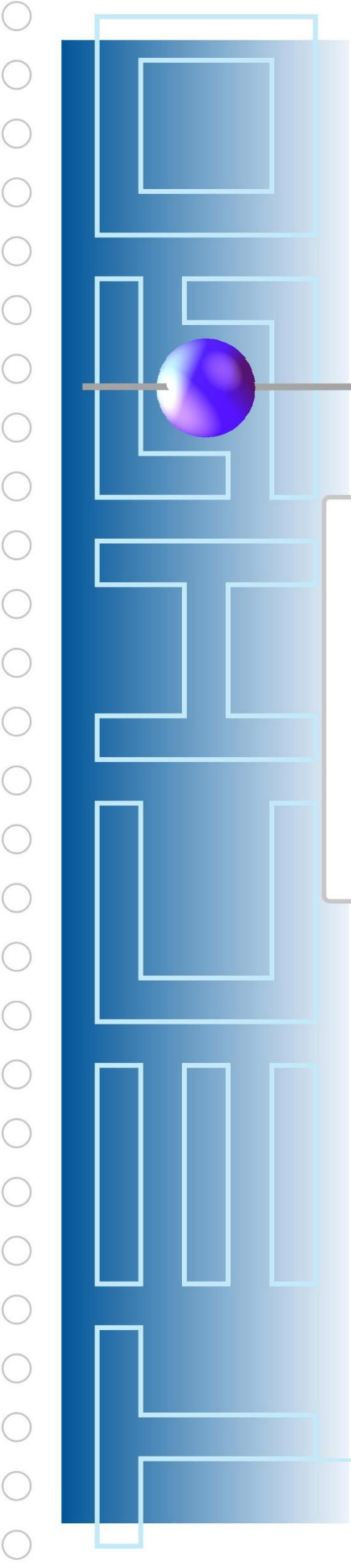




Traffic Impact Statement

**FOR PROPOSED CONSENT USE
APPLICATION TO ESTABLISH A SAND
MINE ON PTN 4 DOORNFONTEIN NO
814, MALMESBURY**



August 2026

Summary Sheet

Report Type:	Traffic Impact Statement
Title:	Traffic Impact Statement Report for proposed consent use application to establish a sand and gravel mine on Portion 4 Doornfontein No 814, Malmesbury
Location:	Portion 4 Doornfontein No 814, Malmesbury Road, Malmesbury
Client:	Dyck Advisory Group (Pty) Ltd.
Reference Number:	TJ2671
Project Team:	Mr Stephen Fautley (PR Tech Eng. – Reg. 200270171)
Contact Details:	021-557 7730
Date:	13 August 2026
Report Status:	DRAFT
File Name:	https://techsolutions-smartsolutions-my.sharepoint.com/personal/steve_techso_co_za/Documents/TECHSO/Projects/Projects 2026/Doornfontein Sand Mine/TIS - Sand and gravel mine on Ptn 4 Doornfontein 814 (20260813).docx

This traffic impact study has been prepared in accordance with the National Department of Transport's Guidelines for Traffic Impact Studies' PR93/635 (1995) by a suitably qualified and registered professional Traffic Engineering Technologist. Details of any of the calculations on which the results in this report are based will be made available on request.

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1. PURPOSE OF REPORT

This Traffic Impact Statement (TIS) Report considers the traffic impact of the proposed sand and gravel mine on Portion 4 of Farm Doornfontein No 814, Malmesbury. Particular attention is given to trip generation, cumulative trips, turning lane warrants and road safety.

2. LOCATION

The site is located some 6.5 km south of Malmesbury (see **Figure 2-1**).

