

2024



TRAFFIC IMPACT ASSESSMENT REPORT

For the proposed Mining Right Application on South 3 Opencast within Modikwa Platinum Mine in Burgersfort, Limpopo Province.

Prepared By:



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1. INTRODUCTION

Segope Water and Environmental Services (Segope Consulting) has been appointed by Modikwa Platinum Mine (MPM) to undertake the Traffic Impact Assessment (TIA) study for the proposed mining development on the farm Winterveldt 293 KT under the Magisterial District of Sekhukhune District in Limpopo Province.

The proposed Mining Application is a progression of Modikwa Platinum Mine (MPM) South 2 Shaft Environmental Management Programme (EMP) which was approved in 2014 with the DMRE Reference: LP30/5/1/2/2/129MRC/00017/102MR. The additional South 3 Opencast Project will follow the conventional open cast methods, which include the stripping at 40 to 60 thousand tonnes per month (ktpm) with concurrent backfill. The ore from the open pit will be extracted by a combination of excavation, crushing, washing and concentration, then be transported by truck to the primary crusher stockpile and waste will be disposed to waste dumps on the surface.

The proposed project area can be accessed through a gravel road that connects to the D1392 road that joins Lebidike Road and leads to the regional roads R555 (Southern part of the project) in Steelpoort town, and the Northern part of the project area can be accessed through the regional road R37 and the Modikwa Road which ultimately leads into the Modikwa Platinum Mine. However, it was mentioned for South 3 Opencast Project that gravel road from Mahlakwena community will not be used to avoid destruction to the community and all the trucks will pass from South 3 opencast to South 2 then South 1 through the Modikwa tar road that meets with the regional roads R37 at Elegant Fuel Station (refer to **Figure 1**). Additionally, there is an existing road recently created by the Modikwa Platinum Mine as part of traffic management and the gravel road that connects Modikwa Road and Lebidike Road.

The purpose of this traffic impact report is to investigate the expected peak hour traffic that will be generated by the proposed mining development, to quantify as well as evaluate its impact on the existing road network. The report documents the findings of the study, and make recommendations regarding road upgrading that may be required due to the proposed development and also evaluates the need for providing improvements to the existing road network which will include the key intersections.

The proposed South 3 opencast mine is likely to generate high to medium traffic volumes, so it is critical that traffic is managed in a way that maximizes productivity while also ensuring the safety of workers and the local community. This plan has been developed to enable Modikwa Platinum Mine to identify and implement all legal and best practice traffic management needs for the project. The requirements of this Plan apply to all construction staff, including any subcontractor hired to supply trucks, machinery, or drivers for the Project.

2. SITE LOCATION

The proposed Modikwa Platinum Mine (MPM) South 3 Opencast development covers approximately 273 Hectors and it is situated within the Farm Winterveldt 293 KT under the Local Municipality of Fetakgomo Tubatse in the Sekhukhune District Municipality, Limpopo Province. The project area is located approximately 600 m north of Pelaneng community, approximately 4km north-west of Stocking Town and approximately 3 km north-east of Tukakgomo Community, refer to **Figure 1**.

The project area will be accessed using the main entrance of Modikwa Platinum Mine from Shaft 2, to avoid destruction and degrading the tar roads from the Mahlakwena Community and also limit traffic. The mine will be constructing the road from Shaft 3 to Shaft 2 and the will be using Modikwa Road, R37 regional road for transportation and the gravel road to release traffic on the R37 to R555 road using Lebidike Road, refer to **Figure 2**.

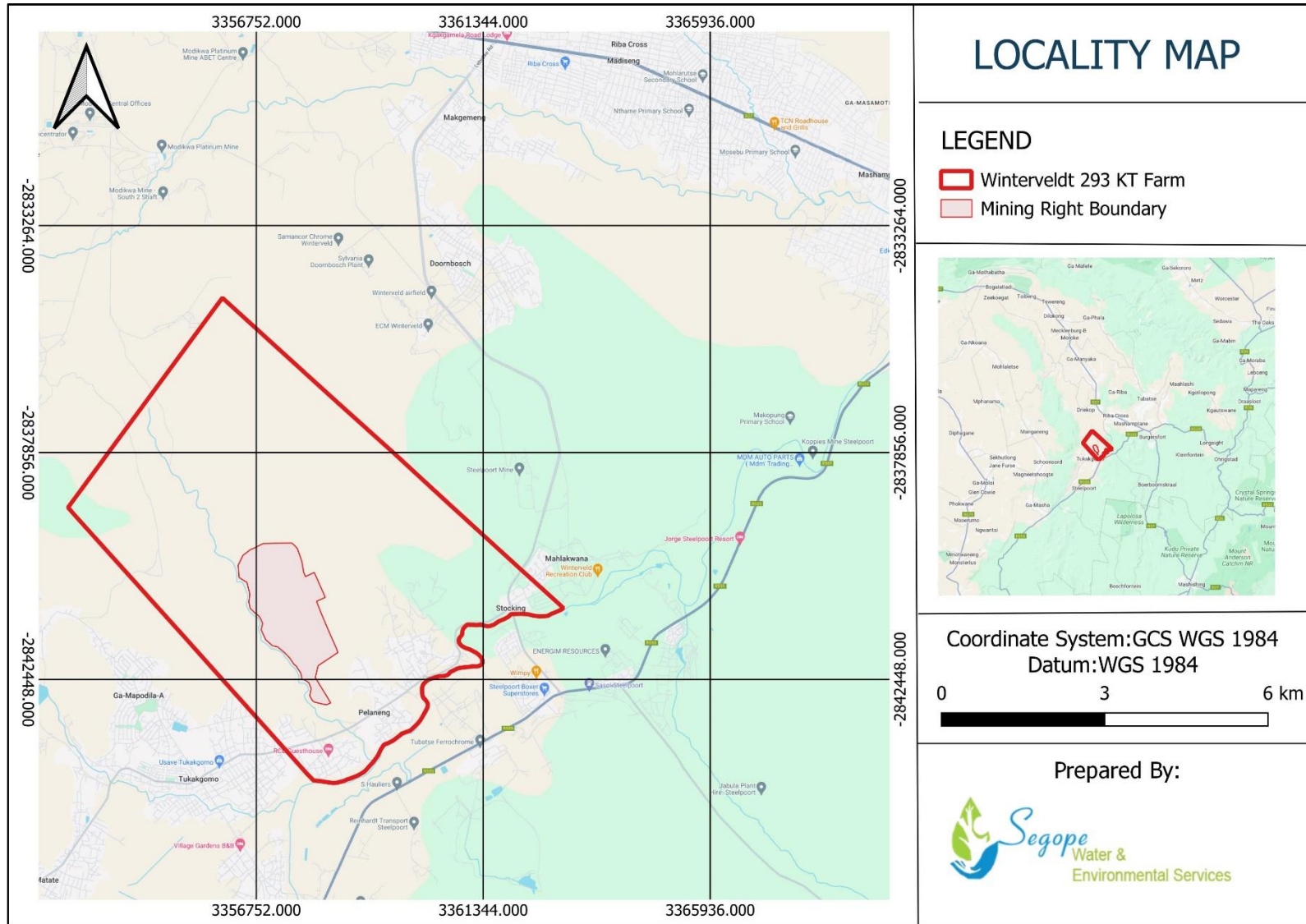


Figure 1: Locality Map for the proposed South 3 Opencast development (Segope Consulting, 2024)

