



Aus-10 Rhyolite Pty Ltd

ENVIRONMENTAL IMPACT STATEMENT

Proposed Expansion of Tinda Creek Sand Quarry

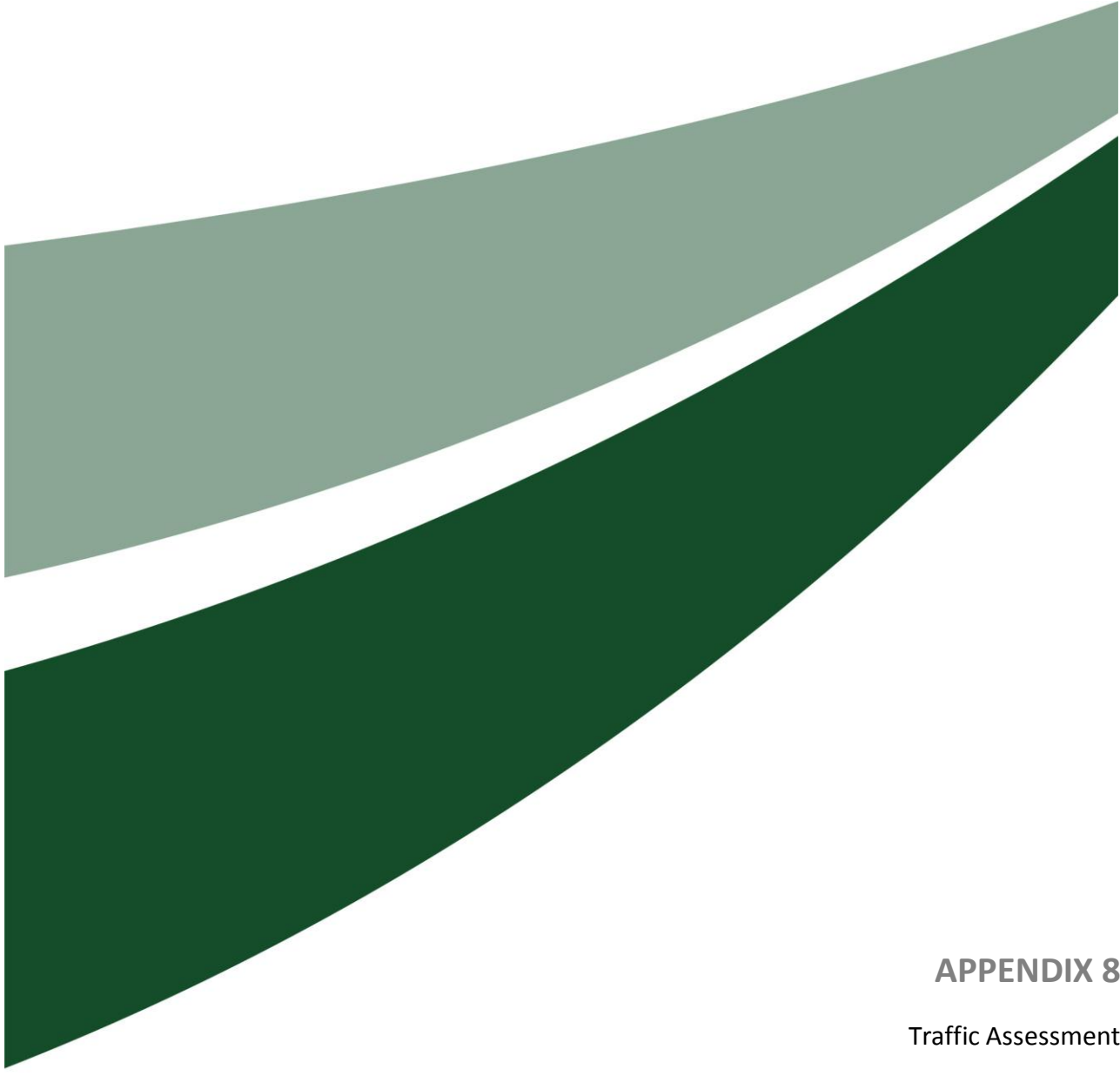
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APPENDIX 8

