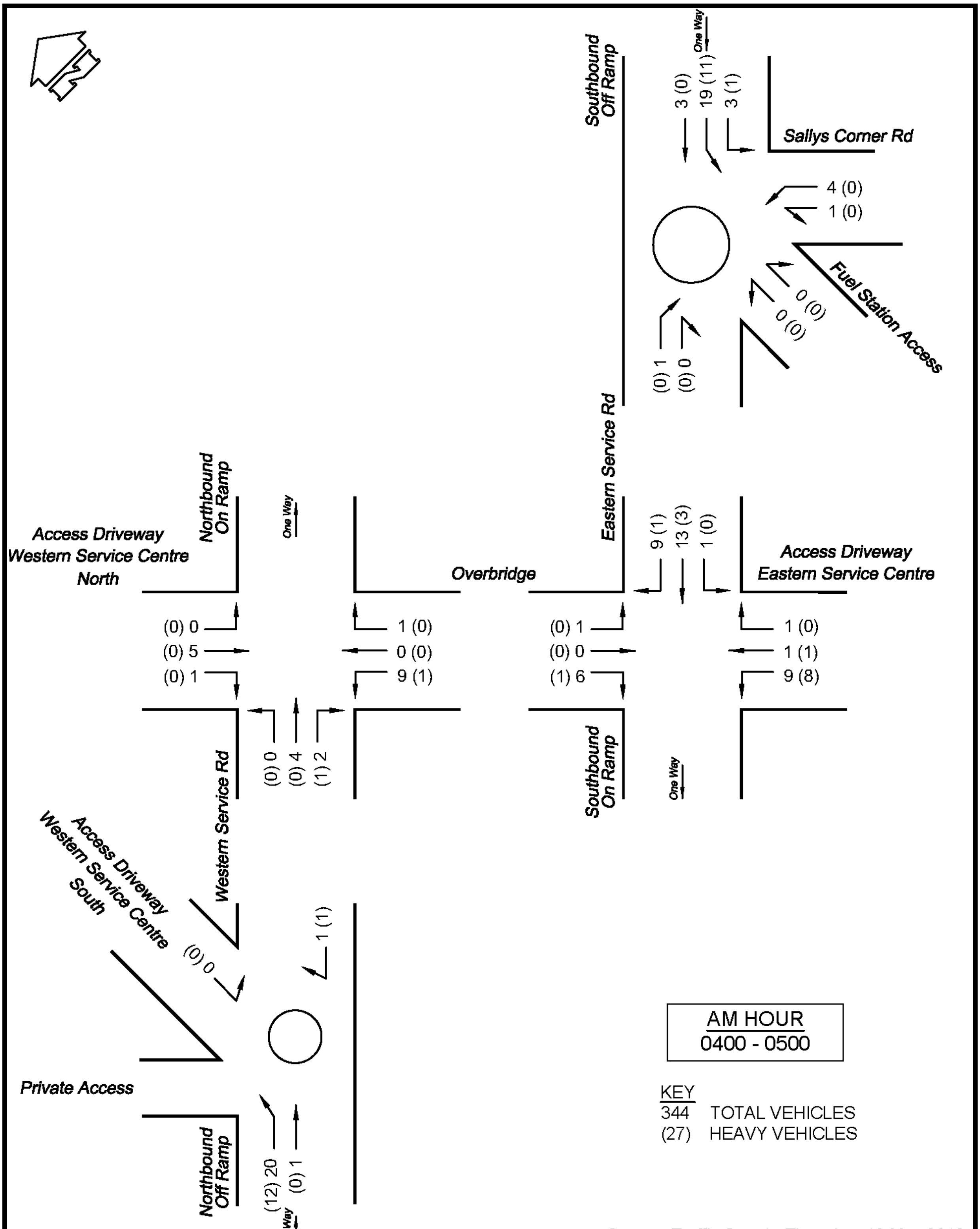

Source: Traffic Count - Thursday, 12 May 2016

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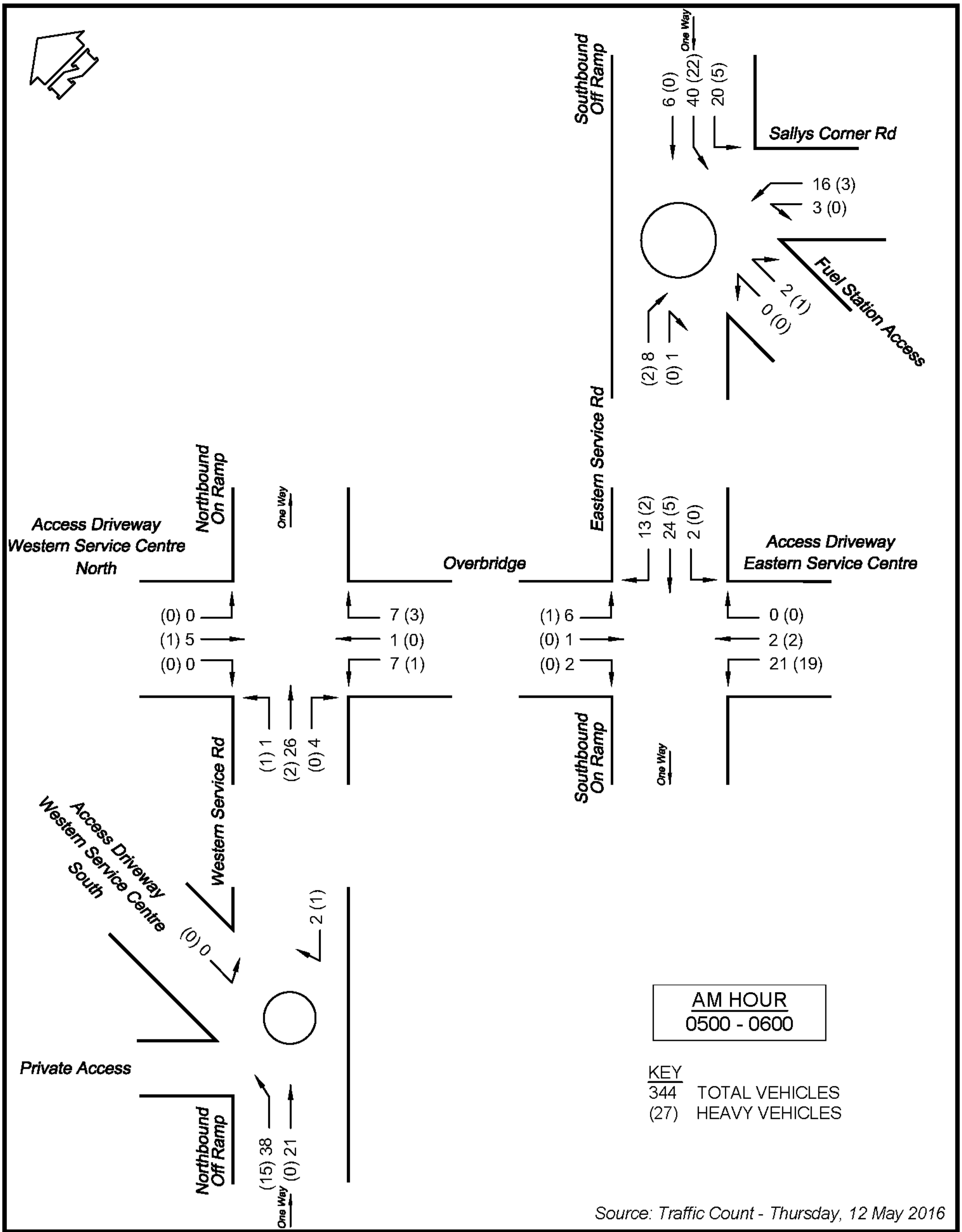
APPENDIX 1 - A
SUTTON FOREST SAND QUARRY

EXISTING AM HOUR TRAFFIC VOLUMES

JOB NO.16061



Source: Traffic Count - Thursday, 12 May 2016

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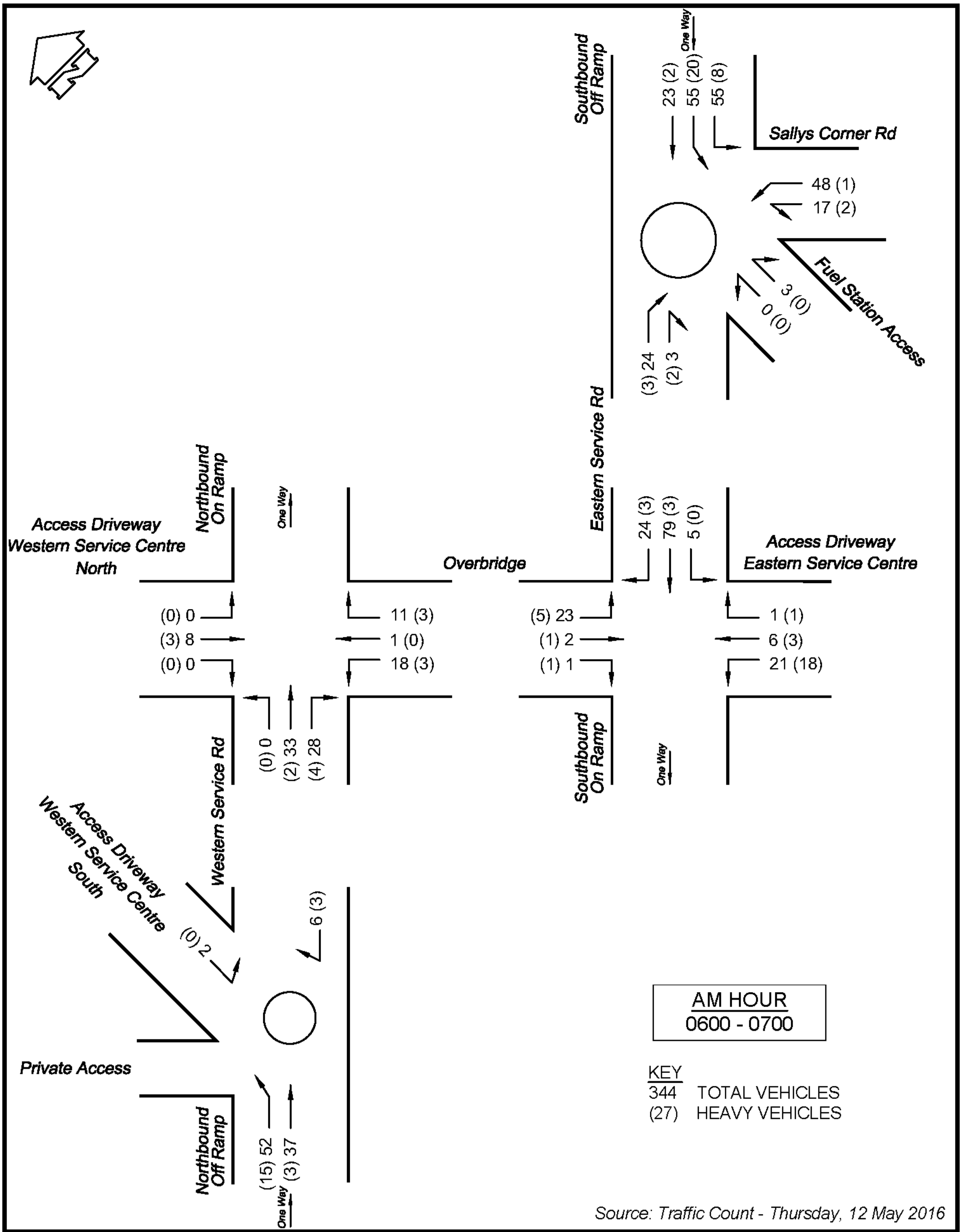
APPENDIX 1 - B
SUTTON FOREST SAND QUARRY