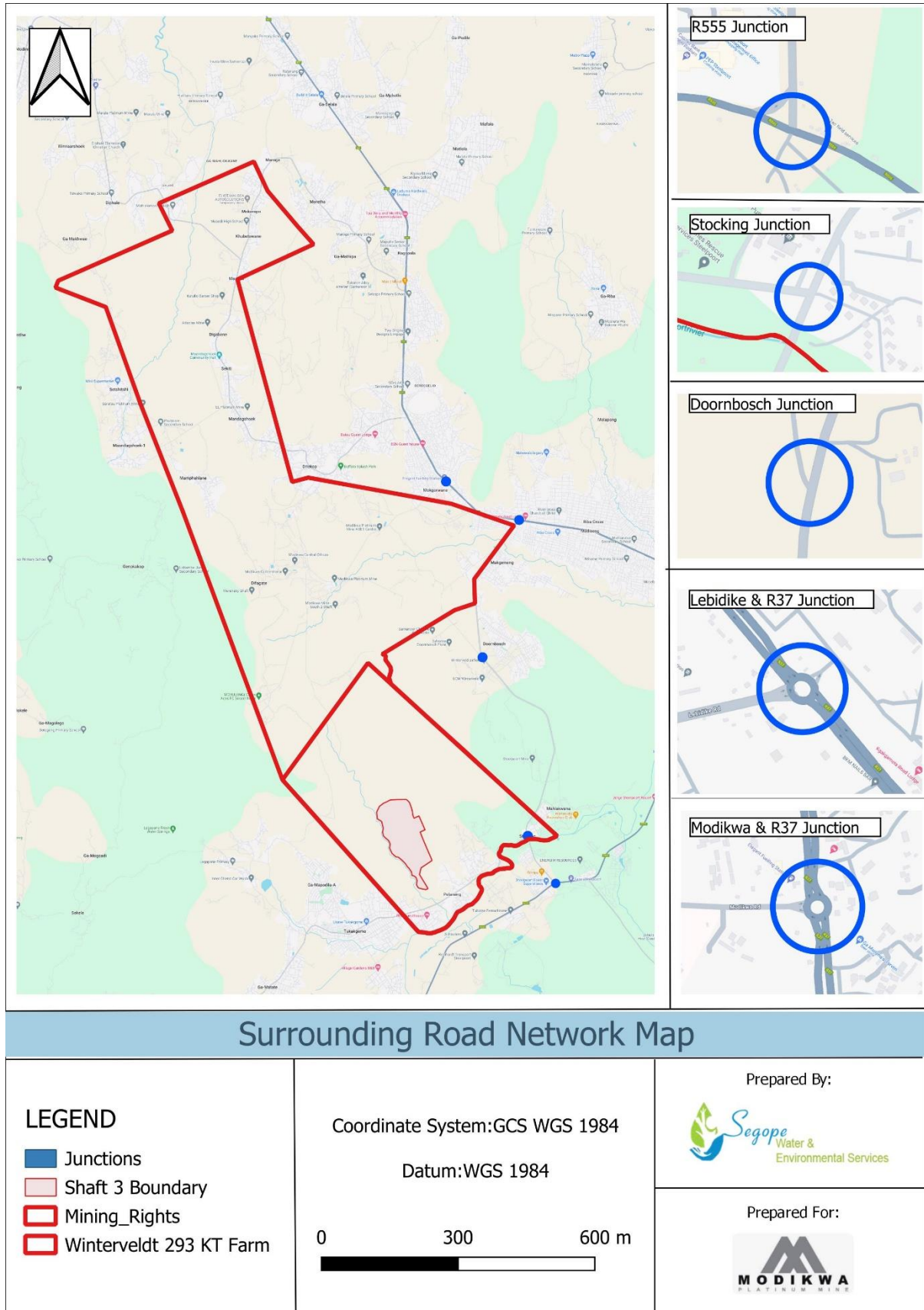


Figure 2: The proposed development location and the existing traffic flows at the key intersections (Segope Consulting, 2024)

3. SURROUNDING ROAD NETWORK AND TRAFFIC FLOW

3.1. Surrounding Road Network

The following roads and streets are relevant to the study area and they are categorized into different classes as shown on Table 1 below:

- **Regional Road (R37):** This road functions as a Minor Arterial (Class 3) and the road is a surfaced dual carriageway road with a large median and two (2) lanes in each direction. This road has a signalized intersection with the R555 at Tubatse Crossing Mall four way.
- **Regional Road (R555):** This road functions as a Collector Street (class 4). This road is a surfaced single carriageway road with no median and one (1) lane in each direction and has a T-junction stop with Lebidike Road.
- **Modikwa Road:** This road functions as a Local Road (Class 5) and it is a surfaced single carriageway road with no median and one (1) lane in each direction. This road has a signalized intersection with R37.
- **Lebidike Road:** This road functions as a Local or Access Street (Class 5) and it connects R37 and R555. The road is a surfaced single carriageway road with no median and one (1) lane in each direction.
- **D1392 Road:** This road functions as a Local or Access Street (Class 5). This road is a surfaced single carriageway road with no median and one (1) lane in each direction and has a T-junction stop with Lebidike Road at Stocking Settlement.

3.2. Future Road Network

The following roads and streets are relevant to the study area.

- **Gravel Road:** This is a gravel road that connects Modikwa Road and Lebidike Road and it was recently created to manage traffic from both road ends. The road needs to be upgraded for future use.

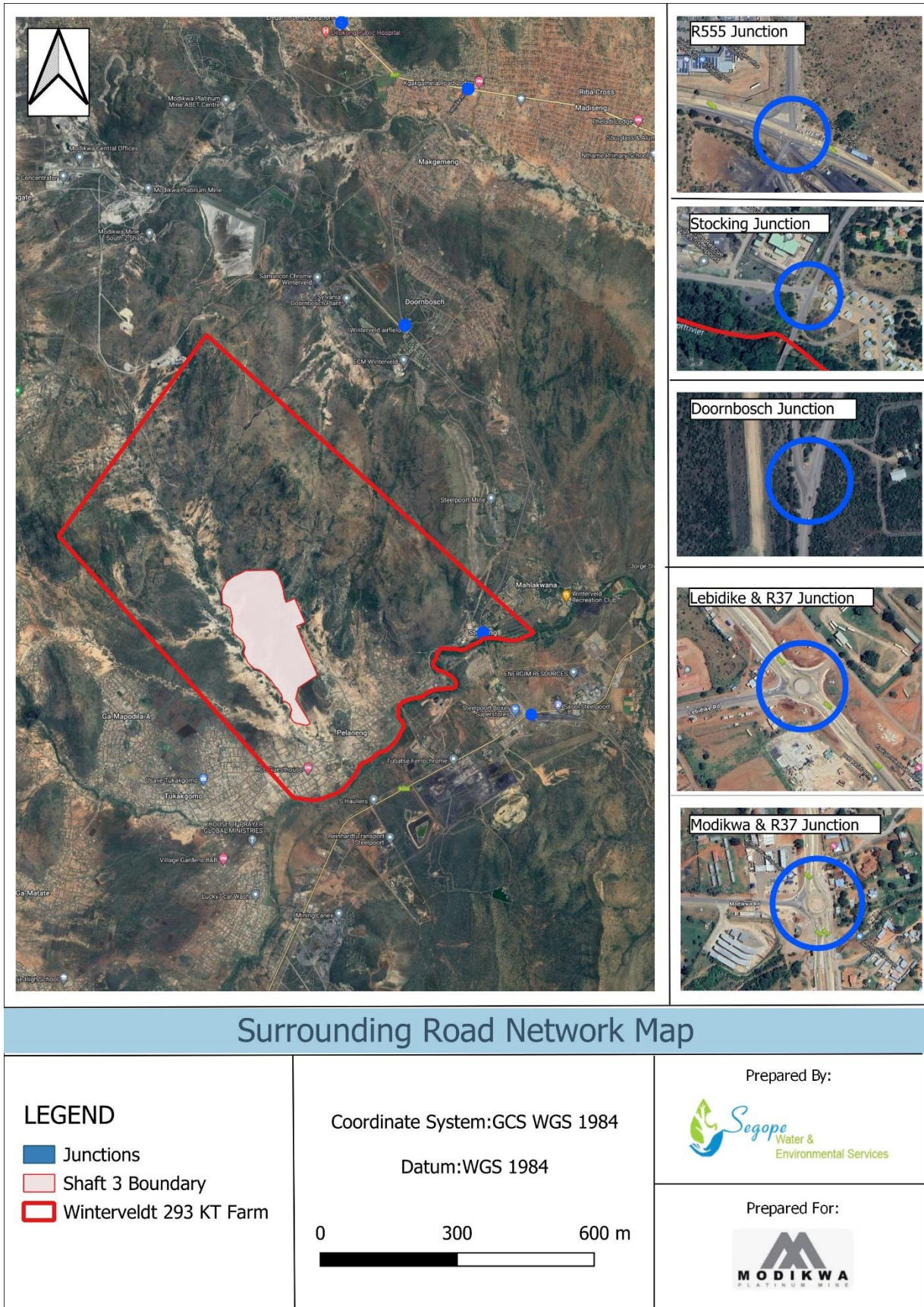


Figure 3: The figure shows proposed development location and the existing traffic flows at the key intersections (Segope Consulting, 2024)

Table 1: Rural Functional Road Classification ((COTO), 2012)

Function			Description		Mobility				
Basic Function	Alternate functional descriptions	Determining function	Class No (R_)	Class name	Origin / destination	Through traffic component	Reach of connectivity	% of built km	AADT (average annual daily traffic)
Mobility	Vehicle priority, vehicle only, long distance, through, high order, high speed, numbered, commercial, economic, strategic; route, arterial road or highway.	Movement is dominant, through traffic is dominant, the majority of traffic does not originate or terminate in the immediate vicinity, the function of the road is to carry high volumes of traffic between urban areas	1	Principal arterial*	Metro areas, large cities, large border posts, join national routes	Exclusively	> 50 km	2 - 4% Classes 1 and 2	1000 – 100 000+
			2	Major arterial*	Cities and large towns, transport nodes (harbours and international airports), smaller border posts, join major routes	Exclusively	>25 km		500 – 25 000+
			3	Minor arterial*	Towns, villages and rural settlements, tourist destinations, transport nodes (railway sidings, seaports, landing strips), small border posts, other routes	Predominant	> 10 km	6 - 12% Classes 1, 2 and 3	100 – 2 000+
Access / Activity	Access, mixed pedestrian and vehicle traffic, short distance, low order, lower speed, community / farm, road or street.	Access, turning and crossing movements are allowed, the majority of traffic has an origin or destination in the district, the function of the road is to provide a safe environment for vehicles and pedestrians using access points	4	Collector road	Connect farming districts, rural settlements, tourist areas, national and private parks and mines to mobility routes	Minimal	< 10 km	20 - 25%	< 1 000
			5	Local road	Farm or property access, connection to other routes	Nil Discontinuous	< 5 km		65 - 75%
			6	Walkway (path or track)	Settlements, farms, transport nodes, water points	n/a			

* In rural areas, the term distributor may be preferred to arterial

4. LAND USE AND INFRASTRUCTURE

4.1. Land-use and Land Cover

The majority of the project area is covered with mountainous topography which act as a habitat to faunal species while other parts of the project area consisted of human settlements where they practiced agricultural activities (grazing and planting activities). It was noted that the settlements were demolished during the apartheid era and the only visibility of the existed activities was through the graves and some natural vegetation observed onsite. The area is currently highly affected by erosion and invaded by the alien vegetation species (**Figure 4**).