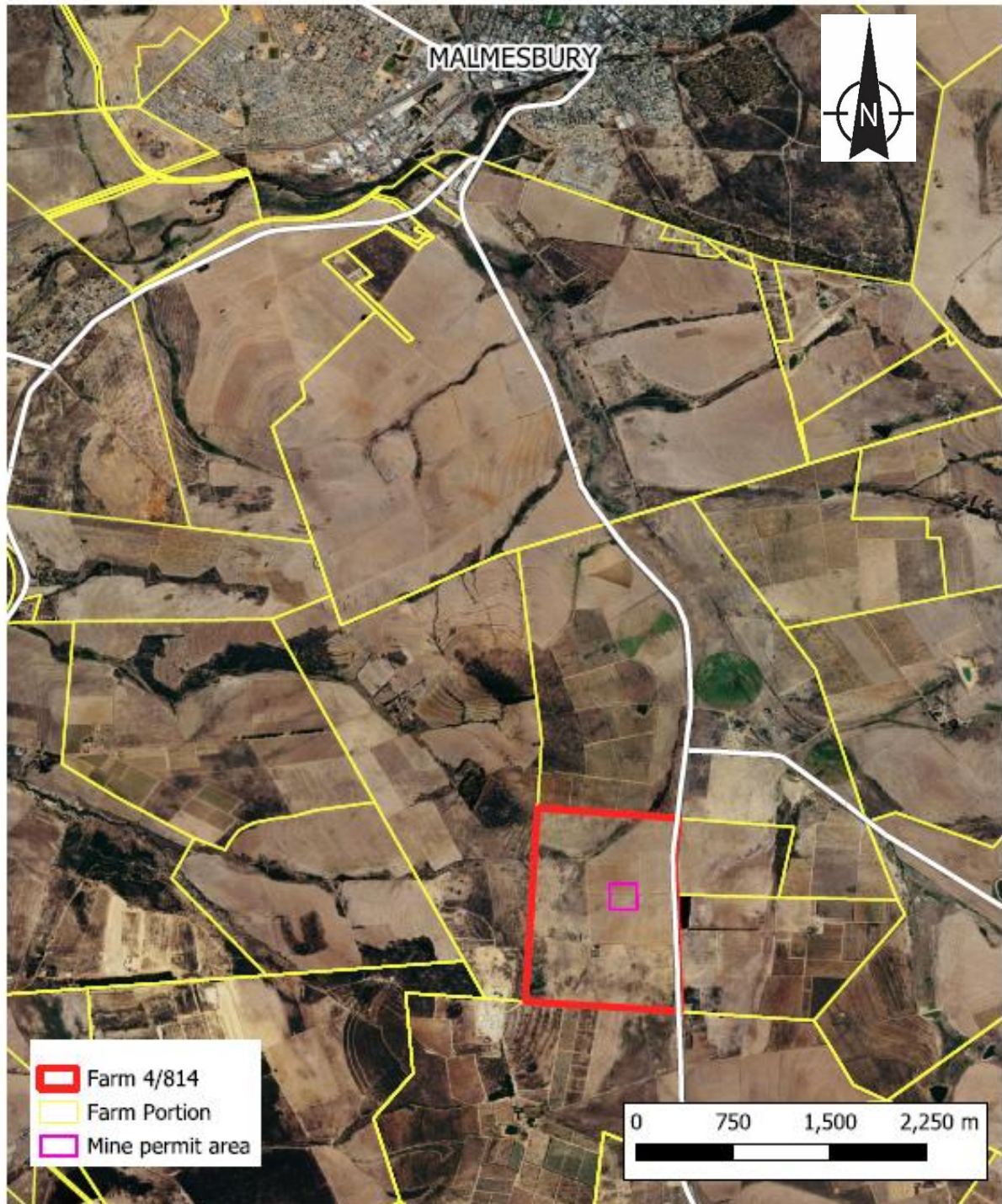


Figure 2-1: Location Map

3. SURROUNDING ROAD NETWORK

The property is accessed via the R302, Main Road 174 (Malmesbury Road) that is a Primary Arterial (Class 2) road

Main Road 174 is with a two-lane undivided carriageway with a 120 km/h speed restriction in the vicinity of the site (see **Figure 3-1** below).

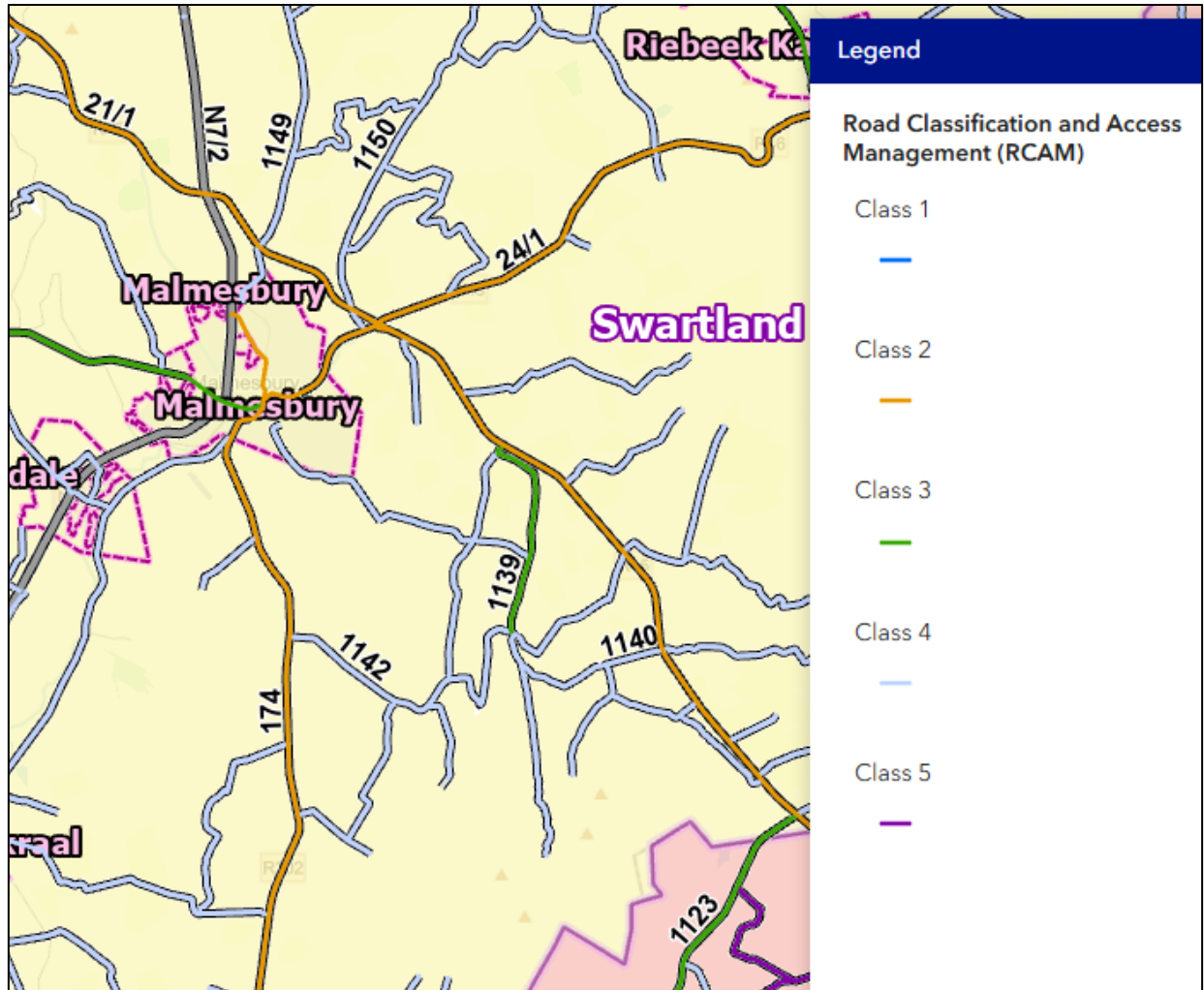


Figure 3-1: MR174 Classification

The subject property is located in a rural roadside environment and enjoys good access to the regional road network.

