ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE N17 TOLL ROAD

PROPOSED REHABILITATION AND UPGRADING OF THE N17 FROM SPRINGS TO ERMEOLO AND PROPOSED CONSTRUCTION OF NEW SECTIONS BETWEEN LEANDRA AND LEVEN STATION, AT TRICHARDT AND BETHAL

FINAL ENVIRONMENTAL IMPACT REPORT
PURPOSE OF THIS DOCUMENT

This document, the Final Environmental Impact Report (EIR) for the proposed rehabilitation and upgrading of the N17 from Springs to Ermelo and proposed construction of new sections between Leandra and Leven Station, at Trichardt and Bethal, presents the findings of the impact assessment in respect of issues and concerns raised during the scoping phase of the EIA.

The findings are presented in the following reports:

- The Final Environmental Impact Report (this report), with several appendices, including the Issues and response report (indicating to stakeholders where their issues have been captured)
- Four specialist reports, containing the findings of the specialist studies

Appreciation for participation by stakeholders

Many stakeholders have participated actively during the process by attending small briefing meetings, open days and by taking the time to prepare written submissions. Stakeholders contributed considerable local knowledge, and contributed information on previous studies done in the area. Many have also hosted members of the EIA team in their homes, and showed them around the area. The EIA team wishes to express sincere appreciation for these efforts by stakeholders.
PUBLIC REVIEW OF THE DRAFT ENVIRONMENTAL IMPACT REPORT

A period of seven weeks (from 5 June to 24 July 2002) was available for public comment on the Draft Environmental Impact Report. Copies of this report were couriered to nine public places as well as to key stakeholders. Copies of this report were also made available at the Open Day held on 8 June 2002, where the findings were presented.

In addition, the availability of the Draft Environmental Impact Report was announced in the media as well as by way of letters addressed to over 400 stakeholders personally.

OPPORTUNITIES FOR PUBLIC REVIEW

The following methods of public review of the Draft Environmental Impact Report were available:

- Completing the comment sheet enclosed with the reports
- Additional written submissions
- Comment by email or telephone
- Comment during the Open Day on 8 June 2002 at the Christo Country Lodge, Eeufees Street, Bethal, Mpumalanga during which the contents of the report were explained

FINAL ENVIRONMENTAL IMPACT REPORT (EIR)

Comments received from stakeholders on the draft findings during the review period were assessed, and are now included in this Final EIR.

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This Final Environmental Impact Report describes the Environmental Impact Assessment process that was undertaken for the proposed rehabilitation and upgrading of the N17 Road from Springs to Ermelo, and the proposed construction of new sections between Leandra and Leven Station, at Trichardt and Bethal. The development project is needed because the condition of the existing N17 Road has deteriorated, the road is not continuous and motorists have to make time-consuming detours.

The Environmental Impact Assessment is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), to assess the environmental consequences of the proposed project.

The South African National Roads Agency Limited (SANRAL) is the proponent for the proposed project. In line with the Environment Conservation Act, 1989 (Act No. 73 of 1989), they appointed an independent consultant, L&W Environmental (Pty) Ltd, to undertake the Environmental Impact Assessment for the project.

The Environmental Impact Assessment consisted of a technical and a public participation process. The technical process included the two phases of the Environmental Impact Assessment, namely the Scoping Phase and the Impact Assessment Phase.

The Environmental Impact Assessment commenced in April 2001 and a Record of Decision is expected in March 2003.

The original route alignment was researched 20 years ago. Since then, changes in landowners, land use and environmental requirements have taken place. The South African National Roads Agency Limited therefore revisited landowners and investigated various route alignment alternatives. The route has been realigned where the proposed road crosses the Rolspruit at two places. The revised route alignment eliminates the previously-required river diversions. Route alternatives were also considered where the proposed road would have passed very close to a cattle farmer’s kraals and also through a wetland. Stakeholders requested that route alignment alternatives be investigated where the proposed road passes Trichardt. The engineers investigated five alternatives and chose a preferred route, based on engineering, environmental and financial viability.

During the Impact Assessment Phase, four specialist studies were conducted:

1. **The geohydrological survey** established that the proposed road would affect the flow of water to two springs on a farm along the route, if the road is constructed in significant fill. If the road is at natural grade, then suitable drainage culverts will allow for flow of shallow groundwater.

2. **The soils, land use and land capability assessment** found six different soil types along the new section of the route. Five of the soil types have a high agricultural potential. The primary land capability of the surveyed area is grazing, followed by arable and then wetland.

3. **The biophysical survey** found that many sections along the route, such as roadside verges and disturbed grasslands, have a low sensitivity and therefore a low conservation and functional status. Some areas such as pristine grasslands have a medium sensitivity and conservation status. Sensitive areas that were identified are inhabited areas, certain wetlands and watercourses. Design principles for construction across wetlands were discussed with the engineers, so that water flow patterns and hence, ecology, of the wetland are maintained.

4. **The Noise Impact Assessment** found that the proposed road will have an impact on the ambient noise climate, particularly at Trichardt, Bethal and some sections between Leandra and Leven Station.

The Impact Assessment covered all potential impacts of the project. The noise impact was found to be high, even after mitigation. Four impacts will have a medium environmental significance after mitigation. These are faunal and floral habitat destruction, physical disruption of rivers and wetlands, fragmentation of farms, and the visual impact of the proposed road.
In conclusion, it is believed that this report covers the full suite of potential environmental issues related to the proposed development, and that sufficient information regarding the identification, assessment and potential mitigation of impacts has been presented to facilitate informed decision making by the appropriate authorities.
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1. INTRODUCTION AND OVERVIEW

The South African National Roads Agency (SANRAL) has been responsible for the maintenance, upgrading and operation of the national road network since its establishment in 1998. The SANRAL receives an annual allocation from the country’s national budget to maintain, upgrade and operate approximately 7 200km of roads in South Africa. However, these funds are not sufficient to carry out the aforementioned functions, or to build the new roads required by the country for economic growth. In line with Government policy, the SANRAL therefore makes use of the “user-pay” principle where appropriate for the upgrading, maintenance and expansion of the national road system. The approximately 2 000km of toll roads serviced by 50 toll gates, introduced since the early 1980’s, are examples of this strategy representing a total capital improvement in excess of R12 billion.

The SANRAL’s proposal to declare the N17 from Springs to Ermelo as a national toll road is a further development of this strategy, which will enable the provinces of Gauteng and Mpumalanga to allocate scarce funding to improvements on their remaining road network. Declaring the N17 a national toll road will cover construction and future maintenance costs for a total length of approximately 164 kilometres with toll plazas at four locations along this route. The proposed project will involve the improvement of certain sections of the N17 between Springs and Ermelo, together with the construction of new sections and toll plazas.

The N17 runs in an east/west direction, joining the N3 east of Johannesburg and ending at the Oshoek Border Post, between Swaziland and South Africa. The proposed toll road will therefore traverse the provinces of Gauteng and Mpumalanga.

In terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), an Environmental Impact Assessment (EIA) must be undertaken before construction can commence. The EIA will ensure that environmental consequences are considered at all stages of the project. In addition, the EIA will assist the SANRAL and its consulting engineers to design a road based on sound environmental principles. The term ‘environment’ in the context of an EIA refers to the biological, physical, economic and social environments.

The initial phase of the EIA is a Scoping exercise. This defines the nature and extent of the impact assessment required. A Draft Scoping Report, Summary Draft Scoping Report and Final Scoping Report were circulated to key stakeholders and authorities. The Final Scoping Report was approved by the lead authority for the EIA, which are the National Department of Environmental Affairs and Tourism (N-DEAT). Specialist studies were conducted during the EIA Phase. The findings of the Specialist Studies are presented in this document, the Final Environmental Impact Report, together with all comments received from Interested and Affected Parties (I&APs) throughout the EIA Process. The lead authority will make a decision, based on this report, on whether the proposed project may proceed.

1.1 WHO IS CONDUCTING THE EIA?

In line with the Environment Conservation Act, 1998, the proponent, the SANRAL, has appointed an independent consultant, L&W Environmental (Pty) Ltd, to undertake the Environmental Impact Assessment for this project.

L&W is experienced in environmental management and assessment, familiar with the EIA requirements for road development and rehabilitation projects, and has over the years undertaken extensive work in the project area. L&W is well known for its integrity, independence, technical expertise and skill in assisting stakeholders to participate in the EIA process. The consultants have signed declarations of independence in terms of the EIA regulations, which confirms that they have no vested interest in the proposed project.
1.2 **MOTIVATION FOR THE PROPOSED PROJECT**

1.2.1 **Improved and safer road**

The N17 road is not continuous and motorists have to make time-consuming detours. The proposed project will provide a continuous route offering an improved, safer road for all road-users which will serve as a development spine for a fast growing area and which will link this area with the economic hub of Gauteng. Existing sections will be upgraded and new sections added. Once completed, the N17 will be 2 km shorter than the current road. It will also provide excellent travelling conditions and reduced travelling time.

1.2.2 **Economic development**

Secunda, Kinross and Evander are strategically placed for export markets in relation to the Maputo Corridor and the ports of Richards Bay and Durban, as well as for trading with the Gauteng Metropolitan Region. Improved road networks could encourage business, industry and investment for these towns and help alleviate the high unemployment in the region as a whole. A delegation of the Eastern Ridge Municipality, Highveld Ridge Business Chamber and the Afrikaans Handels Instituut, approached the SANRAL to assist with the provision of an improved road network between the Highveld Ridge area and ports as well as the Gauteng region.