Figure 4: The overview of the proposed mining right area (Segope Consulting , 2024)

4.2. Mining Method

Modikwa Platinum Mine South 2 Shaft is currently operating under the existing approved Environmental Management Programme (EMP) Amendment. South 2 Shaft is an extension of South 1 Shaft and Onverwacht Hill shaft developments. An application is being made to amend the current environmental authorisation to include proposed additional mining related infrastructure at South 3 Opencast. The proposed additional Opencast mining together with the mining related infrastructure at South 3 Opencast project is necessary and will effectively increase the Life of Mine for Modikwa Platinum Mine (Segope Water and Environmental Services, 2024)

The mine will be using Quarrying process with three-dimensional survey. It allows the explosives engineers to design the blast and to plot where the shot holes should be drilled so that the blast can be carried out safely and efficiently. After blasting, blasted rocks are collected by a bulldozer. Rocks are loaded onto a dump truck by a hydraulic excavator or wheel loader and transported from Shaft 3 to Shaft 2 to a screening and crushing plant. Waste material will be handled by excavators and small-articulated trucks, as well as dozers. Where practical, throw blasting will be utilized to minimize loading and hauling requirements of hard material. The final product will be transported from Shaft 2 then the trucks will use Modikwa Road which joins R37 to their clients or use the Gravel Road from Modikwa Road to Lebidike Road to R555 to limit traffic in peak hours.

4.3. Mine Infrastructures

Infrastructure to be constructed at South 3 Opencast includes the following:

- South 3 Opencast;
- Waste Rock Dump
- South 3 Opencast offices, workshops, and stores;
- Change houses;
- Salvage transfer yard;
- Wash bay and service area;
- Parking area;
- Fuel and material storage and handling facilities;
- Explosive storage and waste explosive materials and packaging destruction areas;
- Access roads from Shaft 3 to Shaft 2
- Topsoil stockpile areas;
- Electricity provision and distribution facilities;
- Security;
- Stormwater management infrastructure
- Pollution control dams;
- Septic sewage system

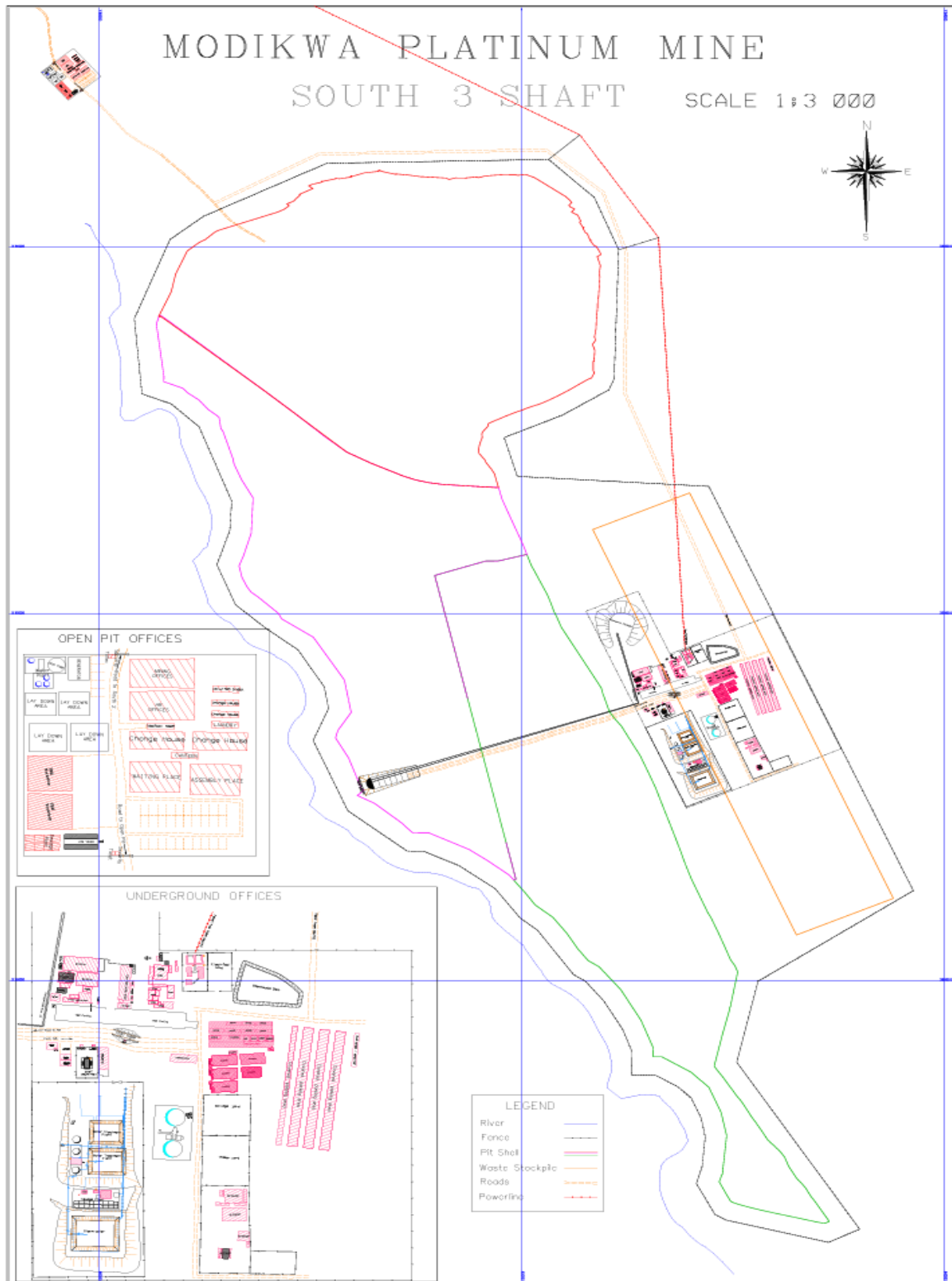


Figure 5: Mine layout plan for the proposed mining area (Segope Consulting, 2024)

4.4. Construction

It is estimated that the mine infrastructure (offices and workshop facilities). The infrastructure area will be linked to the mining operation using a haul road. Electrical power will be from the existing power line as part of the process plant infrastructure for workshops and office requirements. A site access road will be required to link the Shaft 2 to the road network system. The nearest major road is the R37 and R555 which are approximately 10km northeast and 3 km south of the site boundary respectively.

4.5. Mine Equipment's

Table 2 summarizes all of the major and secondary equipment that was allowed and the numbers shown are the steady-state needs. The quantities in the table may change over the course of the mine's life, depending on typical hauling lengths and necessary tonnage throughput.

It is expected that the mine will produce on average of 40 to 60 thousand tonnes per month of ore per annum for market. It is expected that the haul route will link up to the Shaft 2 where the ore will be transported for processing and other routes will be used for transportation of the product to the clients. There will also be a fair amount of routine and regular traffic to and from the mine, from light delivery vehicles, to passenger cars, trucks and buses. It is estimated that once the mine once fully operational is expected to employ ± 1000 and the professional team will be assumed to be 5 percent of the total labour force. It is expected that the mine will have 3 production shifts of Mining operations Dayshift 5h00 – 13h00, Afternoon shift 13h00 – 21h00, Night Shift 21h00 – 5h00.

Table 2: Recommended fleet required *(Ukwazi Mining Studies (Pty) Ltd, 2019)*

Equipment Type	Description	Quantity
Primary Equipment's	CAT 374D loader	2
	CAT 745C truck	8
	Atlas Copco D65	1
Secondary Equipment's	CAT D9 dozer	4
	CAT 814H wheel dozer	1
	CAT 140 road grader	2
	CAT 725 23 000l water tanker	2
	CAT 428E backhoe (TLB)	1
	Nissan UD90 service truck	1
	Main M2000 crane truck	1
	CAT 725 23 000l diesel bowser	1
	340 KVA FGD generator	1
	Light plant	8
	Water pump	2
	Atlas Copco D56	3
	LDV	18

5. METHODOLOGY

The study followed the guidelines outlined in TMH 16 (COTO, 2012)¹, the Department of Transport Manual for Traffic Impact Studies published by the South Africa National Roads Agency Limited (SANRAL), 2012.

- The extent of the study was determined by identifying the intersections in the vicinity of the development on which the traffic generated by the development may have a significant impact. The target years and peak scenarios to be analyzed were also determined, based on the land-use and extent of the development.
- Conducting vehicle count surveys, intersection performance analysis and road safety assessment applicable. Measures such as level of service, delay, and volume or capacity ratio were used to quantify the performance of an intersection or a roadway facility. Based on this assessment, mitigation measures were recommended for the proposed development to minimize the potential impacts on the existing road network.
- The existing traffic flow patterns were surveyed, where after the functioning of the intersections in the area was analyzed. Recommendations were made on the present need for road upgrading, without the development.
- As part of the study, the existing public transport infrastructure was also evaluated and where required upgrading to the existing infrastructure was recommended.
- The study also investigated the impact of future road network planned in the area, on the proposed development.

6. ASSUMPTIONS AND LIMITATIONS

- It was assumed that the period 06:00 – 09:00 am and 15:00 – 18:00 are the peak traffic hours
- The traffic count was conducted on the 24th and 25th of April 2024, when it was predicted that the site would have substantial traffic generation.
- The survey was conducted on two T-Junctions (that were assumed to produce most impacts when comes to traffic impacts

7. TRIP GENERATION

7.1. Background

Trip generation is a critical step in the determination of traffic impact from proposed developments and therefore plays a key role in this study. The South African Trip Data Manual (Version 1 September 2012) by the Committee of Transport Officials as well the South African Trip Generation Manual (SATGM) (2nd Edition 1995) by the Department of Transport does not provide rates for Mining Operations. In this study literature from past studies as well as operations data from the proposed Modikwa Platinum Mine have been used in estimating the expected trip generation of the proposed mine.

7.2. Mine operations traffic

7.2.1. Employee Traffic

It is estimated that once fully developed the mine will employ about 1 000 workers, most of them will be from the surrounding settlements. The mine will provide transportation through provision of buses to ferry the workers for the different shifts. Although the mine will operate in shifts as detailed in Section 4.5 in order to model the worst-case scenario **Table 3** models all the employees arriving in the AM peak hour and departing in the PM peak hour.

