

PROPOSED MOOKODI-MAHIKENG 400kV POWERLINE, NORTH WEST PROVINCE

Scoping Report

DEA Reference: 14/12/16/3/3/2/1056

March 2018

Final

Prepared for: Eskom Holdings (SOC) Ltd



Environmental, Social and OHS Consultants

P.O. Box 1673 147 Bram Fisher Drive Tel: 011 781 1730
Sunninghill Ferndale Fax: 011 781 1731
2157 2194 Email: info@nemai.co.za

Title and Approval Page

Project Name:	Proposed Mookodi-Mahikeng 400kV Powerline, North West Province
Report Title:	Scoping Report
Authority Reference:	14/12/16/3/3/2/1056
Report Status:	Final

Applicant:	Eskom Holdings (SOC) Ltd
------------	--------------------------

Prepared By:	Nemai Consulting		
	 +27 11 781 1730		147 Bram Fischer Drive, FERNDALE, 2194
	 +27 11 781 1731		
	 kristyr@nemai.co.za		PO Box 1673, SUNNINGHILL, 2157
	 www.nemai.co.za		
Report Reference:	10645-20180322-FSR	R-PRO-REP 20150514	

<p>Authors: N. Naidoo and K. Robertson</p>
--

*This Document is Confidential Intellectual Property of Nemai Consulting C.C.
 © copyright and all other rights reserved by Nemai Consulting C.C.
 This document may only be used for its intended purpose*

Amendments Page

Date:	Nature of Amendment	Amendment Number:
2018/02/12	First Draft for Public Review	01
2018/03/23	Final Submission to DEA	02

Executive Summary

This document serves as the Final Scoping Report (FSR) for the proposed Mookodi-Mahikeng 400kV Powerline, in the North West Province.

Project Background

The North West Province sources its generation supply from Matimba and Grootvlei power stations, as well as from the Apollo DC converter station. Within the province, the two Customer Load Centres (CLC) are Rustenburg and Carletonville. The Carletonville CLC consists of Hermes, Pluto, Midas, Watershed substations as well as the newly-built Mookodi substation. However, the existing Watershed substation is currently un-firm and has insufficient capacity to support the forecasted load in the area, which includes Lichtenburg and extends to Mahikeng town. There is also anticipated load growth in the Mafikeng area indicating a need for further enhancement of capacity in the area.

Hence there is a need for further network expansion through establishing a new transmission substation in Mahikeng. There are several projects underway to alleviate the constraint problems and this is referred to as the Watershed Strengthening Scheme. As part of establishing the site for the proposed Mahikeng substation, Mahikeng substation will be designed with an end state of 3x 500MVA 400/132kV transformers and install 2x 500MVA 400/132kV transformers initially. A 1x 160km Pluto – Mahikeng 400kV line will also be established. These two project components are currently undergoing a separate Environmental Impact Assessment (EIA) Process. This EIA Process is for the proposed approximately 180km Mookodi - Mahikeng 400kV Powerline project.

Project Description

The proposed project falls within the jurisdiction of the Naledi Local Municipality (LM), Kagisano-Molopo LM, Ratlou LM, and Mahikeng LM in the North West Province. Four alternative routes have been considered for the Scoping and EIA Process. The proposed alternative routes for the powerline start in Vryburg at the existing Mookodi substation, and travel in a north-east direction where the line ends near Mahikeng at the proposed Mahikeng substation site.

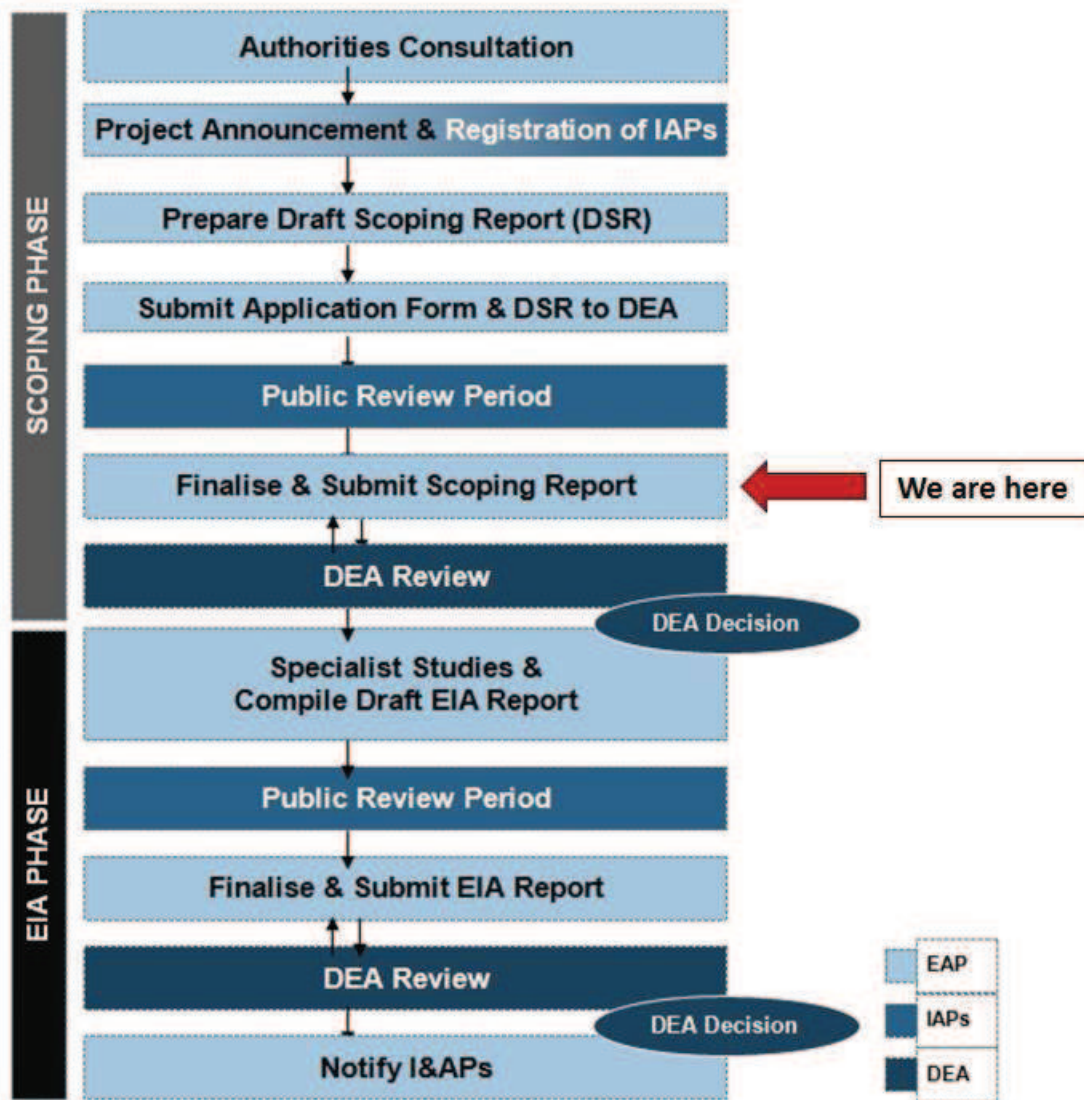
The fundamental purpose of the Scoping exercise is the consideration of viable and reasonable alternative sites, processes, and technologies of achieving the objectives of the project. The aim of this comparative environmental analysis is to make the necessary environmental input in the decision making processes in selecting a route for the powerline that is environmentally sustainable, socially acceptable, and economically viable; in other words, the Best Practicable Environmental Option (BPEO).