4. TRAFFIC FLOW

Link traffic counts for Main Road 174 were sourced from the Western Cape Government Road Network Information System. The average annual daily traffic flow is 6300 vehicles with heavy vehicles comprising some 18% of traffic (see **Annexure B Figure 15-1**).

Main Road 174 hourly traffic distribution reveals typical AM and PM peak traffic flows, with 730 vehicles in the AM peak hour (07:00 to 08:00) and 699 vehicles in the PM peak hour (17:00 to 18:00). Off-peak traffic flow ranges from approximately 400 to 700 vehicles per hour (see **Annexure B Figure 15-2** and **Figure 15-4**).

Traffic grown on MR174 was 3.74 % per annum between 2015 to 2026, as shown in **Annexure B Figure 15-5**).

Traffic flow on Main Road 174 is moderate with average traffic growth providing sufficient gaps in traffic flow for motorists entering Main Road 174 from low order intersecting roads and property accesses.

5. EXISTING AND PROPOSED DEVELOPMENT

The existing land development is typically rural / farming in nature.

It is proposed to establish a sand and gravel mine on the subject property. The average depth of mine-able sand spread over the mine area (5ha) is ± 30 cm deep and the average depth of gravel, ± 50 cm. The total volume of mine-able sand on the mining area is conservatively estimated to be $\pm 15\,000\text{m}^3$ and gravel $\pm 25\,000\text{m}^3$, totalling $\pm 40\,000\text{m}^3$.

6. SITE ACCESS

The existing farm road access intersecting with Main Road 174 will be used as a haul road for the proposed sand and gravel mine (see Figure 6-1).

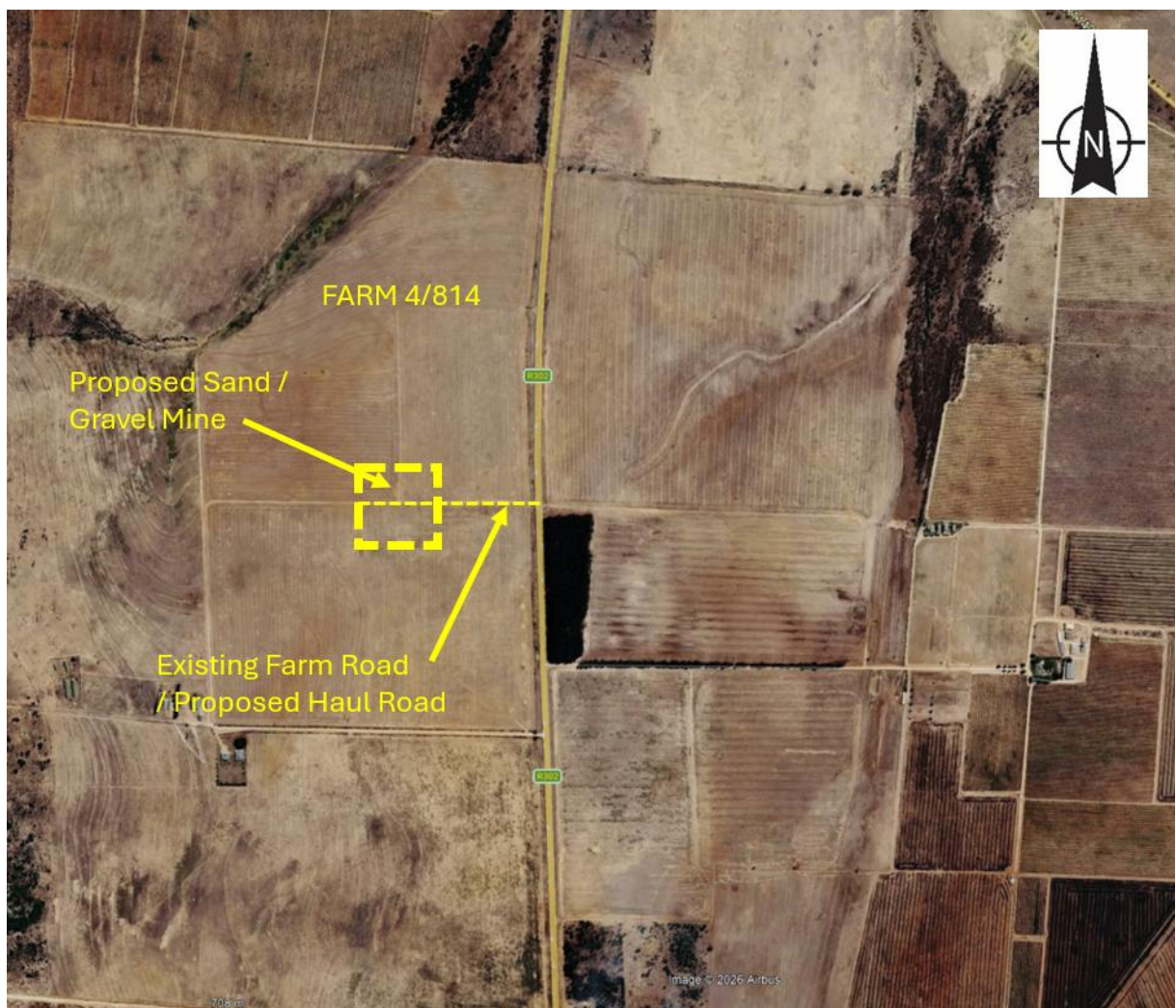


Figure 6-1: Proposed sand mine and haul road/access

The farm/haul road access on Main Road 174 has good shoulder sight distance of 400m to the north and over 600m to the south (exceeding the minimum 350m shoulder sight distance for SU vehicles) (see **Annexure A - Pictures 1 – 4**).