1.3 **PROJECT FEASIBILITY**

National routes are of strategic importance to the economic well being of South Africa. These routes need to be maintained and improved to accommodate increased traffic volumes and ensure safe and efficient travelling between economic hubs in South Africa. Due to its budgetary constraints, the SANRAL has studied the viability of using toll roads to pay for national route improvement and maintenance. A feasibility study indicated that the N17 between Springs and Ermelo would be a feasible route to improve and toll. However, ultimate viability hinges on construction cost, traffic volumes, traffic growth, possible revenue streams, inflation, bank interest rates and other factors.

1.4 **LEGAL REQUIREMENTS**

The Environment Conservation Act, 1989, requires that an EIA be undertaken to assess the environmental consequences of the proposed project, especially those that might have an adverse effect on the environment. The proposed rehabilitation and upgrading of certain sections of the existing N17 Toll Road, as well as the construction of new sections of road between Springs in Gauteng and Ermelo in Mpumalanga, are activities that require an EIA according to Sections 21, 22 and 26 of the Environment Conservation Act, 1989 (Act No. 73 of 1989).

Broader environmental legislation that is also of relevance includes:


1.4.1 **Tolling issues**

Issues related to tolling will be addressed in a separate process as prescribed by the South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998). Issues related to tolling that are raised by I&APs during the EIA process will be forwarded to the SANRAL for inclusion in the Intent to Toll process and presentation to the Minister of Transport. Tolling related issues will, however, also be included in the final EIR for completeness but will not be considered by the Minister of Environmental Affairs and Tourism for issuing the ROD for this project.
2. BACKGROUND TO THE PROPOSED PROJECT

The N17 from Springs to Ermelo is under the jurisdiction of the Gauteng and Mpumalanga provincial authorities. In the late 1970’s and early 1980’s, the previous Transvaal Provincial Administration (TPA) investigated and designed a future alignment for the N17 between Springs and Oshoek. The route was proclaimed by the TPA. In 1990, the first section of the new alignment was constructed between Springs and Leandra. Since then, political changes have occurred in South Africa and the previous Transvaal Province has been sub-divided into four provinces. Due to the increased social responsibilities of the new provincial governments, budgets for infrastructure development and maintenance have diminished to levels where it has become impossible to provide new facilities or even upgrade existing facilities.

Concurrently with the feasibility study, strategic planning by the Eastern Ridge Municipality together with the business community, which includes the development of the towns of Secunda, Kinross and Evander, has indicated the need for improved road infrastructure. Improved networks will encourage business, industry and investment for the abovementioned towns and the region as a whole. This will help alleviate the high level of unemployment.

The Eastern Ridge Municipality, Highveld Ridge Business Chamber and Afrikaans Handels Instituut therefore approached the SANRAL to assist with the provision of road infrastructure.

3. THE ENVIRONMENTAL ASSESSMENT PROCESS

An EIA is a step-wise process used to ensure that the environmental consequences of a project are taken into consideration before a project is approved.

3.1 AIM OF AN EIA

The main aim of an EIA is to minimise potential negative environmental impacts due to the development. The term ‘environment’ includes the social (affected persons or communities), economic (local and regional economic benefits) physical (e.g. wetlands and soils) and biological (fauna and flora) elements of the area.

3.2 THE EIA PROCESS

The EIA Process as illustrated in Figure 1, is summarised below.

AN EIA CONSISTS OF SEVERAL PHASES

<table>
<thead>
<tr>
<th>Scoping Phase</th>
<th>Impact Assessment Phase</th>
<th>Environmental Impact Report</th>
<th>Decision-Making Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>To identify issues, to focus the EIA</td>
<td>Detailed studies of potential impacts, positive and negative</td>
<td>Consolidate findings of impact assessment studies</td>
<td>Proponent and authorities use EIA findings to decide if project goes ahead</td>
</tr>
</tbody>
</table>

Figure 1. An Environmental Impact Assessment consists of various phases. The EIA for the proposed N17 toll road project is currently in the Impact Assessment Phase. This is the second phase of the EIA during which issues that were raised during the Scoping Phase were investigated.

3.2.1 Scoping Phase

Details regarding the project were made available to the public, authorities and to various specialists. Based upon the issues and concerns raised as a result of this process, the following were determined:
• Relevant environmental issues and potential impacts of the proposed development;
• Specialist studies, which are required to fully understand the potential environmental impacts of the proposed development.

The findings of the Scoping Phase were presented in a Scoping Report, which was submitted to the authorities (name) for approval (give date), and also to Interested and Affected Parties (I&APs) for review and comment. The environmental authorities approved the Scoping report on ..Following the approval of the Scoping document, the Plan of Study for EIA was submitted on …and approved on….

3.2.2 Impact assessment Phase
Specialists in the necessary fields conducted the required investigations that were identified during the Scoping phase. These studies included quantifying the risks involved with the proposed development and proposed measures to minimise or eliminate negative impacts and enhance positive impacts.

3.2.3 Compilation of an Environmental Impact Report (EIR)
The findings of the impact assessment were combined into a final report (this document), which forms the basis for decision-making by the authorities. I&APs had an opportunity to comment on this document before submission to the authorities. This document was also available on request to all I&APs after submission to the authorities.

3.3 EIA PROCESS TO DATE
The following has been carried out:
• A review of the proposed project and available information by L&W Environmental.
• Monthly meetings with the SANRAL project team.
• Submission of Plan of Study for Scoping to the authorities.
• A biophysical assessment of the route by technical specialists.
• A Draft Scoping Report and Summary Draft Scoping Report were distributed to stakeholders.
• An Open Day was held in Secunda on Wednesday, 5 December 2001.
• A Final Scoping Report was distributed to key stakeholders, public places, to those who requested copies and to the authorities for comment and approval.
• Specialist studies conducted during the EIA Phase.
• A Draft Environmental Impact Report was compiled and distributed to stakeholders.
• An Open Day was held at the Christo Country Lodge in Bethal on Saturday 8 June 2001.
• A Final Environmental Impact Report (this document) was submitted to the authorities for approval.

4. PUBLIC PARTICIPATION PROCESS
Public participation is a cornerstone of any EIA. The principles of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998) govern many aspects of environmental impact assessments, including public participation. These include provision of sufficient and transparent information on an ongoing basis to stakeholders to allow them to comment, and ensuring the participation of historically disadvantaged individuals, women and the youth.

4.1.1 Objectives of the public participation process
The public participation process has been designed to provide sufficient, accessible and objective information to interested and affected parties (I&APs) or stakeholders to assist them to participate.

During the Scoping Phase they should:
- Raise issues of concern and suggestions for enhanced benefits
- Verify that their issues have been captured correctly.

**During the Impact Assessment Phase they should:**
- Verify that their issues have been considered by the technical investigations.
- Comment on the findings of the EIA.

The public participation process and approximate scheduling are illustrated in **Figure 2** and summarised below.

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**EIA FOR THE PROPOSED UPGRADE, REHABILITATION AND CONSTRUCTION OF NEW SECTIONS OF THE N17**

**PUBLIC PARTICIPATION PROCESS: SCOPING PHASE**

<table>
<thead>
<tr>
<th>August 2001</th>
<th>IDENTIFY STAKEHOLDERS AND KEY STAKEHOLDERS (400)</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2001</td>
<td>INVITATION TO PARTICIPATE IN EIA</td>
</tr>
<tr>
<td>Personal letters (400)</td>
<td>BID</td>
</tr>
<tr>
<td>• English</td>
<td>Afrikaans</td>
</tr>
<tr>
<td>• Afrikaans</td>
<td>Zulu</td>
</tr>
<tr>
<td>Media adverts</td>
<td>Public places</td>
</tr>
<tr>
<td>• The Ridge Times</td>
<td>Sunday Times</td>
</tr>
<tr>
<td>October – November 2001</td>
<td>KEY STAKEHOLDER CONSULTATION</td>
</tr>
<tr>
<td>Directly affected landowners</td>
<td>Local TLCs</td>
</tr>
<tr>
<td>Business</td>
<td>Stakeholder comment period</td>
</tr>
<tr>
<td>November 2001</td>
<td>DRAFT ISSUES AND RESPONSE REPORT</td>
</tr>
<tr>
<td>November 2001</td>
<td>DRAFT SCOPING REPORT AND SUMMARY DRAFT SCOPING REPORT</td>
</tr>
<tr>
<td>November 2001</td>
<td>ANNOUNCE AVAILABILITY OF DRAFT SCOPING REPORT, SUMMARY DRAFT SCOPING REPORT AND ISSUES AND RESPONSE REPORT</td>
</tr>
<tr>
<td>Personal letters (400)</td>
<td>Public places</td>
</tr>
<tr>
<td>December 2001</td>
<td>OPEN DAY - SECUNDA</td>
</tr>
<tr>
<td>Media adverts</td>
<td>Radio broadcasts</td>
</tr>
<tr>
<td>December 2001</td>
<td>DRAFT ISSUES AND RESPONSE REPORT</td>
</tr>
<tr>
<td>January 2002</td>
<td>FINAL SCOPING REPORT AND FINAL ISSUES AND RESPONSE REPORT</td>
</tr>
<tr>
<td>January 2002</td>
<td>SUBMIT FINAL SCOPING REPORT TO NATIONAL DEAT</td>
</tr>
</tbody>
</table>

**Figure 2.** Public participation process during the environmental impact assessment.
4.1.2 Stakeholder composition

The list of approximately 400 stakeholders who were given the opportunity to contribute is appended to this report as Appendix A, and includes the following sectors of society:

- National, provincial and local government
- Agriculture, including local landowners and agricultural unions
- Industry and mining in the area
- Business and Commerce
- Environmental bodies, both as authorities and NGOs
- Labour unions and the unemployed
- Community representatives, CBOs, development bodies in the immediate vicinity
- Local groupings in the vicinity, including church groups, women's groups, youth groups, schools, voluntary associations, and
- Others.