Table 3: models all the employees arriving in the AM peak hour and departing in the PM peak hour (Niara Environmental Consultants, 2019).

Description	Quantity
Annual production	2 million tonnes*
Haul Days per Year	320
Tons per day	6 250t
Tons per Truck	32
Truck loads per day	195
Truck loads per hour (over 12hr haul period)	16

From the above calculation, it is therefore expected the hourly haul traffic shall be 16 trips per hour with a 50:50 directional split and thus will be evaluated in this report.

This amount of haulage trucks per hour is not anticipated to have that much impact from a traffic engineering point of view, however a review of the existing road network capacity will be done to determine if new network trips can be accommodated

7.3. Trip Generation Rates

Based on the above information and the proposed development trips will be calculated as follows:

Table 4: Estimate of Employee trip generation

	Number	Split	Vehicles
Employees	650	Buses	9
	300	Walk/cycle	-
	50	cars	50
Total number of expected vehicle cars			59 trips
Expected trips total			
		IN	OUT
Directional 90:10 AM		53	6
Directional Split 10:90 PM		6	53

Table 5: Estimate of Haul trips

Directional Split	IN	OUT	Number of Trucks
AM (50:50)	8	8	16
PM (50:50)	8	8	16
Total hour trips Peak			32

The trip calculation in **Table 4** and **Table 5** above assumes that all these trips happen within the typical peak hour duration, so as to model the worst case scenarios however as clearly set out in section 4.5 the mine will operate under 3 different shifts starting as early as 05h00 which falls outside the typical peak hour.

Table 6: Total trip generation AM and PM peak hours (*Niara Environmental Consultants, 2019*)

Period	In	Out	Total
Weekday AM	61	14	75
Weekday PM	14	61	75

Considering the worst-case assumptions and scenario modelled, it is expected that the Modikwa Platinum Mine will generate 75 peak hour trips within the AM and PM peak hours respectively.

8. DATA COLLECTION AND DESCRIPTION OF TRAFFIC CONDITIONS

8.1. Traffic Survey

The traffic count was conducted for two days on the 24th of April 2024 and the 25th of April 2024. Local Technicians were picked by the community leader to assist with the process, Four (4) males and Four (4) Females. The Traffic Impact assessment was conducted on two T-junctions namely the Stocking Junction (Lebidike Road & D1392 Roads) and the R37 & Modikwa Road Junction for both AM peak (06h00-09h00) and PM peak (15h00-18h00)

The survey was conducted to monitor the peak morning hours traffic of heavy and light vehicles and the afternoon peak hours of the light and heavy vehicles near the project area. Recordings were made on all three sides with the understanding that the vehicles may turn to any side (North, South and West) at both T-junctions stop. The morning peak was recorded in 15 minutes interval from 6:00 am to 09:00 am, the afternoon peak recorded in 15 minutes interval from 15:00 pm to 18:00 pm (**Table 7**) and **Figure 6** shows a schematic diagram on how the traffic count was conducted.

Table 7: Different Peaks.

Symbol	Meaning
Light vehicles	Private cars, taxis and bakkies
Heavy vehicles	Trucks and buses
Morning peak	06:00am - 09:00am
Afternoon peak	15:00pm - 18:00pm

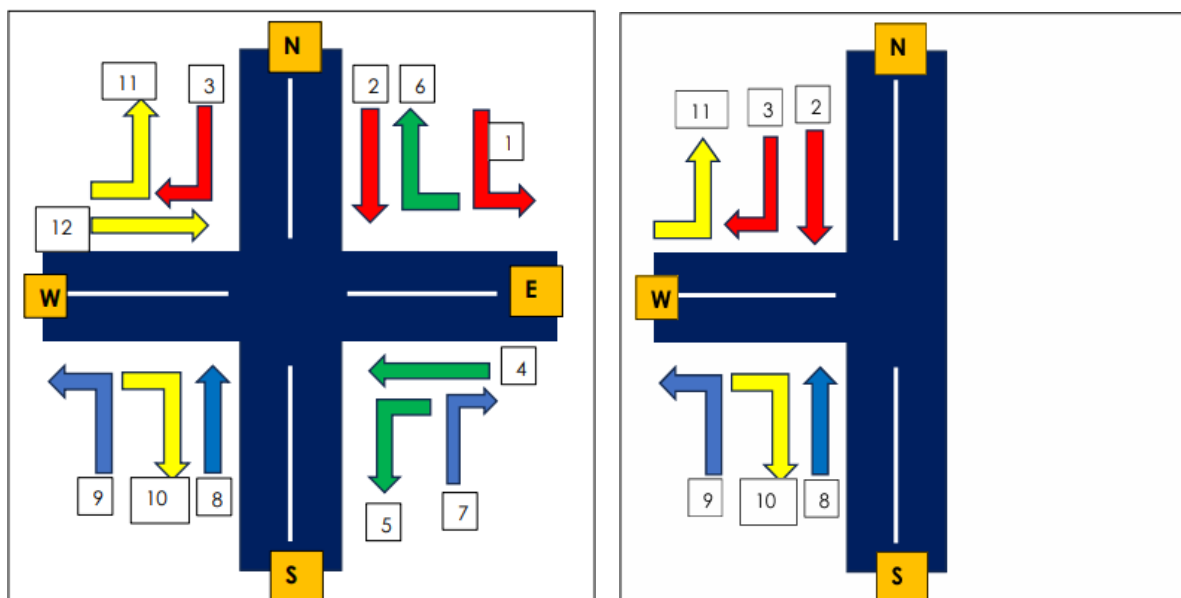


Figure 6: Illustration of the road along which the traffic count was conducted.

8.2. Observations on Stocking Junction

8.2.1. Observations on the 24th of April 2024

It was observed that the traffic is heavier in the morning at 06h10 and gradually decreases from Northern (R37) to Southern (R555) directions precisely around 06h38 while the Western Part (D1392) becomes heavier due to school transportations. The traffic becomes slightly heavy on the PM peaks. Observations made onsite are shown on **Table 8 & 9** below, which indicates that at least more than 300 light vehicles per 15 minutes passed through the Lebidikwe road (North and South directions) in the morning between 06:00 am and 08:00 am. Furthermore, there were more heavy vehicles moving from West to South or North in the PM Peak (15:00 pm -17:00 pm).

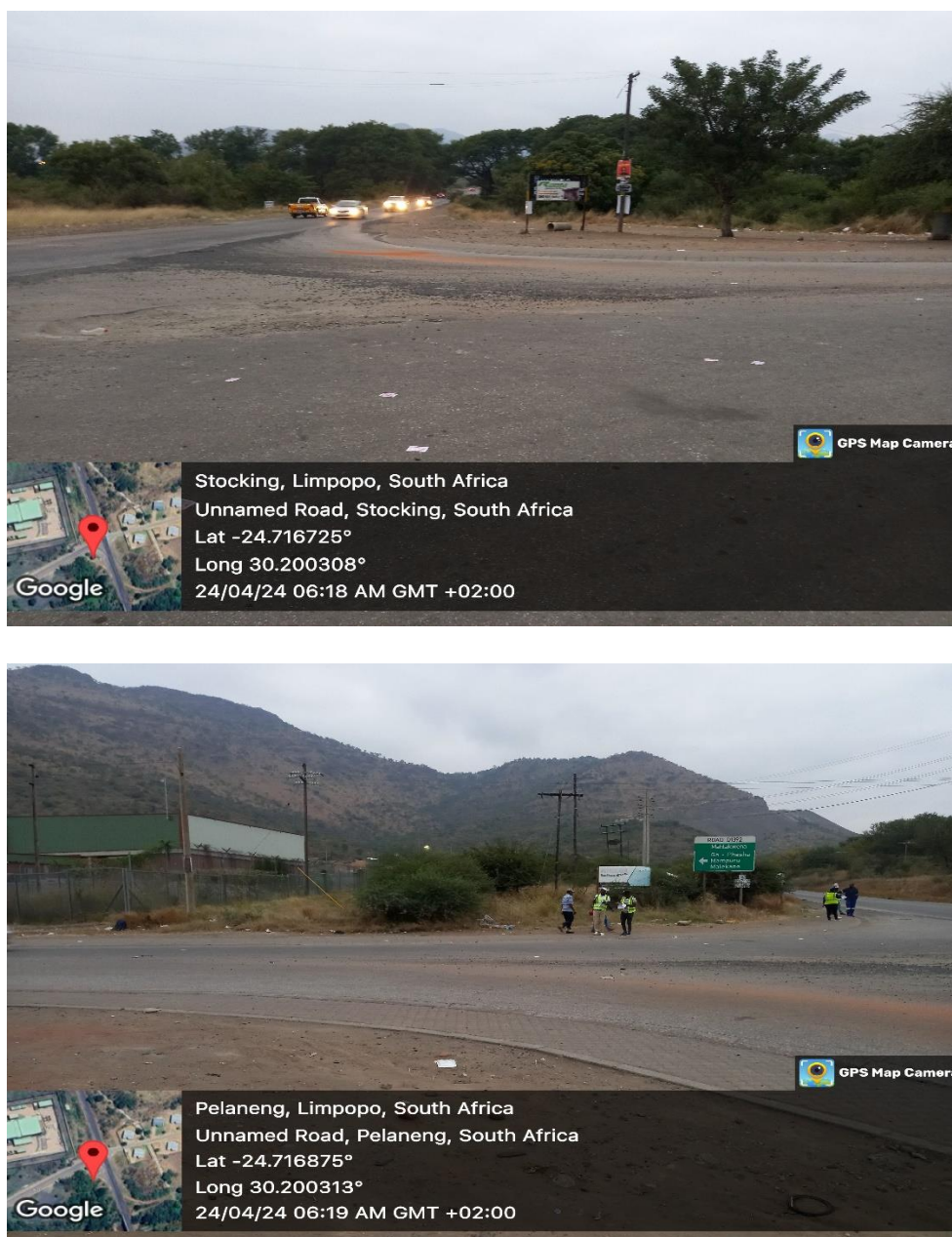














Figure 7: The Stocking T-Junction (Segope Consulting , 2024)







Table 8: Display of the traffic counts observed onsite.