Traffic Assessment



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TRAFFIC ASSESSMENT

UPGRADE OF EXISTING SAND QUARRY FACILITY

TINDA CREEK QUARRY, PUTTY ROAD
MELLONG

June 2013

Hy-Tec Concrete & Aggregate, Tinda Creek Quarry – The Applicant

Hawkesbury City Council Local Government Area

Prepared by
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UPGRADE SAND QUARRY FACILITY

TRAFFIC ASSESSMENT

Section 1 – INTRODUCTION

TPK & Associates Pty Ltd (TPK) has been commissioned by Umwelt (Australia) Pty Ltd, for The Applicant to join the project team in preparation of a submission to Department of Planning for an Upgrade to an Existing Sand Quarry Facility at:

- **6102 Putty Road, Mellong (Tinda Creek Quarry)**

Figure 1 shows the location of the subject site.

TPK'S assessment was focused on:

- Traffic Generation.
- Potential Traffic Impact on intersection capacity.
- Road Environment

Mr. Terry Keating, Director, TPK undertook the evaluation and preparation of this report. He has over 40 years experience in the road safety and traffic management profession, including the assessment of traffic generating developments.

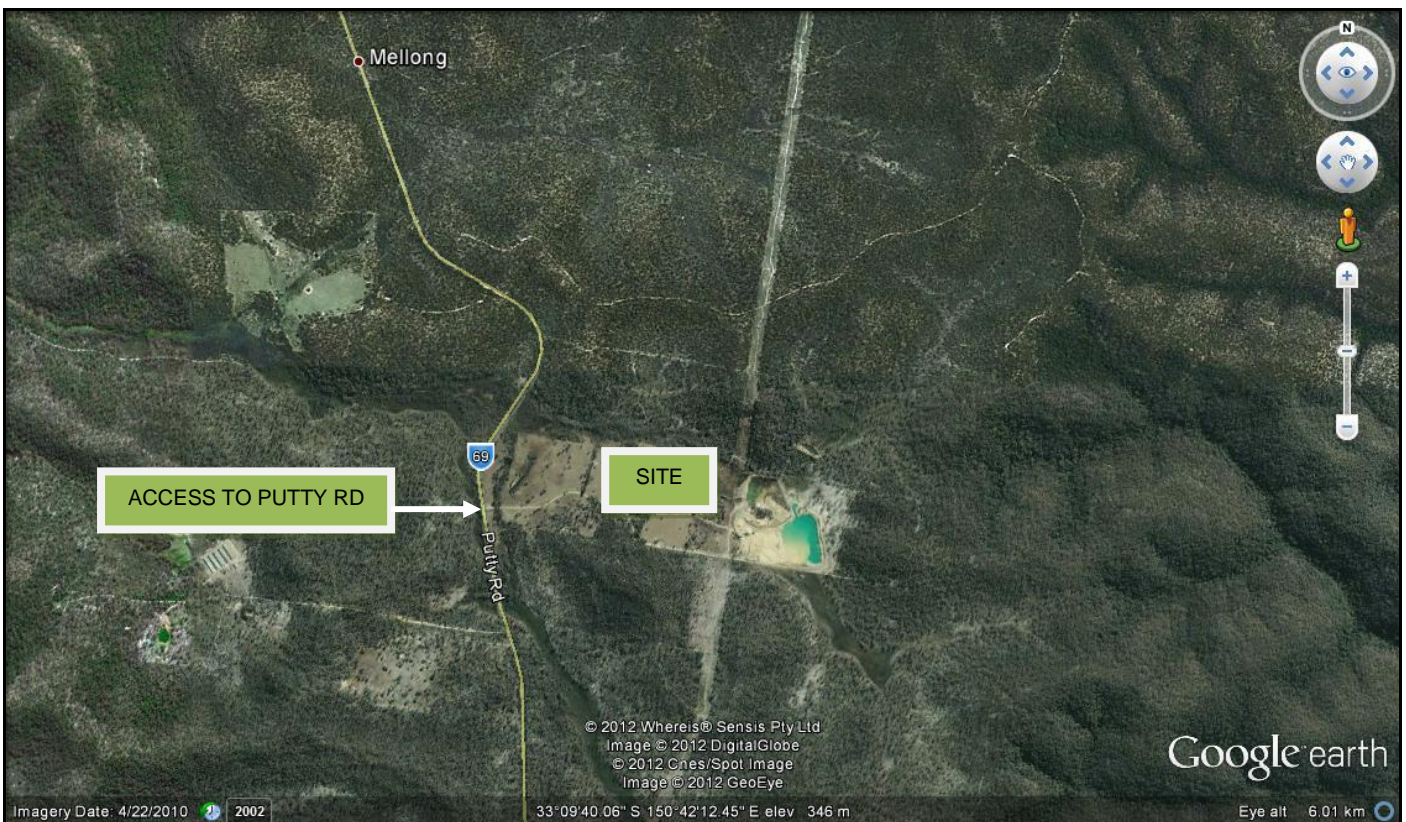


FIGURE 1 – LOCALITY PLAN

Section 2 – TRAFFIC GENERATION