4.1.3 Announcing the opportunity to participate

The opportunity for stakeholders to participate in the EIA was announced as follows:

- Several hundred copies of a 4-page Background Information Document (BID) were distributed to stakeholders in the area in October 2001 as a first step to announce the opportunity for comment. The document outlined the proposed project and environmental impact assessment, and listed potential issues of concern. These documents were also left in various public places such as local libraries and council offices, including the Eastern Highveld Ridge Transitional Local Council (TLC). Copies were also left with stakeholders for further distribution to their colleagues and neighbours. The document was available in English, Afrikaans and Zulu.
- More than 400 stakeholders received a letter of invitation to comment together with a reply sheet, addressed to them personally and mailed on 26 October 2001.
- More than 40 telephone calls were made to stakeholders in the area to advise them of the opportunity to comment, and to arrange meetings.
- Advertisements were placed in two local newspapers, the Springs Advertiser (11 October 2001) and the Ridge Times (18 October 2001), as well as one national newspaper, the Sunday Times (14 October 2001).

4.1.4 Stakeholder briefings and community consultation

Numerous local landowners on farms along the route were visited personally or phoned, in particular those who may be directly affected by the proposed road, as well as the chairpersons of some of the local Agricultural Unions active in the area. The Eastern Highveld Ridge TLC was consulted to obtain issues of a local government nature, and in particular regarding proposed future infrastructure developments in the Trichardt and Bethal areas. A meeting was convened with the Eastern Highveld Ridge Business Commerce to obtain their views, comments and concerns regarding the project.

In addition, several meetings were arranged with representatives of the éMbalenhle community, as well as with local Councillors, representatives of the South African National Civic Organisation (SANCO) and the Community Development Forums, including the Unemployed Forum in Leandra.

The purpose of the meetings with landowners and community representatives was to:

- Introduce members of the public participation and technical team to stakeholders
- Announce the proposed project and environmental impact assessment
- Clarify the statutory need for public participation in environmental impact assessments in terms of South Africa’s most recent legislation (copies of documents such as the User Guide to the NEMA, You and your environmental rights, a summary of the Minimum Requirements of the Department of
Water Affairs and Forestry, newsletters explaining the new National Water Act, Act, 1998 (Act No. 54 of 36 of 1998) and other documents were left with stakeholders)

- Explain the proposed project and the feasibility studies to date
- Obtain their initial issues of concern and suggestions, and encourage further participation.

These meetings took place in the language of choice of the stakeholders.

4.1.5 Capacity-building

The public participation office made efforts to assist stakeholders in understanding their environmental rights, the legislation underpinning environmental management, and the complexities involved in linear developments. For example:

- Briefing sessions were held for small groups of stakeholders in the language of their choice at the start of the process
- Concepts were illustrated visually during briefing meetings and Open Days
- Discussion documents (e.g., Background Information Documents, the Draft Scoping Report and Summary Draft Scoping Report), were presented in simple language
- Discussion documents, or simplified summaries of documents, were translated
- Concepts were explained by way of line drawings and photographs used to illustrate concepts in discussion documents
- There was opportunity for one-on-one interaction with members of the project team at every small briefing meeting and Open Day
- More complex documents such as the Draft Scoping Report and the Draft EIR were presented verbally to previously disadvantaged people
- An Open Day was arranged on Saturday, 8 June 2002 to obtain comment on the Draft EIR.

In addition, several hundreds of the following informative materials were distributed to stakeholders at the Open Days:

- User’s Guide to the National Environmental Management Act
- Your Environmental Rights – information booklet
- Principles of the National Environmental Management Act (simplified version)
- The EIA Regulations 1998 - DEAT
- Working towards a clean and healthy community – information booklet
- Waste Management and the Minimum Requirements by the DWAF – information booklet
- Managing South Africa’s Environmental Resources – information booklet
- Source book for students on air pollution topics: Part 1 – 4, including information on the human health effects of air emissions
- Various informative posters produced by the Department of Water Affairs and Forestry and Department of Environmental Affairs and Tourism
- National Water Act News – protection of water resources
- National Water Act News – Catchment Management Agencies and Water User Associations
- National Water Act News – regulating water use (registration and licencing)
- River Health News (several editions).

The following documents were also available at the Open Day:

- The National Water Act (please name all the Act in the correct way!!)
- The National Environmental Management Act
- The Assessment Guide for Quality of Domestic Water Supplies – Volume 1
- The Aide-Memoire for EMPRs, Department of Minerals and Energy.
4.1.6 Raising issues for investigation by EIA specialists

Stakeholders had the opportunity to raise issues either in writing, by telephone or e-mail, during meetings with individuals or small groups of stakeholders (see above), and during Open Days hosted respectively at Secunda on Wednesday, 5 December 2001 from 09:00 to 19:00 and Bethal on Saturday, 8 June 2002 from 09:00 to 12:00.

To date, more than 2050 issues (Toni check) have been received from stakeholders. These issues are summarised in Appendix B appended to this Final Environmental Impact Report as the Issues / Response Report. This report also provides an indication where issues were taken up in the EIA studies. All contributions received from stakeholders were acknowledged in writing by way of letters addressed to them personally.


All the issues raised were captured in a Draft Scoping Report, which was available in English, with a summary in English and Afrikaans, for comment by stakeholders. The EIA Guidelines specify that stakeholders must have the opportunity to verify that their issues have been captured before the Scoping Report is approved by the lead authority, as a basis for the specialist studies during the Impact Assessment Phase.

A period of almost three weeks was available for public comment on the Draft Scoping Report (21 November– 17 December 2001).

Announcement of availability of reports

The availability of the Draft Scoping Report was announced by way of:

- All initial calls for comment
- All initial contact and meetings with stakeholders
- A letter addressed personally to all 400 stakeholders on the distribution list.

Distribution of the Draft Scoping Report

The report was distributed for comment as follows:

- Left in the following public places: local libraries in the towns of Springs, Leandra, Kinross, Secunda, Bethal, Trichardt and Ermelo, as well as offices of the local councils
- Proactively mailed to all key stakeholders, e.g. the authorities and local land owners.

A Summary Draft Scoping Report was distributed as follows:

- Proactively mailed to all 400 stakeholders
- Public places as listed above.

Public review

Public review of the Draft Scoping Report was by the following methods:

- Written comment, including email – a comment sheet asking stakeholders to respond to particular questions accompanied the report; further written submissions were encouraged
- Verbal comment during the open day held on Wednesday, 5 December 2001 where the contents of the Draft Scoping Report were presented.

The contents of the Draft Scoping Report together with other relevant information, i.e. complete and detailed maps of the study area and different sections of the N17 route, photos of potentially affected areas, data on a traffic analysis study, the EIA and Public Participation Process, were displayed at the Open Day. Copies of relevant documents were available for stakeholders to take away. Reference material was also made available (see 4.1.5).
4.1.8 Final Scoping Report and Issues and Response Report

The Final Scoping Report was prepared at the end of the public review period in January 2002. It was updated with additional issues raised by stakeholders and new information and submitted to the lead authority, the N-DEAT. Stakeholders were informed once the Final Scoping Report was submitted to the N-DEAT. Copies of the Final Scoping Report were distributed to key stakeholders, public places and to everyone who requested a copy, for their information. The report was approved by the N-DEAT.

4.1.9 Ongoing progress feedback

As the process progressed, all stakeholders on the distribution list received personalised letters to report on progress, to thank those who commented, and to outline the next steps in the process. They were offered copies of the documents produced during the Scoping Phase, and were advised that the Final Scoping Report was handed to the authorities for approval for the Specialist Studies to proceed.

4.1.10 Impact Assessment Phase: Review of Draft Environmental Impact Report

Public participation during the impact assessment phase of the EIA revolved mainly around a review of the draft findings of the EIA. The objective was for stakeholders to verify that the issues they had raised during the Scoping Phase were considered in the specialist investigations, and to comment on the findings of the EIA.

The findings were presented in a Draft Environmental Impact Report (EIR) and the volume of Specialist Studies, for comment by stakeholders from 5 June 2002 to 24 July 2002.

4.1.11 Announcement of opportunity to comment

The opportunity to comment on the draft findings was announced as follows:

- In the Draft Scoping Report and at the Open Day to comment on the Draft Scoping Report in early December 2001
- Personalised letters to at this stage more than 420 stakeholders on the distribution list
- Advertisements in the Springs Advertiser, The Ridge Times and the Highveld Herald

4.1.12 Distribution of draft findings

The full set of reports (Draft EIR and its various appendices including an Issues/Response Report) were left in the following public places for review:

- Eastern Highveld Ridge TLC
- Springs Public Library
- Eendracht Public Library
- Kinross Public Library
- Trichardt Public Library
- Secunda Public Library
- éMbalenhle Public Library
- Bethal Public Library
- Ermelo Public Library
- L&W Environmental, Midrand
- Manyaka Greyling Meiring (Pty) Ltd Reception, Pretoria.