Main Road 174 is in a good condition. The stopping sight distance on Main Road 174 approaches to the farm /proposed haul access is acceptable, far exceeding the minimum of 210m.

7. ACCESS TREATMENT

The existing gravel farm road has a concrete edge beam, in good condition, at its junction with Main Road 174 (see **Annexure A - Picture 5**).

The farm/haul road access gate needs to be set back to achieve 30 m stacking space to the roadway, or the gate must be left open during operations.

Ideally, the farm/haul road approach to Main Road 174 should be hard surfaced for 30 metres to reduce carry of gravel onto Main Road 174. Gravel carry onto roads contributes to deterioration of road markings and can impact on road safety.

8. TRIP GENERATION

Sand Mining Volume and Transport Analysis:

The estimated volume of sand to be mined, based on an average depth of 1.0 meter, is approximately 40 000 cubic meters. The trucks designated for this operation will on average have a capacity of 15 cubic meters (equivalent to 30 tonnes). This mining activity is expected to generate around 6,660 truck trips, with an even distribution of 50% inbound and 50% outbound trips.

Assuming that the materials are mined out within three and a half years, it would generate 3 truckloads of material daily (3 inbound and 3 outbound trips)

Rough Calculation:

$$3 \text{ truckloads} \times 15 \text{ m}^3 = 45 \text{ m}^3 \text{ per day}$$

$$45 \text{ m}^3 \times 22 \text{ working days per month} = 990 \text{ m}^3 \text{ per month}$$

$$990 \text{ m}^3 \times 12 \text{ months} = 11\,880 \text{ m}^3 \text{ per year}$$

$$11\,880 \text{ m}^3 \text{ per year} \times 3.5 \text{ years} = 41\,580 \text{ m}^3 \text{ (i.e. } >40\,000 \text{ m}^3 \text{) in 3.5 years}$$

However, if demand is lower than anticipated, the mining operations may extend for the duration of the project (five years) which would then generate 2 truckloads per day (4 trips per day).

These trips would be towards the north and south along Main Road 174, with possibly greater attraction to the north (towards Malmesbury). The trips should be accommodated on the road network with ease.

Cumulative Trips:

The existing farm operations as well as the proposed sand and gravel mine have insignificant trip generation. Main Road 174 background traffic flow is moderate and the cumulative farm and mining traffic impact is negligible.

9. INTERSECTION ANALYSIS

Intersection analysis should be undertaken where 75 or more additional development trips are added to the sum of the critical lane volumes.

The sand mine is expected to generate some 6 trips per day, with negligible peak hour trips and therefore does not warrant intersection capacity analysis.

10. TURNING LANE WARRANTS

Government Western Cape Road Access Management Guidelines 2020 (2nd Edition was Volume 2) contains guidelines for turning lanes. Typical right-turn lane assessment criteria and relevant data relating to the proposed access is shown in **Annexure C**.

The Table below shows the key risk elements when considering right-turn movements, particularly in rural and semi-rural areas where operating speeds are often high.

Table 10-1: Key considerations for Right-turn lanes in rural and semi-rural areas.

Criteria	Data
Key Risk Considerations in Rural and Semi-Rural Areas	
■ Rear-end collisions, particularly in instances where a driver who is unfamiliar with the road brakes unexpectedly to turn into an access, or only indicates his intention very late;	The farm / haul road access is clearly visible to motorists and truck drivers transporting sand and gravel will be familiar with the site and access. The access has a low traffic flow
■ Right angle collisions: where there are high volumes of turning traffic and following vehicles cannot pass on the left, right-turning drivers may feel pressured to take very short gaps;	Following vehicles can pass very low flow right-turn vehicles, by encroaching on the premiss shoulder.
■ Drivers passing on the left where pedestrians, cyclists or slow/stationary vehicles in the shoulder are not clearly visible due to overcast/rainy weather, darkness or deep shade. Sudden stops by vehicles wanting to turn may also force following vehicles into the shoulder to avoid a rear-end collision.	The location of the site is in a rural area where there should be no cyclists or pedestrians or slow-moving vehicles in the shoulder, thereby freeing up use of the road shoulder for passing opportunities. Also, the road section is level and the road and shoulder is clearly visible to approaching vehicles.

The site is located in a rural area, some 6,5 km south of Malmesbury, where there are negligible to nil cyclists or pedestrians. The moderate traffic flows present passing opportunities, and slow-moving vehicles are not expected to be travelling in the road shoulder.

Also, Main Road 174 approaches to the farm/haul road access are level and straight with good visibility of approaching vehicles(see **Annexure A - Pictures 1 to 4**).

Truck drivers serving the sand mine would be familiar with the sand mine haul road access and advance signage informing motorists of the access is not required to prevent sudden slowing down, stopping manoeuvres to turn into the access.

The proposed sand mine will not add significant trips to the existing farm access on Main Road 174.

11. CONCLUSIONS

It is concluded that:

1. The site has access on Main Road 174, a Primary Arterial (Class 2) road located in a rural roadside environment.
2. Main Road 174 is a two-lane undivided carriageway road with a 120 km/h speed limit and is in good condition.
3. The existing agricultural land use has a low trip generation rate.
4. The proposed sand mine will generate a low number of truck trips (average of approximately 6 trips per day) over a period of 3.5 years and will have a negligible impact on traffic.
5. The road environment, background traffic flow and low number of development trips do not warrant turning-lanes at the farm road / proposed sand mine access on Main Road 174.
6. The farm access on Main Road 174 has adequate shoulder sight distance to the south and north.
7. Stopping sight distance on Main Road 174 approaches to the farm access / proposed haul road access exceeds the minimum 210m.
8. The haul road access on Main Road 174 has a concrete edge beam that is on good condition.
9. The farm/haul access gate should be set back to achieve 30 m stacking space to the roadway, or the gate must be left open during operations.
10. Ideally, the last 30 m of the farm road/proposed haul road leading to Main Road 174 should be hard surfaced, to reduce materials carry onto Main Road 174.
11. The safety of the general road user should not be unduly affected by the proposed development.