The Applicant proposes to increase product output at the existing quarry from 125Kt to 300Kt per annum; the impact of the increased production in terms of traffic demands is summarised in Table 1. The quarry operation hours are expected to be, details are:

- 0500 to 2200 Monday to Friday
- 0500 to 1500 Saturday

TABLE 1 – TRAFFIC GENERATION SCENARIOS

| QUARRY LEVEL OF OPERATION | VOLUMES |
|---------------------------|---|
| Existing | <p>Heavy Vehicle Loads per Day on Average 12 to 16.</p> <ul style="list-style-type: none"> • Equates to 12 to 16 inward and 12 to 16 outward heavy vehicle trips per day. <p>Site Staff 6 to 8 persons. Equates to a spread of 6 to 8 inward trips in the morning and the reverse at site closure.</p> |
| Proposed | <p>Heavy Vehicle Loads per Day on Average 30 to 34.</p> <ul style="list-style-type: none"> • Equates to 30 to 34 inward and 30 to 34 outward heavy vehicle trips per day. <p>Site Staff 6 to 8 persons.</p> <ul style="list-style-type: none"> • Equates to a spread of 6 to 8 inward trips in the morning and the reverse at site closure. |

The potential increase in truck flow is 18 loads spread over the day; an increase of 36 trips.

Traffic survey of existing traffic flows was undertaken by TPK as part of the site inspection for this assessment; the volumes are shown in Figure 1.

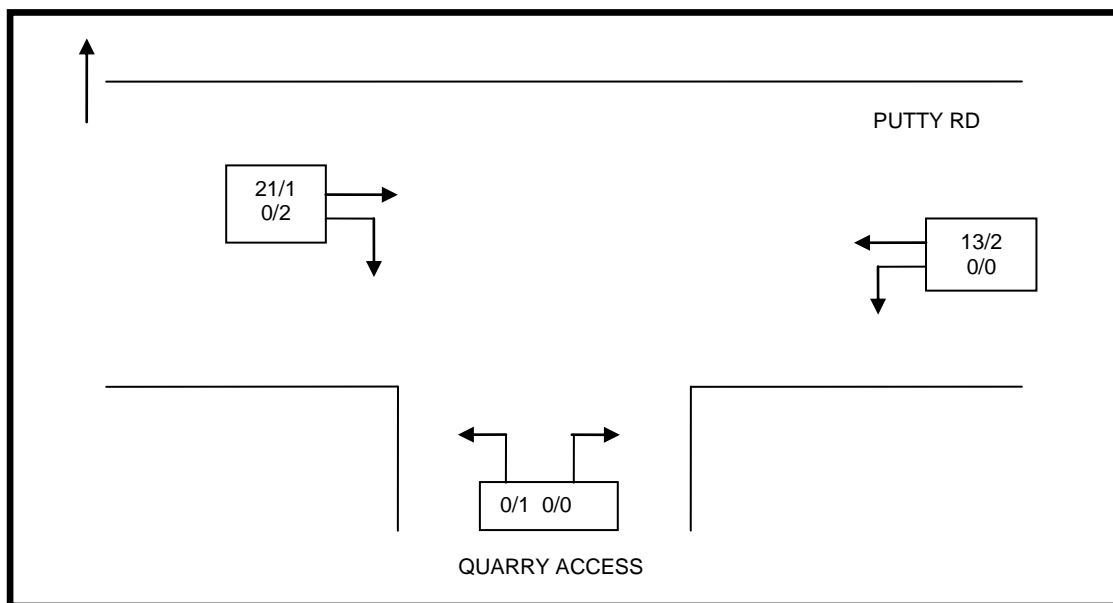


FIGURE 1 – TYPICAL FLOWS (Light/Heavy), Survey taken over period 1230 to 1330 on 13th May 2013

