Draft Report: Traffic Impact Statement (TIS)

Traffic Impact Statement (TIS): Proposed Harmony West Wits Reclamation and Deposition Project

Prepared for: Environmental Impact Management Services (Pty) Ltd (EIMS)
29 May 2026
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1. Introduction

1.1 Background

SMEC South Africa Pty (Ltd) was appointed by Environmental Impact Management Services (Pty) Ltd (EIMS) to undertake a traffic impact assessment to support the environmental authorisation process for the proposed new Deelkraal II Tailings Storage Facility (TSF) project and associated infrastructure (Project Description: Proposed Harmony West Wits Reclamation and Deposition Project).

The project site is located approximately 13km southwest of Carletonville in the Merafong City Local Municipality, West Rand District Municipality, Gauteng Province. Figure 1-1 illustrates the general location of the project within the broader regional context.

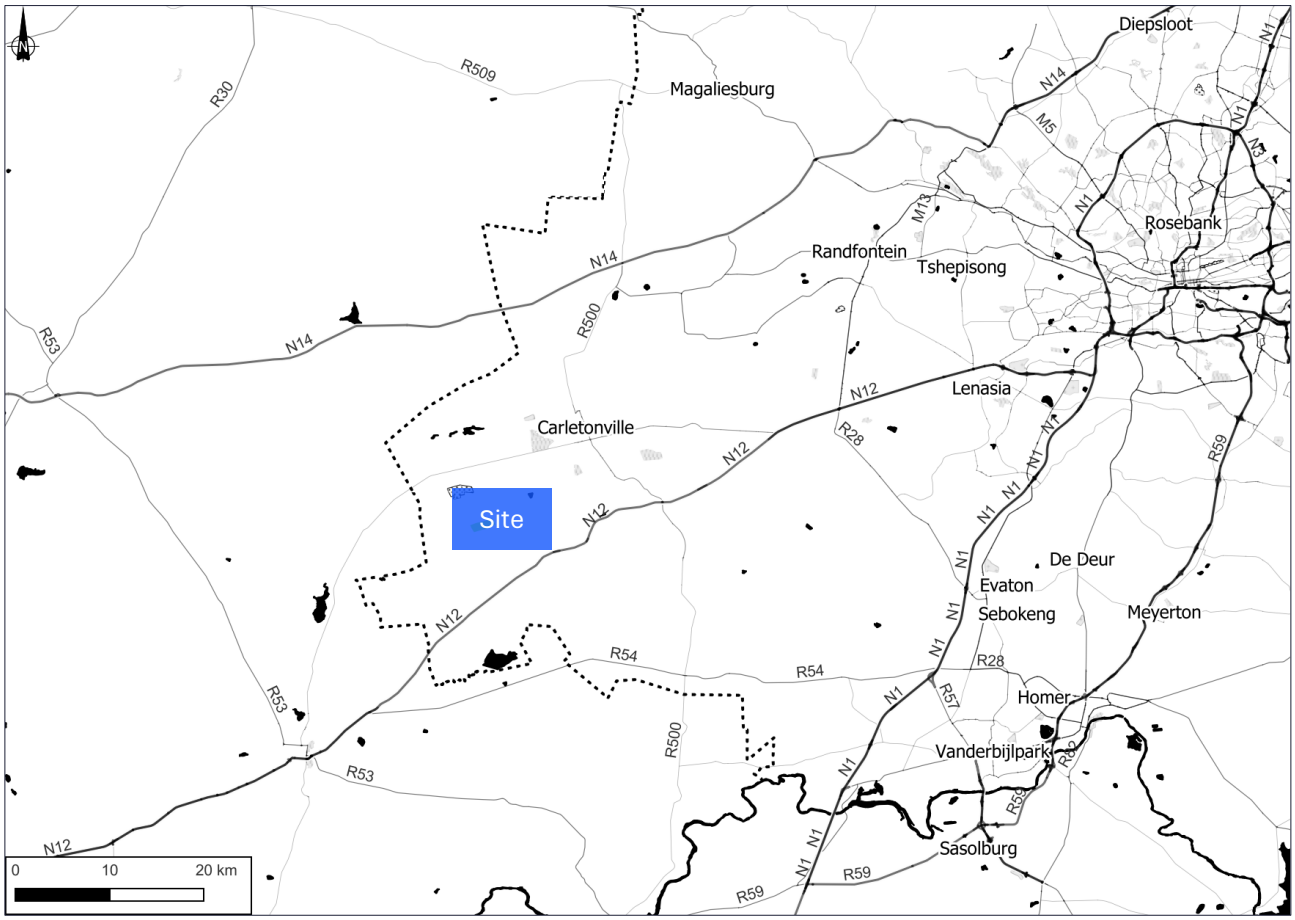


Figure 1-1: Locality Map

1.2 Purpose of this Report

This Traffic Impact Statement (TIS) presents an assessment of the potential traffic impacts associated with the proposed Deelkraal II Tailings Storage Facility (TSF) on the surrounding road network. The study has been undertaken in accordance with the requirements of relevant road authorities, as well as applicable traffic impact assessment standards and guidelines to support the proposed development application.

The proposed Deelkraal II TSF is not expected to generate significant vehicular traffic during its operational phase. Tailings will primarily be transported from the processing plant to the TSF via pipeline, resulting in minimal reliance on road-based transport. Consequently, the development is anticipated to generate fewer than 150 vehicle trips per hour during peak periods.

In line with the South African Traffic Impact and Site Traffic Assessment Manual (TMH 16), Volume 1, developments generating up to 150 trips per peak hour fall within the threshold where a Traffic Impact Statement (TIS), rather than a more detailed Traffic Impact Assessment (TIA), is considered an appropriate level of analysis.

2. Development Particulars

2.1 Proposed Development

The project description, as provided by the Client, is outlined below. Details of the proposed site, including the layout of existing and planned infrastructure, are presented in Appendix A.