AM PEAK

Light Vehicles						
						
Time Intervals						
06h00-06h15	50	9	3	10	4	20
06h15-06h30	56	3	5	7	6	25
06h30-06h45	114	7	2	1	4	44
06h45-07h00	85	17	2	1	4	35
07h00-07h15	80	11	-	2	6	33
07h15-07h30	53	-	6	2	1	46
07h30-07h45	51	8	-	1	2	47
07h45-08h00	35	4	-	1	4	28
08h00-08h15	22	8	2	2	-	26
08h15-08h30	38	3	5	1	6	18
08h30-08h45	46	-	5	2	2	26
08h45-09h00	36	3	6	1	2	40
TOTAL	666	73	36	31	41	388
	1 235					

Heavy Vehicles						
						
Time Intervals						
06h00-06h15	10	2	-	2	-	5
06h15-06h30	8	1	1	1	-	2
06h30-06h45	14	1	-	1	-	16
06h45-07h00	24	1	-	-	-	10
07h00-07h15	27	1	-	-	-	15
07h15-07h30	19	-	-	-	-	15
07h30-07h45	15	-	3	-	1	14
07h45-08h00	15	-	-	-	-	15
08h00-08h15	9	-	-	4	-	12
08h15-08h30	15	1	1	1	-	16
08h30-08h45	15	-	1	-	-	27
08h45-09h00	18	1	4	1	-	19
TOTAL	189	8	10	10	1	166
	384					

PM PEAK







Light Vehicles						
						
Time Intervals						
15h00-15h15	48	8	5	1	8	73
15h15-15h30	30	6	11	-	15	82
15h30-15h45	71	6	4	-	6	88
15h45-16h00	30	2	6	-	11	114
16h00-16h15	20	5	5	-	20	93
16h15-16h30	37	3	2	1	23	103
16h30-16h45	34	2	6	2	5	101
16h45-17h00	40	10	3	-	6	71
17h00-17h15	35	7	4	-	2	61
17h15-17h30	38	2	7	1	9	43
17h30-17h45	37	11	1	2	11	57
17h45-18h00	26	2	7	-	4	35
TOTAL	446	64	61	7	120	921
	1 619					







Heavy Vehicles						
						
Time Intervals						
15h00-15h15	37	-	1	3	-	13
15h15-15h30	22	-	3	1	-	14
15h30-15h45	28	-	2	2	1	27
15h45-16h00	25	-	3	-	-	13
16h00-16h15	15	1	1	3	1	7
16h15-16h30	11	1	2	3	-	19
16h30-16h45	24	--	4	1	-	11
16h45-17h00	19	-	1	1	-	14
17h00-17h15	11	1	4	2	-	13
17h15-17h30	17	-	3	-	-	15
17h30-17h45	16	-	1	3	1	10
17h45-18h00	8	-	1	-	1	11
TOTAL	233	3	27	19	4	157
	443					

8.2.2. Observation on the 25th of April 2024







Table 9: Display of the traffic counts observed onsite.







AM PEAK

Light Vehicles						
						
Time Intervals						
06h00-06h15	31	4	-	-	-	-
06h15-06h30	16	19	-	2	-	-
06h30-06h45	24	20	1	-	-	-
06h45-07h00	26	18	-	-	1	-
07h00-07h15	16	18	-	1	1	2
07h15-07h30	39	41	-	1	-	-
07h30-07h45	16	18	-	-	-	1
07h45-08h00	27	26	-	1	1	1
08h00-08h15	26	21	-	-	1	-
08h15-08h30	15	24	-	1	-	2
08h30-08h45	18	24	-	-	2	-
08h45-09h00	21	23	-	1	-	-
TOTAL	223	256	1	7	6	6
	499					

Heavy Vehicles						
						
Time Intervals						
06h00-06h15	8	3	-	-	-	-
06h15-06h30	5	9	-	-	-	-
06h30-06h45	4	10	-	-	-	-
06h45-07h00	3	4	-	-	-	-
07h00-07h15	5	7	-	-	-	-
07h15-07h30	4	4	-	-	-	-
07h30-07h45	1	3	-	-	-	-
07h45-08h00	4	3	-	-	-	-
08h00-08h15	-	3	-	-	-	-
08h15-08h30	4	3	-	-	-	-
08h30-08h45	1	3	-	-	-	-
08h45-09h00	3	4	-	-	-	-
TOTAL	42	56	-	-	-	-
	98					

PM PEAK

Light Vehicles						
						
Time Intervals						
15h00-15h15	18	26	-	-	-	-
15h15-15h30	25	20	1	-	2	-
15h30-15h45	22	18	-	-	2	1
15h45-16h00	33	9	-	-	-	-
16h00-16h15	35	27	-	-	1	-
16h15-16h30	26	25	-	-	1	-
16h30-16h45	28	22	1	-	1	1
16h45-17h00	26	24	-	-	-	-
17h00-17h15	30	29	-	-	-	-
17h15-17h30	22	31	-	-	-	-
17h30-17h45	21	36	-	-	-	-
17h45-18h00	28	23	1	-	-	-
TOTAL	314	290	3	-	7	2
	616					

Heavy Vehicles						
						
Time Intervals						
15h00-15h15	6	9	-	-	-	-
15h15-15h30	1	5	-	-	-	1
15h30-15h45	5	11	-	-	-	-
15h45-16h00	4	2	-	-	-	-
16h00-16h15	5	3	-	-	-	-
16h15-16h30	4	2	-	-	-	-
16h30-16h45	3	2	-	-	-	-
16h45-17h00	10	1	-	-	-	-
17h00-17h15	2	1	-	-	-	-
17h15-17h30	6	3	-	-	1	-
17h30-17h45	4	3	-	-	-	-
17h45-18h00	3	7	-	-	-	-
TOTAL	49	49	-	-	1	1
	100					

8.3. Observations on R37 & Modikwa Road Junction

8.3.1. Observations on the 24th of April 2024

The T-junction consists of a roundabout, which is one of the markers that the route had significant traffic congestion and accidents, but in order to limit them, a roundabout (Traffic Circle) was built as a safer alternative for traffic management. Traffic on the T-Junction was at its highest Peak around 07h00 and lessened at 09h00 peak. The traffic becomes slightly heavy on the PM peaks. Observations made onsite are shown on **Table 10 & 11** below, which indicates that at least more than 450 light vehicles per 15 minutes passed through the R37 road (North and South directions) in the morning between 06:00 am and 08:00 am. Furthermore, there were more heavy vehicles moving from West (Modikwa Road) to South or North in the PM Peak (15:00 pm -17:00 pm).

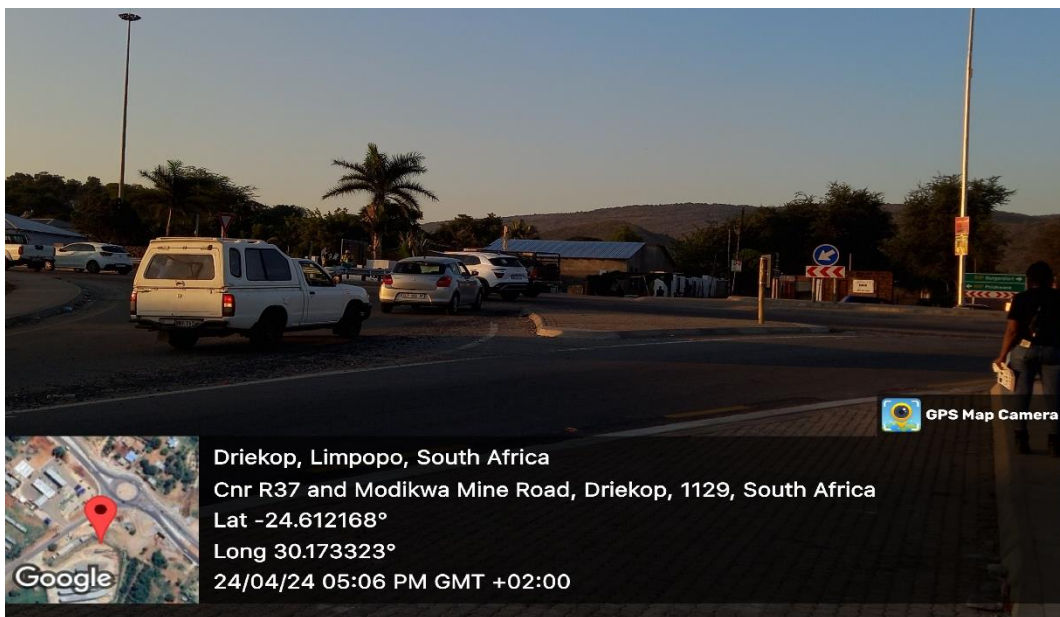














Figure 8: R37 & Modikwa Road T-Junction (Segope Consulting , 2024)







Table 10: Display of the traffic counts observed onsite.