The traffic survey undertaken by TPK was not peak hour for Putty Road. BJ Bradley & Associates undertook traffic survey in 2009 on Putty Road at a location to the north; the volumes are relevant to this assessment as there are no significant influences in between to impact on the peak hour indications.

| TRAFFIC SURVEYS AT DUCK FARM ACCESS ON PUTTY ROAD, HOWES VALLEY | | | | | | | |
|---|---|----------------------------------|----------------------------------|--|---------------------------------------|--|-----------|
| THURSDAY 23/04/2009 | | | | | | | |
| Fine, warm (approx. 27C) | | | | | | | |
| Movement | Northbound on Putty Road left into Duck Farm Access | Northbound through on Putty Road | Southbound through on Putty Road | Southbound on Putty Road right into Duck Farm Access | Duck Farm Access left onto Putty Road | Duck Farm Access right onto Putty Road | |
| Light Vehicles | | | | | | | |
| 1.45-2.00 | 0 | 7 | 6 | 0 | 0 | 0 | |
| 2.00-2.15 | 0 | 5 | 8 | 0 | 0 | 0 | |
| 2.15-2.30 | 0 | 5 | 6 | 0 | 0 | 0 | |
| 2.30-2.45 | 0 | 5 | 14 | 0 | 0 | 0 | |
| 2.45-3.00 | 0 | 11 | 11 | 0 | 0 | 0 | |
| 3.00-3.15 | 0 | 7 | 10 | 1 | 0 | 0 | |
| 3.15-3.30 | 0 | 5 | 12 | 0 | 0 | 0 | |
| 3.30-3.45 | 0 | 6 | 1 | 0 | 1 | 0 | |
| 3.45-4.00 | 0 | 6 | 6 | 0 | 0 | 0 | |
| 4.00-4.15 | 0 | 3 | 2 | 0 | 0 | 0 | |
| 4.15-4.30 | 0 | 4 | 7 | 0 | 0 | 0 | |
| Total | 0 | 64 | 83 | 1 | 1 | 0 | |
| Peak Hour | 0 | 28 | 47 | 1 | 0 | 0 | |
| Heavy Vehicles | | | | | | | |
| 1.45-2.00 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 2.00-2.15 | 0 | 1 | 1 | 0 | 0 | 0 | |
| 2.15-2.30 | 0 | 1 | 1 | 0 | 0 | 0 | |
| 2.30-2.45 | 0 | 1 | 0 | 0 | 0 | 0 | |
| 2.45-3.00 | 0 | 2 | 1 | 0 | 0 | 0 | |
| 3.00-3.15 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 3.15-3.30 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 3.30-3.45 | 0 | 1 | 2 | 0 | 0 | 0 | |
| 3.45-4.00 | 0 | 1 | 0 | 0 | 0 | 0 | |
| 4.00-4.15 | 0 | 0 | 1 | 0 | 0 | 0 | |
| 4.15-4.30 | 0 | 1 | 1 | 0 | 0 | 0 | |
| Total | 0 | 8 | 7 | 0 | 0 | 0 | |
| Peak Hour | 0 | 3 | 1 | 0 | 0 | 0 | |
| Total Vehicles | | | | | | | |
| 1.45-2.00 | 0 | 7 | 6 | 0 | 0 | 0 | |
| 2.00-2.15 | 0 | 6 | 9 | 0 | 0 | 0 | |
| 2.15-2.30 | 0 | 6 | 7 | 0 | 0 | 0 | |
| 2.30-2.45 | 0 | 6 | 14 | 0 | 0 | 0 | 61 |
| 2.45-3.00 | 0 | 13 | 12 | 0 | 0 | 0 | 73 |
| 3.00-3.15 | 0 | 7 | 10 | 1 | 0 | 0 | 76 |
| 3.15-3.30 | 0 | 5 | 12 | 0 | 0 | 0 | 80 |
| 3.30-3.45 | 0 | 7 | 3 | 0 | 1 | 0 | 71 |
| 3.45-4.00 | 0 | 7 | 6 | 0 | 0 | 0 | 59 |
| 4.00-4.15 | 0 | 3 | 3 | 0 | 0 | 0 | 47 |
| 4.15-4.30 | 0 | 5 | 8 | 0 | 0 | 0 | 43 |
| Total | 0 | 72 | 90 | 1 | 1 | 0 | |
| Peak Hour | 0 | 31 | 48 | 1 | 0 | 0 | 80 |