Project Description:

Randfontein Estates Limited (a subsidiary of Harmony Gold Mining Company) (hereafter referred to as the applicant) has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioner (EAP) to assist with undertaking the required authorisation processes and to compile and submit the required documentation in support of application for the proposed new Deelkraal II Tailings Storage Facility (TSF) project and associated infrastructure on a site located approximately 13km southwest of Carletonville in the Merafong City Local Municipality, West Rand District Municipality, Gauteng Province (i.e. the Proposed Harmony West Wits Reclamation and Deposition Project).

The Applicant requires additional deposition capacity for West Wits region's operations. The applicant plans on constructing the Deelkraal II Tailings Storage Facility (TSF) to cater for the additional future capacity. This TSF will receive residue from Kusasalethu, and Savuka plants and will also assist in returning process water for reclaiming the existing Deelkraal 1 TSF and Kusasalethu TSF for processing at Kusasalethu plant. Additional planned infrastructure includes slurry, potable, sewage and return water pipelines, access roads, pump stations, a return water dam and a power line. Proposed upgrades to the existing Kusasalethu plant are also proposed as part of the project.

The Savuka Plant treats tailings from the Savuka Dormant TSFs (Old North TSFs) at a rate of 330 000 tpm and deposits the subsequent tailings on Savuka 5 & 7 TSFs. Harmony plans on remining Deelkraal 1 Dormant TSF and Kusasalethu TSF amongst other potential future sources. These TSFs will be processed through the Kusasalethu Plant at 500 000 tpm. The planned Life of Mine (LOM) for the West Wits region exceed the available deposition capacity of the existing TSFs. Therefore additional depsotion capacity is required.

The Kusasalethu Plant will accommodate future reclamation operations and will therefore need site/s to deposit the tailings. Harmony owns ground, located adjacent to the Deelkraal 1 Dormant TSF, that can be used i.e. for the proposed Deelkraal II TSF. The Deelkraal 1 Dromant TSF and adjacent virgin ground footprint combined geometry will accommodate the future reclamation operations deposition rate and capacity. The proposed TSF will cover an area of approximately 430 ha .

The West Wits Reclamation (WWR) Concept Study explores ways to unlock the potential of recycling historic gold tailings using the existing Kusasalethu and Savuka process plants and infrastructure. The Concept Study (SGS Bateman, 2024) evaluated different options for the treatment of the Deelkraal 1 and Kusasalethu Tailings Storage Facilities (TSF) at the existing processing plants. The reworked tailings will be deposited on a new TSF, referred to as Deelkraal II, assumed to be constructed on a site adjacent to the existing Deelkraal TSF. While reviewing the preliminary metallurgy testwork results it became evident that the Deelkraal TSF contained higher grades of accessible gold and it was agreed that that TSF would be reclaimed first, with the Kusasalethu TSF being reclaimed thereafter (SGS Bateman, 2024).

In addition to the Deelkraal II TSF, additional infrastructure is also proposed, as follows:

- A new Return Water Dam in the vicinity of the Deelkraal II TSF;
- Upgrades to the existing Kusasalethu plant including new/upgrade of gold and new uranium sections;

- Slurry pipelines:
    - Reclaimed Slurry from Deelkraal 1 to Kusasalethu (~10,6km[1]);
    - Kusasalethu Barren Tailings to Deelkraal II and booster pump station (~10,2km);
    - Reclaimed Slurry from Kusasalethu TSF to Kusasalethu Plant (~2km);
    - Slurry pipeline from Kusasalethu Plant to Savuka TSF (~4,97km); and
    - Slurry pipeline from Savuka plant to DF5 TSF (~2,9km).
- Process Water Pipelines:
    - Process Water Feed from Kusasalethu Plant to Deelkraal Reclamation(~9.54km) –
    - Return Water Feed to Kusasalethu Process Water Tank (~9,58km); -
    - Driefontein DP2 Pump Station to North Boundary Dam (~4,78km); -
    - DP2 feed to Tau Tona Reverse Osmosis Plant (~0,1km); -
    - Nursery Pumpstation #3 to Kusasalethu Process Water Tank (~9km); and
    - 2 Process Water pipelines from Kusasalethu Plant to Savuka White Tanks (~8km).
- Powerlines (all powerlines will be 22kV or lower):
    - Powerline from Kusasalethu Plant to the existing Deelkraal TSF (~9.2km);
    - Powerline from Kusasalethu Plant to the Kusasalethu TSF (~1.8km);
    - Powerline from Savuka shaft to Kusasalethu Plant (~8.1km);
- Potable Water pipeline from Rand Water supply point to the Deelkraal TSF (~8.52km).
- Deelkraal 1 TSF Reclamation Pump Station.
- Kusasalethu TSF Reclamation Pump Station.
- New Access Roads (2x3,5m double road) adjacent to pipeline routes/OH lines and around Deelkraal II TSF (where no access road is already in place).
- Topsoil Stockpiles and overburden stockpiles.
- Ancillary construction infrastructure including workshops and laydown areas.

All pipelines listed above will be flanged steel pipelines installed above-ground on pre-cast concrete plinths and two 3.5m wide access roads (double road), adjacent to the pipelines, will be cleared/graded to provide access for construction, maintenance and inspections (for areas where no access road is already in place). The diameter of the pipelines will be confirmed in the EIA phase once further design information becomes available.

[1] Lengths of pipelines and powerlines provided are approximate and could change by 1 – 2 km depending on the routing alternative selected

2.2 Site Access

Access to the mine during construction will be gained via internal mine dirt roads and construction roads from the existing public roads mainly via the following intersections:

1. Existing D92 and Access Road to Deelkraal;
2. Existing D92 and D1648
3. Existing D1648 and Kusasalethu Main Entrance;
4. Existing D1648 and Mponeeng operations (Savuka) - informal access;
5. Existing D1648 and Elandsridge;
6. Existing R500 and Access Road to Mponeng Operations (Surface Ops Entrance);
7. Existing N12 and D92
8. D92 and proposed site access road.
   - This proposed site access road will need to be consolidated with the nearest existing intersection to the north to illuminate substandard access spacing along Class 2 provincial road (D92).

All informal and proposed private accesses off provincial roads to the mine will require approval from the affected road authority.