EXISTING AM HOUR TRAFFIC VOLUMES
JOB NO.16061



Source: Traffic Count - Thursday, 12 May 2016

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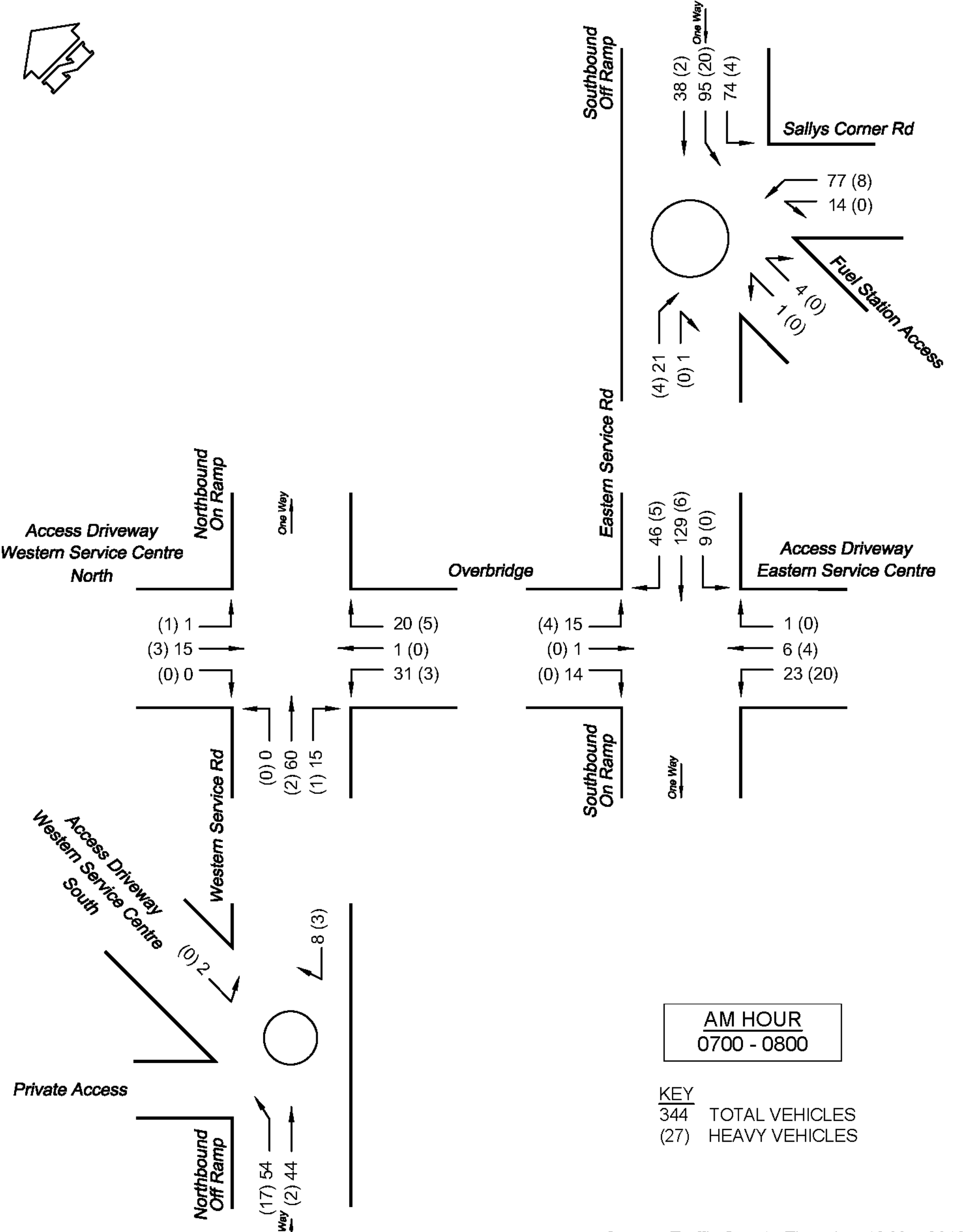
APPENDIX 1 - C

SUTTON FOREST SAND QUARRY

EXISTING AM HOUR TRAFFIC VOLUMES

JOB NO.16061



Source: Traffic Count - Thursday, 12 May 2016

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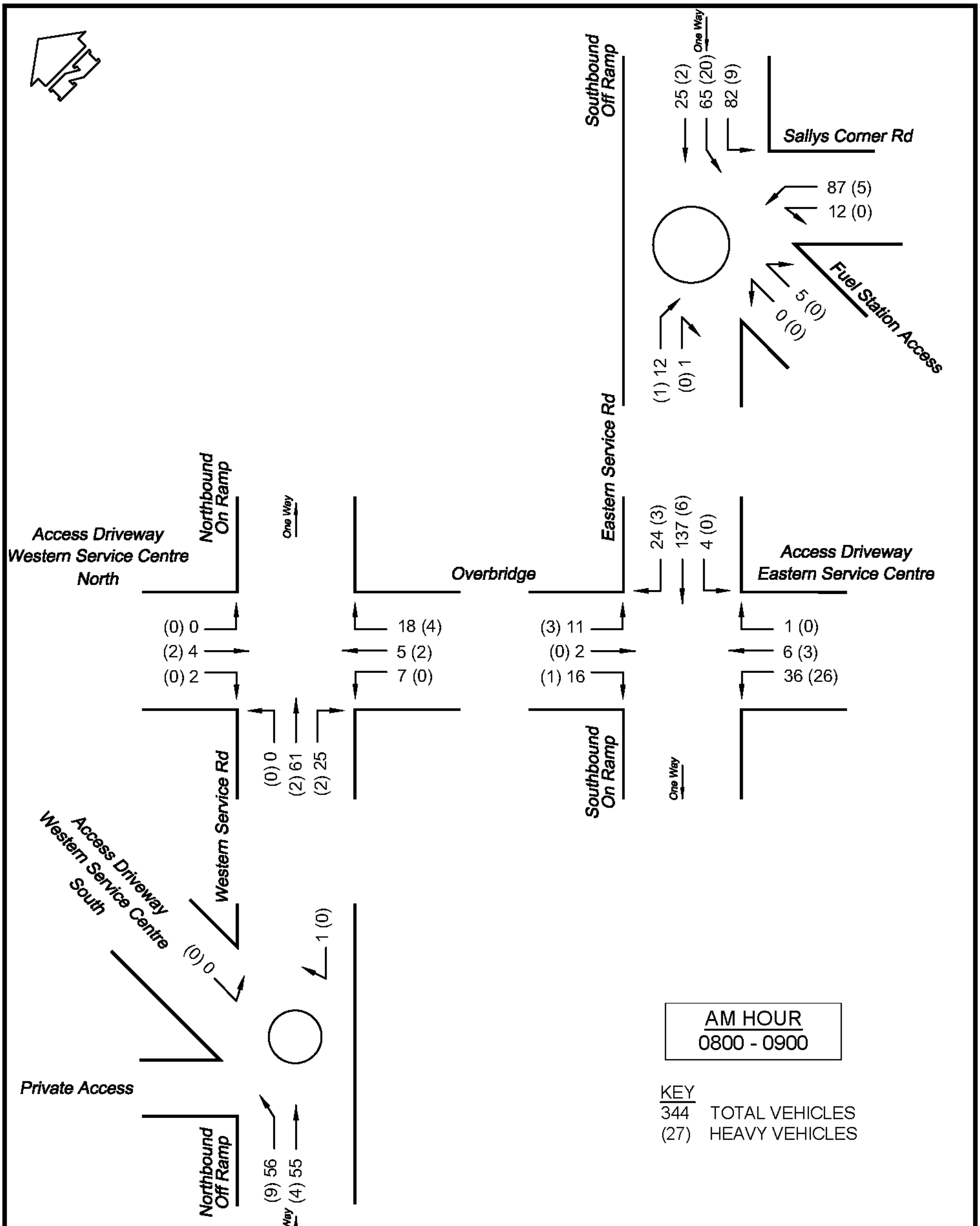
APPENDIX 1 - D
SUTTON FOREST SAND QUARRY

EXISTING AM HOUR TRAFFIC VOLUMES
JOB NO.16061



Source: Traffic Count - Thursday, 12 May 2016

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APPENDIX 1 - E
SUTTON FOREST SAND QUARRY

EXISTING AM HOUR TRAFFIC VOLUMES

JOB NO.16061

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Appendix 2

Traffic Counts – Penrose Forest Way / Kingsbury VC Rest Area Intersection

* A colour version of this Appendix is available on the digital version of this document

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R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : TUPA
Job No/Name : 6217 EXETER Kingsbury VC Rest Area
Day/Date : Tuesday 27th February 2018