AM PEAK

Light Vehicles						
						
Time Intervals						
06h00-06h15	50	9	3	10	4	20
06h15-06h30	56	3	5	7	6	25
06h30-06h45	114	7	2	1	4	44
06h45-07h00	85	17	2	1	4	35
07h00-07h15	80	11	-	2	6	33
07h15-07h30	53	-	6	2	1	46
07h30-07h45	51	8	-	1	2	47
07h45-08h00	35	4	-	1	4	28
08h00-08h15	22	8	2	2	-	26
08h15-08h30	38	3	5	1	6	18
08h30-08h45	46	-	5	2	2	26
08h45-09h00	36	3	6	1	2	40
TOTAL	666	73	36	31	41	388
	1 235					

Heavy Vehicles						
						
Time Intervals						
06h00-06h15	10	2	-	2	-	5
06h15-06h30	8	1	1	1	-	2
06h30-06h45	14	1	-	1	-	16
06h45-07h00	24	1	-	-	-	10
07h00-07h15	27	1	-	-	-	15
07h15-07h30	19	-	-	-	-	15
07h30-07h45	15	-	3	-	1	14
07h45-08h00	15	-	-	-	-	15
08h00-08h15	9	-	-	4	-	12
08h15-08h30	15	1	1	1	-	16
08h30-08h45	15	-	1	-	-	27
08h45-09h00	18	1	4	1	-	19
TOTAL	189	8	10	10	1	166
	384					

PM PEAK







Light Vehicles						
						
Time Intervals						
15h00-15h15	48	8	5	1	8	73
15h15-15h30	30	6	11	-	15	82
15h30-15h45	71	6	4	-	6	88
15h45-16h00	30	2	6	-	11	114
16h00-16h15	20	5	5	-	20	93
16h15-16h30	37	3	2	1	23	103
16h30-16h45	34	2	6	2	5	101
16h45-17h00	40	10	3	-	6	71
17h00-17h15	35	7	4	-	2	61
17h15-17h30	38	2	7	1	9	43
17h30-17h45	37	11	1	2	11	57
17h45-18h00	26	2	7	-	4	35
TOTAL	446	64	61	7	120	921
	1 619					







Heavy Vehicles						
						
Time Intervals						
15h00-15h15	37	-	1	3	-	13
15h15-15h30	22	-	3	1	-	14
15h30-15h45	28	-	2	2	1	27
15h45-16h00	25	-	3	-	-	13
16h00-16h15	15	1	1	3	1	7
16h15-16h30	11	1	2	3	-	19
16h30-16h45	24	--	4	1	-	11
16h45-17h00	19	-	1	1	-	14
17h00-17h15	11	1	4	2	-	13
17h15-17h30	17	-	3	-	-	15
17h30-17h45	16	-	1	3	1	10
17h45-18h00	8	-	1	-	1	11
TOTAL	233	3	27	19	4	157
	443					

8.3.1. Observation on the 25th of April 2024







Table 11: Display of the traffic counts observed onsite.







AM PEAK

Light Vehicles						
						
Time Intervals						
06h00-06h15	31	4	-	-	-	-
06h15-06h30	16	19	-	2	-	-
06h30-06h45	24	20	1	-	-	-
06h45-07h00	26	18	-	-	1	-
07h00-07h15	16	18	-	1	1	2
07h15-07h30	39	41	-	1	-	-
07h30-07h45	16	18	-	-	-	1
07h45-08h00	27	26	-	1	1	1
08h00-08h15	26	21	-	-	1	-
08h15-08h30	15	24	-	1	-	2
08h30-08h45	18	24	-	-	2	-
08h45-09h00	21	23	-	1	-	-
TOTAL	223	256	1	7	6	6
	499					

Heavy Vehicles						
						
Time Intervals						
06h00-06h15	8	3	-	-	-	-
06h15-06h30	5	9	-	-	-	-
06h30-06h45	4	10	-	-	-	-
06h45-07h00	3	4	-	-	-	-
07h00-07h15	5	7	-	-	-	-
07h15-07h30	4	4	-	-	-	-
07h30-07h45	1	3	-	-	-	-
07h45-08h00	4	3	-	-	-	-
08h00-08h15	-	3	-	-	-	-
08h15-08h30	4	3	-	-	-	-
08h30-08h45	1	3	-	-	-	-
08h45-09h00	3	4	-	-	-	-
TOTAL	42	56	-	-	-	-
	98					

PM PEAK

Light Vehicles						
						
Time Intervals						
15h00-15h15	18	26	-	-	-	-
15h15-15h30	25	20	1	-	2	-
15h30-15h45	22	18	-	-	2	1
15h45-16h00	33	9	-	-	-	-
16h00-16h15	35	27	-	-	1	-
16h15-16h30	26	25	-	-	1	-
16h30-16h45	28	22	1	-	1	1
16h45-17h00	26	24	-	-	-	-
17h00-17h15	30	29	-	-	-	-
17h15-17h30	22	31	-	-	-	-
17h30-17h45	21	36	-	-	-	-
17h45-18h00	28	23	1	-	-	-
TOTAL	314	290	3	-	7	2
	616					

Heavy Vehicles						
						
Time Intervals						
15h00-15h15	6	9	-	-	-	-
15h15-15h30	1	5	-	-	-	1
15h30-15h45	5	11	-	-	-	-
15h45-16h00	4	2	-	-	-	-
16h00-16h15	5	3	-	-	-	-
16h15-16h30	4	2	-	-	-	-
16h30-16h45	3	2	-	-	-	-
16h45-17h00	10	1	-	-	-	-
17h00-17h15	2	1	-	-	-	-
17h15-17h30	6	3	-	-	1	-
17h30-17h45	4	3	-	-	-	-
17h45-18h00	3	7	-	-	-	-
TOTAL	49	49	-	-	1	1
	100					

9. PROPOSED ROAD NETWORK UPGRADING

According to the summary intersection description above, the projected additional development trips can be accommodated on the current road network with the road upgrade of the following, given that the mine will occasionally utilize the unnamed tar road from the southern portion of the area (Mahlakwena).

It is proposed to provide:

- Upgrading of the unnamed tar road (Mahlakwena) and Lebidike Road
- Maintain the T-junction of R37 and Modikwa Road by updating the roadways on a regular basis.
- Provide public transport laybys
- Re-gravelling / tarring of existing surface of gravel road linking Modikwa Road to Lebidike Road **(Figure 9).**

The mine shall construct internal service roads with adequate geometric considerations for the movement of tipper trucks, tankers, low bed carriers and flatbed trucks. Any unpaved roads within the development must be wet-sprayed to reduce dust pollution (Niara Environmental Consultants, 2019).



Figure 9: The gravel Road linking Modikwa Road to Lebidike Road onsite (Segope Consulting , 2024)

10. PUBLIC TRANSPORT ASSESSMENT

This study assumes that the mine will provide transport to the employees of the mine. The vehicles are therefore assumed to drive into the mining areas and drop off employees at designated areas.

10.1. Background

In terms of the National Land Transport Act (NLTA) (Act No 5 of 2009) Section 35, it is requirement that assessment of public transport be included in traffic impact assessments. The following comments are relevant in respect to the public transport availability at the proposed development (Niara Environmental Consultants, 2019).

10.2. Availability of Public Transport

Public transport will be an integral part of the operations. Public transportation like taxis and buses will be positively impacted economically as more people who will be working at the proposed mining right area and requiring public transports for commuting.

11. IMPACT ASSESSMENT METHODOLOGY

The predicted impacts of the traffic generated by the proposed Modikwa Platinum Mine Shaft 3 opencast on the surrounding road network are quantitatively evaluated in this chapter of the study. The purpose of this impact evaluation is to assign relative significance to the predicted impacts associated with the project and to determine the manner in which these impacts are to be avoided, mitigated, or managed, if need to be.

The impact significance rating process serves two purposes: firstly, it helps to highlight the critical impacts requiring consideration in the management and approval process; secondly, it shows the primary impact characteristics, as defined above, used to evaluate impact significance.

The impact significance rating system is presented in **Table 12**, **Table 13**, **Table 14** and **Table 15** and involves four parts:

1.1. Impact Assessment Method

- **Part A:** Define impact consequence using the three primary impact characteristics of magnitude, spatial scale/population, and duration.
- **Part B:** Use the matrix to determine a rating for impact consequence based on the definitions identified in Part A; and
- **Part C:** Use the matrix to determine the impact significance rating, which is a function of the impact consequence rating (from Part B) and the probability of occurrence.
- **Part D:** Define the Confidence level.

11.1.1. Part A Defining Consequence in Terms of Magnitude, Duration and Spatial Scale:

Use these definitions to define the consequence in Part B

Table 12: Part A Consequence Rating Methodology

Impact Characteristics	Definition	Criteria
Magnitude	Major	Substantial deterioration or harm to receptors; receiving environment has an inherent value to stakeholders; receptors of impact are of conservation importance; or identified threshold often exceeded
	Moderate	Moderate/measurable deterioration or harm to receptors; receiving environment moderately sensitive; or identified threshold occasionally exceeded
	Minor	Minor deterioration (nuisance or minor deterioration) or harm to receptors; change to receiving environment not measurable; or identified threshold never exceeded
	Minor+	Minor improvement; change not measurable; or threshold never exceeded
	Moderate+	Moderate improvement; within or better than the threshold; or no observed reaction
	Major+	Substantial improvement; within or better than the threshold; or favorable publicity

Spatial Scale or Population	Site or local	Site specific or confined to the immediate project area
	Regional	May be defined in various ways, e.g. cadastral, catchment, topographic
	National/ International	Nationally or beyond
Duration	Short term	Quickly reversible. Less than two years.
	Medium term	Reversible over time. Life of the project (2 – 15 years)
	Long term	Permanent. Beyond closure (15 years and beyond)

11.1.2. Part B: Determining Consequence Rating

Rate consequence based on definition of magnitude, spatial extent and duration.