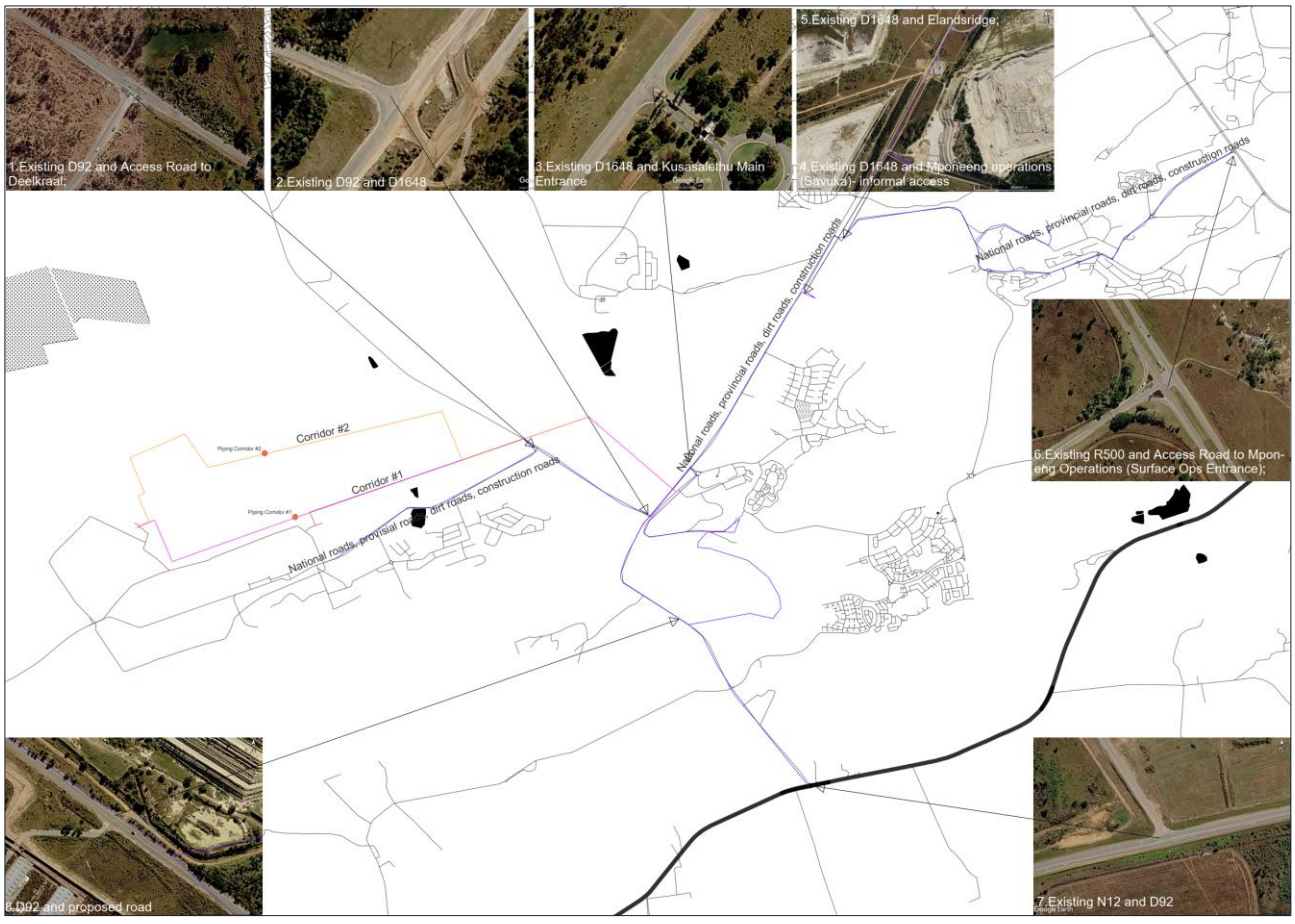


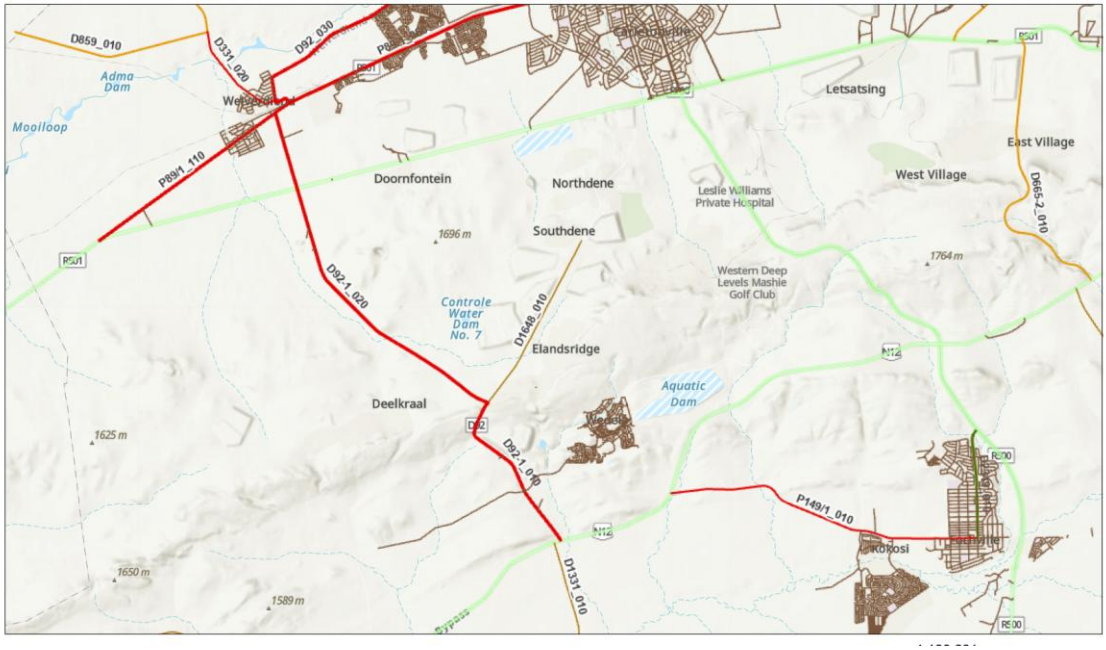
Figure 2-1: Proposed Site Access

3. Surrounding Road Network

3.1 Existing Road Hierarchy

The study area is served by several key roads, including

Road Name	Class	Description	Road Ownership
N12, R500 and R501	1, 2	• N12 National Road is a major east-west Class 2 single carriageway with 1 to 2 lanes per direction and situated to the south of the proposed development. • R500 is a major north-south Class 2 dual carriageway with 2 lanes per direction and situated to the east of the proposed development. • R501 is a major east-west Class 2 road comprising both single and dual carriageway sections with 1 to 2 lanes per direction, respectively.	South African National Roads Agency Limited (SANRAL)
D92, D1648	2, 4	• Road D92 is a primary north-south Class 2 Arterial which connects the N12 National Road to the R501 with an approximate (paved – flexible) road length:16.3km, 2 lanes (3.5m each), road width:15m and paved width:7.4m. • Road D1648 is a primary east-west Class 4 Collector which connects D92 to R501 with an approximate (paved – flexible) road length:5.5km, 2 lanes (3.5m each), road width:10m and paved width:8.0m.	Gauteng Department of Roads and Transport (GDRT)
Access Roads	4, 5	• Local residential access roads	Municipal Merafong Local Municipality



3.2 Existing Intersection Capacity

The following intersections represent critical nodes within the study area, serving as key points of traffic movement and network connectivity. Figure 3-1 shows the spatial layout and positioning of these intersections within the broader study area.

1. R501 and D92;
2. R501 and R500;
3. R500 and Access Road to Mponeng Operations (Surface Ops Entrance);
4. R500 and N12;
5. N12 and D92,
6. D92 and Road to Wedela
7. D92 and D1648;
8. D1648 and Kusasalethu Main Entrance
9. D92 and Road to Deelkraal



Figure 3-1: Key Intersections

A desktop assessment of each intersection, including geometric layout and intersection control, and operational characteristics, is presented in Table X.

Table 3-1: Intersection Characteristics

Intersection Configuration	Junction Control and Lane Configuration
	**1. R501 and D92** 4-Way Stop-controlled junction • north approach: 1 lane • east approach: 3 lanes including 2 x 70m short right and left turn lanes • south approach: 1 lane • west approach: 3 lanes including left slip lane
	**2. R501 and R500** 4-Way Stop-controlled junction • north approach: 3 lanes including left slip lane • east approach: 3 lanes including left slip lane • south approach: 4 lanes including left slip lane • west approach: 4 lanes including left slip lane
	**3. R500 and Access Road to Mponeng Operations (Surface Ops Entrance)** Priority-controlled T- junction • north approach: 3 lanes, priority (R500) • south approach: 3 lanes including left slip lane, priority (R500) • west approach: 2 lanes including left slip lane, stop (Mponeng Operations Access)
	**4. R500 and N12** 4-Way Stop-controlled junction • north approach: 2 lanes including shared left slip lane • east approach: 2 lanes • south approach: 3 lanes • west approach: 2 lanes including shared left slip lane

	**5. N12 and D92** Priority-controlled T- junction • north approach: 1 lane, stop (D92) • east approach: 2 lanes, priority (N12) • west approach: 2 lanes, priority (N12)