Lights	WEST		NORTH		EAST		
	To Hume		*Rest Area*		*State Forest*		
Time Per	T	L	R	L	R	T	TOT
0530 - 0545	1	0	0	0	0	0	**1**
0545 - 0600	1	0	0	0	0	0	**1**
0600 - 0615	1	0	1	0	0	0	**2**
0615 - 0630	0	0	0	0	0	0	**0**
0630 - 0645	0	0	1	0	0	1	**2**
0645 - 0700	0	0	0	0	0	0	**0**
0700 - 0715	1	0	0	0	0	1	**2**
0715 - 0730	1	2	1	0	0	4	**8**
0730 - 0745	1	0	2	0	0	1	**4**
0745 - 0800	1	2	1	0	1	4	**9**
0800 - 0815	0	0	1	0	0	1	**2**
0815 - 0830	0	1	1	0	0	0	**2**
0830 - 0845	0	1	0	0	0	1	**2**
0845 - 0900	0	0	0	0	0	0	**0**
0900 - 0915	2	1	1	0	0	1	**5**
0915 - 0930	0	3	0	0	0	1	**4**
Per End	**9**	**10**	**9**	**0**	**1**	**15**	**44**

Heavies	WEST		NORTH		EAST		
	To Hume		*Rest Area*		*State Forest*		
Time Per	T	L	R	L	R	T	TOT
0530 - 0545	0	0	0	0	0	0	**0**
0545 - 0600	0	0	0	0	0	0	**0**
0600 - 0615	0	0	0	0	0	0	**0**
0615 - 0630	0	0	0	0	0	0	**0**
0630 - 0645	0	0	0	0	0	0	**0**
0645 - 0700	0	0	0	0	0	0	**0**
0700 - 0715	0	0	0	0	0	0	**0**
0715 - 0730	0	0	0	0	0	0	**0**
0730 - 0745	0	0	0	0	0	0	**0**
0745 - 0800	0	0	0	0	0	0	**0**
0800 - 0815	0	0	0	0	0	0	**0**
0815 - 0830	0	0	0	0	0	0	**0**
0830 - 0845	0	0	0	0	0	0	**0**
0845 - 0900	3	0	0	0	0	0	**3**
0900 - 0915	0	0	0	0	0	0	**0**
0915 - 0930	0	0	0	0	0	0	**0**
Per End	**3**	**0**	**0**	**0**	**0**	**0**	**3**

Combined	WEST		NORTH		EAST		
	To Hume		*Rest Area*		*State Forest*		
Time Per	T	L	R	L	R	T	TOT
0530 - 0545	1	0	0	0	0	0	**1**
0545 - 0600	1	0	0	0	0	0	**1**
0600 - 0615	1	0	1	0	0	0	**2**
0615 - 0630	0	0	0	0	0	0	**0**
0630 - 0645	0	0	1	0	0	1	**2**
0645 - 0700	0	0	0	0	0	0	**0**
0700 - 0715	1	0	0	0	0	1	**2**
0715 - 0730	1	2	1	0	0	4	**8**
0730 - 0745	1	0	2	0	0	1	**4**
0745 - 0800	1	2	1	0	1	4	**9**
0800 - 0815	0	0	1	0	0	1	**2**
0815 - 0830	0	1	1	0	0	0	**2**
0830 - 0845	0	1	0	0	0	1	**2**
0845 - 0900	3	0	0	0	0	0	**3**
0900 - 0915	2	1	1	0	0	1	**5**
0915 - 0930	0	3	0	0	0	1	**4**
Per End	**12**	**10**	**9**	**0**	**1**	**15**	**47**

Lights	WEST		NORTH		EAST		
	To Hume		*Rest Area*		*State Forest*		
Peak Per	T	L	R	L	R	T	TOT
0530 - 0630	3	0	1	0	0	0	**4**
0545 - 0645	2	0	2	0	0	1	**5**
0600 - 0700	1	0	2	0	0	1	**4**
0615 - 0715	1	0	1	0	0	2	**4**
0630 - 0730	2	2	2	0	0	6	**12**
0645 - 0745	3	2	3	0	0	6	**14**
0700 - 0800	4	4	4	0	1	10	**23**
0715 - 0815	3	4	5	0	1	10	**23**
0730 - 0830	2	3	5	0	1	6	**17**
0745 - 0845	1	4	3	0	1	6	**15**
0800 - 0900	0	2	2	0	0	2	**6**
0815 - 0915	2	3	2	0	0	2	**9**
0830 - 0930	2	5	1	0	0	3	**11**
PEAK HR	**3**	**4**	**5**	**0**	**1**	**10**	**23**

Heavies	WEST		NORTH		EAST		
	To Hume		*Rest Area*		*State Forest*		
Peak Per	T	L	R	L	R	T	TOT
0530 - 0630	0	0	0	0	0	0	**0**
0545 - 0645	0	0	0	0	0	0	**0**
0600 - 0700	0	0	0	0	0	0	**0**
0615 - 0715	0	0	0	0	0	0	**0**
0630 - 0730	0	0	0	0	0	0	**0**
0645 - 0745	0	0	0	0	0	0	**0**
0700 - 0800	0	0	0	0	0	0	**0**
0715 - 0815	0	0	0	0	0	0	**0**
0730 - 0830	0	0	0	0	0	0	**0**
0745 - 0845	0	0	0	0	0	0	**0**
0800 - 0900	3	0	0	0	0	0	**3**
0815 - 0915	3	0	0	0	0	0	**3**
0830 - 0930	3	0	0	0	0	0	**3**
PEAK HR	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Combined	WEST		NORTH		EAST		
	To Hume		*Rest Area*		*State Forest*		
Peak Per	T	L	R	L	R	T	TOT
0530 - 0630	3	0	1	0	0	0	**4**
0545 - 0645	2	0	2	0	0	1	**5**
0600 - 0700	1	0	2	0	0	1	**4**
0615 - 0715	1	0	1	0	0	2	**4**
0630 - 0730	2	2	2	0	0	6	**12**
0645 - 0745	3	2	3	0	0	6	**14**
0700 - 0800	4	4	4	0	1	10	**23**
0715 - 0815	3	4	5	0	1	10	**23**
0730 - 0830	2	3	5	0	1	6	**17**
0745 - 0845	1	4	3	0	1	6	**15**
0800 - 0900	3	2	2	0	0	2	**9**
0815 - 0915	5	3	2	0	0	2	**12**
0830 - 0930	5	5	1	0	0	3	**14**
PEAK HR	**3**	**4**	**5**	**0**	**1**	**10**	**23**

R.O.A.R. DATA
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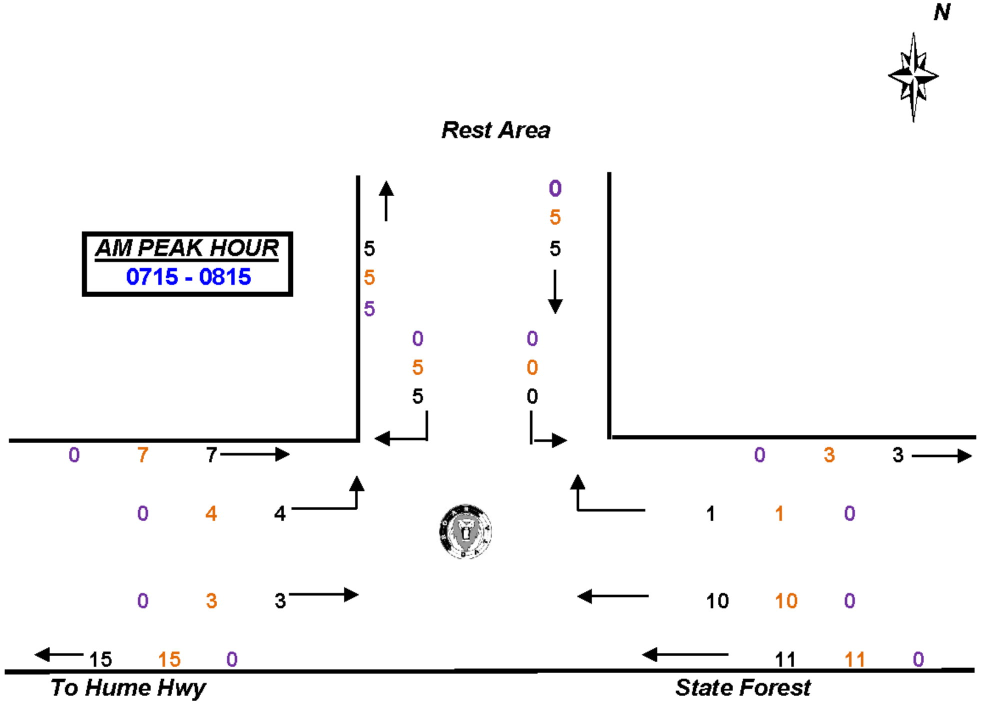
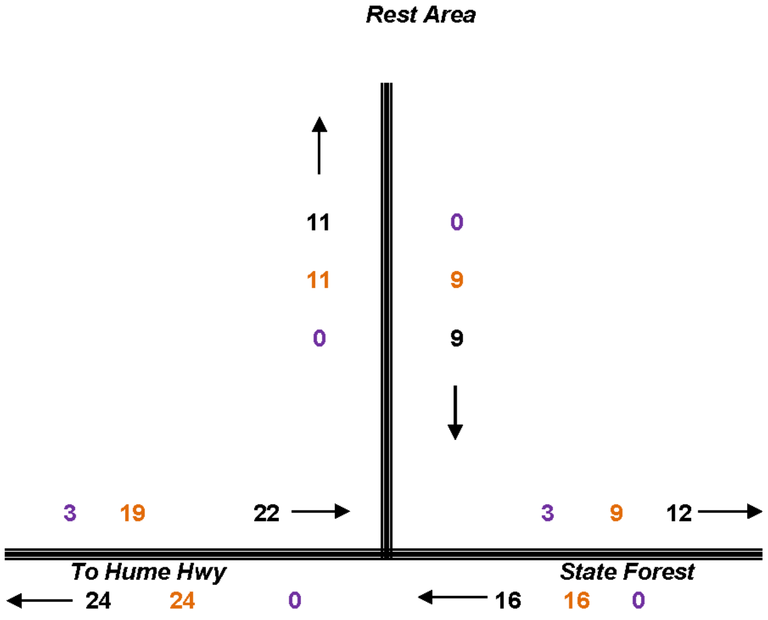
Ph.88196847, Mob.0418-239019