Legislative Framework

The pertinent environmental legislation that has bearing on the proposed development is considered. A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the EIA Process.

Scoping and EIA Process

The process for seeking authorisation is undertaken in accordance with the 2014 EIA Regulations, as amended (07 April 2017), which is promulgated in terms of Chapter 5 of the National Environmental Management Act (Act No. 107 of 1998) (NEMA). The proposed project requires an environmental assessment through a Scoping and EIA Process.



In terms of the Regulations, the lead decision-making authority for the Scoping and EIA Process is the Department of Environmental Affairs (DEA).

Receiving Environment

A general description of the status quo of the receiving environment in the project area is discussed. This serves to provide the context within which the Scoping exercise was conducted. It also allows for an appreciation of sensitive environmental features and possible receptors of the effects of the proposed Mookodi-Mahikeng 400kV Powerline.

The following environmental features have been considered:

- | | |
|--------------------|-----------------------------|
| 1. Climate | 9. Land Use |
| 2. Geology | 10. Heritage |
| 3. Soils | 11. Air Quality |
| 4. Topography | 12. Noise |
| 5. Surface Water | 13. Visual Quality |
| 6. Flora | 14. Existing Infrastructure |
| 7. Fauna | 15. Traffic |
| 8. Land Capability | 16. Socio-Economic |

Public Participation

The public participation process that was followed for the proposed project is governed by NEMA and GN No. R. 982 of the 2014 EIA Regulations (as amended). The public participation process conducted to date as well as the details on the public participation review period for the Draft Scoping Report (DSR) are discussed in the report.

Impact Assessment

In accordance with the purpose of the Scoping exercise as part of the overall environmental assessment, this section aims to identify potentially significant environmental issues for further consideration and prioritisation during the EIA stage. This allows for a more efficient and focused impact assessment in the ensuing EIA Phase, where the analysis is largely limited to significant issues and reasonable alternatives.

Plan of Study

The Plan of Study explains the approach to be adopted to conduct the EIA for the proposed Mookodi-Mahikeng 400kV Powerline. This includes a summary of the key environmental issues, Specialist Studies, public participation and proposed timeframes.

Table of Contents

1	DOCUMENT ROADMAP	1
2	PURPOSE OF THIS DOCUMENT	6
3	ENVIRONMENTAL ASSESSMENT PRACTITIONER	7
4	PROJECT BACKGROUND AND MOTIVATION	8
5	PROJECT LOCATION	10
5.1	Geographical Context	10
5.2	Affected Properties	16
6	PROJECT ALTERNATIVES	23
6.1	Transmission Line Corridor Route Selection Process	23
6.1.1	Identification of Potential Routes	24
6.1.2	Screening Process	25
6.1.3	Multi-criteria Decision-Making Model Process	28
6.1.3.1	Criteria Considered in MCDM Process	28
6.1.3.2	Results of MCDM Process	29
6.2	Feasible Route Alternatives	33
6.2.1	Option 1 (WM1)	33
6.2.2	Option 2 (WM13)	35
6.2.3	Option 3 (WM4a)	35
6.2.4	Option 4 (WM9a)	35
6.3	No-go alternative	39
7	PROJECT DESCRIPTION	39
7.1	Scope of Work	39
7.1.1	Transmission Line	39
7.1.2	Powerline Corridor	41
7.1.3	Powerline Servitude	41
7.1.4	Tower Structures	42
7.2	Project Life-Cycle	45
7.2.1	Construction	47
7.2.1.1	Vegetation Clearance	47

7.2.1.2	Tower pegging _____	48
7.2.1.3	Construction camp establishment _____	48
7.2.1.4	Gate installation _____	48
7.2.1.5	Access roads _____	48
7.2.1.6	Excavation for foundations _____	48
7.2.1.7	Foundation of steelwork _____	48
7.2.1.8	Concrete works _____	49
7.2.1.9	Erection of steel structures _____	49
7.2.1.10	Stringing of transmission cables _____	50
7.2.1.11	Rehabilitation _____	51
7.2.1.12	Inaccessible Sites or Sensitive Areas _____	51
7.2.2	Operation and Maintenance _____	51
7.3	Resources Required for Construction and Operation	51
7.3.1	Water _____	51
7.3.2	Sanitation _____	52
7.3.3	Roads _____	52
7.3.4	Waste _____	52
7.3.5	Electricity _____	52
7.3.6	Construction Workers _____	52
8	LEGISLATION AND GUIDELINES CONSIDERED _____	52
8.1	Overview of Legislation	52
8.2	Constitution of the Republic of South Africa (Act No. 108 of 1996)	54
8.3	National Environmental Management Act (Act No. 107 of 1998)	55
8.3.1	2014 EIA Regulations, as amended (07 April 2017) _____	55
8.4	National Water Act (Act No. 36 of 1998)	61
8.5	National Environmental Management: Protected Areas Act (Act No. 57 of 2003)	62
8.6	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	62
8.7	National Environmental Management: Air Quality Act (Act No. 39 of 2004)	63
8.8	The National Environmental Management Waste Act (Act No. 59 of 2008)	63
8.9	Hazardous Substances Act (Act No. 05 of 1973)	63
8.10	Occupational Health & Safety Act (Act No. 85 of 1993)	64
8.11	National Heritage Resources Act (Act No. 25 of 1999)	64
8.12	Conservation of Agricultural Resources Act (Act No. 43 of 1983)	65

8.13	National Forests Act (Act No. 84 of 1998)	65
8.14	Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)	65
8.15	Guidelines	66
8.16	Regional Plans	66
9	SCOPING AND EIA PROCESS	66
9.1	2014 EIA Listed Activities (as amended)	66
9.2	Formal Process	67
9.3	Competent Authority	67
9.4	Application Form	67
9.5	Scoping Phase	68
9.6	EIA Phase	69
9.7	Landowner Consent	70
9.8	Landowner Notification	70
10	ASSUMPTIONS AND LIMITATIONS	70
11	NEED AND DESIRABILITY	71
12	PROFILE OF THE RECEIVING ENVIRONMENT	73
12.1	Climate	74
12.1.1	Status Quo	74
12.1.2	Potential Impacts/Implications	76
12.1.3	Specialist Studies Required	76
12.2	Geology	76
12.2.1	Status Quo	76
12.2.2	Potential Impacts/Implications	77
12.2.3	Specialist Studies Required	77
12.3	Soils	78
12.3.1	Status Quo	78
12.3.2	Potential Impacts/Implications	78
12.3.3	Specialist Studies Required	79
12.4	Topography	79
12.4.1	Status Quo	79
12.4.2	Potential Impacts/Implications	81
12.4.3	Specialist Studies Required	81
12.5	Surface Water	81