Table 13: Part B Consequence Rating Methodology

SPATIAL SCALE/ POPULATION					
			Site or Local	Regional	National/ international
	MAGNITUDE				
Minor	Duration	Long Term	Medium	Medium	High
		Medium Term	Low	Low	Medium
		Short Term	Low	Low	Medium
Moderate	Duration	Long Term	Medium	High	High
		Medium	Medium	Medium	High
		Short Term	Low	Medium	Medium
Major	Duration	Long term	High	High	High
		Medium	Medium	Medium	High
		Short term	Medium	Medium	High

11.1.3. Part C: Determining Significance Rating

Rate significance based on consequence and probability.

Table 14: Part C Significance Rating Methodology

CONSEQUENCE				
Probability (of exposure to impacts)	Definite	Medium	Medium	High
	Possible	Low	Medium	High
	Unlikely	Low	Low	High

11.1.4. Part D: Determining Significance Rating

Table 15: Part C Significance Rating Methodology

CONFIDENCE LEVEL		
High	Medium	Low

11.2. Potential Environmental Impacts Related to Traffic

The assessment rating for the potential impacts identified relating to traffic is shown in **Table 16**.

Table 16: Environmental Impact Assessment related to Traffic

Affected Environment	Activity	Impact Description	BEFORE MITIGATION						Cumulative Impact	Mitigation measures / Recommendations	AFTER MITIGATION					
			Magnitude	Duration	Spatial Scale	Consequence	Probability	SIGNIFICANCE			Magnitude	Duration	Spatial Scale	Consequence	Probability	SIGNIFICANCE
Construction Phase																
Road network	Construction materials being transported to site	Added traffic on the road network	Minor -	Medium Term > 18 months < 5 years	Site or Local	Low	Definite	Medium	No	Road network able to support additional trucks.	Minor -	Medium Term > 18 months < 5 years	Site or Local	Low	Definite	Medium
Road network	Employees and labourers transported to/ from site	Added traffic on the road network	Minor -	Medium Term > 18 months < 5 years	Site or Local	Low	Definite	Medium	No	Road network able to support additional commuter trips	Minor -	Medium Term > 18 months < 5 years	Site or Local	Low	Definite	Medium
Air quality	Vehicles travelling on gravel roads	Dust will increase with increased traffic flow along gravel roads	Minor -	Short Term < 18 months	Site or Local	Low	Definite	Medium	No	Ensure that gravel roads are kept watered to prevent dust (other dust suppression measures may also be used).	Minor -	Short Term < 18 months	Site or Local	Low	Possible	Low
Access road	Construction Of access roads	New Access roads	Minor - 18 months	Short Term <	Site or Local	Low	Definite	Medium	No	As per EMP	Minor - 18	Short Term <	Site or Local	Low	Definite	Medium

Operation Phase																
Road network	Haulage to/from site; and mine staff to/from site	Added traffic on the road network	Moderate	Long Term >5 years	Site or Local	Medium	Definite	Medium	No	Road network able to support additional trucks.	Minor -	Long Term > 5 years	Regional	Medium	Possible	Medium
Air quality	Vehicles travelling on gravel roads	Dust will increase with increased traffic flow along gravel roads	Minor -	Long Term >5 years	Site or Local	Medium	Possible	Medium	No	Ensure that gravel roads are kept watered to prevent dust (other dust suppression measures may also be used).	Minor -	Long Term > 5 years	Site or Local	Medium	Possible	Medium
Noise	Haulage to/from site; and mine staff to/from site	Noise levels affecting sensitive areas including residential areas	Major	Long Term >5 years	Site or Local	High	Possible	High	No	Speed limits to be kept low, and define routes away from residential areas.	Minor -	Long Term > 5 years	Site or Local	Medium	Possible	Medium
Decommissioning and Closure Phase																
Road Network	Rubble and other materials being removed from site	Added traffic on the road network	Minor -	Medium Term > 18 months < 5 years	Site or Local	Low	Definite	Medium	No	Road network able to support additional trucks.	Minor -	Medium Term > 18 months < 5 years	Regional	Low	Unlikely	Low

12. CONCLUSION AND RECOMMENDATIONS

The analyses of the existing plus development generated traffic showed that the additional traffic generated by the proposed mining right development will not have a major impact on the surrounding road network. The road network is currently operating well below its capacity. Therefore, the generated traffic volumes will easily be accommodated by the existing road network without reducing the levels of service on the surrounding road network and will have minimal effect on public transport or pedestrian activities in the area.

Certain mitigation measures have been recommended to accommodate the traffic demand and any adverse effects on the environment. Based on the conclusions of this assessment, it is recommended that the proposed development should be favorably considered from a traffic engineering point of view by the relevant authorities.

It is therefore recommended that the proposed development is supported from a traffic engineering perspective, provided that the road upgrades and the access is implemented as proposed in this report (and on Drawing 20059/AL/01) and to the relevant standards of the Fetakgomo Tubatse Local Municipality.

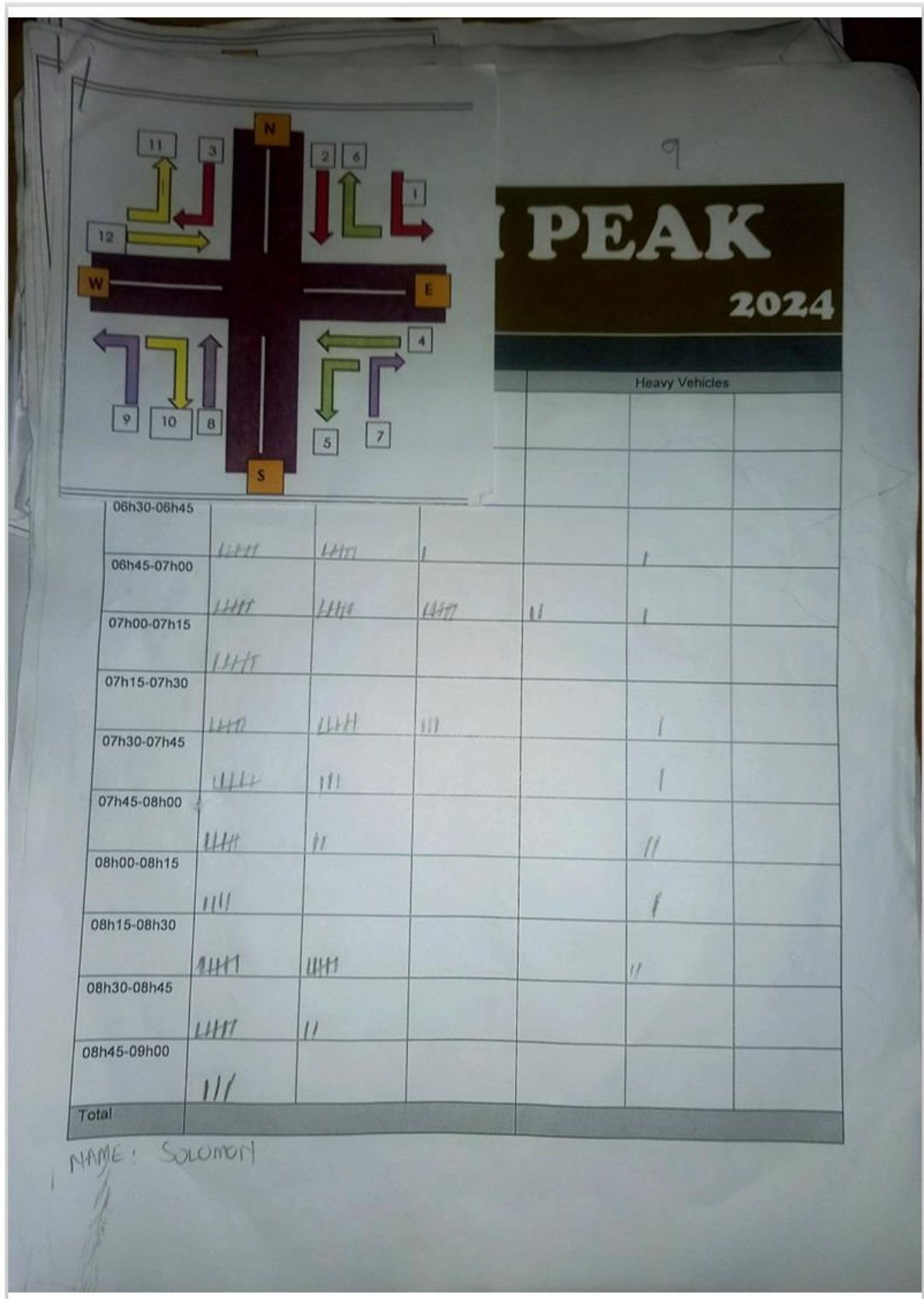
13. BIBLIOGRAPHY

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14. APPENDICES

STOCKING JUNCTION

DAY 1: AM PEAK & PM PEAK



9 5 9




PM PEAK

2024

Traffic Impact Assessment Sheet					
Time Intervals	Light Vehicles			Heavy Vehicles	
15h00-15h15					
15h15-15h30					
15h30-15h45					
15h45-16h00					
16h00-16h15					
16h15-16h30					
16h30-16h45					
16h45-17h00					
17h00-17h15					
17h15-17h30					
17h30-17h45					
17h45-18h00					
Total					

DAY 2: AM PEAK & PM PEAK

37 ↓



AM PEAK


2024

Traffic Impact Assessment Sheet

Time Intervals	Light Vehicles			Heavy Vehicles	
06h00-06h15					
06h15-06h30					
06h30-06h45					
06h45-07h00					1
07h00-07h15					
07h15-07h30					1
07h30-07h45					
07h45-08h00					1
08h00-08h15					1
08h15-08h30					1
08h30-08h45					
08h45-09h00					1
Total					1