Section 3 – TRAFFIC ASSESSMENT

TPK has assessed the following aspects of traffic generation:

- Sight Distance at Access.
- Access Intersection, Capacity & Channelisation.

Putty Road is a State Road classification (MR 503); TPK has discussed the project with Mr G Trotter RMS Sydney Region. There were no specific directions disclosed from the preliminary consultation, indications were that every consideration would be given to the recommendations of this report.

Putty Road in the vicinity of the access presents as a sealed carriageway with 3.5m lanes and 0.5m sealed shoulders; see P1 & P2 below and on the following page.

3.1 – Sight Distance

The RMS Supplement to Austroads Guide to Road Design Part 4A indicates that between 282m and 304m is the required Safe Intersection Sight Distance (SISD) to be available at intersections within a 100kph speed zone, Putty Road at this access is zoned 100kph.

P1 shows the sight lines available to the south at the quarry access, the view exceeds 304m.



P1 – LOOKING SOUTH ALONG PUTTY ROAD FROM QUARRY ACCESS

P2 shows the sight lines available to the north at the quarry access.

The approach on Putty Road curves north of the access however the view is not obstructed across the land and exceeds 304m. An approaching vehicle, over 300m from the access is identified as visible in the photo P2.




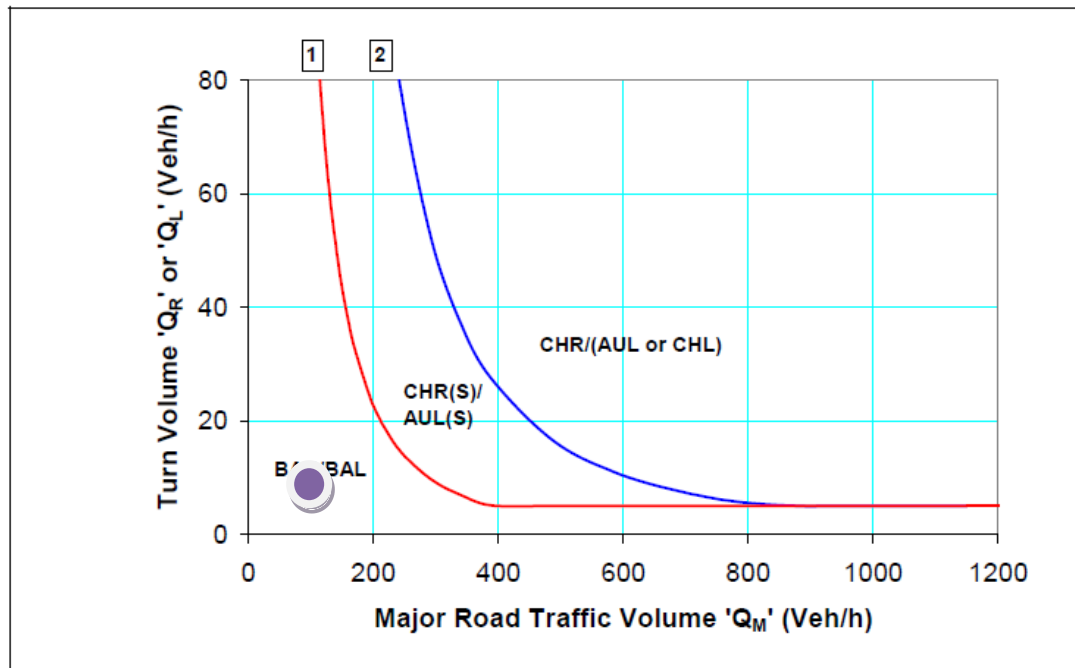
P2 – LOOKING NORTH ALONG PUTTY ROAD FROM QUARRY ACCESS

TPK submits that acceptable SISD is available at the quarry access.