12.5.1	Status Quo _____	81
12.5.2	Potential Impacts/Implications _____	82
12.5.3	Specialist Studies Required _____	83
12.6	Flora	84
12.6.1	Status Quo _____	84
12.6.1.1	Biome and Vegetation _____	84
12.6.1.2	Terrestrial Threatened Ecosystems _____	86
12.6.1.3	North West Biodiversity Sector Plan (2015) _____	87
12.6.1.4	Protected Areas _____	92
12.6.1.5	Plant Species of Conservation Concern _____	92
12.6.2	Potential Impacts/Implications _____	93
12.6.3	Specialist Studies Required _____	94
12.7	Fauna	94
12.7.1	Status Quo _____	94
12.7.1.1	Mammals _____	94
12.7.1.2	Reptiles _____	95
12.7.1.3	Amphibians _____	95
12.7.1.4	Avifauna _____	95
12.7.2	Potential Impacts/Implications _____	96
12.7.3	Specialist Studies Required _____	97
12.8	Land Capability	97
12.8.1	Status Quo _____	97
12.8.2	Potential Impacts/Implications _____	98
12.8.3	Specialist Studies Required _____	98
12.9	Land Use	98
12.9.1	Status Quo _____	98
12.9.2	Potential Impacts/Implications _____	100
12.9.3	Specialist Studies Required _____	101
12.10	Heritage	101
12.10.1	Status Quo _____	101
12.10.2	Potential Impacts/Implications _____	101
12.10.3	Specialist Studies Required _____	101
12.11	Air Quality	101
12.11.1	Status Quo _____	101
12.11.2	Potential Impacts/Implications _____	102

12.11.3 Specialist Studies Required _____	102
12.12 Noise _____	102
12.12.1 Status Quo _____	102
12.12.2 Potential Impacts/Implications _____	102
12.12.3 Specialist Studies Required _____	103
12.13 Visual Quality _____	103
12.13.1 Status Quo _____	103
12.13.2 Potential Impacts/Implications _____	104
12.13.3 Specialist Studies Required _____	104
12.14 Existing Infrastructure _____	105
12.14.1 Status Quo _____	105
12.14.2 Potential Impacts/Implications _____	105
12.14.3 Specialist Studies Required _____	105
12.14.4 Specialist Studies Required _____	105
12.15 Traffic _____	105
12.15.1 Status Quo _____	105
12.15.2 Potential Impacts/Implications _____	105
12.15.3 Specialist Studies Required _____	106
12.16 Socio-Economic _____	106
12.16.1 Status Quo _____	106
12.16.2 Potential Impacts/Implications _____	113
12.16.3 Specialist Studies Required _____	113
13 PUBLIC PARTICIPATION _____	113
13.1 Landowner Notification _____	114
13.2 Public Participation Notification – Initial IAP Registration Period _____	114
13.2.1 Identification of IAPs and Compilation of IAP Database _____	114
13.2.2 Initial IAP Registration _____	115
13.2.2.1 Background Information Document (BID) _____	115
13.2.2.2 Site Notices _____	115
13.2.2.3 Newspaper Notice _____	116
13.2.2.4 Update of IAP Database _____	116
13.2.3 Focus Group Meetings _____	116
13.2.3.1 Focus Group Meeting 01 – Agri North West and Agri Stella _____	117
13.2.3.2 Focus Group Meeting 02 – Affected Landowner _____	117

13.2.3.3 Focus Group Meeting 03 – Ramatlhamba Traditional Authority (Mahikeng)	117
13.3 Public Participation – Scoping Phase	117
13.3.1 Scoping Phase Notification	118
13.3.1.1 Background Information Document (BID)	118
13.3.1.2 Site Notices	118
13.3.1.3 Update of IAP Database	119
13.3.2 Public Review	119
13.3.3 Authority Review	119
13.3.4 Scoping Phase Meetings	120
13.3.5 Comments and Responses Report	120
13.4 Public Participation – EIA Phase	121
14 ENVIRONMENTAL ISSUES	121
14.1 Approach	121
14.1.1 Predicting Significant Environmental Issues	121
14.1.2 Mitigation of Impacts	122
14.2 Summary of Environmental Issues	122
14.3 Cumulative Impacts	125
15 METHODOLOGY TO ASSESS THE IDENTIFIED IMPACTS	126
16 PLAN OF STUDY FOR EIA	128
16.1 Key Environmental Issues Identified During Scoping Phase	128
16.2 Environmental Specialist Studies	128
16.2.1 General Terms of Reference	129
16.2.2 Specific Terms of Reference	131
16.2.2.1 Terrestrial Ecological Impact Assessment	131
16.2.2.2 Avifaunal Impact Assessment	132
16.2.2.3 Agricultural Impact Assessment	132
16.2.2.4 Phase 1 Heritage Impact Assessment	133
16.2.2.5 Social Impact Assessment	134
16.2.2.6 Economic Impact Assessment	134
16.2.2.7 Visual Impact Assessment	135
16.2.2.8 River Health Impact Assessment and Wetland/Riparian Habitat Delineation	136
16.3 Public Participation – EIA Phase	136

16.3.1	Notification – Approval of Scoping Report and Notification of Public Review of Draft EIA Report	136
16.3.2	EIA Public Meeting	136
16.3.3	Review of Draft EIA Report	136
16.3.4	Updating of IAP Database and Comments and Responses Report	136
16.3.5	Notification of DEAs Decision	137
16.4	Proposed Timeframes	137
17	OATH OF THE EAP AND DECLARATION OF INDEPENDENCE	138

List of Tables

Table 1:	Document Roadmap	1
Table 2:	Scoping and EIA core team members	8
Table 3:	Coordinates of bend points - route alternative option 1 (WM1)	39
Table 4:	Coordinates of bend points - route alternative option 2 (WM13)	40
Table 5:	Coordinates of bend points - route alternative option 3 (WM4a)	40
Table 6:	Coordinates of bend points - route alternative option 4 (WM9a)	41
Table 7:	Environmental legislative framework	53
Table 8:	EIA Listed Activities for the proposed Mookodi-Mahikeng 400kV Powerline	56
Table 9:	Need and Desirability of the Mookodi-Mahikeng 400kV Powerline	71
Table 10:	Criteria used to define CBA map categories (Desmet and Schaller, 2015)	90
Table 11:	Red Data Plant species recorded which could potentially occur in the study area (SANBI data)	93
Table 12:	Definitions of Red Data plant status (Raimondo et al. 1999)	93
Table 13:	Mammal species recorded which could occur in the study area	94
Table 14:	Amphibian species recorded which could occur in the study area	95
Table 15:	List of threatened bird species which could occur in the study area	96
Table 16:	Local Municipalities, Wards and Sub Places	106
Table 17:	Locations of site notices during registration period	115
Table 18:	Locations of site notices during scoping phase	118
Table 19:	Details of meetings during scoping phase	120
Table 20:	Pertinent issues (construction phase) for prioritisation during the EIA Phase	122
Table 21:	Pertinent issues (operational phase) for prioritisation during the EIA Phase	124
Table 22:	Impact methodology	127
Table 23:	Ranking of overall impact score	128
Table 24:	Scoping and EIA timeframes	137

List of Figures

Figure 1: Mahikeng substation integration via Pluto and Mookodi substations	9
Figure 2: Regional locality map	10
Figure 3: Municipality map	11
Figure 4: Locality map of the study area.....	12
Figure 5: 1 in 250 000 Topographical map of the study area.....	13
Figure 6: Existing Mookodi substation and start point for the proposed development.....	14
Figure 7: Photograph of the Mookodi substation	14
Figure 8: Photographs of the study area	15
Figure 9: End point for the proposed development.....	16
Figure 10: Cadastral map of the study area	17
Figure 11: Sections of the study area to be zoomed-in.....	18
Figure 12: Section A farm portions	19
Figure 13: Section B farm portions	20
Figure 14: Section C farm portions.....	21
Figure 15: Section D farm portions.....	22
Figure 16: All route options between Mookodi and Watershed B substations, based on the outcomes of the route screening process (Transmission Line Corridor Route Selection Process Report, 2017)	26
Figure 17: Preferred route options between Mookodi and Watershed B substation for MCDM process (Transmission Line Corridor Route Selection Process Report, 2017)	27
Figure 18: Watershed-Mookodi corridor overall preference	33
Figure 19: Route Alternative Option 1 (WM1).....	34
Figure 20: Route Alternative Option 2 (WM13).....	36
Figure 21: Route Alternative Option 3 (WM4a).....	37
Figure 22: Route Alternative Option 4 (WM9a).....	38
Figure 23: Guyed-Vee suspension tower type.....	42
Figure 24: Cross-rope suspension tower type	43
Figure 25: Self-supporting suspension tower type.....	44
Figure 26: Foundation work.....	49
Figure 27: Delivery of steel (left) and assembly of tower (right)	50
Figure 28: Stringing with pilot tractor (left) and pulleys (right)	50
Figure 29: Scoping and EIA Process.....	68
Figure 30: Climate graph – Vryburg (https://en.climate-data.org/region/501/).....	75
Figure 31: Climate graph – Stella (https://en.climate-data.org/region/501/)	75
Figure 32: Climate graph – Mahikeng (https://en.climate-data.org/region/501/).....	76
Figure 33: Geology	77
Figure 34: Soil class.....	78