12. RECOMMENDATIONS

It is recommended that the application for consent to establish a sand mine on the subject property be favourably considered with the following recommendations:

1. Hard surfaced the last 30 m of the farm road/proposed haul road approach to Main Road 174, to reduce materials carry onto Main Road 174.
2. Locate the farm/haul road access gate 30 m from Main Road 174 road edge or ensure that the gate remains open during mining operations.

13. REFERENCES

1. Department of Transport, Guidelines for Traffic Impact Studies, Report No. PR93/635, Pretoria, 1995.
2. Government Western Cape Road Access Management Guidelines 2020 (2nd Edition, Volume 2)
3. TRH 17 – Geometric Design of Rural Roads - 1988
4. <https://rnis.westerncaperoadsinfrastructure.org.za>

14. ANNEXURE A – PICTURES

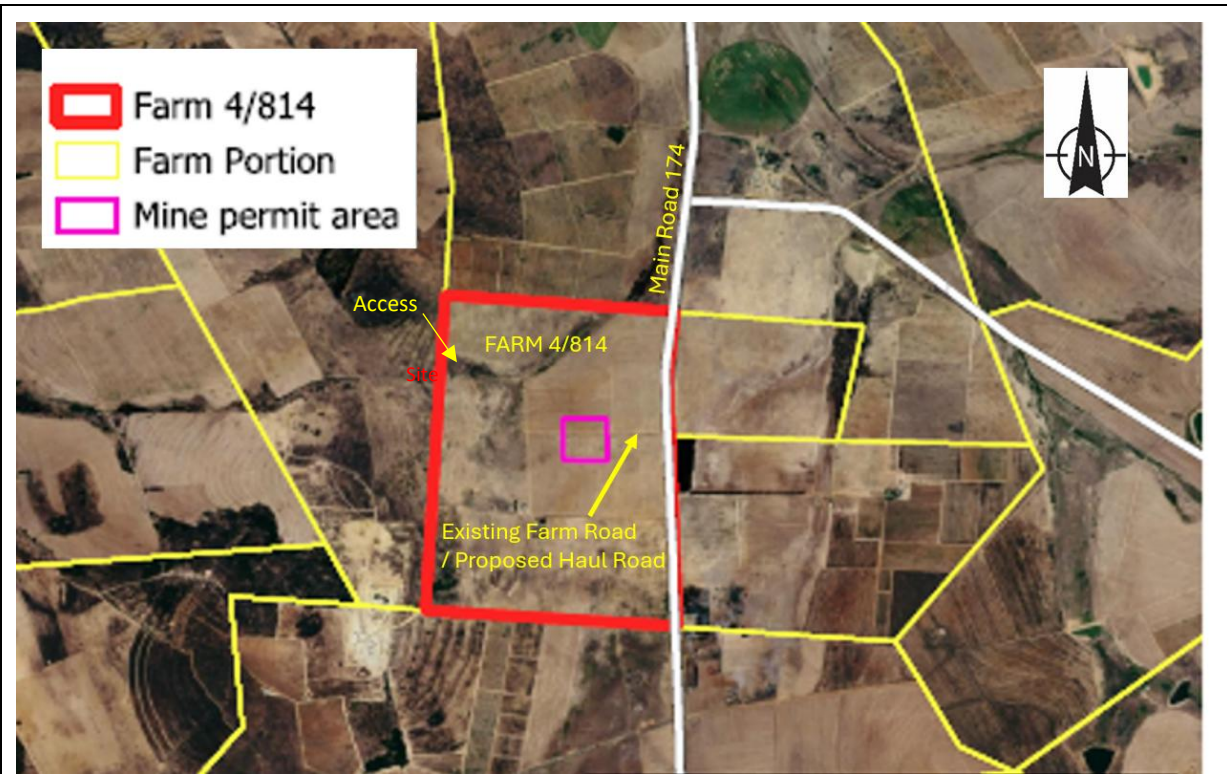


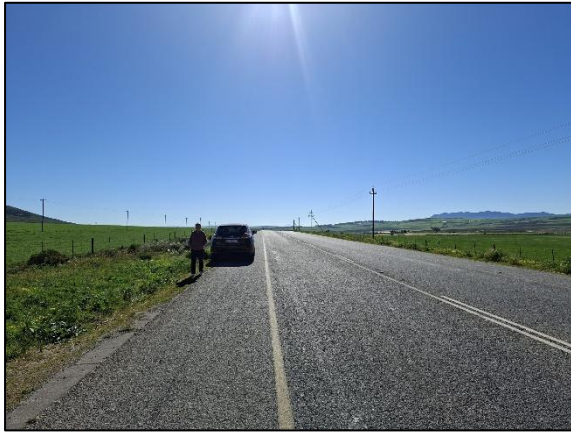
Figure 4 – Farm access on Main Road 174 to serve proposed sand and gravel mine



Pic 1 – View of farm access to be used for the proposed sand and gravel mine



Pic 2 – View opposite of farm access



Pic 3 – View to north / left of farm road access
(proposed haul road access)



Pic 4 – View to south / right of farm access
(proposed haul road access)



