



Appendix C

Traffic

Traffic Investigation – Scoping

Exxaro Leeuwpan Coal

April 2012

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Title: Traffic Investigation – Scoping

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Project nr: ITS 3039

Date: April 2012

Report Status: Draft

Traffic Investigation – Scoping

Exxaro Leeuwpán Coal

	Description	Reference
1. Introduction	<p>ITS (Pty) Ltd is currently undertaking a Traffic Impact Assessment for the Exxaro Leeuwpán Colliery, situated on the farm Witklip. The Exxaro Leeuwpán Coal mine area is located approximately 8 km east of Delmas and north of the R50 Road between Delmas and Leandra (Lebohang). The town of Delmas (Victor Khanye Local Municipality) is part of the Nkangala District Municipality in the Mpumalanga Province.</p> <p>Exxaro Leeuwpán Coal needs to undertake the consolidation of the current Environmental Management Plans (EMPs) and EMP Addendums within the surface areas and mining authorisation areas of Leeuwpán Coal into one consolidated EIA and EMP document according to the Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002) (MPRDA).</p> <p>This mining operation is located in the Highveld Coalfields and Exxaro Leeuwpán Coal started in 1994 with open cast mining on the farm Witklip. Mining ceased during 2005. The remaining reserves being mined are Blocks OWM, OG, OH, OJ and the planned new expansions OL and OI. The new OI block was previously designated as underground mining.</p> <p>All the seams of the remaining reserves are mined by means of opencast mining using the drilling, blasting, loading and hauling with trucks and shovel, excavator and fleets methodologies. Exxaro Leeuwpán Coal is planning to start the new block OL and OI during 2013.</p> <p>The purpose of the traffic assessment is to assess the impact of the proposed stooping area and the proposed opencast developments, on the existing external road network surrounding the mine development (Refer to Figure 1 for the location of the proposed sites). Based on this assessment, mitigation measures will be recommended to minimise the impact on the road network.</p> <p>This document only addresses the scoping investigation, which includes baseline information, guidelines to be used for the investigation, expected impacts/issues and the methodology of investigation. The full assessment of the traffic impact will follow at a later stage of the project.</p>	<p>Appendix A Figure 1a and 1b</p>

2. **Baseline information**

Study Area:

The following external roads might be affected by the mining activities:

- R50 Road, R548 Road and Access to the mine
- R42 Road;
- Goedgedacht Road, north of the proposed site and Access 2 to the mining area.

The following intersections will be investigated:

- R50 Road / R548 Road (Access 1);
- R50 Road / R42 Road; and
- R50 Road / Goedgedacht Road (Access 2).

Status Quo

A site visit has been conducted on the 5th of April 2012, for the purpose of the scoping investigation. Traffic counts were carried out during the morning and afternoon peaks hours (6:00 – 9:00 morning and 16:00 – 19:00 afternoon) at the above mentioned intersections. Light vehicles, heavy vehicles (2 - 4 axles) and very heavy vehicle (5 and more axles), were counted at the intersections. The AM and PM Peak hour was determined based on the highest traffic volumes registered during the morning and afternoon period respectively. The AM Peak was found to be from 7:30 to 8:30 and the PM Peak hour was recorded at 16:45 to 17:45. The existing AM and PM traffic volumes are indicated in **Figures 2a and 2b**.

The R50, R548 and R42 routes are single carriage way (2 lanes, one lane per direction), paved roads with a capacity of ±1500 vehicles/hour/direction.

Existing Accesses

- Access 1 is located at the R50 Road / R548 Road west of the mining area and is mainly use for mining staff, deliveries and contractors; and
- Access 2 is located on Goedgedacht Road north of the mining area. Despatch of coal is controlled through this access.

Intersection Geometry

The R50 Road / R548 Road intersection is a priority controlled intersection with priority on the R50 Road and currently provided access to the mine (Access 1).

The R50 Road / R42 Road intersection is a priority controlled T-intersection with priority on the R50 Road.