In addition, the Draft EIR was couriered to a few key stakeholders, e.g. the authorities, local landowners and others, and was available upon request. Furthermore, copies of the Draft EIR were available at the Open Day held on 8 June 2002.
4.1.13 Methods of public review

Public review of the Draft EIR was by the following methods:

- Written comment, including e-mail – a comment sheet asking stakeholders to respond to particular questions accompanied the report; further written submissions were encouraged
- Verbal comment during community briefings
- Verbal comment during an Open Day (see below).

4.1.14 Open Day

An Open Day where the contents of the Draft EIR were presented was held at the Christo Country Lodge in Bethal on Saturday, 8 June 2002. The Open Day was widely advertised in the media.

The draft findings were presented by the EIA specialists who attended the meeting. Translation into local languages was done during the meeting.

The issues and concerns raised during the Open Day were distributed to everyone who attended, and everyone else who requested a copy.

4.1.15 Impact Assessment Phase: Final Environmental Impact Report

After the public review period, the Draft EIR and Specialist Reports will be updated with comments received from stakeholders and the authorities. These reports will then be submitted to the N-DEAT for a decision on whether the project may commence or not. This department will consult with all other national, provincial and local government departments during the decision-making process.

4.1.16 Record of Decision (ROD) and opportunity for appeal

The authority record of decision will be widely announced in the media and by way of letters addressed personally to all stakeholders on the database. The EIA Regulations make provision for the opportunity to appeal the authority decision. Normally, 30 days are allowed for appeals. Stakeholders will be informed in writing of the exact details and timing.

5. DESCRIPTION OF THE PROPOSED ROUTE

The N17 road (Figure 3) is under the jurisdiction of the Mpumalanga and Gauteng roads authorities. The N17 is a provincial road and needs to be declared as a national road before it can be tolled. Once this is done, the proposed project will comprise two types of road development:

- Firstly, the rehabilitation and upgrading of certain sections of the existing N17 road between Springs and Ermelo
- Secondly, the construction of a new section of road between Leandra and Leven Station, the construction of a ringroad at Trichardt and the rerouting of the N17 at Bethal.
Figure 3. The proposed N17 route stretches from Springs, Gauteng to Ermelo, Mpumalanga.

5.1 SPRINGS TO LEANDRA

A stretch of 48km of the existing N17 road, commencing at Anchor Road in Springs and ending where the N17 meets the R50 near Leandra will be repaired and upgraded. Road repairs will entail resurfacing the road with an asphalt overlay. Upgrading will include adding climbing lanes where traffic volumes necessitate this. Climbing lanes are additional lanes along steep sections of the road to enable slow-moving traffic to be easily passed.

Two new interchanges will be constructed along this section of the N17. These will be constructed at existing intersections and will consist of overhead bridges with on- and off-ramps on either side of the road. The first interchange will be constructed at the Nigel – Delmas intersection and the second interchange at the Devon/Delmas – Balfour intersection. The Boesmanskop – Langzeekoeigat at grade-intersection will be eliminated by means of an overpass structure. No on- and off-ramps will be provided at this intersection. Agricultural over- and underpasses were constructed during the initial construction of this section of the N17. It is therefore unlikely that any additional agricultural over- and underpasses will be required for this section.
5.2 **Leandra to Kinross**

New road construction will take place along a 21km stretch of undulating hills and valleys between Leandra and Kinross. An existing half diamond -interchange south of Leandra, where the N17 meets the R50, will be upgraded to a full diamond interchange by constructing the two eastern ramps. A toll plaza will be constructed within close proximity to this new interchange. The exact location of the toll plaza has not been established yet. An existing borrow pit at the interchange will be used to alleviate a shortfall of approximately 0.5 million cubic metres of road construction material.

A new diamond interchange, including on- and off-ramps, will be constructed south of Kinross, where the proposed N17 will meet the R546.

Six new bridges will be constructed. These include the bridges for the diamond interchange at Kinross, two agricultural overpasses, two crossings of provincial roads and one freeway (N17) over a rail bridge. The 21km stretch of new road will traverse wetlands and streams, which are environmentally sensitive areas requiring careful routing and construction of the road. This will require two watercourse bridges across the Rolspruit and approximately 10 box/pipe culverts at various points along the route.

5.3 **Kinross to Trichardt**

New road construction will resume from Kinross to Leven Station, just before the Secunda - Delmas intersection, where the road will join the existing N17. A new grade separation in the form of a partial interchange will be constructed at the existing Delmas – Secunda intersection. A cutting will be blasted from the junction with the N17, to the Secunda - Delmas intersection. An existing borrow pit in the vicinity of this intersection will be used to gather approximately 50 000 cubic metres of road construction material. The proposed N17 will cross water pipes, telephone lines and power lines at certain points.

Upgrading of the N17 will occur along an 8km stretch from Leven Station to Trichardt. This will entail adding climbing lanes as well as the addition of paved shoulders. An informal settlement exists on either side of the N17 at Leven Station. No relocation will occur as a result of the upgrading of the N17 at this point.

5.4 **At Trichardt**

A 2.8km ring road (Figure 4) is proposed to circumvent the town of Trichardt. Two access points to Trichardt will be provided. The first will be a grade separation in the form of a partial interchange, on the western side. The second will be an at-grade intersection near the existing sand works on the eastern side, where a small gravel road joins the existing N17. The ring road will cross the Trichardtspruit.

5.5 **Trichardt to Bethal**

A stretch of 23km of the existing N17 road, from Trichardt to Bethal will be upgraded to include new climbing and passing lanes. Shoulder upgrades will occur within the existing road reserve. Existing intersections will be upgraded to smooth the flow of traffic. New borrow pits will be excavated. Old rehabilitated borrow pits may also be used. A toll plaza will be constructed between Trichardt and Bethal, however, the exact location of the proposed toll plaza has not been established yet. The Intent to Toll Process, which is being conducted independently to this EIA, will provide more information on the tolling strategy.
Figure 4. The proposed northern ringroad around Trichardt.

5.6  AT BETHAL

A 1.2km re-alignment of the road (Figure 5) at the north-west entrance to Bethal has been proposed in order to eliminate the staggered routing of traffic through Bethal. The link road will pass through a wetland and will cross the Blesbokspruit.
5.7 **Bethal to Ermelo**

A 55km stretch of road, from Bethal to Ermelo, will be upgraded. Climbing lanes and shoulders will be upgraded and/or added. The road surface will be sealed with a bituminous surfacing to prevent the ingress of water into the pavement layers. The intersection at Davel will be upgraded. The road will be realigned at two sections, with one involving a river crossing. A toll plaza will be constructed between Bethal and Ermelo.

6. **CONSIDERATION OF ALTERNATIVES**

6.1 **ROUTE ALIGNMENT ALTERNATIVES**

The project proposes that the existing N17 route generally be retained. Traffic capacity requirements indicated that the existing route could be used with limited upgrading in certain areas. However, three discontinuities exist on the existing N17 route and new alignments are proposed for these sections. These are discussed in detail below.

**Leandra to Leven Station**

A discontinuity exists at Leandra where the new N17 alignment constructed in 1990 ends at a half diamond interchange with the R50 (Delmas – Standerton road). The existing route to Trichardt requires...
the road user to make use of other provincial routes, which traverse the main streets of Leandra and Kinross. It is therefore necessary to complete the link between the end of the 1990 construction up to the point where it intersects the existing N17. For route continuity, the Leandra half diamond interchange and Trichardt are fixed points on the N17 route. The SANRAL has investigated two options.

Firstly the TPA alignment between the Leandra half diamond interchange and Leven Station and the existing alignment between Leven Station and Trichardt were considered. The TPA alignment was determined by engineering consultants appointed by the former TPA in the late 1970’s and early 1980’s. The consultants considered various alignments at the time. Factors such as engineering design standards and best practice, farming activities, existing and future mining activities, existing and future services, i.e. power lines, pipelines, road and rail lines, and existing and future town developments were considered. Landowner needs were also taken into account, all within the norms of engineering, practicality and financial viability. All parties then agreed on the position of the alignment and the road reserve was proclaimed and owners paid compensation.

Secondly, the SANRAL considered an alternative alignment whereby the N17 from the Leandra half diamond interchange is linked with the Evander-Secunda dual carriageway road (P185-2). A mine slimes dam is situated on the alignment and there is inappropriate intersection spacing on the existing P185-2. Due to the costs associated with the removal of the slimes dam and the improvement of the intersection spacing, this alternative alignment was discarded.

The SANRAL therefore concluded that the TPA alignment between the Leandra half diamond interchange and Leven Station where it intersects with the existing N17, is the most appropriate alignment. However, the SANRAL understands that the alignment was decided 20 years ago and since then, changes in landowners, land use and environmental requirements have taken place. Landowners and environmental issues have therefore been revisited. An example where alternatives have been considered is in the case of Mr At van der Bergh, landowner of an established stud farm with over 430 stud stock. A section of the proposed new N17 would have passed very closely next to the stock kraals and over a wetland next to the farm dam. This section of the proposed new N17 has subsequently been realigned.

The SANRAL has already agreed in principle to a realignment of the Green Fields section where it crosses the Rolspruit at two places (refer to Figures 3 & 4 in Appendix E). The previous alignment required river diversions. With the revised road alignment, no river diversions are required.