Figure 35: Photograph of relatively flat terrain on site.....	80
Figure 36: 20m Contour lines	80
Figure 37: Water management areas.....	81
Figure 38: Surface water	82
Figure 39: Biomes	84
Figure 40: Vegetation type	85
Figure 41: Threatened terrestrial ecosystems	87
Figure 42: CBA and ESA	89
Figure 43: Protected areas.....	92
Figure 44: Important bird and biodiversity area	95
Figure 45: Land capability (Schoeman et al. 2000)	97
Figure 46: Land use	99
Figure 47: 2013-14 South African National Legend.....	100
Figure 48: Game farm along the N18.....	103
Figure 49: Existing powerlines along the N18	104
Figure 50: Wards	107
Figure 51: Population	107
Figure 52: Age	108
Figure 53: Gender.....	108
Figure 54: Education	109
Figure 55: Employment.....	109
Figure 56: Annual household income	110
Figure 57: Access to water.....	110
Figure 58: Access to sanitation	111
Figure 59: Energy for lighting	111
Figure 60: Energy for heating.....	112
Figure 61: Energy for cooking	112
Figure 62: Location of site notices during registration period.....	116
Figure 63: Location of site notices during scoping phase	119

List of Appendices

- Appendix 1: Curricula Vitae
- Appendix 2: Maps
- Appendix 3: Site Photographs
- Appendix 4: Copy of Amended Application Form
- Appendix 5: Interested and Affected Party (IAP) Database
- Appendix 6: Background Information Documents (BIDs)
- Appendix 7: Proof of Site Notices
- Appendix 8: Proof of Newspaper Advertisements
- Appendix 9: Proof of Notification – Initial Registration
- Appendix 10: Proof of Notification – Scoping Phase
- Appendix 11: Meetings
- Appendix 12: Reply Forms and Comments
- Appendix 13: Comments and Responses Report (CRR)

List of Abbreviations

BID	Background Information Document
BOSA	Botswana – South Africa
BPEO	Best Practicable Environmental Option
CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
EMPr	Environmental Management Programme
FSR	Final Scoping Report
GA	General Authorisation
GIS	Geographic Information System
GN	Government Notice
IAP	Interested and Affected Party
IBA	Important Bird and Biodiversity Area
IDP	Integrated Development Plan
km	Kilometre
LM	Local Municipality
m ³	Cubic metre
MCDM	Multi-criteria Decision-Making Model
mm	Millimetre
MPRDA	Mineral and Petroleum Resources Development Act
NEMA	National Environmental Management Act
NEM:AQA	National Environmental Management: Air Quality Act
NEM:BA	National Environmental Management: Biodiversity Act
NEM:WA	National Environmental Management: Waste Act
NWA	National Water Act
OHS	Occupational Health and Safety
PES	Present Ecological State

QDS	Quarter Degree Square
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
ToR	Terms of Reference
WMA	Water Management Area
WUL	Water Use License
WULA	Water Use License Application

Definitions of Key Terms

Term	Definition
Alternatives	<p>In terms of the 2014 EIA Regulations, alternatives refer to the different means of meeting the general purpose and requirements of the activity, which may include alternatives to:</p> <ul style="list-style-type: none"> a) property or location where the activity is proposed to be undertaken; b) type of activity to be undertaken; c) design or layout of the activity; d) technology to be used in the activity; or e) operational aspects of the activity. <p>And includes the option of not implementing the activity.</p>
Application	<p>In terms of the 2014 EIA Regulations (GN No. R. 982), this is defined as an Application for:</p> <ul style="list-style-type: none"> a) environmental authorisation in terms of Chapter 4; b) amendment to an environmental authorisation in terms of Chapter 5; c) amendment to an EMPr in terms of Chapter 5; and d) amendment of a closure plan in terms of Chapter 5.
Biodiversity	<p>The variety of life forms, including the plants, animals and micro-organisms, the genes they contain and the ecosystems and ecological processes of which they are a part.</p>
Cumulative Impact	<p>In relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.</p>
Development	<p>The building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthworks or borrow pits, that is necessary for the undertaking of a listed or specified activity, including any associated post development monitoring, but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.</p>
Endangered	<p>A taxon is regarded as endangered when it faces a high risk of extinction in the wild. This is defined as a 20% probability of extinction within 20 years.</p>
Environment	<p>The biophysical, social, economic, cultural, political and historical context within which people live and within which development takes place.</p>

Term	Definition
Environmental Impact	A change resulting from the effect of an activity on the environment, whether desirable or undesirable. Impacts may be the direct consequence of an organisation's activities or may be indirectly caused by them.
Environmental Impact Assessment	A systematic process of identifying, assessing and reporting environmental impacts associated with an activity.
Environmental Issue	A concern felt by one or more parties about some existing, potential or perceived environmental impact.
Environmental Management Programme	A detailed plan of action prepared to ensure that recommendations for enhancing positive impacts and/or limiting or preventing negative environmental impacts are implemented during the life-cycle of a project.
Groundwater	Sub-surface water in the zone in which permeable rocks, and often the overlying soil, are saturated.
Habitat	The place where a population (e.g. animal, plant, micro-organism) lives and its surroundings, both living and non-living.
Hazardous Waste	Waste that are proven to be toxic, corrosive, explosive, flammable, carcinogenic, radioactive, poisonous or classified as such in legal terms.
Heritage Resource	Any place or object of cultural significance including buildings, structures, landscapes, graves and geological, archaeological and palaeontological sites.
Independent	<p>In terms of the 2014 EIA Regulations (GN No. R. 982), this is defined as: In relation to an EAP, a specialist or the person responsible for the preparation of an environmental audit report, means:</p> <ul style="list-style-type: none"> a) that such EAP, specialist or person has no business, financial, personal or other interest in the activity or application in respect of which that EAP, specialist or person is appointed in terms of these Regulations; or b) that there are no circumstances that may compromise the objectivity of that EAP, specialist or person in performing such work. <p>Excluding:</p> <ul style="list-style-type: none"> i. normal remuneration for a specialist permanently employed by the EAP; or ii. fair remuneration for work performed in connection with that activity, application or environmental audit;
Interested and Affected Party	Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public.
Mitigation	To anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.
Pollution	Any change in the environment caused by substances, radioactive or other waves, or noise, odours, dust or heat, emitted from any activity where there is an adverse effect on human health or well-being or on