3.2 – Intersection Capacity & Layout

3.2.1 – Intersection Layout

Austrroads Part 4A provides guidance in respect to intersection turn lanes; Graph 1 provided below is the relevant extract from that reference document. Taking into account the existing and potential traffic generations established in Section 2 of this report the Quarry Access intersection traffic is placed on Graph 1 as shown by 



GRAPH 1 – AUSTRROADS GUIDE TO TURN LANES (100kph)

The volumes for the Putty Road/Quarry Access Road intersection place the intersection in the BAR/BAL zone of the Austrroads graph.

The following site conditions are considered relevant to this assessment:

- There is limited numbers of left turn movements into the Access Road over the typical day.
- The Putty Road traffic volumes are a small volume in terms of both daily and hourly levels; as such trucks turning right into the Quarry Access Road rarely encounter an opposing flow that requires the turning vehicle to stand on Putty Road waiting for a gap in the opposing flow before turning.
- The sight lines on Putty Road approaching the Quarry Access Road intersection are on level carriageway with clear view of vehicles ahead. Truck warning signs are provided on both Putty Road approaches to the Quarry Access Road intersection.

TPK submits that the current alignment of Putty Road is acceptable for prevailing conditions given the above points and that widening of the shoulders to BAR layout standard is not essential.

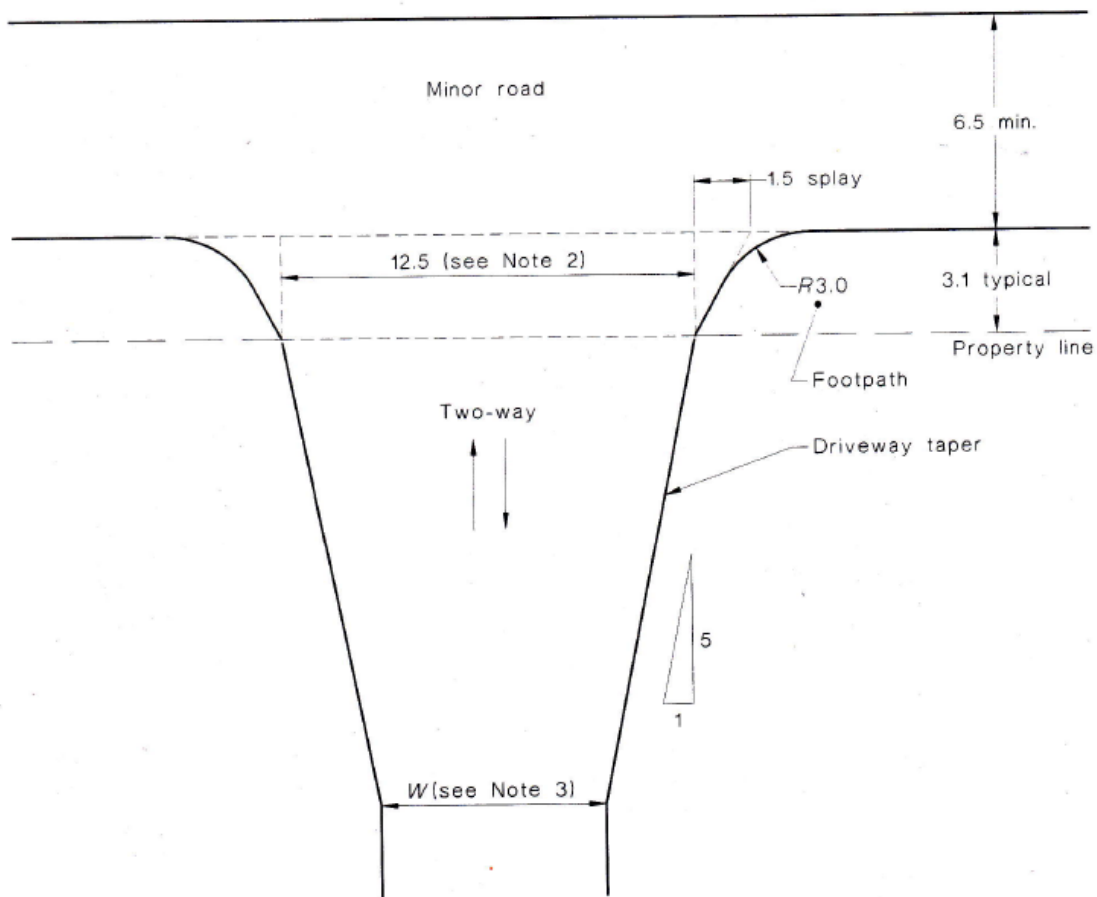
P3 shows the existing Quarry Access Road conditions on the approach to Putty Road.