**Trichardt Ring Road**

The SANRAL intends to include the construction of the ring road as part of the project. However, the construction of the ring road will only commence in approximately 4 years time. The former TPA appointed consultants to investigate a northern ring road around Trichardt. The consultants appointed by the SANRAL reviewed the TPA alignment and concluded that the alignment does not conform to appropriate standards associated with toll roads (**Alternative 1**). Alternative alignments were investigated to balance the effect of the required geometric standards and land requirements (**Alternatives 2 – 5**). Alternatives 4 & 5 are more difficult to phase construction works and requires the entire proposed road to be constructed from the outset, which will impact negatively on the financing strategy of the Toll Road. The preferred alignment (**Alternative 2**) crosses the Trichardtspruit and requires access roads to be relocated. The needs of the affected landowners will be addressed within the norms of engineering, the environment, practicality and financial viability. **Figure 6** shows the alternatives around Trichardt.
Figure 6. Map of alternatives around Trichardt.
Alternatives Considered

Alternative 1 : “Do Nothing” (Existing Road P5-2 through Trichardt)

It was considered to use the existing alignment of P5-2 through Trichardt. With traffic flow already in the region of 4 000 vehicles per day, no further growth could be accommodated. Within the next 2 years, traffic flow conditions will become unsatisfactory (interrupted traffic flow) on this section of P5-2. Staggered intersections between Road D618 and P185-1 with Road P5-2 (at Swiss Ranch) have a very negative impact on the capacity of Road P5-2 just west of Trichardt. Insufficient road width and on-street parking are further constraints on the level of service of traffic flow. Should on-street parking be taken away, the travelling speed of traffic through Trichardt will increase and thus cause a dangerous situation for pedestrians. Future upgrading to a dual carriageway with a median will be costly because it will involve extensive acquisition of properties.

The following advantages/disadvantages for this proposal have been identified:

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Trichardt businesses have direct exposure to the N17</td>
<td>• Existing road reserve would be insufficient</td>
</tr>
<tr>
<td>• No further mining rights are required in the first phase</td>
<td>• Very dangerous situation for pedestrians in Trichardt CBD</td>
</tr>
<tr>
<td></td>
<td>• Level of service D (interrupted traffic flow) is reached in 2 years time and only limited possibility for capacity improvement exists.</td>
</tr>
<tr>
<td></td>
<td>• Staggered intersection on western side of Trichardt is not acceptable.</td>
</tr>
<tr>
<td></td>
<td>• At grade intersection (4-way and 2-way stops) with all local streets has negative impact on capacity of road.</td>
</tr>
<tr>
<td></td>
<td>• As soon as Road P185-1 intersection with Road P5-2 reaches level of service D (long traffic delays due to right turning movements, only an expensive grade separation (interchange) to provide for additional capacity will result. Additional land will be required.</td>
</tr>
<tr>
<td></td>
<td>• Mining rights will be affected in second phase</td>
</tr>
<tr>
<td></td>
<td>• Parts of the road will have a design speed of 100km/h and less</td>
</tr>
</tbody>
</table>

Alternative 2 : Northern Bypass

This alternative follows the existing road between Leven Station (A) and point B, from where a bypass follows the proposed alignment of the previous TPA proposed ring road alignment around Trichardt. The only difference is that the TPA proposal had a T-junction with Road P5-2 to the east of Trichardt. Alternative 1 proposes a curve of 2 500 m on the new proposed ring road, to link up with Road P5-2. The 2 500 m radius is also required to accommodate the intersection with Road D618. Between G and E this alternative follows the existing road again.

This project allows for phased implementation as follows:

Initially one lane of P5-2 together with the realignment of P185-1 is constructed. The existing road P5-2 to the west of Trichardt is linked to the realigned N17 as part of a partially developed interchange (a quarter link). Since capacity problems for right turn movements will develop within 2 years at this quarter link, ramp B of a future interchange with Road P185-1 should be constructed within 2 years. This configuration can accommodate the traffic growth up to 34 years whereafter a full interchange will be required, making use of the existing Road P5-1 to the west as ramp D. The quarter link will be amended to become ramp C and a new ramp will be constructed between N17 and P185-1 as ramp A.
The following advantages/disadvantages for this proposal have been identified:

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Although mining rights are affected, the road is located in the area that is already impeded by Trichardt town as well as the Trichardtspruit, which may not be permissible for mining.</td>
<td>• A future interchange could be accommodated in a phased manner.</td>
</tr>
<tr>
<td>• Business activities in Trichardt will not be affected in terms of land acquisition or the utilisation of on street parking for road building purposes.</td>
<td>• Due to the topography of the alignment, the N17 crosses the realigned P185-1, which will require additional earthworks.</td>
</tr>
<tr>
<td>• The by-pass is close to Trichardt and will stimulate growth in the area.</td>
<td>• The road is located very close to residents and businesses in the northern part of Trichardt. Noise mitigation will be required.</td>
</tr>
<tr>
<td>• Proposed alignment almost follows the previous TPA proposed alignment</td>
<td>• The road is located on the flood plains of the Trichardtspruit. Some erosion protection will be required.</td>
</tr>
<tr>
<td>• Maximum utilisation of existing roads.</td>
<td></td>
</tr>
<tr>
<td>• Staggered intersection at the Swiss Ranch will be eliminated</td>
<td></td>
</tr>
</tbody>
</table>

Alternative 3 : Realignment North of Trichardtspruit

This alternative follows the existing road between Leven Station (A) and point B. From this point a bypass follows the proposed alignment on the northern side of the Trichardtspruit. The route follows the Trichardtspruit around Trichardt. Between G and E this alternative follows the existing road again.

Initially one lane of P5-2 together with the realignment of P185-1 is constructed where a new interchange is provided.

The following advantages/disadvantages for this proposal have been identified:

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Mining rights will be affected.</td>
<td>• Due to the height of the ramps, a physical visual barrier would result towards the north.</td>
</tr>
<tr>
<td>• Future planned interchanges must be constructed from the outset.</td>
<td>• Wetlands, which are potentially sensitive areas, will be affected along Trichardtspruit</td>
</tr>
<tr>
<td>• The N17 crosses the realigned P185-1, thus requiring additional earthworks.</td>
<td></td>
</tr>
<tr>
<td>• The road is located on the flood plains of the Trichardtspruit. Some erosion protection would be required.</td>
<td></td>
</tr>
</tbody>
</table>

Alternative 4 : Proposed route along P109-2 across Trichardtsfontein

This alternative follows the existing road between Leven Station (A) and point C, from where a link must be constructed to link the road to the proposed alignment of the previous TPA proposal for P109-2. Between D and E this alternative follows the alignment of P109-2 as it was originally proclaimed.

Initially one lane of the N17 together with the realignment of P185-1 would be constructed. The existing P5-2 to the west of Trichardt would be linked to the realigned N17 with link C-D. The P185-1 would have to be constructed immediately with an interchange.
The following advantages/disadvantages for this proposal have been identified:

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Although mining rights are affected, the road is located in the area already agreed with mining authorities.</td>
<td>• Future planned interchange must be constructed from the outset.</td>
</tr>
<tr>
<td></td>
<td>• Existing roads are not utilised.</td>
</tr>
<tr>
<td></td>
<td>• The road is located far from Trichardt and Secunda, which may be perceived negatively by businesses.</td>
</tr>
<tr>
<td></td>
<td>• Certain sections (Springs-Leven, and C-E) would be of a high geometric standard (120 km/h), while section A-C would be of a lower standard (100 km/h).</td>
</tr>
</tbody>
</table>

**Alternative 5 : New alignment along P109-1 (Leven to Rietfontein)**

This alternative follows the new alignment for P109-1 as was proposed in 1973 (Route A-D-E). Only one carriageway of the future dual carriageway freeway will be constructed. This proposal requires two interchanges at roads and P185-1 and A637.

The following advantages/disadvantages for this proposal have been identified:

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Although mining rights are affected, the road is located in the area already agreed upon with mining authorities</td>
<td>• Two interchanges are required</td>
</tr>
<tr>
<td></td>
<td>• Existing roads are not fully utilised.</td>
</tr>
<tr>
<td></td>
<td>• The road is located far from Trichardt and Secunda, which may be perceived negatively by businesses.</td>
</tr>
</tbody>
</table>

**Bethal Link Road**

A 1.2km link road through Bethal has been proposed. The link road would be constructed to remove the staggered, inconvenient routing through Bethal. It would pass through a wetland and would cross the Blesbokspruit. Since the beginning and end points of this link road are fixed, and the road length is very short, little room for alignment alternatives are available. Different radii for the link road have been considered to minimise the impact on the wetland.

**6.2 TECHNOLOGY ALTERNATIVES**

The SANRAL is aware of different noise levels associated with different pavement (road) surfacing. This will be taken into account during the engineering design in order to minimise the effect of noise to adjoining landowners and residents. Similar application of technology will prevail for the following:

- Discharge of water from the road
- Provision of cross accesses where required
- Construction techniques to limit dust
- Erosion protection of embankments
- Stability of cut and fill slopes
- Width of construction where applicable.
6.3 The No-Action Alternative

The condition of some sections of the existing N17 is poor, as also indicated by some of the stakeholders. If rehabilitation is not performed timeously, the current asset will become degraded (e.g. the R35 between Bethal and Middelburg) with a major loss in national assets. Due to provincial budgetary constraints, it is unlikely that any road improvements, such as horizontal and vertical alignment, and capacity and structural improvements, will take place. Two consequences will follow. Firstly, due to increased traffic volumes, the road will deteriorate, resulting in uncomfortable and unsafe driving conditions. Secondly, due to poor accessibility to the Highveld Ridge area, the area may become unattractive for investors, which will have a negative effect on economic growth and associated job opportunities.