Client : TUPA
Job No/Name : 6217 EXETER Kingsbury VC Rest Area
Day/Date : Tuesday 27th February 2018

TOTAL VOLUMES FOR COUNT PERIOD

AM PEAK HOUR
0715 - 0815





R.O.A.R. DATA

Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : TUPA
Job No/Name : 6217 EXETER Kingsbury VC Rest Area
Day/Date : Tuesday 27th February 2018

Lights

	WEST		NORTH		EAST		
	To Hume		*Rest Area*		*State Forest*		
Time Per	T	L	R	L	R	T	TOT
1530 - 1545	1	0	0	0	0	0	**1**
1545 - 1600	3	0	1	0	0	1	**5**
1600 - 1615	2	1	1	0	0	0	**4**
1615 - 1630	0	1	0	0	0	3	**4**
1630 - 1645	2	0	0	0	0	5	**7**
1645 - 1700	1	1	1	0	0	3	**6**
1700 - 1715	0	2	0	0	0	1	**3**
1715 - 1730	1	1	0	0	0	4	**6**
1730 - 1745	2	0	0	0	0	0	**2**
1745 - 1800	1	0	0	0	0	0	**1**
1800 - 1815	3	0	0	0	0	1	**4**
1815 - 1830	3	0	0	0	0	0	**3**
Per End	**19**	**6**	**3**	**0**	**0**	**18**	**46**

Heavies

	WEST		NORTH		EAST		
	To Hume		*Rest Area*		*State Forest*		
Time Per	T	L	R	L	R	T	TOT
1530 - 1545	0	0	0	0	0	0	**0**
1545 - 1600	0	0	0	0	0	0	**0**
1600 - 1615	0	0	0	0	0	0	**0**
1615 - 1630	0	0	0	0	0	0	**0**
1630 - 1645	0	0	0	0	0	0	**0**
1645 - 1700	0	0	0	0	0	0	**0**
1700 - 1715	0	0	0	0	0	0	**0**
1715 - 1730	0	0	0	0	0	0	**0**
1730 - 1745	1	0	0	0	0	0	**1**
1745 - 1800	0	0	0	0	0	0	**0**
1800 - 1815	0	0	0	0	0	0	**0**
1815 - 1830	0	0	0	0	0	0	**0**
Per End	**1**	**0**	**0**	**0**	**0**	**0**	**1**

Combined

	WEST		NORTH		EAST		
	To Hume		*Rest Area*		*State Forest*		
Time Per	T	L	R	L	R	T	TOT
1530 - 1545	1	0	0	0	0	0	**1**
1545 - 1600	3	0	1	0	0	1	**5**
1600 - 1615	2	1	1	0	0	0	**4**
1615 - 1630	0	1	0	0	0	3	**4**
1630 - 1645	2	0	0	0	0	5	**7**
1645 - 1700	1	1	1	0	0	3	**6**
1700 - 1715	0	2	0	0	0	1	**3**
1715 - 1730	1	1	0	0	0	4	**6**
1730 - 1745	3	0	0	0	0	0	**3**
1745 - 1800	1	0	0	0	0	0	**1**
1800 - 1815	3	0	0	0	0	1	**4**
1815 - 1830	3	0	0	0	0	0	**3**
Per End	**20**	**6**	**3**	**0**	**0**	**18**	**47**

Lights

	WEST		NORTH		EAST		
	To Hume		*Rest Area*		*State Forest*		
Peak Per	T	L	R	L	R	T	TOT
1530 - 1630	6	2	2	0	0	4	**14**
1545 - 1645	7	2	2	0	0	9	**20**
1600 - 1700	5	3	2	0	0	11	**21**
1615 - 1715	3	4	1	0	0	12	**20**
1630 - 1730	4	4	1	0	0	13	**22**
1645 - 1745	4	4	1	0	0	8	**17**
1700 - 1800	4	3	0	0	0	5	**12**
1715 - 1815	7	1	0	0	0	5	**13**
1730 - 1830	9	0	0	0	0	1	**10**
PEAK HR	**4**	**4**	**1**	**0**	**0**	**13**	**22**

Heavies

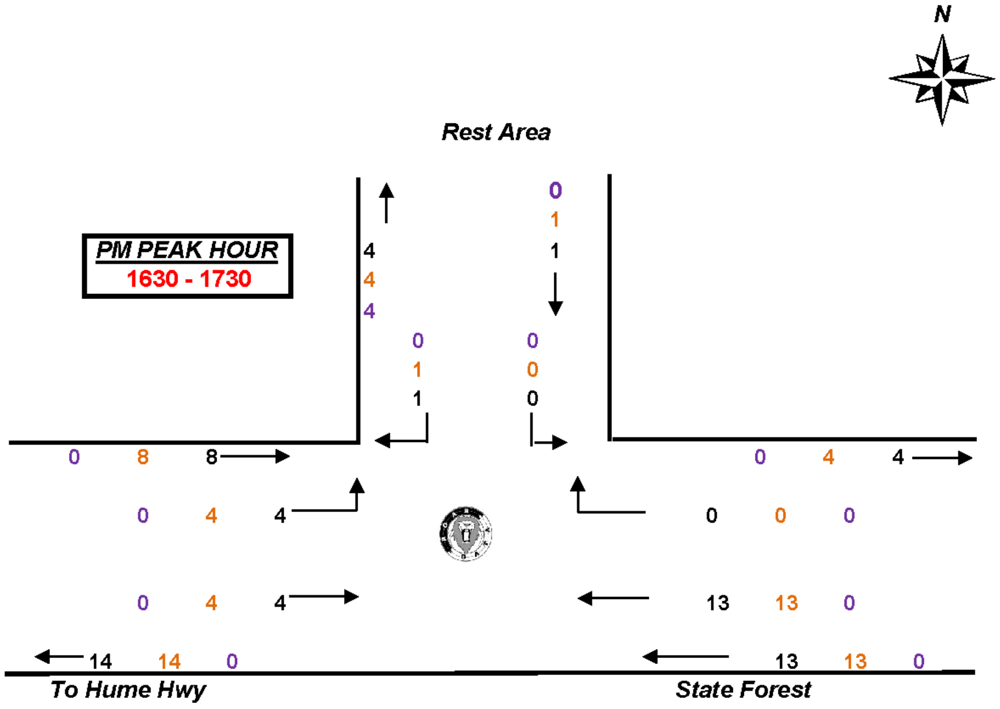
	WEST		NORTH		EAST		
	To Hume		*Rest Area*		*State Forest*		
Peak Per	T	L	R	L	R	T	TOT
1530 - 1630	0	0	0	0	0	0	**0**
1545 - 1645	0	0	0	0	0	0	**0**
1600 - 1700	0	0	0	0	0	0	**0**
1615 - 1715	0	0	0	0	0	0	**0**
1630 - 1730	0	0	0	0	0	0	**0**
1645 - 1745	1	0	0	0	0	0	**1**
1700 - 1800	1	0	0	0	0	0	**1**
1715 - 1815	1	0	0	0	0	0	**1**
1730 - 1830	1	0	0	0	0	0	**1**
PEAK HR	**0**	**0**	**0**	**0**	**0**	**0**	**0**

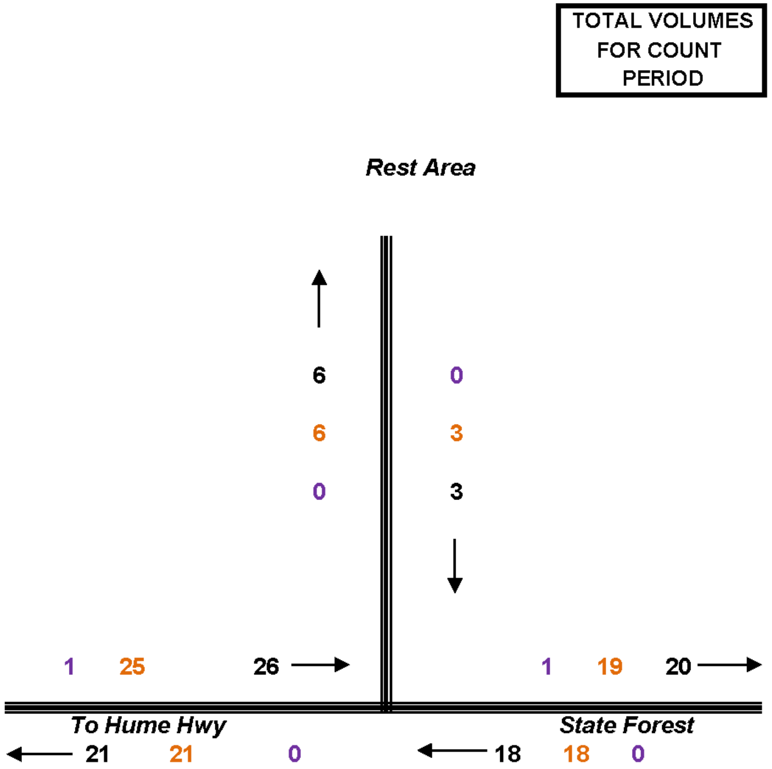
Combined

	WEST		NORTH		EAST		
	To Hume		*Rest Area*		*State Forest*		
Peak Per	T	L	R	L	R	T	TOT
1530 - 1630	6	2	2	0	0	4	**14**
1545 - 1645	7	2	2	0	0	9	**20**
1600 - 1700	5	3	2	0	0	11	**21**
1615 - 1715	3	4	1	0	0	12	**20**
1630 - 1730	4	4	1	0	0	13	**22**
1645 - 1745	5	4	1	0	0	8	**18**
1700 - 1800	5	3	0	0	0	5	**13**
1715 - 1815	8	1	0	0	0	5	**14**
1730 - 1830	10	0	0	0	0	1	**11**
PEAK HR	**4**	**4**	**1**	**0**	**0**	**13**	**22**

R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : TUPA
Job No/Name : 6217 EXETER Kingsbury VC Rest Area
Day/Date : Tuesday 27th February 2018