Term	Definition
	the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future. Furthermore, pollution can also be regarded as an undesirable state of the natural environment being contaminated with harmful substances as a consequence of human activities.
Population	Population is defined as the total number of individuals of the species or taxon.
Registered Interested and Affected Party	In relation to an application, means an interested and affected party whose name is recorded in the register opened for that application in terms of regulation 42 of the 2014 EIA Regulations.
Riparian Habitat	The physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.
Scoping	This refers to the process of determining the spatial and temporal boundaries (the extent) for the EIA and key issues to be addressed in an environmental assessment.
Significant Impact	An impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence.
Specialist	A person that is generally recognised within the scientific community as having the capability of undertaking, in conformance with generally recognised scientific principles, specialist studies or preparing specialist reports, including due diligence studies and socio-economic studies.
Species	A group of organisms that resemble each other to a greater degree than members of other groups and that form a reproductively isolated group that will not produce viable offspring if bred with members of another group.
Taxon (Taxa):	Any group of organisms considered to be sufficiently distinct from other such groups to be treated as a separate unit.
Throughput Capacity	The design capacity or maximum capable capacity of a facility, structures or infrastructure, whichever is the greater.
Urban Edge	Areas situated within the urban edge (as defined or adopted by the competent authority), or in instances where no urban edge or boundary has been defined or adopted, it refers to areas situated within the edge of built-up areas.
Vulnerable	A taxon is vulnerable when it is facing a medium risk of extinction in the wild in the medium-term future, defined as a 10% probability of extinction within 100 years.

Term	Definition
Waste	<p>Any substance, whether or not that substance can be reduced, re-used recycled and recovered –</p> <ul style="list-style-type: none"> a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of; b) which the generator has no further use of for the purposes of production; c) that must be treated or disposed of; and d) that is identified as a waste by the Minister by notice in the Gazette. <p>It includes waste generated by the mining, medical, and other sector, but-</p> <ul style="list-style-type: none"> i) a by-product is not considered waste; and ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste.
Watercourse	<p>The National Water Act (Act No. 36 of 1998) defines a watercourse as:</p> <ul style="list-style-type: none"> a) A river or spring; b) A natural channel in which water flows regularly or intermittently; and c) a wetland, pan, lake or dam into which, or from which, water flows; and any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998). <p>A reference to a watercourse includes, where relevant, its bed and banks;</p>
Wetland	<p>Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.</p>

1 DOCUMENT ROADMAP

This document serves as the Final Scoping Report (FSR) for the proposed Mookodi-Mahikeng 400kV Powerline, in the North West Province. In order to provide clarity to the reader, a document roadmap is provided in **Table 1** below. The document roadmap provides information on the requirements of the 2014 Environmental Impact Assessment (EIA) Regulations, as amended (07 April 2017) as stipulated in Appendix 2 of Government Notice (GN) No. R. 982, as promulgated in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998) as well as a guide on the content of each chapter. Please note that in some cases more information is provided than required in the EIA Regulations in which case there will be no correlating section to these EIA Regulations.

Table 1: Document Roadmap

Chapter	Title	Correlation with Appendix 2 of GN No. R. 982	
1.	Document Roadmap	-	-
2.	Purpose of this Document	1 (a)	Identify the relevant policies and legislation relevant to the activity
		1 (b)	Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location
		1 (c)	Identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks
		1 (d)	Identify and confirm the preferred site, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment
		1 (e)	Identify the key issues to be addressed in the assessment phase
		1 (f)	Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence,

Chapter	Title	Correlation with Appendix 2 of GN No. R. 982	
			extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site
		1 (g)	Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored
3.	Environmental Assessment Practitioner (EAP)	2 (1) (a)	Details of – i) the EAP who prepared the report; and ii) the expertise of the EAP, including a curriculum vitae
4.	Project Background and Motivation	2 (1) (f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity within the context of the preferred location
5.	Project Location	2 (1) (b)	The location of the activity including – i) The 21 digit Surveyor General code of each Cadastral land parcel; ii) Where available, the physical address and farm name; and iii) Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundary of the property or properties
		2 (1) (c)	A plan which locates the proposed activity or activities applied for at an appropriate scale, or if it is – i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is undertaken; and ii) On land where the property has not yet been defined, the coordinates within which the activity is to be undertaken
6.	Project Alternatives	2 (1) (g)	A full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including: i) Details of all alternatives considered; ix) The outcome of the site selection matrix; and x) If no alternatives including alternative locations for the activity were investigated, the motivation for not considering such

Chapter	Title	Correlation with Appendix 2 of GN No. R. 982	
7.	Project Description	2 (1) (d)	A description of the scope of the proposed activity, including – i) All listed and specified activities triggered; and ii) A description of the activities to be undertaken, including associated structures and infrastructure
8.	Legislation and Guidelines Considered	2 (1) (e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process
9.	Scoping and EIA Process	-	-
10.	Assumptions and Limitations	-	-
11.	Need and Desirability	2 (1) (f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity within the context of the preferred location
12.	Profile of the Receiving Environment	2 (1) (g)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including: iv) The environment attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects
13.	Public Participation	2 (1) (G)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including: ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations including copies of supporting documents and inputs; and iii) A summary of the issues raised by IAPS and an indication of the manner in which the issues were incorporated or the reasons for not including them
14.	Environmental Issues	2 (1) (g)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including:

Chapter	Title	Correlation with Appendix 2 of GN No. R. 982	
			<ul style="list-style-type: none"> v) The impacts and risks which have informed the identification of each alternative including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts – <ul style="list-style-type: none"> aa) can be reversed, bb) may cause irreplaceable loss of resources; and cc) can be avoided, managed or mitigated vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; and viii) The possible mitigation measures that could be applied and level of residual risk
15.	Methodology to Assess the Identified Impacts	2 (1) (g)	<p>A full description of the process followed to reach the proposed preferred activity, site and location within the site, including:</p> <ul style="list-style-type: none"> vi) The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives
16.	Plan of Study for EIA	2 (1) (h)	<p>A plan of study for undertaking the environmental impact assessment process to be undertaken including –</p> <ul style="list-style-type: none"> i) A description of the alternatives to be considered and assessed within the preferred site including the option of not proceeding with the activity; ii) A description of the aspects to be assessed as part of the EIA process; iii) Aspects to be assessed by specialists; iv) A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists; v) A description of the proposed method of assessing duration and significance; vi) An indication of the stages at which the competent authority will be consulted;

Chapter	Title	Correlation with Appendix 2 of GN No. R. 982	
			<ul style="list-style-type: none"> vii) Particulars of the public participation process that will be conducted during the EIA Phase; viii) A description of the tasks that will be undertaken as part of the EIA Phase; and ix) Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.
17.	Oath of the EAP and Declaration of Independence	2 (1) (g)	<p>A full description of the process followed to reach the proposed preferred activity, site and location within the site, including:</p> <ul style="list-style-type: none"> xi) A concluding statement indicating the preferred alternative, including preferred location of the activity
		2 (1) (i)	<p>An undertaking under oath or affirmation by the EAP in relation to:</p> <ul style="list-style-type: none"> i) The correctness of the information provided in the report; ii) The inclusion of comments and inputs from stakeholders and IAPS; and iii) Any information provided by the EAP to IAPS and any responses by the EAP to comments or inputs made by IAPS
		2 (1) (j)	<p>An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and IAPS on the Plan of Study for undertaking the EIA</p>
-		2 (1) (k)	Where applicable, any specific information required by the Competent Authority
-		2 (1) (l)	Any other matters required in terms of sections 24(4)(a) and (b) of the Act
-		2 (2)	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a scoping report, the requirements as indicated in such notice will apply

Note that the following sections of Appendix 2 of GN No. R. 982 of the 2014 EIA Regulations (as amended) will be investigated further and reported on in the EIA Report, following the execution of the relevant specialist studies and targeted public participation:

- Section 2(1)(g)(v) - The impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts -
aa) can be reversed;
bb) may cause irreplaceable loss of resources; and
cc) can be avoided, managed or mitigated.
- Section 2(1)(g)(vii) - Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.
- Section 2(1)(g)(viii) - The possible mitigation measures that could be applied and level of residual risk.
- Section 2(1)(g)(ix) - The outcome of the site selection matrix.
- Section 2(1)(g)(xi) - A concluding statement indicating the preferred alternatives, including preferred location of the activity.