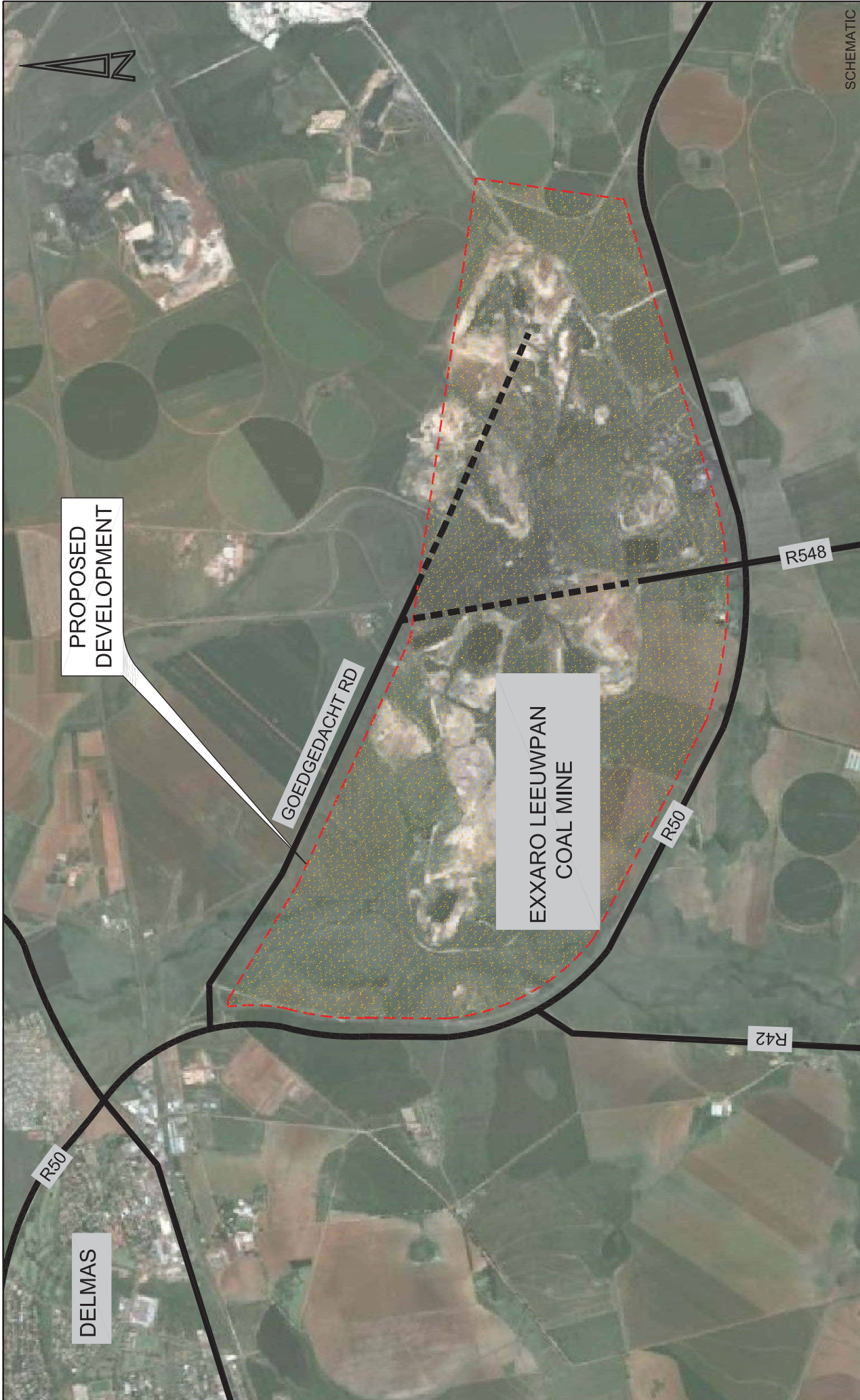
The R50 Road / Goedgedacht Road intersection is a priority controlled intersection with priority on the R50 Road. Goedgedacht Road links Access 2 with the R50 Road. The existing geometry is indicated in **Appendix A, Figure 3**.