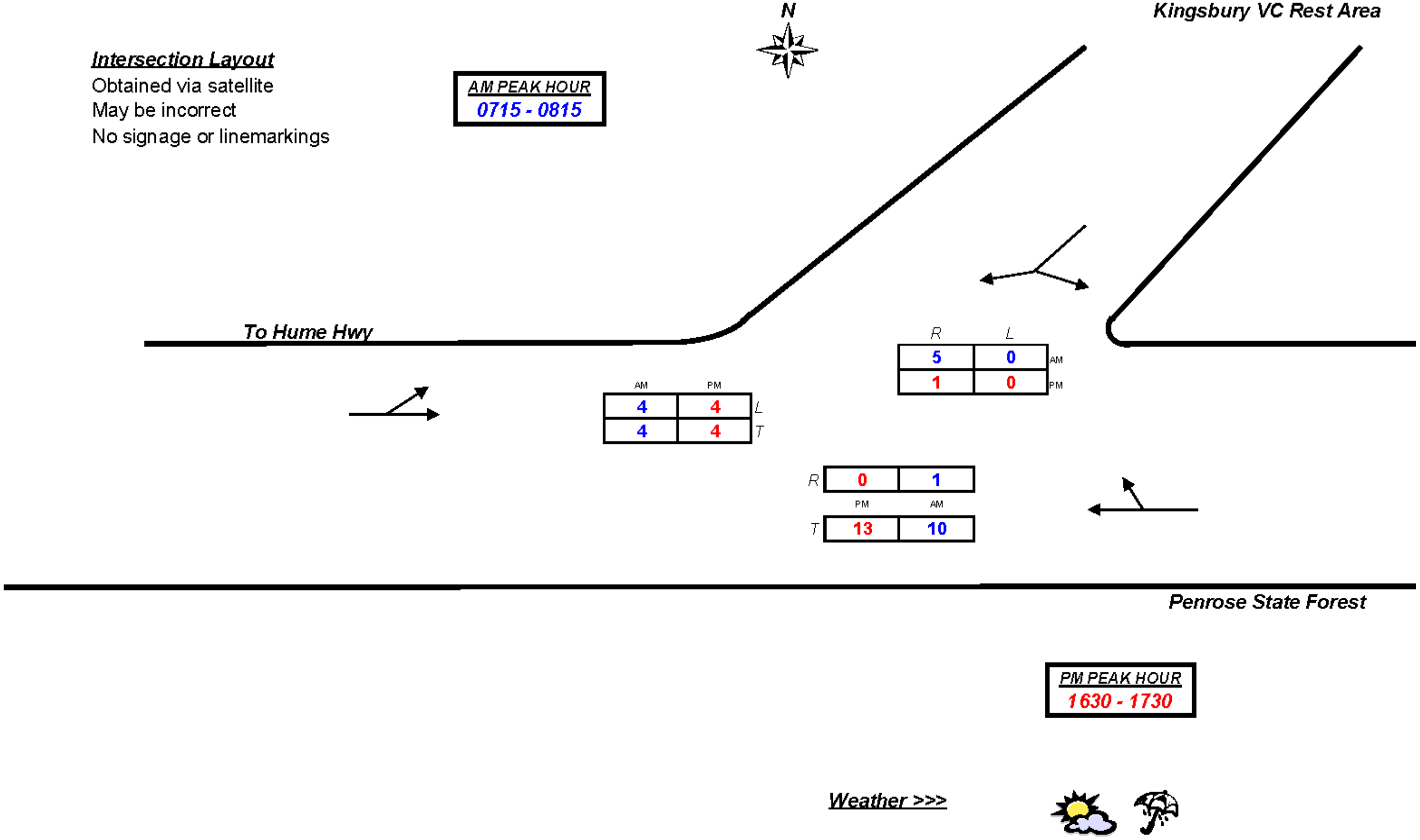




R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : TUPA
Job No/Name : 6217 EXETER Kingsbury VC Rest Area
Day/Date : Tuesday 27th February 2018

Intersection Layout
Obtained via satellite
May be incorrect
No signage or linemarkings



R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : TUPA
Job No/Name : 6217 EXETER Kingsbury VC Rest Area
Day/Date : Tuesday 27th February 2018

Lights	NORTH			WEST			SOUTH			EAST			
	Hume Hwy			Private Rd			Hume Hwy			To State Forest			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0530 - 0545	1	41	0		0	0	0	32	0	0	0	0	74
0545 - 0600	1	50	0	0	0	0	0	37	0	0	0	0	88
0600 - 0615	1	57	0	0	0	0	0	41	0	0	0	1	100
0615 - 0630	0	92	0	0	0	0	0	69	0	0	0	0	161
0630 - 0645	0	95	0	0	0	0	0	91	0	0	0	2	188
0645 - 0700	0	121	0	0	0	0	0	73	0	0	0	0	194
0700 - 0715	1	113	0	0	0	1	0	86	0	0	0	1	202
0715 - 0730	3	129	0	0	0	0	0	77	0	2	0	3	214
0730 - 0745	1	151	0	0	0	0	0	86	0	2	0	1	241
0745 - 0800	3	175	0	0	0	0	0	80	0	1	1	5	265
0800 - 0815	0	148	0	0	0	0	1	86	0	1	0	0	236
0815 - 0830	1	158	0	1	0	1	0	104	0	1	0	0	266
0830 - 0845	1	144	0	1	0	0	0	95	0	0	0	1	242
0845 - 0900	2	198	1	0	0	0	0	163	0	1	0	1	366
0900 - 0915	1	86	0	0	0	0	0	82	0	0	0	0	169
0915 - 0930	3	144	0	0	0	0	0	109	0	0	0	1	257
Period End	19	1902	1	2	0	2	1	1311	0	8	1	16	3263

Lights	NORTH			WEST			SOUTH			EAST			
	Hume Hwy			Private Rd			Hume Hwy			To State Forest			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0530 - 0630	3	240	0	0	0	0	0	179	0	0	0	1	423
0545 - 0645	2	294	0	0	0	0	0	238	0	0	0	3	537
0600 - 0700	1	365	0	0	0	0	0	274	0	0	0	3	643
0615 - 0715	1	421	0	0	0	1	0	319	0	0	0	3	745
0630 - 0730	4	458	0	0	0	1	0	327	0	2	0	6	798
0645 - 0745	5	514	0	0	0	1	0	322	0	4	0	5	851
0700 - 0800	8	568	0	0	0	1	0	329	0	5	1	10	922
0715 - 0815	7	603	0	0	0	0	1	329	0	6	1	9	956
0730 - 0830	5	632	0	1	0	1	1	356	0	5	1	6	1008
0745 - 0845	5	625	0	2	0	1	1	365	0	3	1	6	1009
0800 - 0900	4	648	1	2	0	1	1	448	0	3	0	2	1110
0815 - 0915	5	586	1	2	0	1	0	444	0	2	0	2	1043
0830 - 0930	7	572	1	1	0	0	0	449	0	1	0	3	1034
PEAK HOUR	4	648	1	2	0	1	1	448	0	3	0	2	1110

Heavies	NORTH			WEST			SOUTH			EAST			
	Hume Hwy			Private Rd			Hume Hwy			To State Forest			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0530 - 0545	0	21	0	0	0	0	0	23	0	0	0	0	44
0545 - 0600	0	19	0	0	0	0	0	25	0	0	0	0	44
0600 - 0615	0	18	0	0	0	0	0	24	0	0	0	0	42
0615 - 0630	0	29	0	0	0	0	0	43	0	0	0	0	72
0630 - 0645	0	16	0	0	0	0	0	32	0	0	0	0	48
0645 - 0700	0	18	0	0	0	0	0	30	0	0	0	0	48
0700 - 0715	0	17	0	0	0	0	0	22	0	0	0	0	39
0715 - 0730	0	23	0	0	0	0	0	24	0	0	0	0	47
0730 - 0745	0	18	0	0	0	0	0	38	0	0	0	0	56
0745 - 0800	0	21	0	0	0	0	0	44	0	0	0	0	65
0800 - 0815	0	19	0	0	0	0	0	24	0	0	0	0	43
0815 - 0830	0	34	0	0	0	0	0	35	0	0	0	0	69
0830 - 0845	0	15	0	0	0	0	0	28	0	0	0	0	43
0845 - 0900	3	26	0	0	0	0	0	41	0	0	0	0	70
0900 - 0915	0	14	0	0	0	0	0	18	0	0	0	0	32
0915 - 0930	0	24	0	0	0	0	0	41	0	0	0	0	65
Period End	3	332	0	0	0	0	0	492	0	0	0	0	827

Heavies	NORTH			WEST			SOUTH			EAST			
	Hume Hwy			Private Rd			Hume Hwy			To State Forest			
Peak Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0530 - 0630	0	87	0	0	0	0	0	115	0	0	0	0	202
0545 - 0645	0	82	0	0	0	0	0	124	0	0	0	0	206
0600 - 0700	0	81	0	0	0	0	0	129	0	0	0	0	210
0615 - 0715	0	80	0	0	0	0	0	127	0	0	0	0	207
0630 - 0730	0	74	0	0	0	0	0	108	0	0	0	0	182
0645 - 0745	0	76	0	0	0	0	0	114	0	0	0	0	190
0700 - 0800	0	79	0	0	0	0	0	128	0	0	0	0	207
0715 - 0815	0	81	0	0	0	0	0	130	0	0	0	0	211
0730 - 0830	0	92	0	0	0	0	0	141	0	0	0	0	233
0745 - 0845	0	89	0	0	0	0	0	131	0	0	0	0	220
0800 - 0900	3	94	0	0	0	0	0	128	0	0	0	0	225
0815 - 0915	3	89	0	0	0	0	0	122	0	0	0	0	214
0830 - 0930	3	79	0	0	0	0	0	128	0	0	0	0	210
PEAK HOUR	3	94	0	0	0	0	0	128	0	0	0	0	225