2 PURPOSE OF THIS DOCUMENT

The FSR is an important document as it is the first phase of the EIA Process and thus outlines the Scoping Process to be followed for the proposed Mookodi-Mahikeng 400kV Powerline which aims to:

1. Introduce the proposed project to all Interested and Affected Parties (IAPs);
2. Engage with IAPs to allow for participation in the process that is transparent, cooperative, informative and robust. Allow for informed decision-making with regard to the EIA process;
3. Identify the significant issues and impacts to be investigated further during the execution of the EIA phase;
4. Consider suitable and feasible alternatives for achieving the project's objectives; and
5. Determine the scope of the ensuing EIA phase in terms of specialist studies, public participation, assessment of impacts and appraisal of alternatives.

Further, according to Appendix 2 of the 2014 EIA Regulations (as amended), the objectives of the Scoping Process are, through consultation, to:

- a. Identify the relevant policies and legislation relevant to the activity;
- b. Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- c. Identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks;

- d. Identify and confirm the preferred site, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- e. Identify the key issues to be addressed in the assessment phase;
- f. Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- g. Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

The Draft Scoping Report (DSR) was made available for the public and authorities to review and provide comments on during a 30-Day review period, which took place from 12 February 2018 to 13 March 2018. The Application Form for Environmental Authorisation (EA) was submitted at the same time as the DSR to the Competent Authority: The Department of Environmental Affairs (DEA). The regulated timeframes for the process started from the date of receipt of the application by DEA, according to Section 21(1) of GN R. 982 of the 2014 EIA Regulations (as amended).

The comments received from registered IAPs during the DSR review period (as well as the minutes of the Public Meetings) have been incorporated into the FSR. The FSR contains the updated Comments and Responses Report (CRR). The FSR will be made available for registered IAPs to ensure their comments have been addressed. The FSR will then be submitted to the DEA. Comments received by IAPs will help shape the subsequent EIA Phase to ensure the relevant studies are in place to assess specific impacts.

3 ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nemai Consulting was appointed by Eskom Holdings (SOC) Ltd as the Independent Environmental Assessment Practitioner (EAP) to undertake the EIA for the proposed Mookodi-Mahikeng 400kV Powerline. In accordance with Section 2 (1)(a) of Appendix 2 of GN No. R. 982 of the 2014 EIA Regulations (as amended), this section provides an overview of Nemai Consulting and the company's experience with EIAs, as well as the details and experience of the EAPs that form part of the Scoping and EIA team.

Nemai Consulting is an independent, environmental, social development and Occupational Health and Safety (OHS) consultancy, which was founded in December 1999. The company is directed by a team of experienced and capable environmental engineers, scientists, ecologists, sociologists, economists and analysts. The core members of Nemai Consulting that are involved with the Scoping and EIA Process for the proposed development are captured in **Table 2** below, and their respective Curricula Vitae are contained in **Appendix 1**.

Table 2: Scoping and EIA core team members

Name	Qualification	Responsibility
Mrs N. Naidoo	BSc – Eng (Chem)	Project Manager and Environmental Engineering
Ms K. Robertson	MSc – Environmental Sciences	Project Leader and EAP for EIA Process, Scoping & EIA Report, and Public Participation
Mr. C van der Hoven	B.Sc. Hons – Environmental Science	EAP and Public Participation
Mr D. Henning	MSc – River Ecology	EAP and Public Participation

4 PROJECT BACKGROUND AND MOTIVATION

The North West Province sources its generation supply from Matimba and Grootvlei power stations, as well as from the Apollo DC converter station. Within the province, the two Customer Load Centres (CLC) are Rustenburg and Carletonville. The Carletonville CLC consists of Hermes, Pluto, Midas, Watershed substations as well as the newly-built Mookodi substation.

However, the existing Watershed substation is currently un-firm and has insufficient capacity to support the forecasted load in the area, which includes Lichtenburg and extends to Mahikeng town. The Watershed substation has technical constraints as it has insufficient transformation capacity and poor voltage profile in the 20 year planning horizon, starting from year 2016 till year 2036. The substation experiences capacity and voltage regulation constraints on the 275kV in-feeds to the Watershed substation. There is also anticipated load growth in the Mafikeng area, the forecast shows potential for other economic drivers in Carletonville (particularly in the Watershed/Mafikeng area) such as industrial, commercial and electrification to re-introduce positive load growth trends, thus indicating a need for further enhancement of capacity in the area.

Hence there is a need for further network expansion through establishing a new transmission substation in Mahikeng. There are several projects underway to alleviate the constraint problems and this is referred to as the Watershed Strengthening Scheme. As part of establishing the site for the proposed Mahikeng substation, Mahikeng substation will be

designed with an end state of 3x 500MVA 400/132kV transformers and install 2x 500MVA 400/132kV transformers initially. A 1x 160km Pluto – Mahikeng 400kV line will also be established. These two project components are currently undergoing a separate EIA Process. The proposed project as part of this EIA Process is for the approximate 180km Mookodi - Mahikeng 400kV Powerline. The integration of Mafikeng substation comprises establishment of a Pluto-Mahikeng 400kV line and the Mookodi-Mahikeng 400kV line (**Figure 1**).



Figure 1: Mahikeng substation integration via Pluto and Mookodi substations

The proposed Pluto-Mahikeng 400kV line and Mahikeng substation would be constructed before the Mookodi-Mahikeng 400kV line. The Mookodi-Mahikeng 400kV Line is thus required to transmit electricity to the new Mahikeng Substation, in which the proposed Pluto – Mahikeng 400kV line will improve reliability of the Watershed Substation constraints which are not sufficient to support and supply the demand growth in Mahikeng town.

The study is dependent on the proposed Mookodi and Ngwedi substations which will de-load Watershed load by approximately 180MW by year 2021, of which 100MW is to Mookodi and 80MW to Ngwedi substation. The load shifts from Watershed creates some relief in load however it is not sufficient in restoring the firm capacity in the 20 year planning horizon. There is however a project to install a 250MVA 275/132kV transformer and capacitor banks on the 88kV and 132kV bus bar by year 2021 which improves Watershed firm capacity in the short term. The load growth at Mahikeng and the limitations of the existing Watershed substation

triggers the need for the new transmission injection in Mahikeng substation to be established at the load center to accommodate the new load, de-load Watershed and align with the long term strategic view for regional trade.

5 PROJECT LOCATION

5.1 Geographical Context

The proposed project is situated within the Naledi Local Municipality (LM), Kagisano-Molopo LM, Ratlou LM, and Mahikeng LM in the North West Province (**Figures 2 and 3**). Refer to **Appendix 2** for A3 maps. The proposed alternative routes for the line start in Vryburg at the existing Mookodi substation and travel in a north-east direction where the line ends near Mahikeng at the proposed Mahikeng substation site (**Figures 4 and 5**).