Appendix A
Figure 1a and
Figures 2a, 2b
and 3

	<p><u>Existing Traffic Volumes</u></p> <p>The R50 Road is situated on the eastern side of the Exxaro Leeuwan Coal site and is part of the provincial road network in the area. The traffic data indicates that the highest flow occurs along the R50 Road with approximately 550 vph and 530 vph during the morning AM and afternoon PM peak (two-way flows) respectively. The main direction during the morning peak (\pm 360vph) is in an easterly direction. During the afternoon peak the main direction is westbound with approximately 370 vph. Approximately 20% of the total traffic volume during the peak hours is heavy vehicles.</p> <p>The R548 Road carries approximately 80 vph and 70 vph during the morning AM and afternoon PM peak (two-way flows) respectively with approximately 9% of the total traffic volume being heavy vehicles during the morning peak and approximately 19% during the afternoon peak.</p> <p>The R42 Road carries approximately 200 vph and 260 vph during the morning AM and afternoon PM peak (two-way flows) respectively with approximately 26% of the total traffic volume being heavy vehicles during the morning peak and approximately 42% during the afternoon peak.</p> <p>Goedgedacht Road is situated on the northern side of the Exxaro Leeuwan Coal site and carries low traffic volumes with approximately 10 vph and 55 vph during the morning AM and afternoon PM peak (two-way flows) respectively with approximately 33% of the total traffic volume being heavy vehicles during the morning peak and approximately 19% during the afternoon peak.</p> <p><u>Analyses Scenarios:</u></p> <p>The analyses scenarios will be determined upon confirmation of the lifespan of the proposed developments and the implementation phases and will include the following:</p> <ul style="list-style-type: none"> • Base without the mining development; and • Base with the mining development included. 	
<p>3. Guideline Documents</p>	<p>The Traffic Impact Investigation will be conducted based on the <i>Manual of Traffic Impact Studies (RR 93/635)</i>, published by the <i>Department of Transport (1995)</i>.</p> <p>The intersections will be evaluated using the <i>Highway Capacity Manual (HCM) 2000</i> methodology published by the Transport Research Board (TRB) in the United States of America.</p>	<p>-</p>

<p>4. Impacts or Issues expected</p>	<p>The following impacts will be investigated further:</p> <ul style="list-style-type: none"> • Traffic demand levels during the AM and PM peak hours at the following intersections: <ul style="list-style-type: none"> • R50 Road / R548 Road (Existing main access to mine, staff and deliveries); • R50 Road / R42 Road; and • R50 Road / Goedgedacht Road. • Delays at the access to the mine. • Safety of the local communities (in terms of pedestrian movement). • Sight distance at the access to the mine. • Adequate public transport facilities. • Existing condition of the access roads to the mine. <p>The extent of traffic related impact will be included in the final assessment report.</p>	<p>-</p>
<p>5. Methodology of Investigation</p>	<p>The study will be carried out based on the following methodology:</p> <ol style="list-style-type: none"> 1. Identification of the affected external roads, 2. Status quo investigation of internal and external road network: <ul style="list-style-type: none"> • Existing traffic volumes, and • Basic road network investigation (cross sections, condition of the road), 3. Capacity evaluation of the existing road network (link capacity and intersection capacity), 4. Projection of the future traffic demand (background and mining traffic), 5. Re-evaluation of the road network to accommodate future traffic demand, 6. Propose mitigation measure to minimise the impact on the external road network 7. Public Transport and pedestrian movement investigation, 8. Preparation of the assessment report, including possible mitigating measures. 	<p>-</p>