R.O.A.R. DATA

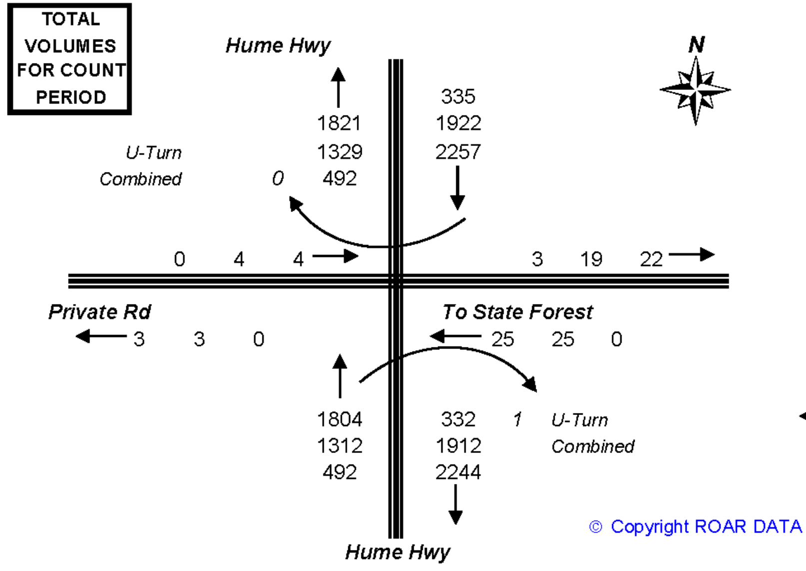
Reliable, Original & Authentic Results

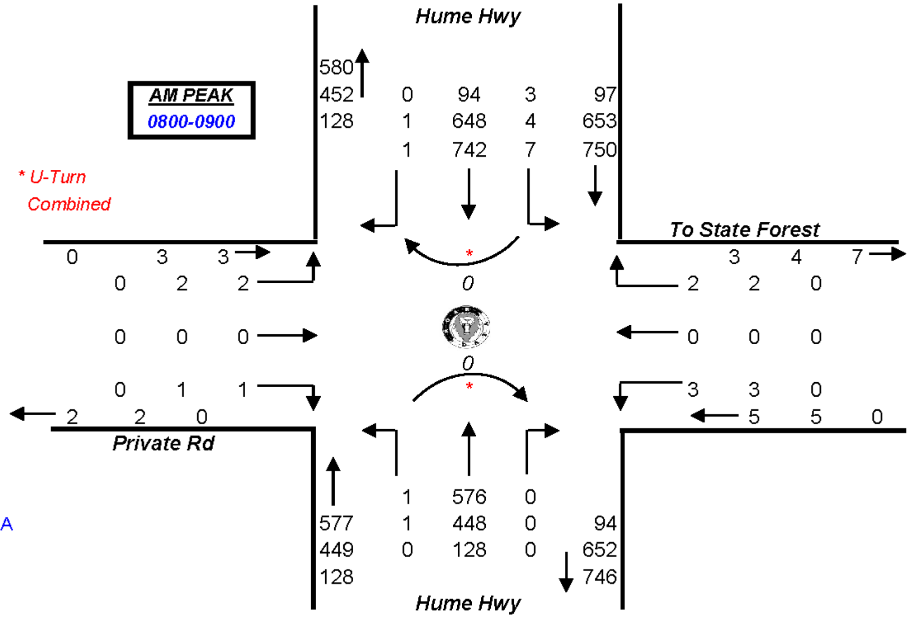
Ph.88196847, Mob.0418-239019

Client : TUPA
Job No/Name : 6217 EXETER Kingsbury VC Rest Area
Day/Date : Tuesday 27th February 2018

Combined	NORTH			WEST			SOUTH			EAST			
	Hume Hwy			Private Rd			Hume Hwy			To State Forest			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0530 - 0545	1	62	0	0	0	0	0	55	0	0	0	0	**118**
0545 - 0600	1	69	0	0	0	0	0	62	0	0	0	0	**132**
0600 - 0615	1	75	0	0	0	0	0	65	0	0	0	1	**142**
0615 - 0630	0	121	0	0	0	0	0	112	0	0	0	0	**233**
0630 - 0645	0	111	0	0	0	0	0	123	0	0	0	2	**236**
0645 - 0700	0	139	0	0	0	0	0	103	0	0	0	0	**242**
0700 - 0715	1	130	0	0	0	1	0	108	0	0	0	1	**241**
0715 - 0730	3	152	0	0	0	0	0	101	0	2	0	3	**261**
0730 - 0745	1	169	0	0	0	0	0	124	0	2	0	1	**297**
0745 - 0800	3	196	0	0	0	0	0	124	0	1	1	5	**330**
0800 - 0815	0	167	0	0	0	0	1	110	0	1	0	0	**279**
0815 - 0830	1	192	0	1	0	1	0	139	0	1	0	0	**335**
0830 - 0845	1	159	0	1	0	0	0	123	0	0	0	1	**285**
0845 - 0900	5	224	1	0	0	0	0	204	0	1	0	1	**436**
0900 - 0915	1	100	0	0	0	0	0	100	0	0	0	0	**201**
0915 - 0930	3	168	0	0	0	0	0	150	0	0	0	1	**322**
Period End	**22**	**2234**	**1**	**2**	**0**	**2**	**1**	**1803**	**0**	**8**	**1**	**16**	**4090**

Combined	NORTH			WEST			SOUTH			EAST			
	Hume Hwy			Private Rd			Hume Hwy			To State Forest			
Peak Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0530 - 0630	3	327	0	0	0	0	0	294	0	0	0	1	**625**
0545 - 0645	2	376	0	0	0	0	0	362	0	0	0	3	**743**
0600 - 0700	1	446	0	0	0	0	0	403	0	0	0	3	**853**
0615 - 0715	1	501	0	0	0	1	0	446	0	0	0	3	**952**
0630 - 0730	4	532	0	0	0	1	0	435	0	2	0	6	**980**
0645 - 0745	5	590	0	0	0	1	0	436	0	4	0	5	**1041**
0700 - 0800	8	647	0	0	0	1	0	457	0	5	1	10	**1129**
0715 - 0815	7	684	0	0	0	0	1	459	0	6	1	9	**1167**
0730 - 0830	5	724	0	1	0	1	1	497	0	5	1	6	**1241**
0745 - 0845	5	714	0	2	0	1	1	496	0	3	1	6	**1229**
0800 - 0900	7	742	1	2	0	1	1	576	0	3	0	2	**1335**
0815 - 0915	8	675	1	2	0	1	0	566	0	2	0	2	**1257**
0830 - 0930	10	651	1	1	0	0	0	577	0	1	0	3	**1244**
PEAK HOUR	**7**	**742**	**1**	**2**	**0**	**1**	**1**	**576**	**0**	**3**	**0**	**2**	**1335**





R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : TUPA
Job No/Name : 6217 EXETER Kingsbury VC Rest Area
Day/Date : Tuesday 27th February 2018

These figures not included in top tables

Lights

Time Per	U-TURNS Nth to Sth	U-TURNS Sth to Nth	Tot
0530 - 0545	0	0	**0**
0545 - 0600	0	0	**0**
0600 - 0615	0	0	**0**
0615 - 0630	0	0	**0**
0630 - 0645	0	0	**0**
0645 - 0700	0	0	**0**
0700 - 0715	0	0	**0**
0715 - 0730	0	0	**0**
0730 - 0745	1	0	**1**
0745 - 0800	0	0	**0**
0800 - 0815	0	0	**0**
0815 - 0830	0	0	**0**
0830 - 0845	0	0	**0**
0845 - 0900	0	0	**0**
0900 - 0915	0	0	**0**
0915 - 0930	0	0	**0**
Period End	**1**	**0**	**1**

Heavies

Time Per	U-TURNS Nth to Sth	U-TURNS Sth to Nth	Tot
0530 - 0545	0	0	**0**
0545 - 0600	0	0	**0**
0600 - 0615	0	0	**0**
0615 - 0630	0	0	**0**
0630 - 0645	0	0	**0**
0645 - 0700	0	0	**0**
0700 - 0715	0	0	**0**
0715 - 0730	0	0	**0**
0730 - 0745	0	0	**0**
0745 - 0800	0	0	**0**
0800 - 0815	0	0	**0**
0815 - 0830	0	0	**0**
0830 - 0845	0	0	**0**
0845 - 0900	0	0	**0**
0900 - 0915	0	0	**0**
0915 - 0930	0	0	**0**
Period End	**0**	**0**	**0**

COMBINED

Time Per	U-TURNS Nth to Sth	U-TURNS Sth to Nth	Tot
0530 - 0545	0	0	**0**
0545 - 0600	0	0	**0**
0600 - 0615	0	0	**0**
0615 - 0630	0	0	**0**
0630 - 0645	0	0	**0**
0645 - 0700	0	0	**0**
0700 - 0715	0	0	**0**
0715 - 0730	0	0	**0**
0730 - 0745	1	0	**1**
0745 - 0800	0	0	**0**
0800 - 0815	0	0	**0**
0815 - 0830	0	0	**0**
0830 - 0845	0	0	**0**
0845 - 0900	0	0	**0**
0900 - 0915	0	0	**0**
0915 - 0930	0	0	**0**
Period End	**1**	**0**	**1**

Lights

Time Per	U-TURNS Nth to Sth	U-TURNS Sth to Nth	Tot
0530 - 0630	0	0	**0**
0545 - 0645	0	0	**0**
0600 - 0700	0	0	**0**
0615 - 0715	0	0	**0**
0630 - 0730	0	0	**0**
0645 - 0745	1	0	**1**
0700 - 0800	1	0	**1**
0715 - 0815	1	0	**1**
0730 - 0830	1	0	**1**
0745 - 0845	0	0	**0**
0800 - 0900	0	0	**0**
0815 - 0915	0	0	**0**
0830 - 0930	0	0	**0**
PEAK HOUR	**0**	**0**	**0**

Heavies

Time Per	U-TURNS Nth to Sth	U-TURNS Sth to Nth	Tot
0530 - 0630	0	0	**0**
05456 - 0645	0	0	**0**
0600 - 0700	0	0	**0**
0615 - 0715	0	0	**0**
0630 - 0730	0	0	**0**
0645 - 0745	0	0	**0**
0700 - 0800	0	0	**0**
0715 - 0815	0	0	**0**
0730 - 0830	0	0	**0**
0745 - 0845	0	0	**0**
0800 - 0900	0	0	**0**
0815 - 0915	0	0	**0**
0830 - 0930	0	0	**0**
PEAK HOUR	**0**	**0**	**0**