7. Description of Receiving Environment

7.1 Physical Characteristics

7.1.1 Climate

Rainfall in the area varies between 650 and 750 mm per year. The average is 719 mm. Most rain falls in the summer months between October and March with heavy falls commonly associated with thunderstorms. The average wind direction is North to North-East, while average monthly temperatures are between 2.7 °C and 25.9 °C.

7.1.2 Geology

The predominant geology within the project area is that of the coal bearing Ecca Group, with minor intrusions of Bushveld granophyte, felsite and pyroclasts. The area is also intruded by Karoo dolerite.

The geology of the proposed 22km route between Leandra and Leven Station is underlain by rocks of the Karoo Supergroup comprising mainly dolerite with mudrock and sandstone of the Ecca Group occasionally occurring in places. Refer to the geohydrological survey in Appendix C for more information on the geology of the area.

7.1.3 Soils

The distribution of soil forms present varies considerably along the route in keeping with changing topography and position on the slope. The soils present can be broadly divided into areas with heavy textured soils (black turf soils derived from dolerite), sandy soils, medium textured soils and shallow and stony soils. Common soil forms present include Rensburg, Arcadia, Mispah, Bainsvlei, Katspruit and Avalon. Refer to the Soils, land Use and Land Capability Assessment in Appendix D.

The agricultural potential of all the soils, with the exception of Mispah, is high, however, within the context of wetlands, the potential is low. The effective depth of these soils is greater than 300mm. The low agricultural potential of Mispah soils is related to their effective depth of less than 300mm. The baseline chemical status of the soils is typical of agricultural soils within the region and no evidence of past contamination of soils was detected.

7.1.4 Hydrology

The landscape is characterised by mature rivers and streams of low gradient. These meander over small, alluvial plains associated with oxbow lakes and other wetland features. The divide between the Vaal River catchment and the Olifants River catchment roughly follows the Leandra-Ermelo railway line.
Eight streams were identified within the study area. The Rolspruit, Grootspruit and Trichardtspruit flow in a southerly direction into the Waterval River and finally into the Vaal River. The Blesbokspruit flows in a southerly direction directly into the Vaal River. The upper Vaal River east of Standerton feeds the Grootdraai Dam, while the western section feeds the Vaal Dam. The Debeerspruit and Piekespruit flow in a northerly direction into the Olifants River. The Olifants River system feeds the Loskop Dam.

7.1.5 Air quality

The Highveld region through which the proposed N17 will traverse is already fairly polluted by power generation and industry (gaseous and particulate emissions). New road construction per se is not a marked generator of dust since effective dust suppression systems exist. However, gaseous emissions as a result of increased traffic volumes may affect the air quality.

7.2 Fauna and Flora

A large proportion of the original grassland that occurred in the area has been lost through agricultural development. The natural veld is a short highveld turf grassland also called a Moist Clay Highveld grassland. Good areas of natural veld are dominated by Rooigrass (Themeda triandra).

In certain parts of the new road section, perennial or semi-perennial streams and small wetlands occur. The condition of the plant communities in these areas varies. Nevertheless, these moist plant communities continue to play a valuable role in the local ecology as well as providing a functional role of flood attenuation, water purification and silt entrapment.

There are a number of old lands and fallow lands within the footprint of the new road section. These previously disturbed areas are dominated by Cosmos (Bidens formosa) and a variety of other opportunistic weeds and grasses. In areas of good quality veld there is considerable evidence of small mammal activity. Red Data mammal species likely to occur in the vicinity of the route are: Rough-haired Golden Mole (vulnerable), South African Hedgehog (rare), African Striped Weasel (rare), Aardwolf (rare), Brown Hyaena (rare) and Serval (rare). At certain times of the year vulnerable or threatened species of birds, including the Blue Crane, Bald Ibis and Blue Korhaan may be found in the area. Grass Owls frequent the moist grassland and wetland areas within the region. For a more detailed explanation refer to the Biophysical Assessment in Appendix E.

The Biophysical Assessment concluded that the majority of the sections along the proposed N17 Toll Road have a low sensitivity and hence a relatively low conservation and functional status. These include areas such as roadside verges along the existing N17 and disturbed grasslands near towns.

Sections with a medium sensitivity include some natural grassland areas and areas with high agricultural potential between Leandra and Kinross. The grasslands have been subjected to relatively heavy grazing and therefore have a medium conservation status.

Relatively sensitive areas along the proposed route are towns and homesteads, wetlands and watercourses such as the Rolspruit, Trichardtspruit, Brakspuit and the Tweefonteinspruit and economically viable production areas where farms will be fragmented. The wetlands along the proposed new section of road between Leandra and Leven Station have been classified as having a medium conservation status and a medium to low functional status because of their relatively limited extent, overgrazed state and reduced plant species diversity. However, during periods of inundation the wetlands provide grazing and also a habitat and feeding grounds for many bird species. For this reason, the following design specifications have been discussed with the engineers, to protect wetlands and to maintain species diversity:

- The width of flow of water in a wetland on the upstream side of the road (i.e. flowing into the road) must be the same width that flows into the wetland on the downstream side of the road (i.e. flowing away from the road). It is important to avoid channelling of flow or preferential flow, as this creates
wet areas and dries out other areas of the wetland with the result that it creates dry and wet habitats within the wetland, thereby changing the wetland vegetation and ultimately altering the entire wetland.

- At identified wetlands along the route, the water must be collected in a drain on the upstream side of the road, and channelled through a culvert under the road. Thereafter, the water must leave the road, again via a drain, at the same width of flow and velocity as the flow upstream of the road.
- A culvert designed for a stream crossing must not be used as a “cattle creep” as well. This is because livestock walking through or near a stream will create preferential flow and therefore disturb riverine ecology.

7.3 VISUAL AND NOISE ASPECTS

7.3.1 Noise

The new sections of the proposed N17 will pass through land that is used primarily for agricultural purposes. These areas are typically relatively quiet during the day and experience low levels of night time noise. Rural areas generally have a background (ambient) noise level of 35dB at night and 45dB during the day, which is considerably lower than in the average urban area (65dB during the day). Rural farming areas, particularly along the 22km stretch of new road between Leandra and Kinross, are thus susceptible to noise intrusion, particularly at night. Existing sources of noise along the route would include traffic along the existing N17, agricultural activities (tractors) and road traffic using the secondary and farm roads in the area.

A noise impact assessment of four specified areas along the proposed N17 Toll Road was undertaken, due to noise being identified as a factor for investigation during the Scoping Phase of the project. The results of the noise impact assessment are detailed in Appendix F. The construction of the new sections of the N17 from Leandra to Leven Station, the Trichardt Bypass and the Bethal Internal Link Road will significantly alter the level and nature of the ambient noise climates close to the new alignments. At most of the assessment sites investigated the noise impact will be severe. However, mitigation measures to reduce the noise impacts have been recommended (Appendix F).

7.3.2 Aesthetics

The countryside through which the proposed N17 will pass is largely one of rural agriculture on a low undulating landscape with shallow valleys. Existing mining, power generation or industrial infrastructure is, however, visible along the proposed route and has a major aesthetic impact in the area.

7.4 SITES OF CULTURAL IMPORTANCE

The study area is not a high-density archaeological area. Members of the technical team observed no sites of archaeological interest during the two route walkovers.

With respect to palaeontological sites, the whole of the study area is underlain by Ecca rocks, which so far are only known to yield plant fossils. There are no known unique localities that would justify influencing the course of the proposed N17 road. I&APs should, however, be given the opportunity to collect exposed fossils following fresh excavations, particularly if they are likely to be covered by earthworks.

Monuments, memorials, historical buildings and war graves are centred mainly in and around the towns.
7.5 **Land use and Land Capability**

Most of the land along the proposed route is proclaimed road servitude, from Springs to Leandra and from Leven Station to Ermelo. The existing road servitude passes through numerous small towns, where the land use can be classified as residential and light to medium industrial. The proposed new road passes through farmland primarily used for agriculture and grazing.

The land capability of the surveyed areas has been identified as arable, grazing or wetland, based on the effective depth of the soils. Where the soil depth is greater than 600mm, land is classified as arable and where the soil depth is less than 600mm, land is classified as grazing. Wet, mottled soils conditions were used to distinguish wetlands. The area surveyed was the Green Fields section from Leandra to Leven Station. 24ha were classified as arable land, 42ha as grazing land and 7 ha are wetlands. Refer to Appendix D for more information.

7.6 **Socio economic issues**

7.6.1 **Security**

Stakeholders are concerned that the construction of new sections of the proposed N17 will pose a safety and security risk. Many stakeholders indicated that the majority of farmsteads along the route, particularly the stretch between Leandra and Leven Station, are isolated, making them vulnerable to criminal activities, especially after dark. Given the current spate of attacks on farmers in South Africa, the security of farmers is particularly important when considering a road development.

8. **Potential environmental impacts and issues and recommended mitigation measures**

Various potential environmental impacts related to the construction and upgrading of the proposed toll road were identified during the EIA process, both through technical investigations and through the public consultation process. An environmental significance rating (described below) was assigned to each of the potential impacts both before and after mitigation as an aid to the authority’s decision-making process. The potential impacts, their significance rating and mitigation measures are presented in this Section and combined into a single table (Table 1), for clarity and ease of use.