APPENDIX A



SCHEMATIC
3039_Fig 1a

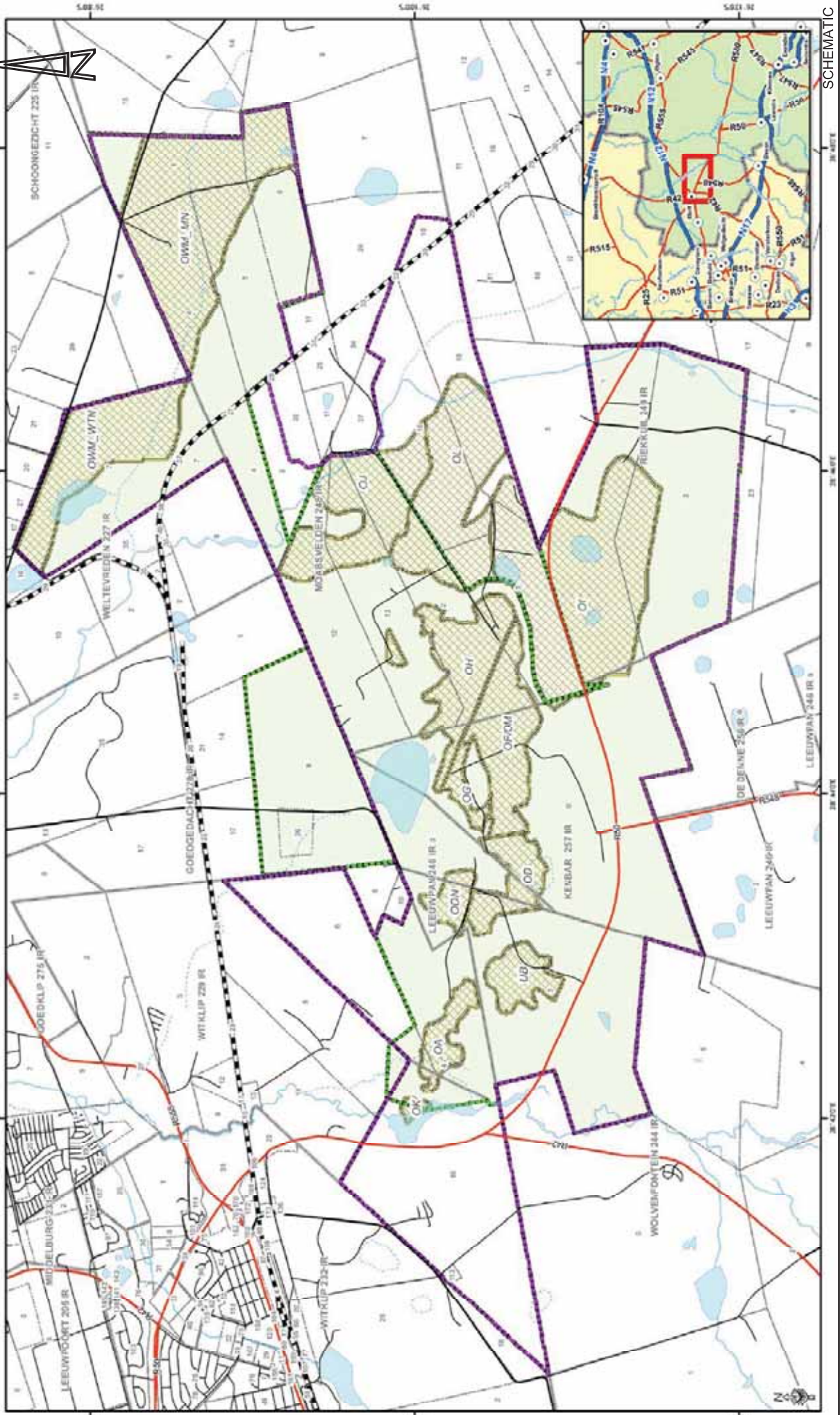
NUMBER:
1a

FIGURE:
LOCALITY PLAN

PROJECT:
EXXARO LEEUWPAN COAL MINE



LEEUPWAN: COAL BOUNDARIES AND AUTHORISATION AREAS



PROJECT: EXXARO LEEUWPAN COAL MINE

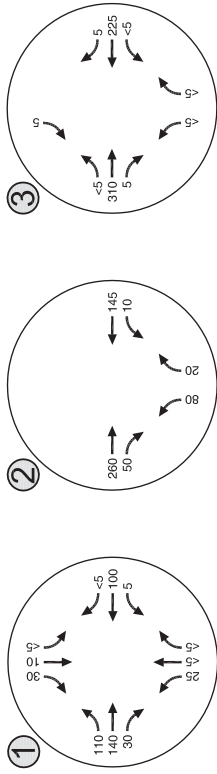
FIGURE: EXTENT OF MINING AREA

NUMBER: 1b

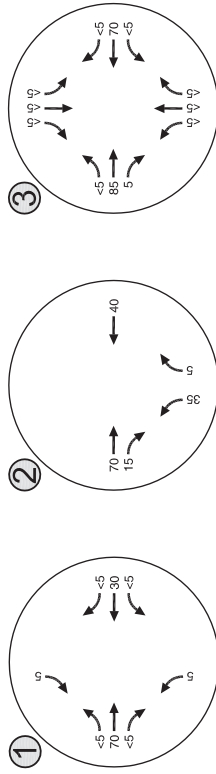
SCHEMATIC