Pic 5 – View of concrete edge beam on Farm
access/Haul Road access on R304

15. ANNEXURE B – TRAFFIC DATA

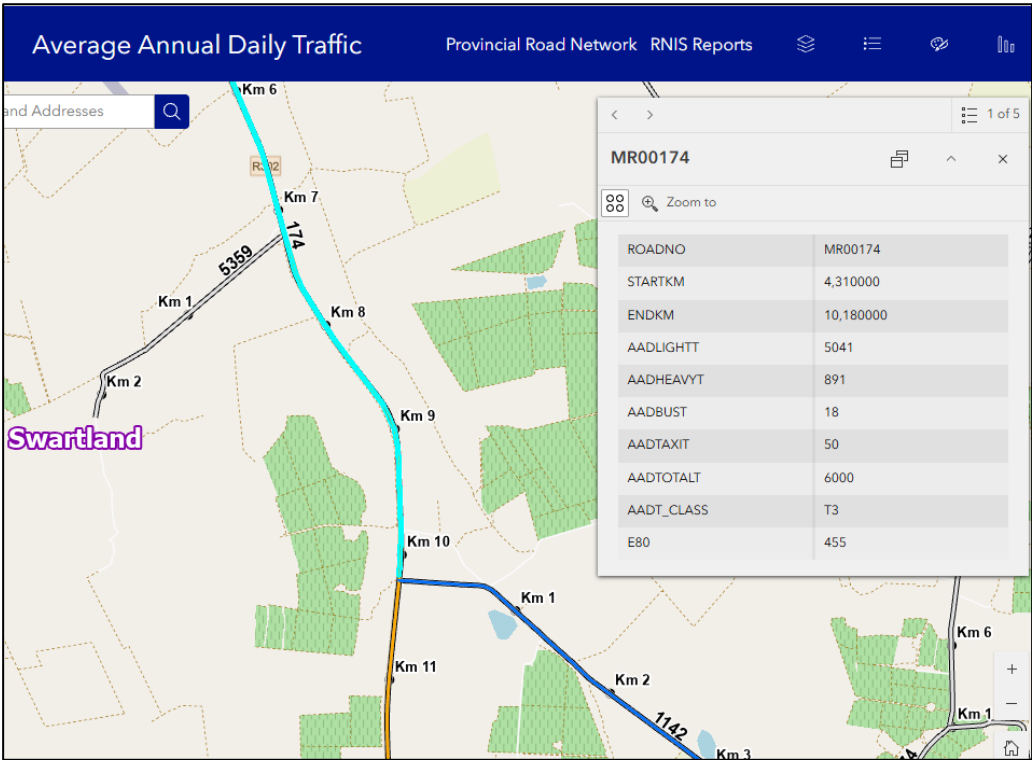


Figure 15-1: MR174 Average Annual Daily Traffic Flow



Figure 15-2: MR174 - Average Daily Classified Traffic Flow distribution