	**6. D92 and Access Road to Wedela** Priority-controlled T- junction • east approach: 2 lanes including left slip lane, priority (D92) • east approach: 1 lane, stop (Access Road to Wedela) • south approach: 2 lanes, priority (D92)
	**7. D92 and D1648** Priority-controlled T- junction • north approach: 1 lane, priority (D1648) • south approach: 1 lane, priority (D1648) • west approach: 1 lane, stop (D92)
	**8. D1648 and Kusasalethu Main Entrance** Priority-controlled T- junction • north approach: 1 lane, priority (D1648) • south approach: 1 lane, priority (D1648) • east approach: 1 lane, stop (Kusasalethu Main Entrance)

	**9. D92 and Road to Access Road to Deelkraal** Priority-controlled T- junction • west approach: 1 lane, priority (D92) • east approach: 1 lane, priority (D92) • south approach: 1 lane, stop (Access Road to Deelkraal)

3.3 Typical Road Network Traffic Volumes

3.3.1 Daily Traffic Volumes

A review of historical traffic volumes within the study area was undertaken using data obtained from the SANRAL Yearbook (2019 & 2023) for national roads and the Gauteng Provincial Department of Roads and Transport Road Asset Management System (GPDRTRAMS, 2025) for provincial roads.

The adjoining road network experiences Average Daily Traffic (ADT) volumes ranging between 992 to 11103 vehicles per day. Of this, 269 to 500 vehicles per day comprise Average Daily Truck Traffic (ADTT), suggesting that heavy vehicles constitute a notable share of total traffic, with potential implications for pavement loading and road performance.



Figure 3-2: Location of Link Counts – SANRAL Yearbook (2019 & 2023)

Surrounding Road Network

Table 3-2: Surrounding Road Network Traffic Volumes (ADT and ADTT) – SANRAL Yearbook (2019 & 2023)

Road	Year	ADT (veh/day)	ADTT (trucks/day)	ADTT (% trucks/day)
N12	2023	8890	1606	18%
R500	2023	9421	269	3%
R501	2019	9332	1149	12%



Figure 3-3: Location of Intersection Link Counts – GPDRTRAMS (2025)

Table 3-3: Surrounding Road Network Traffic Volumes (ADT) – GPDRTRAMS (2025)

Road	Authority	ADT (veh/day)
N12	SANRAL	6303 - 11103
R500	SANRAL	6247 - 9505
R501	SANRAL	992 - 5335
D92	GDRT	1107 - 1322
D1648	GDRT	1469 - 2276

3.3.2 Peak Hour Traffic Volumes

Based on the available ADT data, generally, peak hour traffic volumes constitute approximately 13% of the Average Daily Traffic (ADT) volumes. Accordingly, for the study area, the expected peak hour traffic volumes have been estimated based on the available ADT data, applying a peak hour factor of 13%. This approach provides a practical basis for assessing traffic conditions during the most critical operating period of the road network, typically corresponding to the morning or afternoon peaks. Figure 3 4 shows the estimated peak hour link volumes within the study area. The estimated peak hour volumes are used to support the evaluation of intersection performance, level of service, and lane capacity requirements within the study area. Given the relatively low peak hour volumes observed, the base year hourly link volumes are not expected to be sufficient to justify the need for a roadway cross-section with substantially higher capacity than the existing available capacity.