The impacts have been sub-divided under the following headings:

- Issues related to biological aspects – fauna and flora
- Issues related to air quality
- Issues related to noise
- Issues related to soils, land use and land capability
- Issues related to sensitive sites – rivers, streams and wetlands
- Issues related to hydrology and geohydrology
- Issues related to aesthetic aspects
- Issues related to the social and economic environment
- Issues related to access.

8.1 **Assessment of significance – method**

The significance of every environmental impact identified was determined using the following approach:
In assessing the potential significance of an impact two aspects were considered (terminology from the Department of Environmental Affairs’ guideline document on EIA Regulations, April, 1998):

i) Occurrence
ii) Severity

Occurrence was sub-divided into:
   a) Probability of occurrence
   b) Duration of occurrence

Severity was sub-divided into:
   a) Magnitude (severity) of impact
   b) Scale/extent of impact
In order to assess each of these factors for each impact, ranking scales were employed as follows:

<table>
<thead>
<tr>
<th>Probability:</th>
<th>Duration:</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - Definite/don’t know</td>
<td>5 - Permanent</td>
</tr>
<tr>
<td>4 - Highly probable</td>
<td>4 - Long-term (impact ceases after the operational life of the activity)</td>
</tr>
<tr>
<td>3 - Medium probability</td>
<td>3 - Medium-term (5-15 years)</td>
</tr>
<tr>
<td>2 - Low probability</td>
<td>2 - Short-term (0-5 years)</td>
</tr>
<tr>
<td>1 - Improbable</td>
<td>1 - Immediate</td>
</tr>
<tr>
<td>0 - None</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Scale:</th>
<th>Magnitude:</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - International</td>
<td>10 - Very high/don’t know</td>
</tr>
<tr>
<td>4 - National</td>
<td>8 - High</td>
</tr>
<tr>
<td>3 - Regional</td>
<td>6 - Moderate</td>
</tr>
<tr>
<td>2 - Local</td>
<td>4 - Low</td>
</tr>
<tr>
<td>1 - Site only</td>
<td>2 - Minor</td>
</tr>
<tr>
<td>0 - None</td>
<td>0 - None</td>
</tr>
</tbody>
</table>

Once the above factors had been ranked for each impact, the overall risk (environmental significance) of each impact was assessed using the following formula:

\[
SP = (\text{magnitude} + \text{duration} + \text{scale}) \times \text{probability}
\]

The maximum value is 100 significance points (SP). Environmental impacts were rated as either of **High**, **Moderate** or **Low** significance on the following basis:

- **SP ≥ 60** indicates high environmental significance;
- **SP 30 ≥ 59** indicates moderate environmental significance;
- **SP < 30** indicates low environmental significance.
### Table 1. Impact Assessment Matrix for the rehabilitation and upgrading of the proposed N17 Toll Road.

<table>
<thead>
<tr>
<th>POTENTIAL ENVIRONMENTAL IMPACT</th>
<th>ACTIVITY</th>
<th>ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION</th>
<th>RECOMMENDED MITIGATION MEASURES/ REMARKS</th>
<th>ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION</th>
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<tr>
<td></td>
<td></td>
<td>M</td>
<td>D</td>
<td>S</td>
</tr>
<tr>
<td>ISSUES RELATED TO FAUNA AND FLORA</td>
<td></td>
<td>8</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Destruction / disturbance of Red Data plant and animal species</td>
<td>Pre-construction phase: Demarcation of servitude, Establishment of site camps, Establishment of crusher plants; Construction phase: Earthworks</td>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Disturbance of &quot;non Red Data&quot; plant and animal species</td>
<td>Pre-construction phase: Demarcation of servitude, Establishment of site camps, Establishment of crusher plants; Construction phase: Earthworks, Borrow pit establishment</td>
<td>8</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

Red data species that may potentially occur on site are listed in Appendix E of the Environmental Impact Report. No Red Data plant or animal species were recorded during the site visits. All construction activities will be restricted to the defined construction servitude and no disturbance will occur outside this area. The restriction of activities to the defined servitude is especially important on koppies and near streams and wetlands, as these represent sensitive habitats in the area. The servitude width must be kept to a minimum.

Construction activities must remain within defined construction areas and the servitudes. No construction / disturbance will occur outside these areas. Where construction activities may disturb animal warrens, nests, etc. clearing will take place slowly, so that animals have the chance to escape. Employees must be briefed regarding the consequences of poaching. Only vegetation falling directly in the demarcated access routes will be removed where necessary after consultation with the appointed Designated Environmental Officer.
<table>
<thead>
<tr>
<th>POTENTIAL ENVIRONMENTAL IMPACT</th>
<th>ACTIVITY</th>
<th>ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION</th>
<th>RECOMMENDED MITIGATION MEASURES/ REMARKS</th>
<th>ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION</th>
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<tr>
<td></td>
<td></td>
<td>M</td>
<td>D</td>
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<tr>
<td></td>
<td></td>
<td>6</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Faunal and floral habitat destruction</td>
<td>Pre-construction phase: Demarcation of servitude, Transport of material to site, Establishment of site camps, Establishment of crusher plants; Construction phase: Earthworks, Borrow pit establishment</td>
<td>8</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Disruption of faunal / livestock communities by noise</td>
<td>Pre-construction phase: Demarcation of servitude, Transportation of material to site, Establishment of crusher plants; Construction phase: Earthworks, Borrow pit establishment</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Increase / influx of alien / invasive plant species</td>
<td>Pre-construction phase: Demarcation of servitude, Transportation of material to site Construction phase: Clearing and rehabilitation of site</td>
<td>6</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>POTENTIAL ENVIRONMENTAL IMPACT</td>
<td>ACTIVITY</td>
<td>ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION</td>
<td>RECOMMENDED MITIGATION MEASURES/ REMARKS</td>
<td>ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION</td>
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<td>----------------------------------------------------------</td>
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<tr>
<td></td>
<td></td>
<td>M  D  S  P  TOTAL  SP</td>
<td>Employees must be informed that under no circumstances may they disturb / kill any animals on site or on neighbouring farms. The contractor will be held responsible for transgressions on the part of their employees and sub-contractors.</td>
<td>M  D  S  P  TOTAL  SP</td>
</tr>
<tr>
<td>Poaching of fauna by construction workers</td>
<td>All project phases</td>
<td>8  2  2  3  36  M</td>
<td></td>
<td>4  2  2  2  16  L</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Where the proposed road crosses a sensitive site, it is imperative that a) all activities be restricted to the Road Reserve, b) access for fauna across the sensitive site is not blocked by the road, c) no waste material will be dumped or left in a sensitive site, and d) the flow patterns of all water courses, including wetlands, are not altered: this is achieved by adequate design of drains and culverts to structure, size, number and position. Culverts and drains must be aligned with natural flow directions. Contract workers must not enter a sensitive site unless for stipulated construction activities within these sites, in which case all activities must be confined to the Road Reserve. The contractor must ensure the provision and proper utilisation, maintenance and disposal of ablution facilities. All waste material must be collected and disposed of appropriately off-site.</td>
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<tr>
<td>ISSUES RELATED TO SENSITIVE SITES (rivers, streams &amp; wetlands)</td>
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<td></td>
</tr>
<tr>
<td>Pollution</td>
<td>All project phases</td>
<td>8  2  3  5  65  H</td>
<td></td>
<td>6  2  3  2  22  L</td>
</tr>
<tr>
<td>Fragmentation</td>
<td>Pre-construction phase: Demarcation of servitude, fencing</td>
<td>8  5  2  5  75  H</td>
<td></td>
<td>4  5  2  5  55  M</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Where the proposed road crosses and divides / fragments a sensitive site, it is imperative that a) all activities be restricted to the Road Reserve, b) access for fauna across the sensitive site is not blocked by the road, and c) the flow patterns of all water courses, including wetlands, are not altered: this is achieved by adequate design of drains and culverts to structure, size, number and position. Culverts and drains will be aligned with natural flow directions. Contract workers must not enter a sensitive site unless for stipulated construction activities within these sites, in which case all activities must be confined to the Road Reserve.</td>
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<tr>
<td>ISSUES RELATED TO AIR QUALITY</td>
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</table>
### Potential Environmental Impact

<table>
<thead>
<tr>
<th>Potential Environmental Impact</th>
<th>Activity</th>
<th>Environmental Significance Before Mitigation</th>
<th>Recommended Mitigation Measures/Remarks</th>
<th>Environmental Significance After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust from the site machinery and trucks on the dust roads</td>
<td>Pre-construction phase: Transport of material to site, Movement of machinery, Establishment of site camps; Construction phase: Earthworks, Borrow pit establishment, Site removal</td>
<td>6 2 2 4 40 M</td>
<td>Dust levels must be kept to a minimum by the implementation of dust suppression measures where appropriate (periodic water sprinkling). Water used for dust suppression must be used in quantities small enough not to generate run-off and result in soil erosion.</td>
<td>4 2 2 2 16 L</td>
</tr>
<tr>
<td>Noise due to the increase of high speed traffic on the completed N17 Toll Road</td>
<td>Operational phase</td>
<td>8 5 3 5 80 H</td>
<td>Mitigation measures to reduce the noise impact are proposed in Appendix F of the Draft EIR.</td>
<td>6 5 3 4 72 H</td>
</tr>
</tbody>
</table>