COMBINED

Time Per	U-TURNS Nth to Sth	U-TURNS Sth to Nth	Tot
0530 - 0630	0	0	**0**
0545 - 0645	0	0	**0**
0600 - 0700	0	0	**0**
0615 - 0715	0	0	**0**
0630 - 0730	0	0	**0**
0645 - 0745	1	0	**1**
0700 - 0800	1	0	**1**
0715 - 0815	1	0	**1**
0730 - 0830	1	0	**1**
0745 - 0845	0	0	**0**
0800 - 0900	0	0	**0**
0815 - 0915	0	0	**0**
0830 - 0930	0	0	**0**
PEAK HOUR	**0**	**0**	**0**

R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : TUPA
Job No/Name : 6217 EXETER Kingsbury VC Rest Area
Day/Date : Tuesday 27th February 2018

Lights	NORTH			WEST			SOUTH			EAST			
	Hume Hwy			*Private Rd*			*Hume Hwy*			*To State Forest*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	**TOT**
1530 - 1545	1	104	0	0	0	0	0	139	0	0	0	0	**244**
1545 - 1600	3	123	0	0	0	0	0	162	0	2	0	0	**290**
1600 - 1615	3	156	0	0	0	0	0	188	0	2	0	0	**349**
1615 - 1630	1	144	0	0	0	0	0	139	0	0	0	0	**284**
1630 - 1645	2	148	0	0	0	0	0	207	0	0	0	8	**365**
1645 - 1700	1	141	0	0	0	0	0	188	1	1	0	4	**336**
1700 - 1715	2	133	0	0	0	0	0	171	0	0	0	0	**306**
1715 - 1730	2	151	0	0	0	0	0	157	0	4	0	0	**314**
1730 - 1745	2	115	0	1	0	0	0	161	0	0	0	0	**279**
1745 - 1800	1	158	0	0	0	0	0	140	0	0	0	0	**299**
1800 - 1815	3	122	0	0	0	0	0	158	0	0	0	1	**284**
1815 - 1830	3	104	0	0	0	0	0	104	0	0	0	0	**211**
Period End	**24**	**1599**	**0**	**1**	**0**	**0**	**0**	**1914**	**1**	**9**	**0**	**13**	**3561**

Heavies	NORTH			WEST			SOUTH			EAST			
	Hume Hwy			*Private Rd*			*Hume Hwy*			*To State Forest*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	**TOT**
1530 - 1545	0	26	0	0	0	0	0	17	0	0	0	0	**43**
1545 - 1600	0	41	0	0	0	0	0	19	0	0	0	0	**60**
1600 - 1615	0	42	0	0	0	0	0	24	0	0	0	0	**66**
1615 - 1630	0	46	0	0	0	0	0	17	0	0	0	0	**63**
1630 - 1645	0	36	0	0	0	0	0	20	0	0	0	0	**56**
1645 - 1700	0	43	0	0	0	0	0	25	0	0	0	0	**68**
1700 - 1715	0	37	0	0	0	0	0	21	0	0	0	0	**58**
1715 - 1730	0	29	0	0	0	0	0	16	0	0	0	0	**45**
1730 - 1745	0	34	0	0	0	0	0	15	1	0	0	0	**50**
1745 - 1800	0	47	0	0	0	0	0	23	0	0	0	0	**70**
1800 - 1815	0	36	0	0	0	0	0	24	0	0	0	0	**60**
1815 - 1830	0	27	0	0	0	0	0	16	0	0	0	0	**43**
Period End	**0**	**444**	**0**	**0**	**0**	**0**	**0**	**237**	**1**	**0**	**0**	**0**	**682**

Combined	NORTH			WEST			SOUTH			EAST			
	Hume Hwy			*Private Rd*			*Hume Hwy*			*To State Forest*			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	**TOT**
1530 - 1545	1	130	0	0	0	0	0	156	0	0	0	0	**287**
1545 - 1600	3	164	0	0	0	0	0	181	0	2	0	0	**350**
1600 - 1615	3	198	0	0	0	0	0	212	0	2	0	0	**415**
1615 - 1630	1	190	0	0	0	0	0	156	0	0	0	0	**347**
1630 - 1645	2	184	0	0	0	0	0	227	0	0	0	8	**421**
1645 - 1700	1	184	0	0	0	0	0	213	1	1	0	4	**404**
1700 - 1715	2	170	0	0	0	0	0	192	0	0	0	0	**364**
1715 - 1730	2	180	0	0	0	0	0	173	0	4	0	0	**359**
1730 - 1745	2	149	0	1	0	0	0	176	1	0	0	0	**329**
1745 - 1800	1	205	0	0	0	0	0	163	0	0	0	0	**369**
1800 - 1815	3	158	0	0	0	0	0	182	0	0	0	1	**344**
1815 - 1830	3	131	0	0	0	0	0	120	0	0	0	0	**254**
Period End	**24**	**2043**	**0**	**1**	**0**	**0**	**0**	**2151**	**2**	**9**	**0**	**13**	**4243**

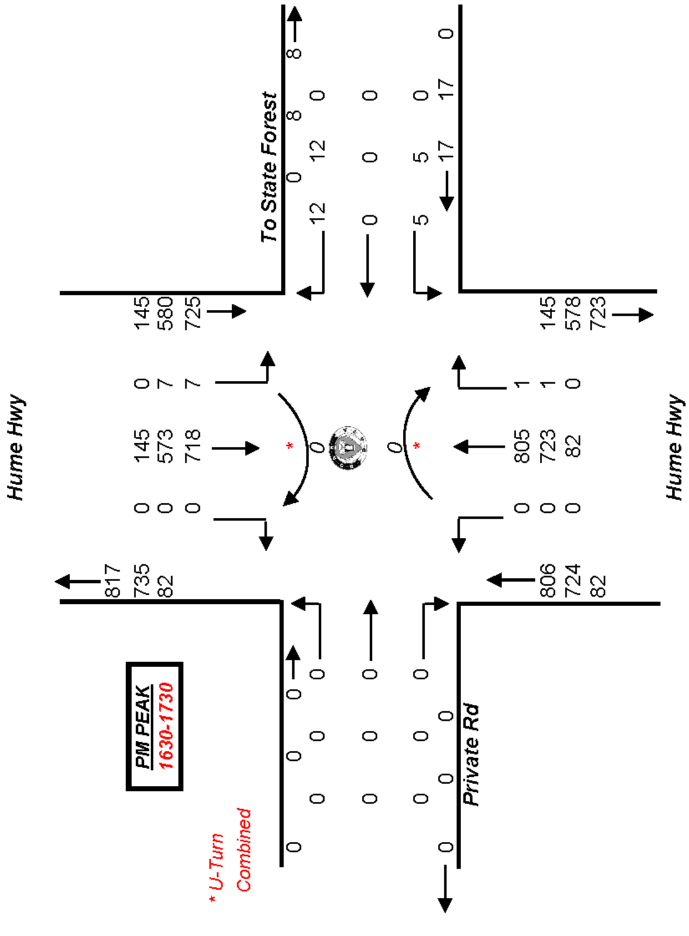
Lights	NORTH			WEST			SOUTH			EAST			
	Hume Hwy			*Private Rd*			*Hume Hwy*			*To State Forest*			
Peak Time	L	T	R	L	T	R	L	T	R	L	T	R	**TOT**
1530 - 1630	8	527	0	0	0	0	0	628	0	4	0	0	**1167**
1545 - 1645	9	571	0	0	0	0	0	696	0	4	0	8	**1288**
1600 - 1700	7	589	0	0	0	0	0	722	1	3	0	12	**1334**
1615 - 1715	6	566	0	0	0	0	0	705	1	1	0	12	**1291**
1630 - 1730	7	573	0	0	0	0	0	723	1	5	0	12	**1321**
1645 - 1745	7	540	0	1	0	0	0	677	1	5	0	4	**1235**
1700 - 1800	7	557	0	1	0	0	0	629	0	4	0	0	**1198**
1715 - 1815	8	546	0	1	0	0	0	616	0	4	0	1	**1176**
1730 - 1830	9	499	0	1	0	0	0	563	0	0	0	1	**1073**
PEAK HOUR	**7**	**573**	**0**	**0**	**0**	**0**	**0**	**723**	**1**	**5**	**0**	**12**	**1321**

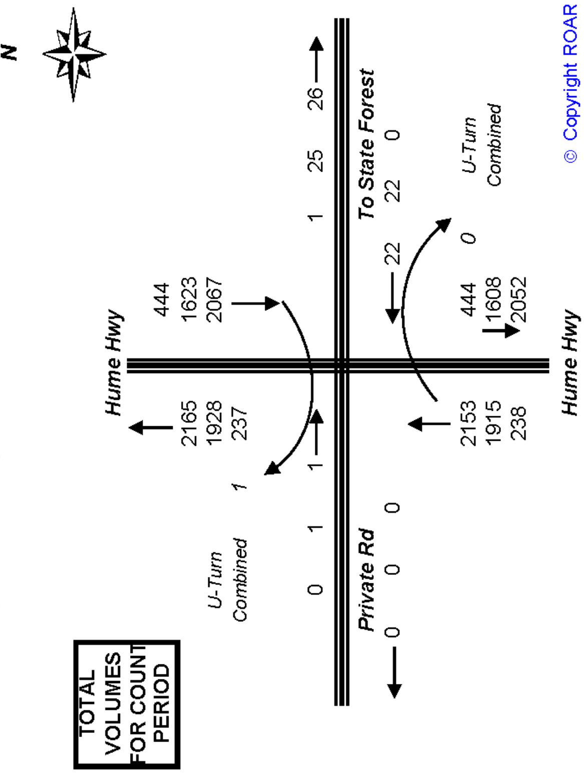
Heavies	NORTH			WEST			SOUTH			EAST			
	Hume Hwy			*Private Rd*			*Hume Hwy*			*To State Forest*			
Peak Per	L	T	R	L	T	R	L	T	R	L	T	R	**TOT**
1530 - 1630	0	155	0	0	0	0	0	77	0	0	0	0	**232**
1545 - 1645	0	165	0	0	0	0	0	80	0	0	0	0	**245**
1600 - 1700	0	167	0	0	0	0	0	86	0	0	0	0	**253**
1615 - 1715	0	162	0	0	0	0	0	83	0	0	0	0	**245**
1630 - 1730	0	145	0	0	0	0	0	82	0	0	0	0	**227**
1645 - 1745	0	143	0	0	0	0	0	77	1	0	0	0	**221**
1700 - 1800	0	147	0	0	0	0	0	75	1	0	0	0	**223**
1715 - 1815	0	146	0	0	0	0	0	78	1	0	0	0	**225**
1730 - 1830	0	144	0	0	0	0	0	78	1	0	0	0	**223**
PEAK HOUR	**0**	**145**	**0**	**0**	**0**	**0**	**0**	**82**	**0**	**0**	**0**	**0**	**227**