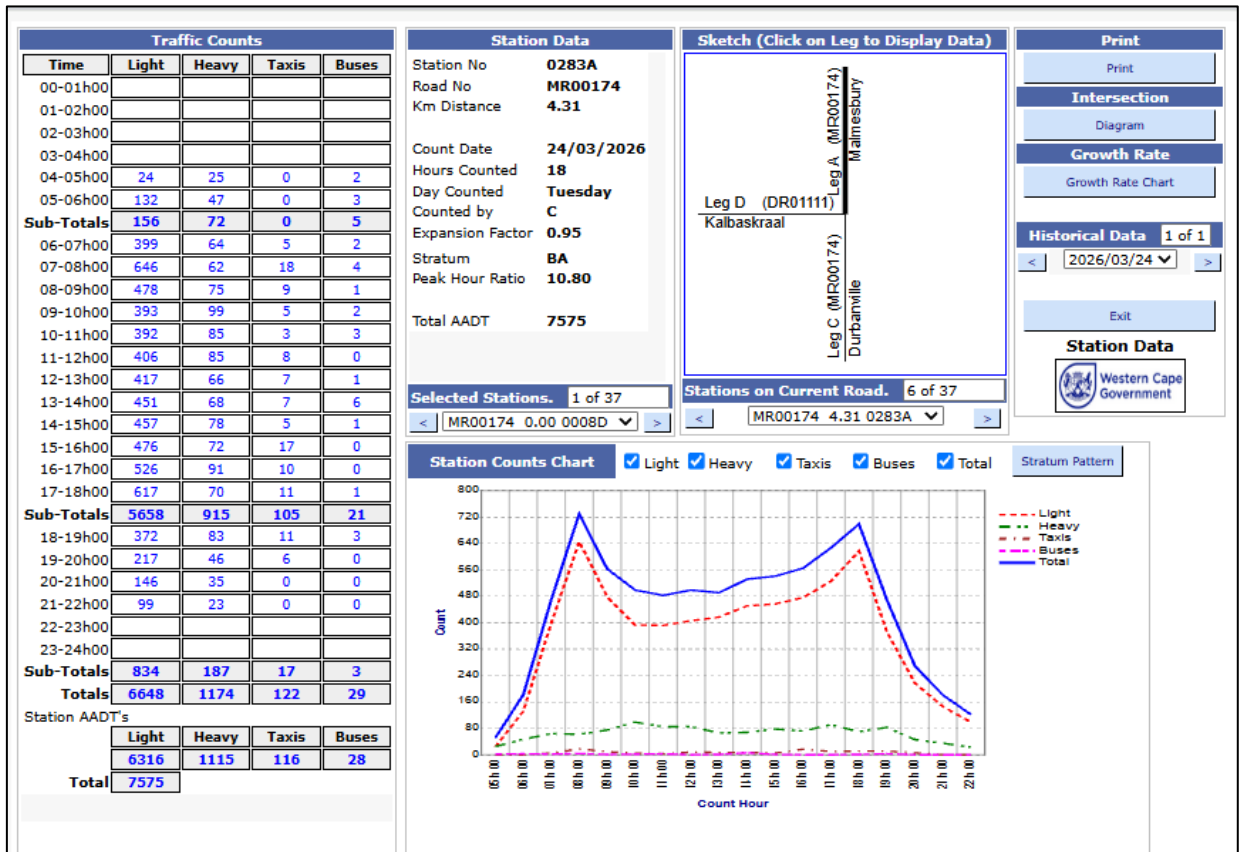


Figure 15-3: MR174 – Average Daily Classified Traffic

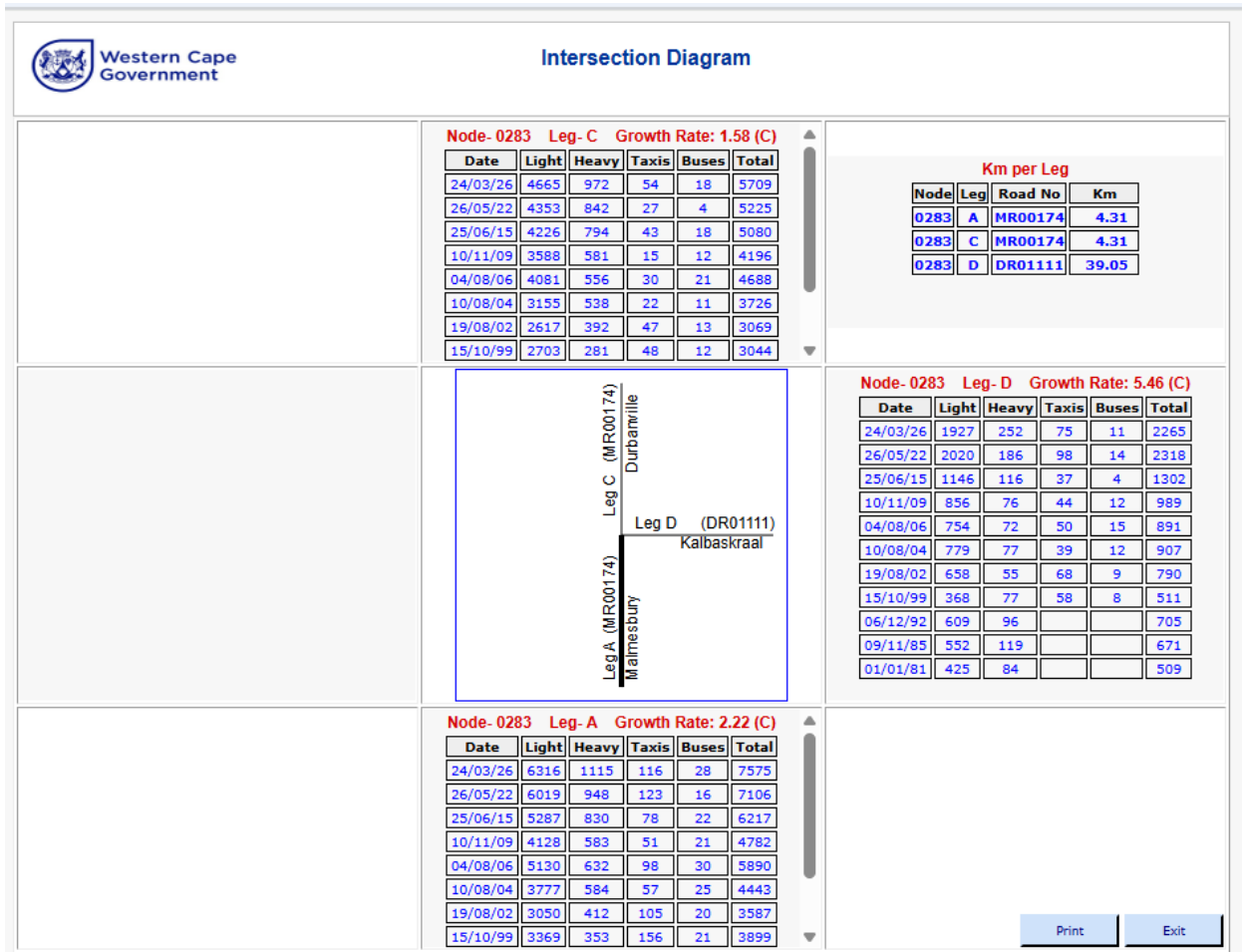


Figure 15-4: MR174 Intersection Traffic Counts at Main Road 174 / DR1111 intersection.