### Issues Related to Soils, Land Use and Land Capability

<table>
<thead>
<tr>
<th>Issue</th>
<th>Activity</th>
<th>Environmental Significance Before Mitigation</th>
<th>Recommended Mitigation Measures/Remarks</th>
<th>Environmental Significance After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased soil erosion</td>
<td>Pre-construction phase: Vegetation and topsoil stripping, Establishment of construction camps; Construction phase: Earthworks, Borrow pit establishment</td>
<td>8 3 2 4 52 M</td>
<td>Erosion along access and temporary roads must be controlled by appropriate erosion control techniques that have been incorporated into the EMP. Topsoil stockpiles must be stored, shaped and sited so that they do not interfere with the flow of water to cause damming or erosion, or be eroded by water. All presently eroded areas within the Road Reserve must be rehabilitated to a state comparable to the surrounding area. The Contractor’s Programme must include measures for stabilisation of areas that may be prone to erosion.</td>
<td>4 1 2 2 14 L</td>
</tr>
<tr>
<td>Compaction of soil by heavy machinery</td>
<td>Pre-construction phase: Vegetation and topsoil stripping; Construction phase: Earthworks</td>
<td>6 2 2 4 40 M</td>
<td>Construction must remain within the Road Reserve. If necessary, soil must be ripped in areas that need to be rehabilitated. Construction near / at wetland and riverine areas must preferably occur during the dry season.</td>
<td>4 2 2 2 16 L</td>
</tr>
<tr>
<td>POTENTIAL ENVIRONMENTAL IMPACT</td>
<td>ACTIVITY</td>
<td>ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION</td>
<td>RECOMMENDED MITIGATION MEASURES/ REMARKS</td>
<td>ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION</td>
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<tr>
<td></td>
<td></td>
<td>M  D  S  P  TOTAL  SP</td>
<td></td>
<td>M  D  S  P  TOTAL  SP</td>
</tr>
<tr>
<td>Soil contamination / pollution</td>
<td>Pre-construction and construction phases</td>
<td>8  3  2  5  65  H</td>
<td>Contractors must ensure provision and proper utilisation, maintenance and disposal of ablution facilities. No waste of any form must be introduced into the environment. All waste material must be contained and disposed of appropriately off-site. No pollutant liquids must be used where a spillage would result in soil contamination. Proper storage facilities must be provided for the storage of fuels, oils, grease, chemicals and any hazardous materials used during the construction and upgrading of the road. Bund walls must surround all containers carrying substances that may pollute the soil. Workshop and maintenance areas must be sited on impermeable surfaces, so that there are no opportunities for contaminated run-off to reach the soil. Spoil heaps must be removed for appropriate disposal regularly. Concrete must only be mixed on an impermeable surface.</td>
<td>4  2  2  3  24  L</td>
</tr>
<tr>
<td>Reduced available water volumes as a result of borehole and river water usage for construction and consumption purposes</td>
<td>Pre-construction and construction phases</td>
<td>8  2  3  3  39  M</td>
<td>Water sources for construction and volumes required are not known accurately at this stage and must be established by the engineers and contractors. An avenue for communication between farmers and the SANRAL / contractors must be established and made known to I&amp;APs in order that problems can be identified and rectified at an early stage. Construction camps should be located near a site where reticulated water is available. Water volumes available must be monitored in order that water usage from boreholes / rivers can be stopped in sufficient time so as not to negatively impact on farmers or local communities. If a water user license is required, it must be obtained from DWAF by the contractor.</td>
<td>4  2  3  2  18  L</td>
</tr>
<tr>
<td>Modifications to hydrology</td>
<td>Construction phase: New structures, Soil stockpiles, Spoil heaps, Cuttings and embankments</td>
<td>8  2  2  3  36  M</td>
<td>Soil and spoils must not be stockpiled so as to obstruct or divert surface water flows during rainfall / storm events. They must not be positioned where they will obstruct drainage to rivers, streams or wetlands. The low wall that has been constructed across the Blesbokspruit at Bethal, adjacent to the artificial wetland, should be removed, so that the</td>
<td>4  2  2  1  8  L</td>
</tr>
</tbody>
</table>
### Potential Environmental Impact

<table>
<thead>
<tr>
<th>Activity</th>
<th>Environmental Significance Before Mitigation</th>
<th>Recommended Mitigation Measures/Remarks</th>
<th>Environmental Significance After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potential Environmental Impact</strong></td>
<td><strong>Activity</strong></td>
<td><strong>M</strong></td>
<td><strong>D</strong></td>
</tr>
<tr>
<td>Physical disruption of streams, rivers and wetlands at crossings and disruption of seepage slopes</td>
<td>Pre-construction phase: Demarcation of servitude; Construction phase: Earthworks, Road laying</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Increased sediment load in runoff and possible siltation downstream from construction areas</td>
<td>Construction phase: Earthworks, Road laying, Vegetation and topsoil stripping, Construction of borrow pits</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

**Issues Related to Aesthetic Aspects**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Environmental Significance Before Mitigation</th>
<th>Recommended Mitigation Measures/Remarks</th>
<th>Environmental Significance After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual impact of new road and construction-related activities, e.g. borrow pits and movement of machinery</td>
<td>All project phases</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

The visual impacts of all permanent and temporary modifications to the environment have been discussed with all I&APs. Mitigation of visual impacts caused by a highway is difficult. Stockpiles of soil and spoil must be located so as not to cause a visual impact. The siting of borrow pits will be discussed with all I&APs. All borrow pits must be rehabilitated. Construction activities should be restricted to the working hours, unless otherwise agreed by the landowners. No construction must take place on Sundays and Public holidays, unless by prior arrangement with the I&APs.
<table>
<thead>
<tr>
<th>POTENTIAL ENVIRONMENTAL IMPACT</th>
<th>ACTIVITY</th>
<th>ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION</th>
<th>RECOMMENDED MITIGATION MEASURES/ REMARKS</th>
<th>ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>D</td>
<td>S</td>
</tr>
<tr>
<td>Stock theft</td>
<td>Pre-construction and construction phases</td>
<td>8</td>
<td>2</td>
<td>3</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Fragmentation of farms</td>
<td>Pre-construction phase: Demarcation of servitude, Fencing; Construction phase: Road laying</td>
<td>8</td>
<td>5</td>
<td>2</td>
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<tr>
<td>Sterilisation of agricultural land</td>
<td>Pre-construction phase: Demarcation of servitude, Vegetation and topsoil stripping, Fencing, Site camp establishment; Construction phase: Road laying</td>
<td>8</td>
<td>2</td>
<td>2</td>
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<td></td>
</tr>
<tr>
<td>Access roads onto private farms</td>
<td>Pre-construction and construction phase</td>
<td>6</td>
<td>2</td>
<td>2</td>
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<td></td>
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<tr>
<td>Hazardous conditions and traffic disruption due to partial road closures</td>
<td>Construction phase</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>POTENTIAL ENVIRONMENTAL IMPACT</td>
<td>ACTIVITY</td>
<td>ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION</td>
<td>RECOMMENDED MITIGATION MEASURES/REMARKS</td>
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<tr>
<td>Motorists must be given adequate warning of all road construction.</td>
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</table>
9. CONCLUSION

The stated objectives of this report, as noted at the beginning of the document, are as follows:

1. To provide sufficient information concerning the proposed development to the authorities and to other I&APs for decision making purposes. This is aimed at ensuring that the environmental effects of the development are taken into consideration before decisions regarding its approval are taken.
2. By so doing, to ensure that the development does not have a substantial detrimental effect on the environment.
3. To demonstrate that sufficient consideration has been given to alternatives and potential impacts associated with the development.
4. To indicate the manner in which I&APs have been afforded the opportunity to contribute to this project throughout the process followed, and to provide a final opportunity for comment and/or objection to the proposed project.

Every effort has been made to satisfy these objectives in this Final Environmental Impact Report. This has been achieved by means of the following:

- The Environmental Impact Assessment process was carried out according to the Environmental Impact Assessment Guidelines published by the Department of Environmental Affairs and Tourism (1998);
- Information regarding the background to and motivation for the proposed development, as well as relevant project details, was obtained from the proponent (SANRAL), and is presented in Chapters 1 and 2;
- A range of alternatives were identified and considered (Chapter 6);
- An extensive public participation and consultation programme (Chapter 4) was undertaken - involving interaction throughout the EIA process - to empower, inform, discuss with and update over three hundred I&APs on issues associated with the proposed project. The manner in which these I&APs were afforded the opportunity to contribute, and the timeframe involved, is described in Chapter 4;
- The key factors of the receiving environment were documented by means of a combination of desktop and specialist investigations (Chapter 7 and Appendices C, D, E & F);
- Impacts were identified and assessed according to internationally and locally accepted criteria (Chapter 8). The methods used to assess the significance of potential impacts are clearly described for the readers' benefit. Mitigation measures have been proposed for most impacts, and the likely success of these measures has been evaluated.

The primary findings of the above processes were that the proposed construction and upgrading of the N17 Toll Road would probably result in:

- No negative environmental impacts of high significance
- Potential positive impacts due to increased economic activity, employment and training and capacity building.

In conclusion, it is believed that this report covers the full suite of potential environmental issues related to the proposed development, and that sufficient information regarding the identification, assessment and potential mitigation of impacts has been presented to facilitate informed decision making by the appropriate authorities.
APPENDIX A

STAKEHOLDER DATABASE
APPENDIX B

ISSUES AND RESPONSE REPORT
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