Figure 3-4: Surrounding Road Network Traffic Volumes (ADT) – GPDRTRAMS (2025)

Table 3-4: Surrounding Road Network Traffic Volumes (ADT) – GPDRTRAMS (2025)

Road	Peak Hour Flow (veh/h)	Free Flow Speed (km/h)	Capacity (veh/h/lane)	Available Capacity (Theoretical)
N12	820 - 1444	100	1240	2480 - 4960
R500	812 - 1236	100	1240	2480 - 4960
R501	129 - 694	100	1240	2480 - 4960
D92	144 - 172	70	770	1540
D1648	191 - 296	70	770	1540

Figure 3-5, Figure 3-6, and Figure 3-7 illustrate the typical peak hour traffic flows on the major road network—namely the N12, R500, and R501, respectively—which range between 800 and 1,000 vehicles per hour and fall below capacity thresholds for each road type/class.

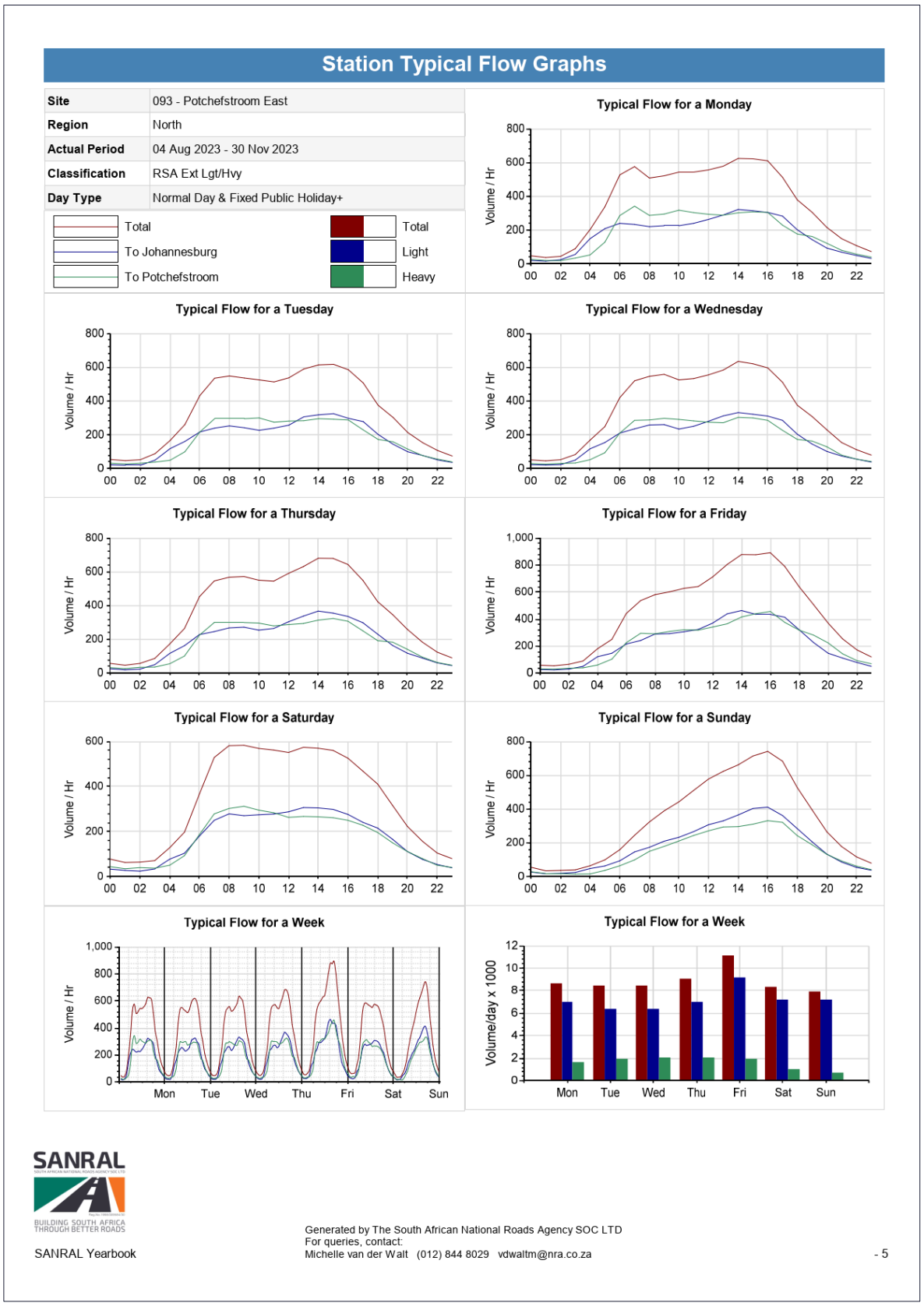


Figure 3-5: N12 Typical Flow Profile

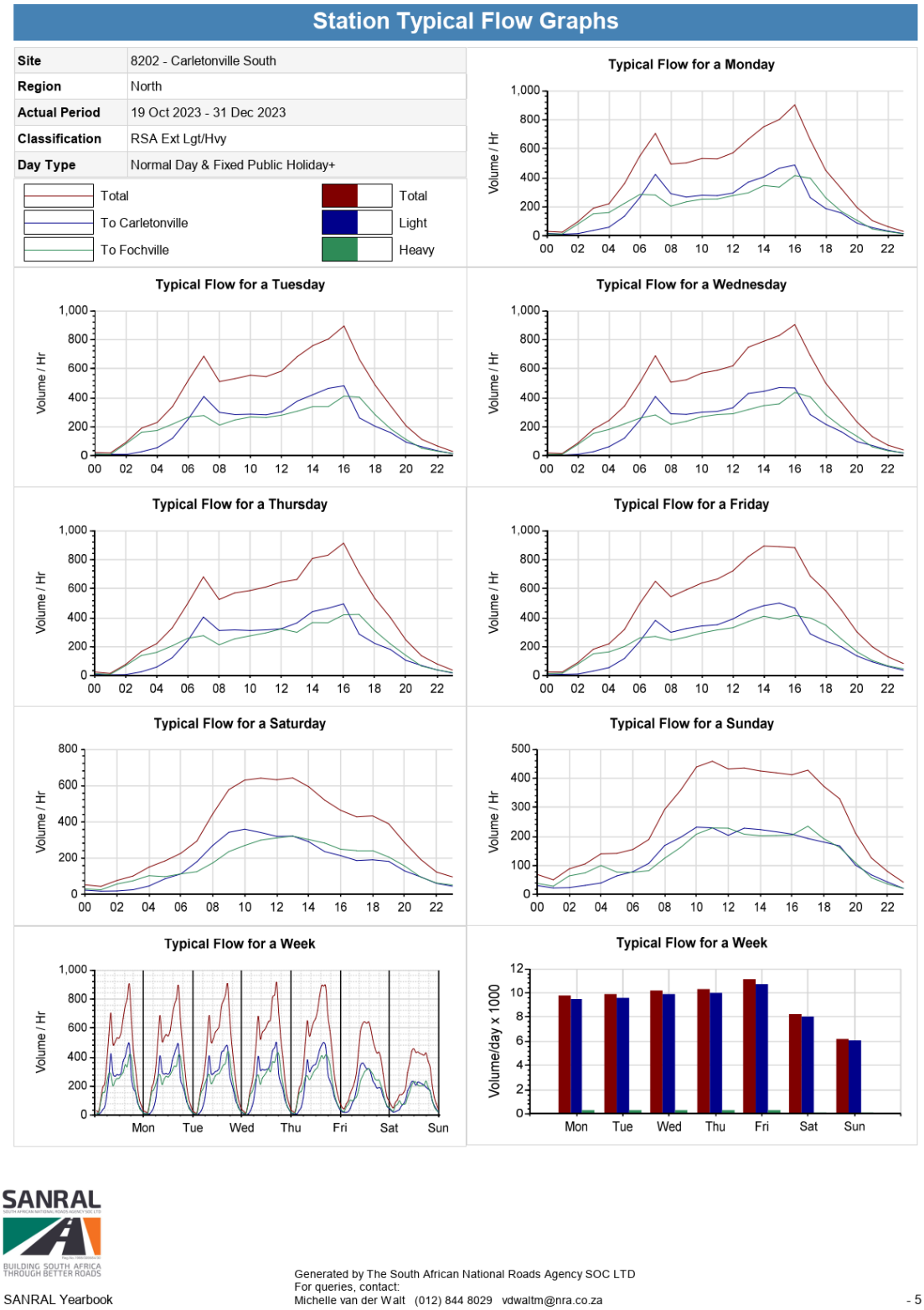


Figure 3-6: R500 Typical Flow Profile

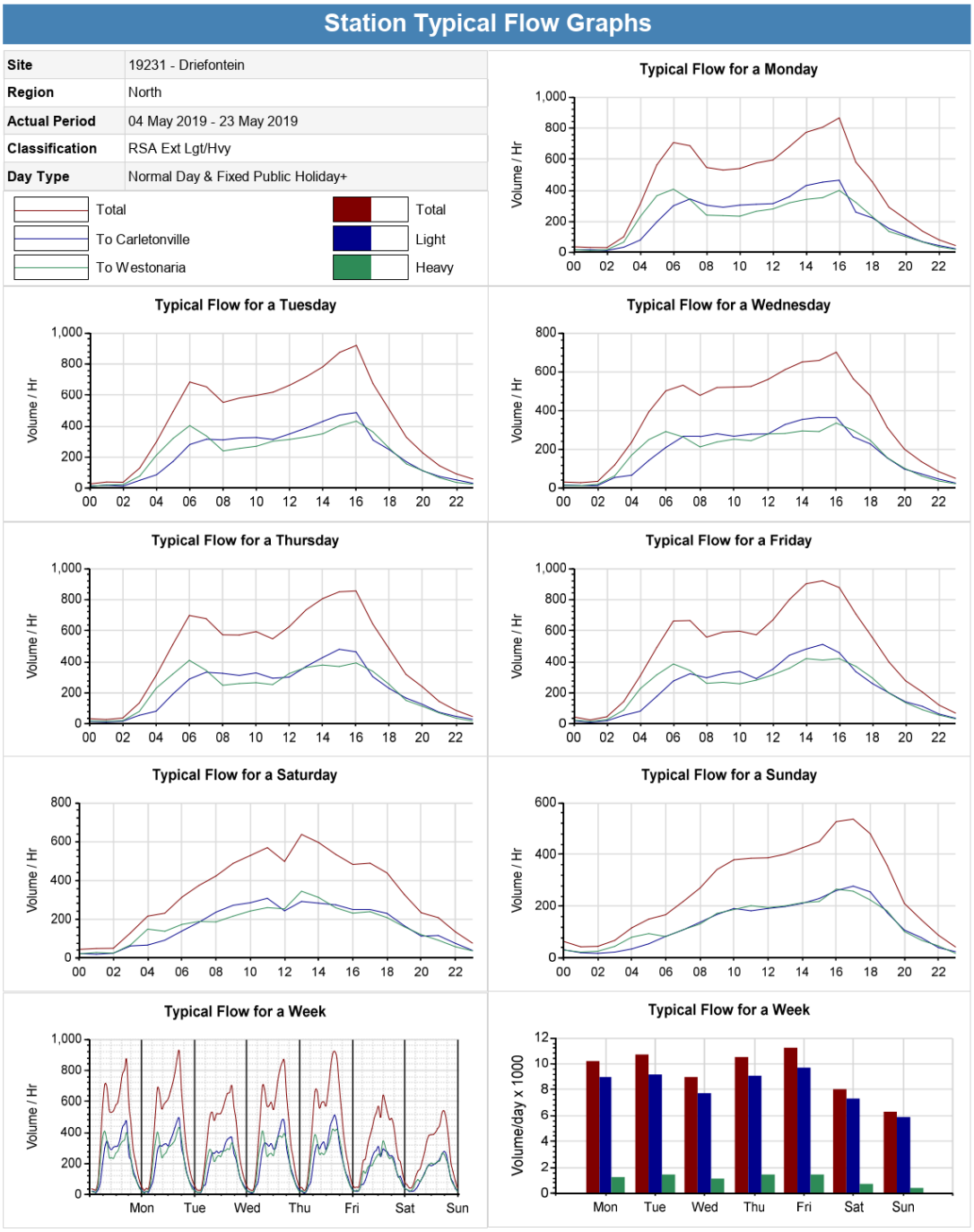


Figure 3-7: R501 Typical Flow Profile

4. Way Forward

4.1 Project Life Cycle

Specialist inputs into the scoping assessment allows for the identification of the anticipated impacts, particularly those that will require detailed specialist investigations.

This section of the report aims to predict the potential impacts likely to occur from the undertaking of the proposed activities that will need to be evaluated during the Impact Assessment phase of the EIA.

- **Feasibility phase** - This includes selecting a suitable location for the associated infrastructure which are assessed as part of the EIA;
- **Planning and design phase** - This phase, which is only undertaken should environmental authorisation be obtained, includes the following:
  - Aerial survey of the route;
  - Selection of the most appropriate infrastructure;
  - Preparation of relevant planning documentation, including technical and design documentation;
- **Construction phase** – During the implementation of the project, the construction activities related to the installation of the necessary infrastructure and equipment is undertaken.
- **Operational phase** - This includes operational activities associated with the maintenance and control of the mining operations; and
- **Decommissioning** - This phase will include measures for complying with the prevailing regulatory requirements, rehabilitation and managing environmental impacts to render the affected area suitable for future desirable use.