Combined	NORTH			WEST			SOUTH			EAST			
	Hume Hwy			*Private Rd*			*Hume Hwy*			*To State Forest*			
Peak Per	L	T	R	L	T	R	L	T	R	L	T	R	**TOT**
1530 - 1630	8	682	0	0	0	0	0	705	0	4	0	0	**1399**
1545 - 1645	9	736	0	0	0	0	0	776	0	4	0	8	**1533**
1600 - 1700	7	756	0	0	0	0	0	808	1	3	0	12	**1587**
1615 - 1715	6	728	0	0	0	0	0	788	1	1	0	12	**1536**
1630 - 1730	7	718	0	0	0	0	0	805	1	5	0	12	**1548**
1645 - 1745	7	683	0	1	0	0	0	754	2	5	0	4	**1456**
1700 - 1800	7	704	0	1	0	0	0	704	1	4	0	0	**1421**
1715 - 1815	8	692	0	1	0	0	0	694	1	4	0	1	**1401**
1730 - 1830	9	643	0	1	0	0	0	641	1	0	0	1	**1296**
PEAK HOUR	**7**	**718**	**0**	**0**	**0**	**0**	**0**	**805**	**1**	**5**	**0**	**12**	**1548**

R.O.A.R DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : TUPA
Job No/Name : 6217 EXETER Kingsbury VC Rest Area
Day/Date : Tuesday 27th February 2018





R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Mob.0418-239019

Client : TUPA
Job No/Name : 6217 EXETER Kingsbury VC Rest Area
Day/Date : Tuesday 27th February 2018

These figures not included in top tables

Lights

	U-TURNS		
	Nth to	Sth to	
Time Per	**Sth**	**Nth**	**Tot**
1530 - 1545	0	0	**0**
1545 - 1600	0	0	**0**
1600 - 1615	0	0	**0**
1615 - 1630	0	0	**0**
1630 - 1645	0	0	**0**
1645 - 1700	0	0	**0**
1700 - 1715	0	0	**0**
1715 - 1730	0	0	**0**
1730 - 1745	0	1	**1**
1745 - 1800	0	0	**0**
1800 - 1815	0	0	**0**
1815 - 1830	0	0	**0**
Period End	**0**	**1**	**1**

Heavies

	U-TURNS		
	Nth to	Sth to	
Time Per	**Sth**	**Nth**	**Tot**
1530 - 1545	0	0	**0**
1545 - 1600	0	0	**0**
1600 - 1615	0	0	**0**
1615 - 1630	0	0	**0**
1630 - 1645	0	0	**0**
1645 - 1700	0	0	**0**
1700 - 1715	0	0	**0**
1715 - 1730	0	0	**0**
1730 - 1745	0	0	**0**
1745 - 1800	0	0	**0**
1800 - 1815	0	0	**0**
1815 - 1830	0	0	**0**
Period End	**0**	**0**	**0**

COMBINED

	U-TURNS		
	Nth to	Sth to	
Time Per	**Sth**	**Nth**	**Tot**
1530 - 1545	0	0	**0**
1545 - 1600	0	0	**0**
1600 - 1615	0	0	**0**
1615 - 1630	0	0	**0**
1630 - 1645	0	0	**0**
1645 - 1700	0	0	**0**
1700 - 1715	0	0	**0**
1715 - 1730	0	0	**0**
1730 - 1745	0	1	**1**
1745 - 1800	0	0	**0**
1800 - 1815	0	0	**0**
1815 - 1830	0	0	**0**
Period End	**0**	**1**	**1**

Lights

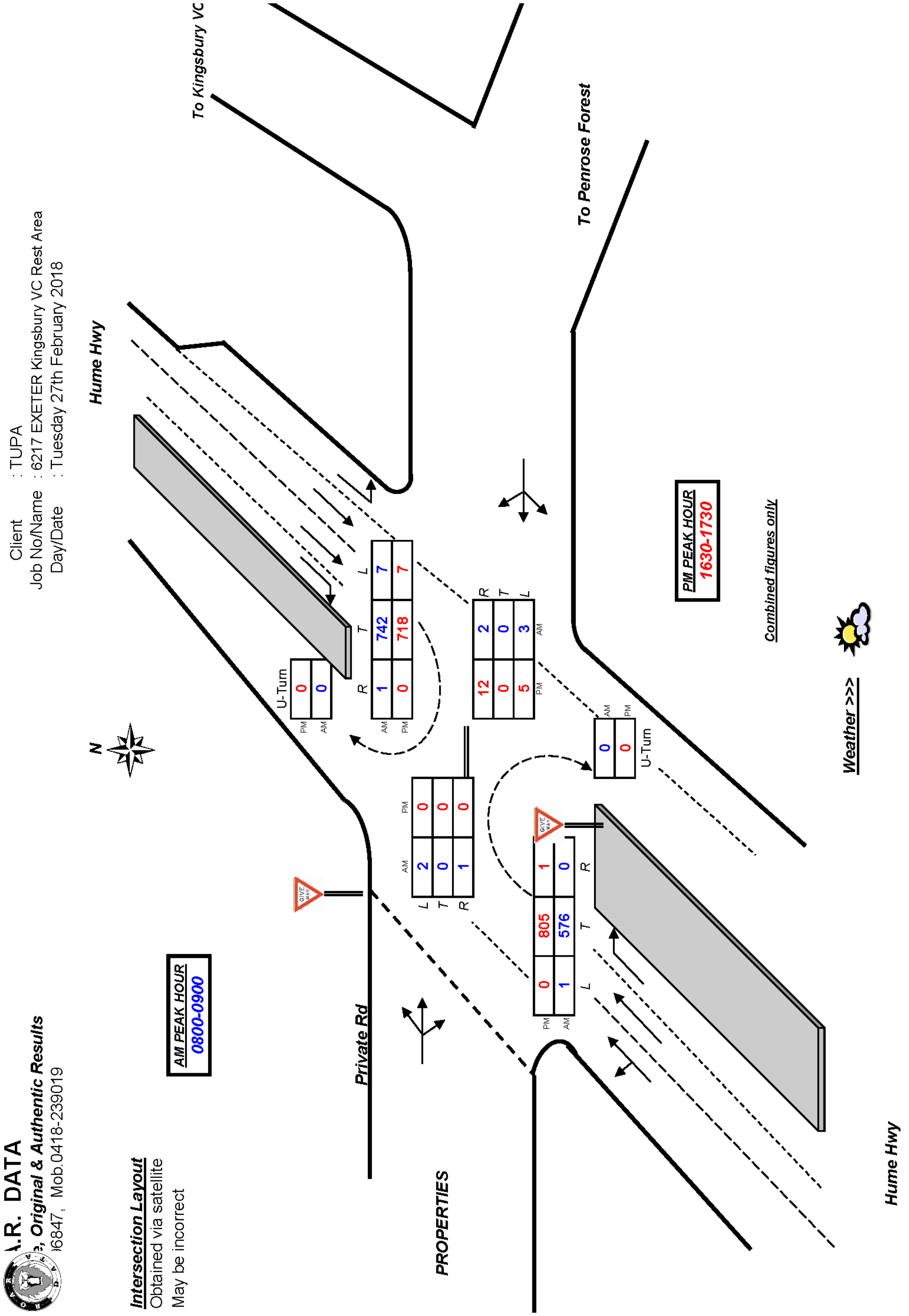
	U-TURNS		
	Nth to	Sth to	
Time Per	**Sth**	**Nth**	**Tot**
1530 - 1630	0	0	**0**
1545 - 1645	0	0	**0**
1600 - 1700	0	0	**0**
1615 - 1715	0	0	**0**
1630 - 1730	0	0	**0**
1645 - 1745	0	1	**1**
1700 - 1800	0	1	**1**
1715 - 1815	0	1	**1**
1730 - 1830	0	1	**1**
PEAK HOUR	**0**	**0**	**0**

Heavies

	U-TURNS		
	Nth to	Sth to	
Time Per	**Sth**	**Nth**	**Tot**
1530 - 1630	0	0	**0**
1545 - 1645	0	0	**0**
1600 - 1700	0	0	**0**
1615 - 1715	0	0	**0**
1630 - 1730	0	0	**0**
1645 - 1745	0	0	**0**
1700 - 1800	0	0	**0**
1715 - 1815	0	0	**0**
1730 - 1830	0	0	**0**
PEAK HOUR	**0**	**0**	**0**

COMBINED

	U-TURNS		
	Nth to	Sth to	
Time Per	**Sth**	**Nth**	**Tot**
1530 - 1630	0	0	**0**
1545 - 1645	0	0	**0**
1600 - 1700	0	0	**0**
1615 - 1715	0	0	**0**
1630 - 1730	0	0	**0**
1645 - 1745	0	1	**1**
1700 - 1800	0	1	**1**
1715 - 1815	0	1	**1**
1730 - 1830	0	1	**1**
PEAK HOUR	**0**	**0**	**0**


A.R. DATA
, Original & Authentic Results
6847 , Mob.0418-239019
Client : TUPA
Job No/Name : 6217 EXETER Kingsbury VC Rest Area
Day/Date : Tuesday 27th February 2018
Intersection Layout
Obtained via satellite
May be incorrect
AM PEAK HOUR
0800-0900
PM PEAK HOUR
1630-1730
Combined figures only
Weather >>>
N
Hume Hwy
Hume Hwy
To Kingsbury VC
To Penrose Forest
Private Rd
PROPERTIES
U-Turn PM 0 AM 0
R AM 1 PM 0
T AM 742 PM 718
L AM 7 PM 7
R AM 2 PM 12
T AM 0 PM 0
L AM 3 PM 5
U-Turn AM 0 PM 0
L AM 2 PM 0
T AM 0 PM 0
R AM 1 PM 0
L PM 0 AM 1
T PM 805 AM 576
R PM 1 AM 0
GIVE WAY
GIVE WAY