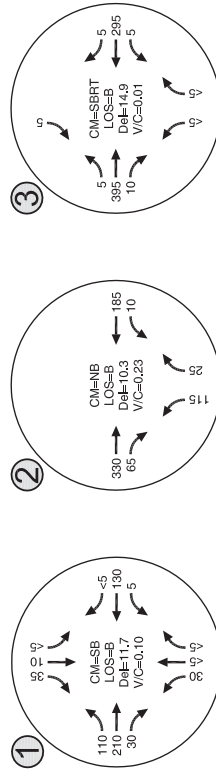
AM PEAK HOUR LIGHT VEHICLE VOLUMES



AM PEAK HOUR HEAVY VEHICLE VOLUMES

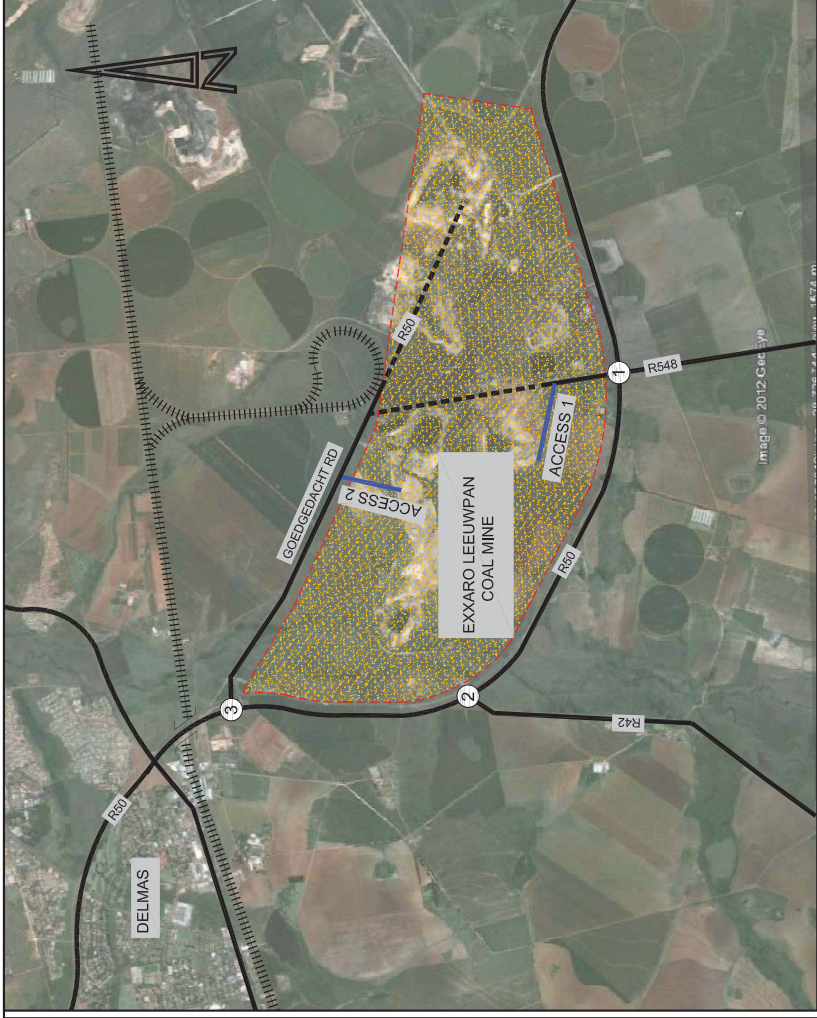


AM PEAK HOUR TOTAL VEHICLE VOLUMES



LEGEND

- 10 ← Turning Volumes (vph)
- 10 →
- LOS — Level of service
- Del — Delay (seconds/vehicle)
- V/C — Volumes / Capacity Ratio
- Site
- Access



SCHEMATIC

3039_Fig 2a

FIGURE:

2012 AM BASE VEHICLE VOLUMES

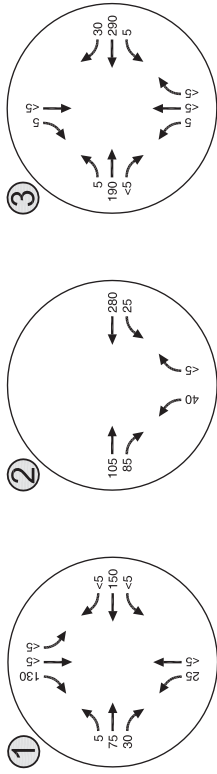
2a

PROJECT:

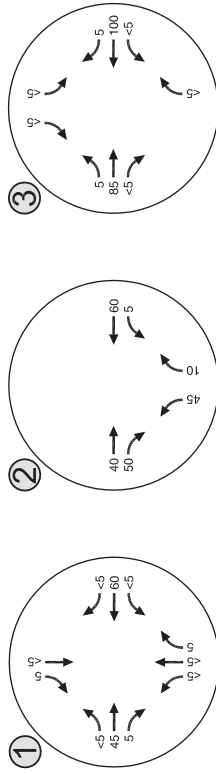
EXXARO LEEUWPAN COAL MINE



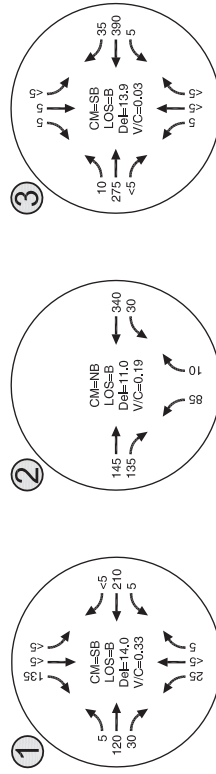
PM PEAK HOUR LIGHT VEHICLE VOLUMES