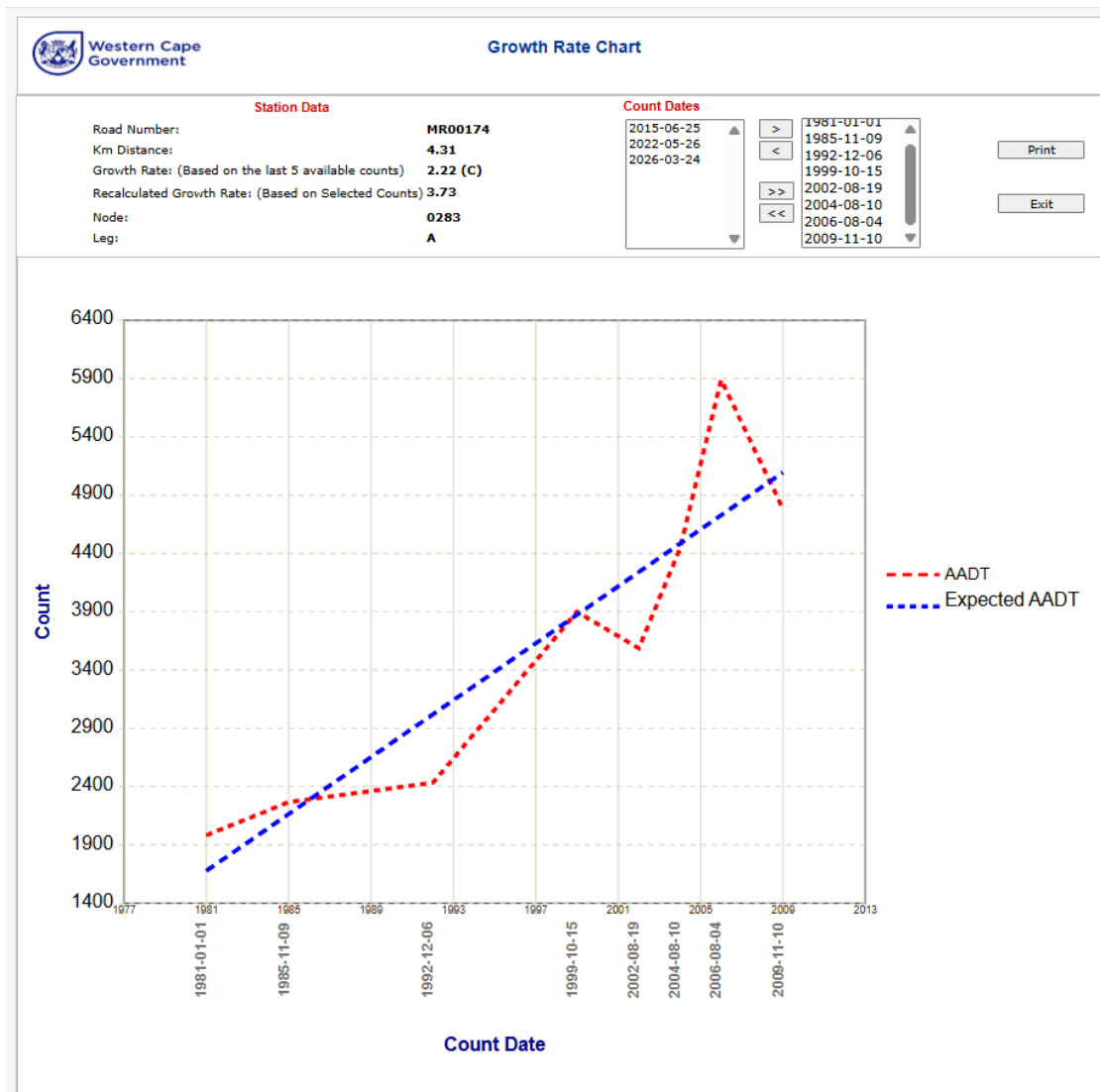


Figure 15-5: MR174 Traffic Growth

16. ANNEXURE C – TYPICAL TURNING LANE CRITERIA

Criteria	Data
Right-turn lanes	
Traffic volumes:	
■ Opposing traffic volume;	365 vph (assume 50% of Peak Hr Volume)
■ Advancing traffic volume;	365 vph (assume 50% of Peak Hr Volume)
■ Advancing right turn volume (either a number or as a percentage of the total advancing volume);	Estimate less than 2 vph vph entering Right-turn vph entering Left-turn
■ Probability of a following vehicle being stopped by a turning vehicle;	Low, can by-pass turning vehicle by encroaching on the 2,0 m wide premix shoulder
■ Number/percentage of trucks; and	18%
■ Likely traffic growth in the foreseeable future.	4% pa
Road geometry and environment:	
■ Roadside development environment;	Rural
■ Class of road;	Class 2
■ Lane and shoulder width and surfacing;	3,7 m lanes with 2,0 m hard surfaced shoulders
■ Sight distance, visibility of shoulder by advancing traffic;	over 400m
■ Available stacking distance in receiving lane of side road/access driveway;	>500m - NA
■ Operating speed (higher operating speed increases the need for a right turn lane/reduces the number of turners required to warrant providing a turn lane).	120 km/h
Non-motorised transport:	
■ Pedestrian and cycle movements;	Negligible to nil
■ Use of the shoulder by NMT users and the availability of separate facilities	Negligible to nil NMT. No separate facilities required or provided.
Other significant factors:	
■ Number of hours per year that the turn volume warrants a turn lane . Road design typically uses factors like the 30th highest hourly volume	None
Other factors, however, may justify non-provision of turn lanes, e.g. wide paved shoulders, few pedestrian movements;	2,0 m surfaced shoulder and insignificant pedestrian movements
■ Accident history at the access/side road intersection.	Should be insignificant considering clear visibility and low Main Road 174 (R304) traffic flow
Criteria	Data
Key Risk Considerations in Rural and Semi-Rural Areas	
■ Rear-end collisions, particularly in instances where a driver who is unfamiliar with the road brakes unexpectedly to turn into an access, or only indicates his intention very late;	The farm / haul road access is clearly visible to motorists and truck drivers transporting sand and gravel will be familiar with the site and access. The access has a low traffic flow
■ Right angle collisions: where there are high volumes of turning traffic and following vehicles cannot pass on the left, right-turning drivers may feel pressured to take very short gaps;	Following vehicles can pass very low flow right-turn vehicles, by encroaching on the premix shoulder.
■ Drivers passing on the left where pedestrians, cyclists or slow/stationary vehicles in the shoulder are not clearly visible due to overcast/rainy weather, darkness or deep shade. Sudden stops by vehicles wanting to turn may also force following vehicles into the shoulder to avoid a rear-end collision.	The location of the site is in a rural area where there should be no cyclists or pedestrians or slow-moving vehicles in the shoulder, thereby freeing up use of the road shoulder for passing opportunities. Also, the road section is level and the road and shoulder is clearly visible to approaching vehicles.