P3 – QUARRY ACCESS ROAD APPROACHING PUTTY ROAD

Australian Standard AS2890.2 provides guidance to the preferred layout for accesses used by heavy vehicles; the standard provides two options one for a major road and the other a minor road access.

TPK submit that despite the State Road classification of Putty Road the traffic volumes deem the appropriate access from the standard would be the minor road; the relevant Figure 3.1 from AS2890.2 is provided on the following page.



NOTES:

- 1 In the case illustrated the HRV can turn left into the driveway from the left hand side of the public road. The design (19.0 m long) AV will take up most of the public road width when turning left into or out of the driveway, as will the HRV when turning out.
- 2 Corresponding dimensions for the MRV and SRV are 9 m and 6 m respectively. Larger vehicles may be able to use these narrower driveways depending on the width of public road available for manoeuvring in or out.
- 3 W = width of circulation roadway (see Table 3.1).

DIMENSIONS IN METRES

FIGURE 3.1 MINIMUM DESIGN FOR AN ACCESS DRIVEWAY ON A MINOR ROAD CATERING FOR HRVs AND AVs

TPK recommends that the current access be upgraded to comply with AS2890.2, Figure 3.1

3.2.2 – Intersection Capacity

A review of RMS AADT data for Putty Road discloses that growth on this section of Putty Road is not a factor in considering intersection layout; given the insignificant historic traffic growth and the indications from Graph 1 TPK submits that the current intersection provides adequate traffic management for potential traffic volumes.

When assessing the volumes and the intersection Austroads also provides guidance to intersection capacity that is relevant to this site; the extract from Austroads inserted below outlines the traffic volume levels at an intersection that do not require modelling as proof of intersection capacity.

Table 4.1 — Intersection Capacity - Uninterrupted Flow Conditions

| Major Road Type ¹ | Major Road Flow (vph) ² | Minor Road Flow (vph) ³ |
|------------------------------|------------------------------------|------------------------------------|
| Two-lane | 400 | 250 |
| | 500 | 200 |
| | 650 | 100 |
| Four-lane | 1000 | 100 |
| | 1500 | 50 |
| | 2000 | 25 |

Notes:

1. Major road is through road (i.e. has priority).
2. Major road design volumes include through and turning movements.
3. Minor road design volumes include through and turning volumes.

TPK submits that the potential volumes at the Putty Road/Quarry Access intersection will not exceed 100vph on Putty Road and 20vph on the Quarry Access Road; those volumes are within the limits of the Austroads guide and therefore acceptable capacity conditions can be assumed at this intersection.

Section 5 – CONCLUDING STATEMENT

TPK has assessed the proposed increase in production undertaking site inspection, traffic survey and reference to accepted standards; TPK has concluded that:

- The increase in production rate at Tinda Creek Quarry will not have an adverse impact on the surrounding road network.
- The existing intersection of Putty Road & Quarry Access Road is acceptable in terms of channelisation and sight distance relevant to Putty Road.
- The Quarry Access Road formation on approach to Putty Road and its connection to Putty Road should be upgraded to comply with Figure 3.1 of AS2890.2.

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