PM PEAK HOUR HEAVY VEHICLE VOLUMES

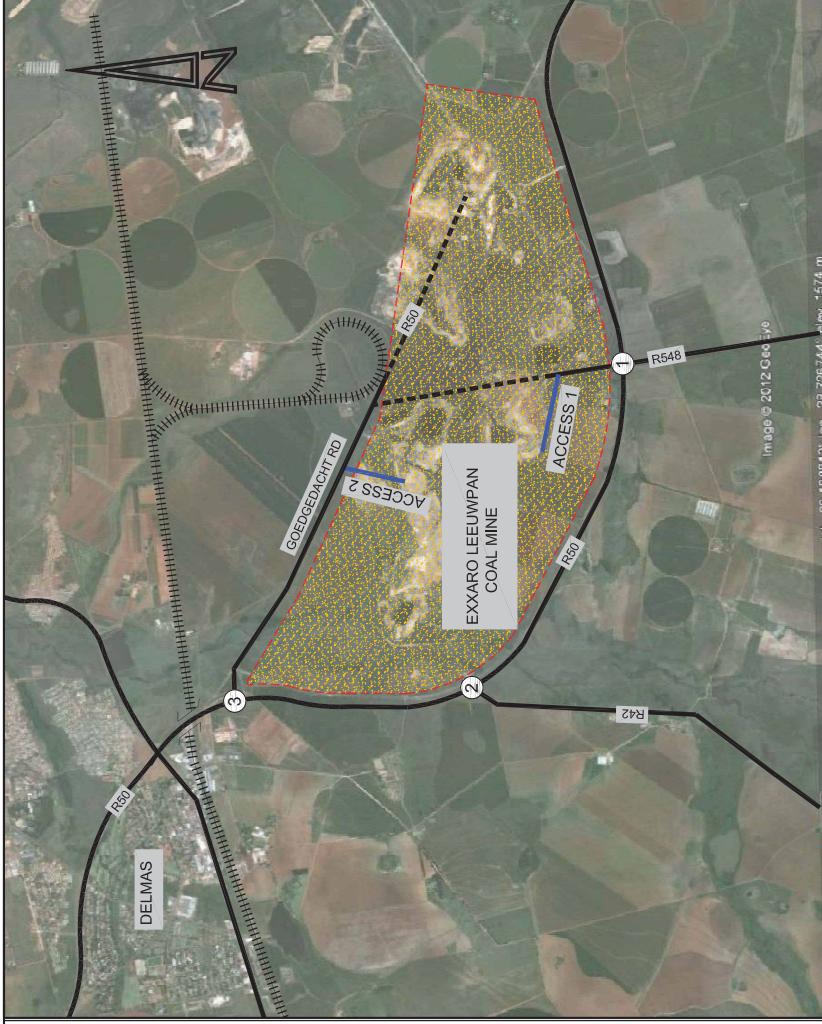


PM PEAK HOUR TOTAL VEHICLE VOLUMES



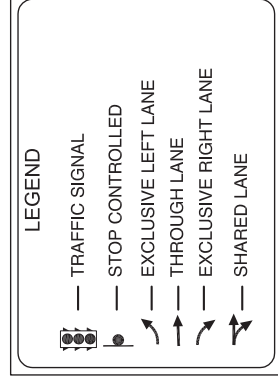
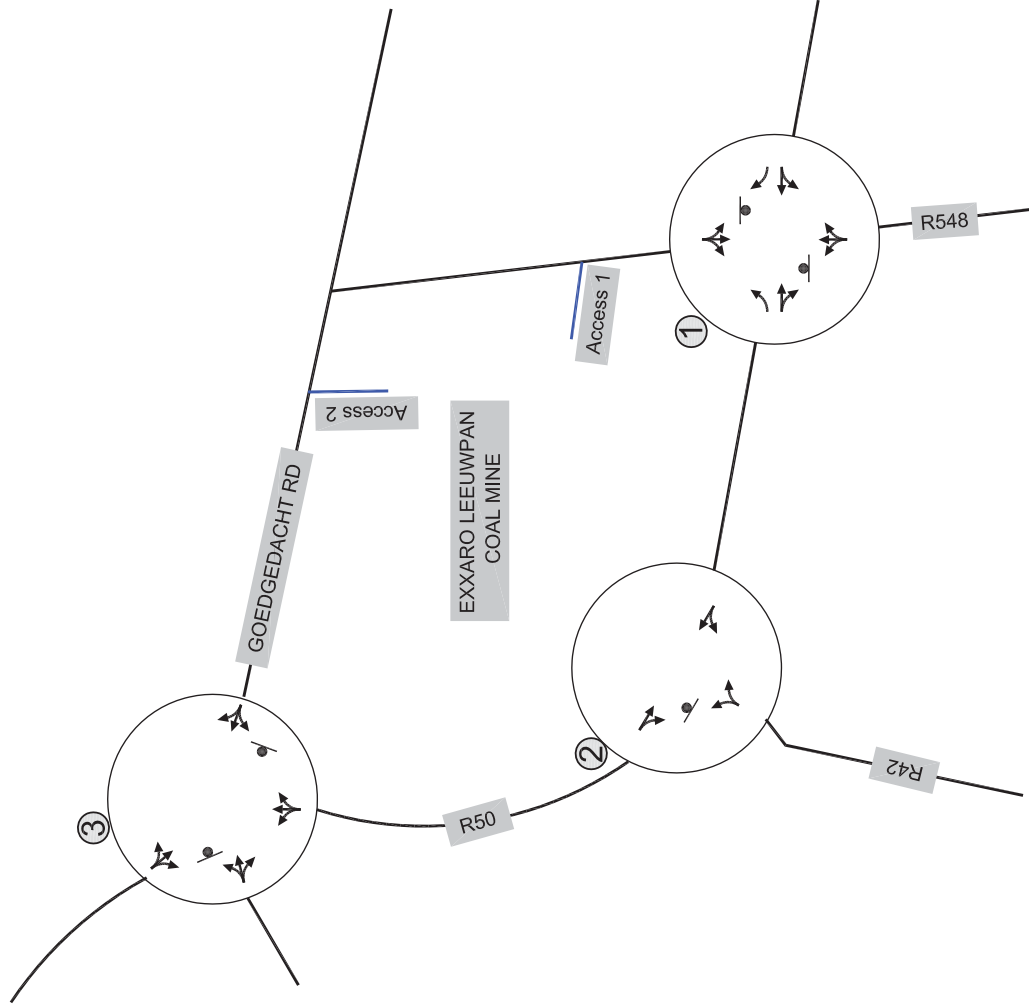
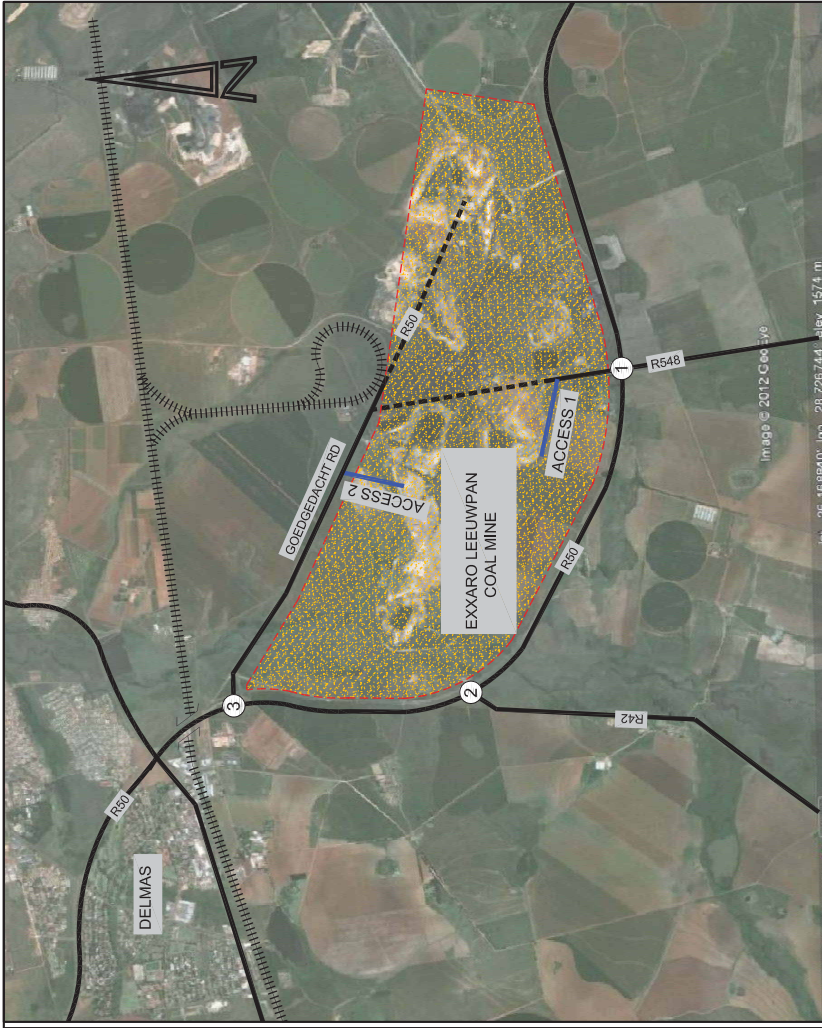
LEGEND