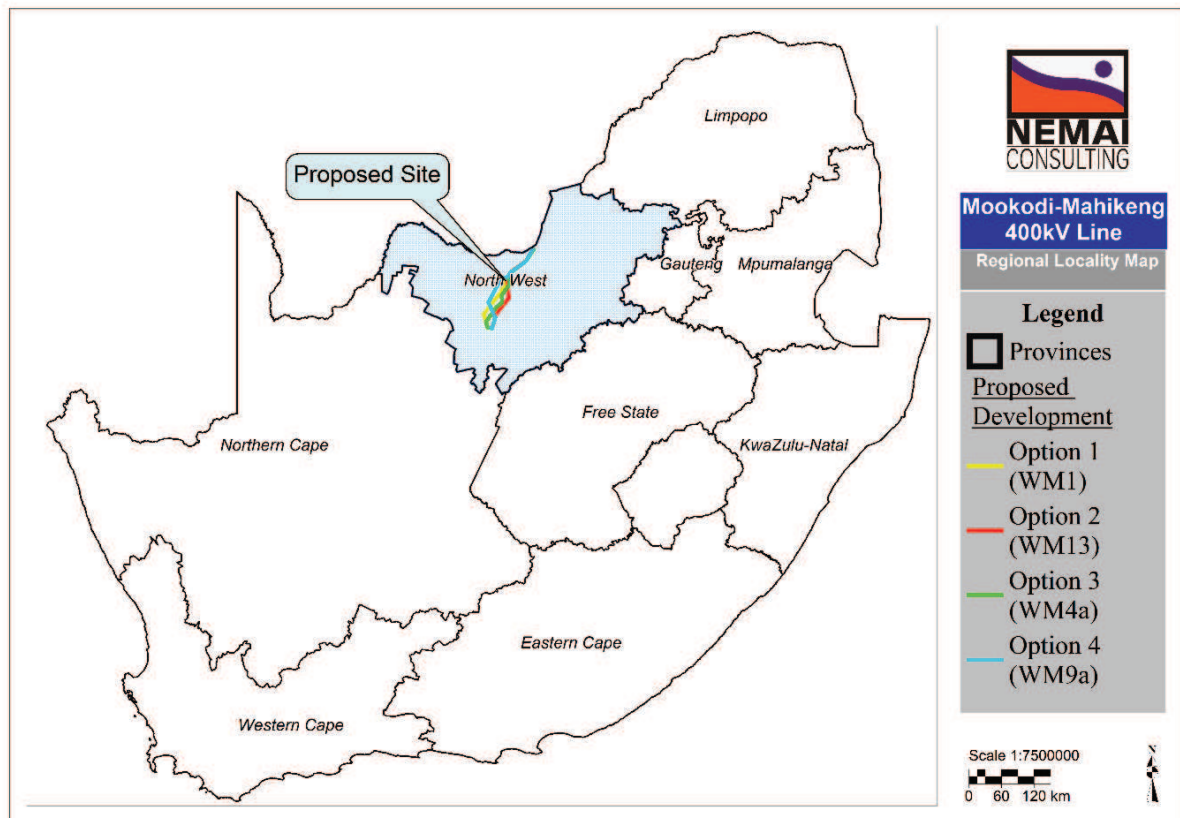


Figure 2: Regional locality map

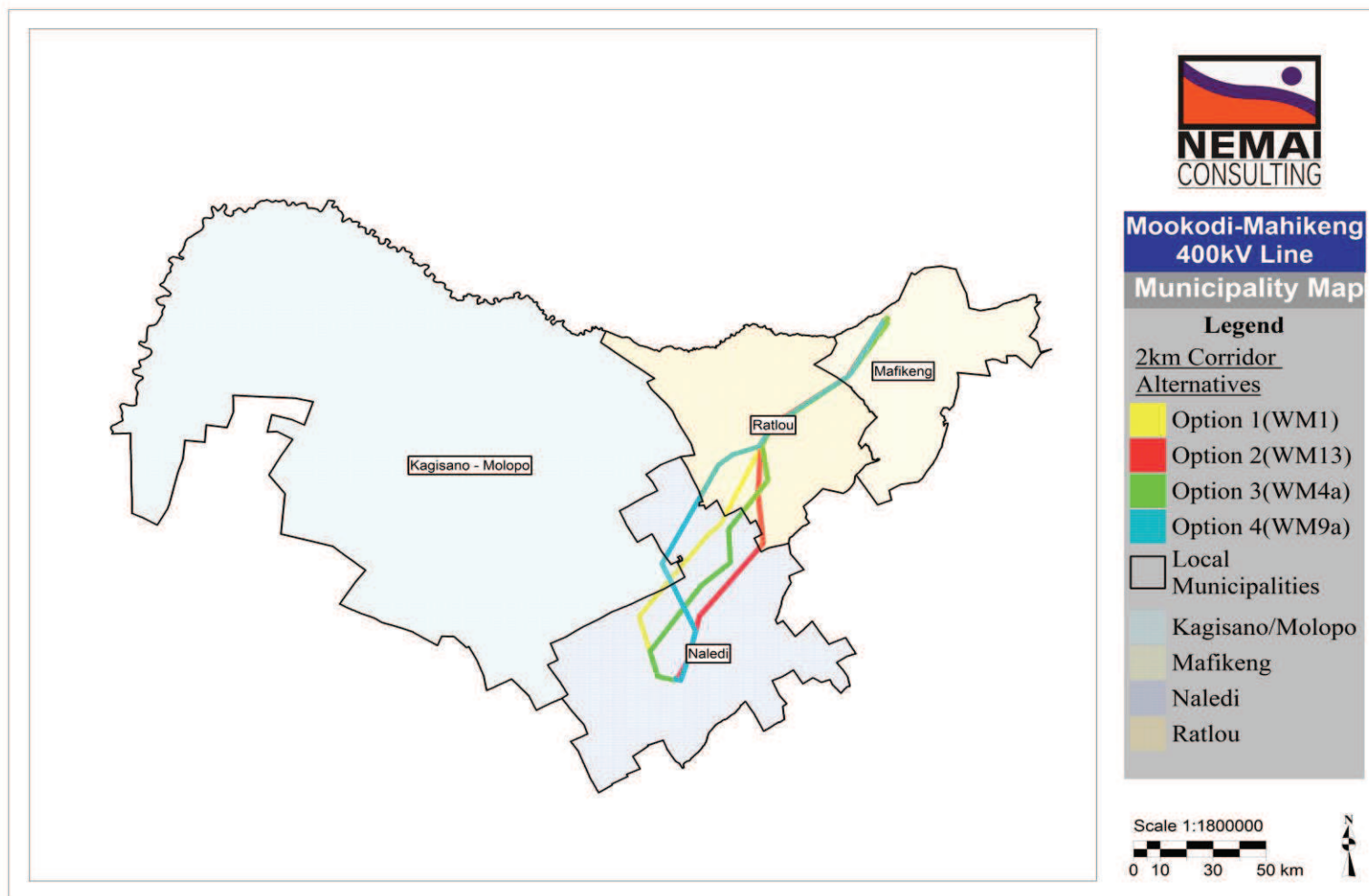


Figure 3: Municipality map

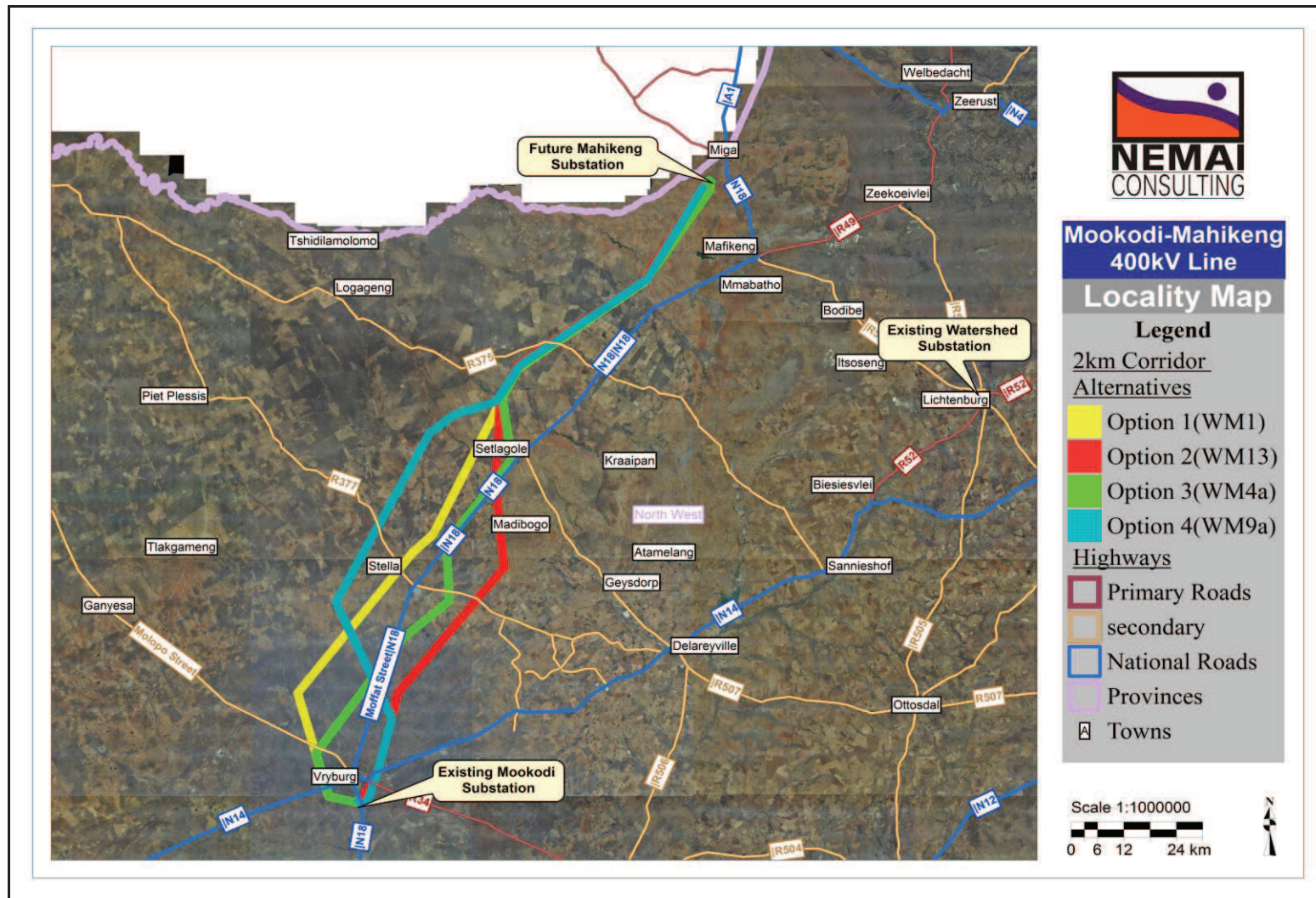


Figure 4: Locality map of the study area