The potential impact is expected to be minimal or insignificant during the planning, and the rehabilitation phase. This is due to low volumes of traffic expected to be generated by the two phases. Considering this, only the Construction, Operational and Decommissioning phases are anticipated to require investigation during the Impact Assessment Phase of the EIA process for the selected site.

4.2 Anticipated Traffic and Transportation Related Impacts

4.2.1 Deterioration of Road Network Conditions

Heavy vehicle traffic during both construction and decommissioning phase of the development are expected to cause additional wear and tear on the surrounding road network. The gravel roads to the sites are also expected to sustain damage during the construction and decommissioning phase of the project (i.e., surface distress - gravel loss leading to damage to the existing gravel road layers and rutting).

4.2.2 Impact of Dust Along Gravel Access Roads

Heavy vehicles are expected to cause dust along unpaved access roads to the site during the transportation of various components to the site leading to possible loss of visibility from a safety point of view, health, damage to roadside vegetation and environmental impact such as air pollution.

4.2.3 Impact of Additional Traffic Volumes on Road Sections, Intersection Capacity and Traffic Safety

The project could potentially result in the disruption of traffic on Local, Regional, and National Routes but to some varying degrees. The severity of the impacts will depend on the order of the road (how many lanes, width, length,

turns, etc.), the receiving environment and vicinity of land uses and towns. Additional traffic on the road network could result in changes to the operations of that road network. Additionally, the severity of the impacts will depend on the expected traffic volumes to be generated by the proposed development. A full traffic impact study will be required to estimate the volume of traffic associated with the transportation of personnel and materials/components to site during the construction and operational phases. The standards, manuals, and guideline documents to be used are as follows (as applicable):

- Technical Methods for Highways (TMH) 16: Volume 1 and Volume 2 - South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual; and
- Technical Recommendations for Highways (TRH) 26 South African Road Classification and Access Management Manual (Version 1.0 August 2012).

4.2.4 Impact of Abnormal Loads