NAME : Salmon

37 ↓



PM PEAK

2024

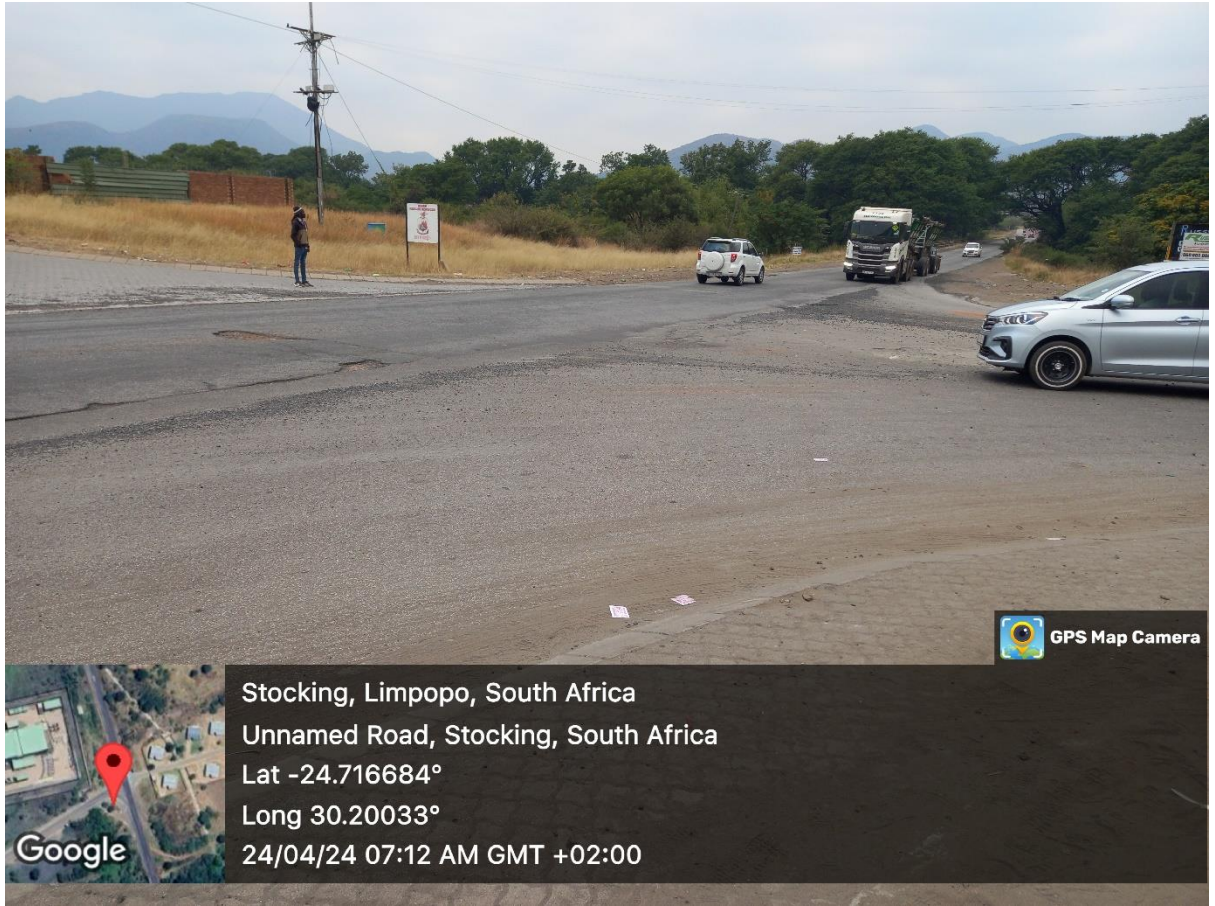
Traffic Impact Assessment Sheet

Time Intervals	Light Vehicles			Heavy Vehicles		
15h00-15h15						
15h15-15h30						
15h30-15h45						1
15h45-16h00						
16h00-16h15						1
16h15-16h30						
16h30-16h45						
16h45-17h00						
17h00-17h15						
17h15-17h30						
17h30-17h45						
17h45-18h00						
Total						

NAME :- Solomon SONTYANA 0661617796

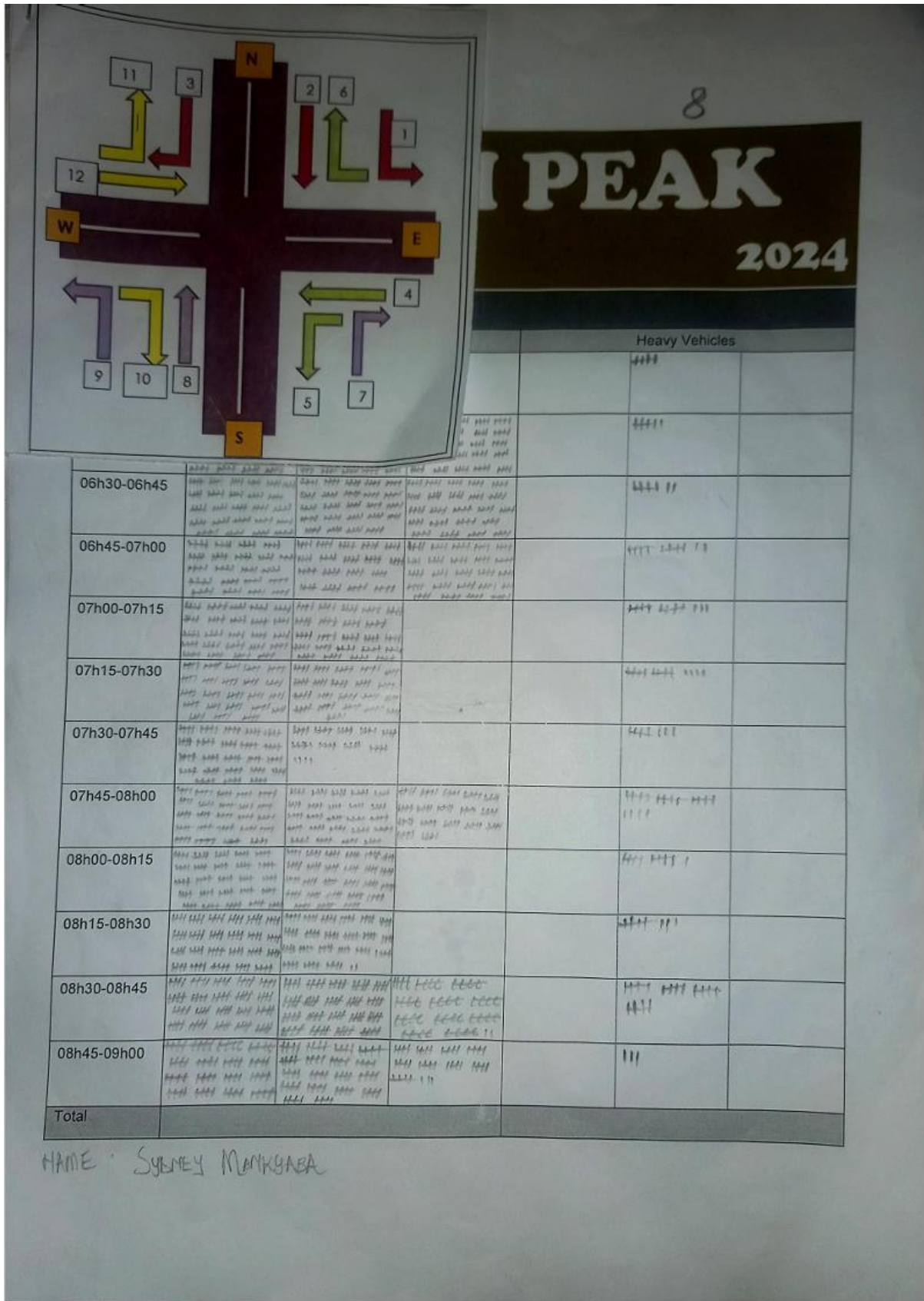
PICTURES STOCKING






ELEGANT FUEL STATION JUNCTION

DAY 1: AM PEAK & PM PEAK (Elegant Fuel Station Junction)




8

		<h1>PM PEAK</h1>		<h2>2024</h2>	
Traffic Impact Assessment Sheet					
Time Intervals	Light Vehicles			Heavy Vehicles	
15h00-15h15					
15h15-15h30					
15h30-15h45					
15h45-16h00					
16h00-16h15					
16h15-16h30					
16h30-16h45					
16h45-17h00					
17h00-17h15					
17h15-17h30					
17h30-17h45					
17h45-18h00					
Total					

DAY 2: AM PEAK & PM PEAK

2



AM PEAK


2024

Traffic Impact Assessment Sheet

Time Intervals	Light Vehicles			Heavy Vehicles		
06h00-06h15						
06h15-06h30	 	 				
06h30-06h45	 	 	 	 	 	
06h45-07h00	 	 	 	 	 	
07h00-07h15	 	 	 		 	
07h15-07h30	 	 	 			
07h30-07h45	 	 	 		 	
07h45-08h00	 	 	 		 	
08h00-08h15	 	 				
08h15-08h30	 	 				
08h30-08h45	 	 				
08h45-09h00	 	 			 	
Total						

NAME: *Khimic Mohlala*

2

		<h1>PM PEAK</h1>			<h2>2024</h2>	
Traffic Impact Assessment Sheet						
Time Intervals	Light Vehicles			Heavy Vehicles		
15h00-15h15						
15h15-15h30						
15h30-15h45						
15h45-16h00						
16h00-16h15						
16h15-16h30						
16h30-16h45						
16h45-17h00						
17h00-17h15						
17h15-17h30						
17h30-17h45						
17h45-18h00						
Total						

NAME: Winnie Mohlala

SITE PICTURES