- 10 ← Turning Volumes (vph)
- 10 →
- LOS — Level of service
- Del — Delay (seconds/vehicle)
- V/C — Volumes / Capacity Ratio
- Site
- Access



PROJECT:	EXXARO LEEUWPAN COAL MINE
FIGURE:	2012 PM BASE VEHICLE VOLUMES
NUMBER:	2b





SCHEMATIC
3039_Fig 3
NUMBER:

PROJECT: **EXXARO LEEUWPAN COAL MINE**

FIGURE: **INTERSECTION CONTROL & GEOMETRY**

NUMBER: **3**

PROJECT: **EXXARO LEEUWPAN COAL MINE**

FIGURE: **INTERSECTION CONTROL & GEOMETRY**

NUMBER: **3**



APPENDIX B

R50 Road



The R50 Road is part of the provincial road network and links Delmas with Leandra.

R548 Road



R548 Road is part of the provincial road network and link the Heidelberg area with the R50 road.

Access Road



One of the accesses to the mining area is provided from the R50 Road / R548 Road intersection as a fourth leg to the intersection.

R42 Road



R42 Road is part of the provincial road network and link the Nigel area with the R50 road.

Goedgedacht Road



The second access to the mining area is located on the Goedgedacht Road approximately 2,8km from the R50 / Goedgedacht Road intersection.