The project will inevitably result in the movement of abnormal loads on Local, Regional and National Routes, but to varying degrees. The severity of the impacts will depend on the travelling speed, vehicle size and loaded height of the abnormal vehicles expected. Thus, additional abnormal traffic on the road network could result in changes to the operational performance/level of service of that road network. The standards, manuals, and guideline documents to be used are as follows (as applicable):

- The National Road Traffic Regulations (1999) promulgated under Section 75 of the National Road Traffic Act (Act No. 93 of 1996) regulate the conveyance of abnormal loads and dangerous goods on public roads; and
- TRH 11 Dimensional and Mass Limitations and Other Requirements for Abnormal Load Vehicles.

4.3 Anticipated Potential Impact Assessment

- Deterioration of road network conditions
  - Impact Before: Medium
  - Impact After Mitigation: Low
  - Mitigation measures: continuous monitoring and upgrading, limiting heavy and overloaded vehicles where possible
- Impact of dust along gravel access roads
  - Impact Before: Medium
  - Impact After Mitigation: Low
  - Mitigation measures: regular wet grading and wetting for dust suppression and limiting dust generating activities during strong wind periods
- Impact of additional traffic volumes on road sections, intersection capacity and traffic safety
  - Impact Before: Low
  - Impact After Mitigation: Low
  - Mitigation measures: scheduling development traffic movement to not coincide with existing peaks where possible and encourage use of public transportation,
- Impact of abnormal loads
  - Impact Before: Medium
  - Impact After Mitigation: Low
  - Mitigation measures: implementation of traffic management strategies during construction - temporal road signs, use of flagmen, reduced temporary speed limits,

5. Conclusion

Based on the nature and extent of the proposed Deelkraal II TSF, some level of disturbance can be expected on the immediate road network and regionally because of the construction and operational phases. The overall potential impact is expected to be moderate to low during both the construction phase and operational phase, respectively.

Provincial Road D92 providing site access carries substantially lower traffic volumes than the N12, R500, R501 which already carry a high proportion of trucks including abnormal vehicles.

There is sufficient capacity on the N12, R500, R501, D92, D1648, and existing intersections to accommodate the traffic generated by the proposed Deelkraal II TSF mine during both construction and operation. This is subject to the implementation of appropriate traffic management strategies and mitigation measures where necessary to address potential negative impacts.

Appendix A Site Layout

West Wits Reclamation Consolidation 7 April 2026

WWR - roads routes for construction

Covalent 6#

DF5 TSF

Driefontein DP2 Pumpstation

Savuka plant to DF5 TSF

Covalent #4 Discharge

North Boundary Dam Pumpstation

DP2 Discharge

Nursery #3 Pumpstation

Tau Tona RO PLant

North Boundary Dam

Nursery Dam

Savuka TSF Drainage Trench

Untitled Path

Savuka plant

Savuka White Tanks

Barren Slurry, Kusasa Plant - Savuka TSF, 5km

Piping Corridor #2

Corridor #2

Reclaimed Slurry from Deelkraal 1 to Kusasalethu

Kusasalethu Barren Tailings to Deelkraal 2 Corridor #1

Piping Construction Laydown Area

Piping Construction Laydown Area

Deelkraal RWD Pumpstation

Deelkraal II Return Water Dam

Deelkraal HT Substation

Deelkraal HT Substation

Deelkraal 1 Reclamation Pumpstation

Deelkraal Reclamation Laydown

Piping Corridor #1

Stockpile 2

Deelkraal 1 TSF

Deelkraal TSF

Deelkraal Reclamation Construction Laydown Area

Proposed Deelkraal II TSF

Proposed Deelkraal II TSF

Return water dam

TSF Construction Laydown Area #1

TSF Construction Laydown Area #1

TSF Laydown Area #2

TSF Construction Laydown Area #2

Stockpile 1

Tailings Transfer

Kusasalethu Plant Parking Area

Kusasalethu plant

Kusasa Plant Construction Laydown Area

Kusasa Plant Construction Laydown Area

Kusasalethu Plant

Reclaimed Slurry Receiving

Kusasalethu TSF

Kusasalethu TSF

Kusasalethu Reclamation 1

Kusasalethu Reclamation Option 1

Kusasalethu Reclamation 1 Laydown

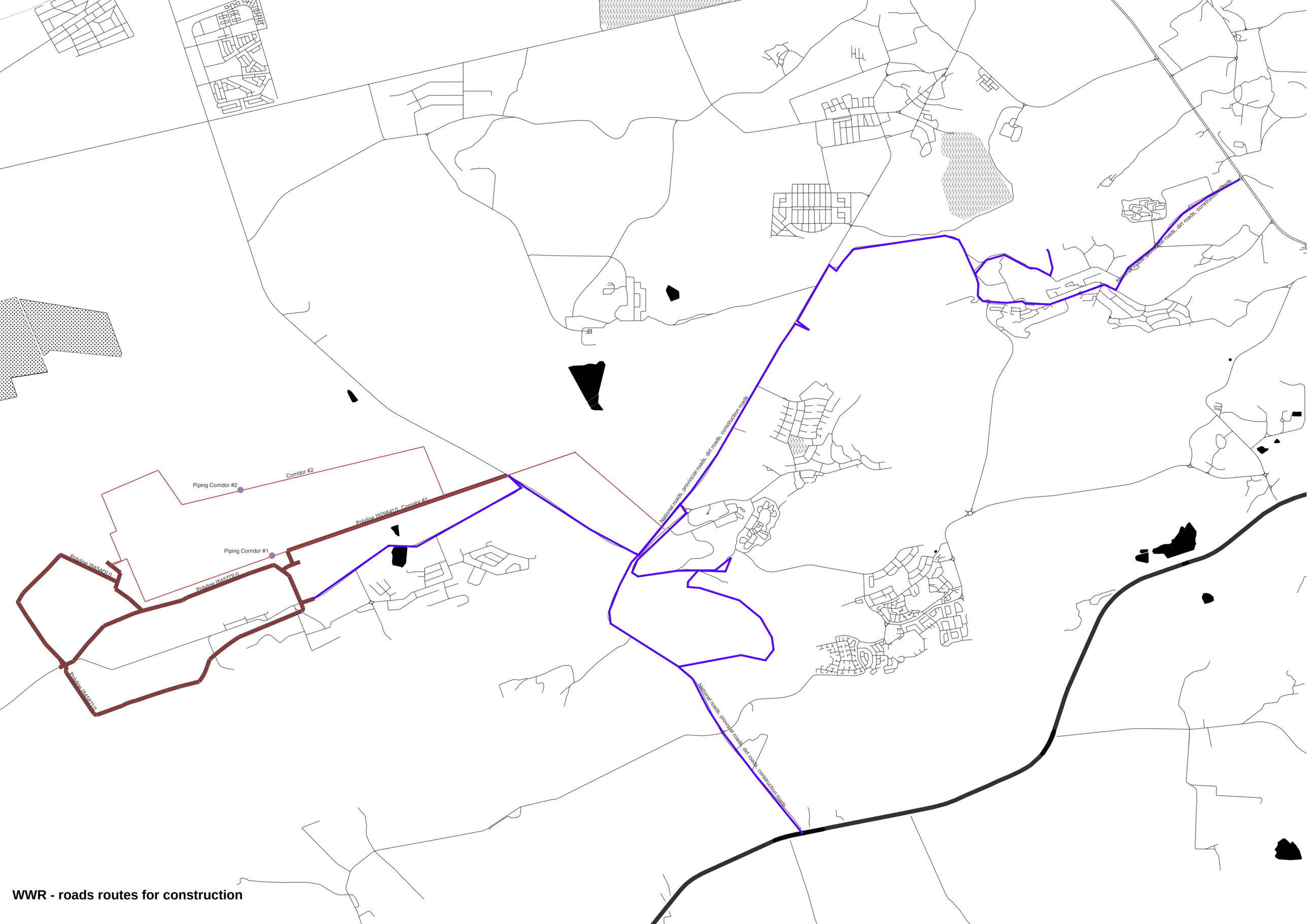
Kusasalethu Reclamation Option 1 Laydown

Kusasalethu Reclamation Option 2

Kusasalethu Reclamation 2 Laydown

Kusasalethu Reclamation Option 2 Laydown

West Wits Reclamation Consolidation 7 April 2026



WWR - roads routes for construction

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