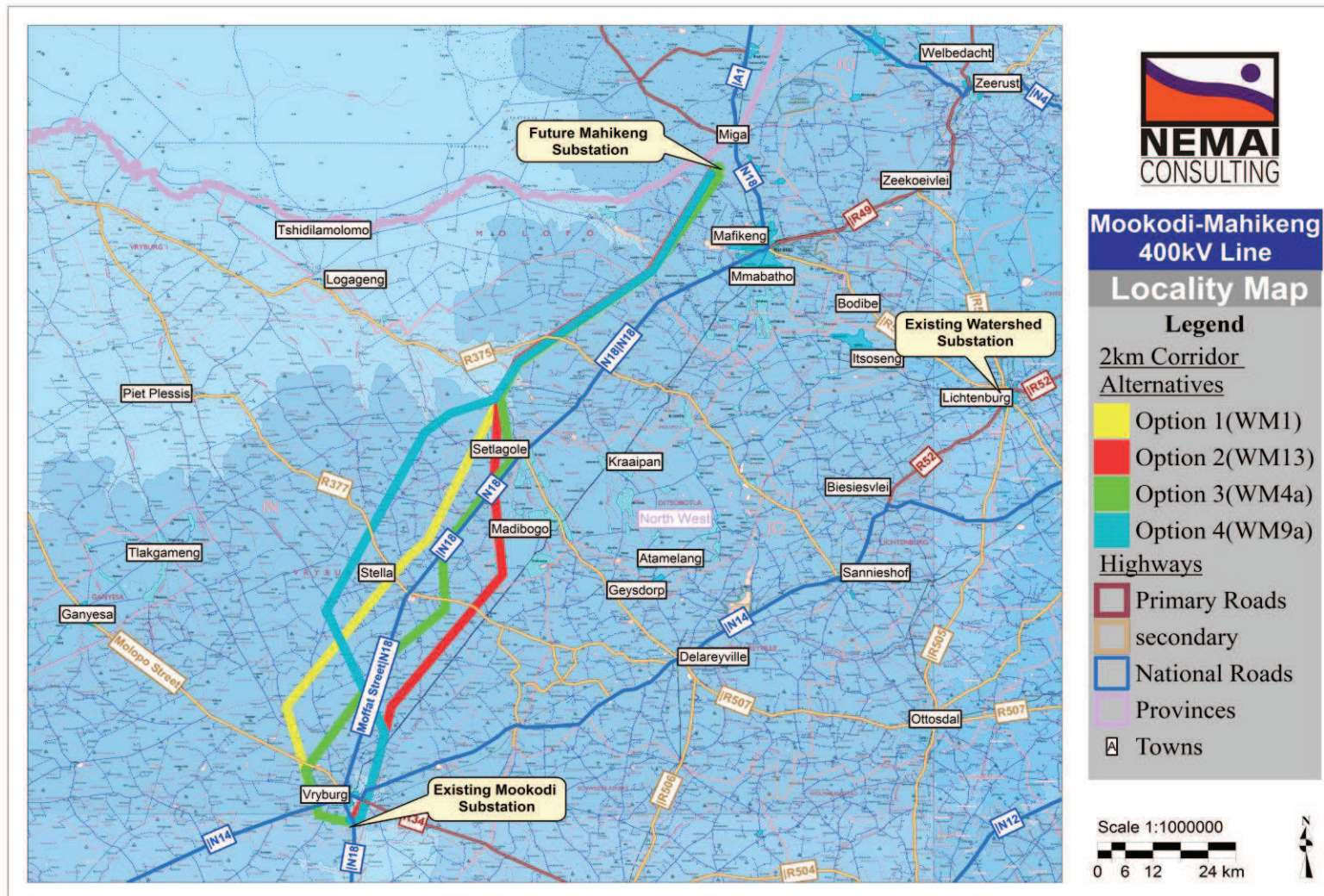


Figure 5: 1 in 250 000 Topographical map of the study area

The start point for the proposed Mookodi-Mahikeng 400kV Powerline is located at the existing Mookodi substation in Vryburg (**Figures 6 and 7**).

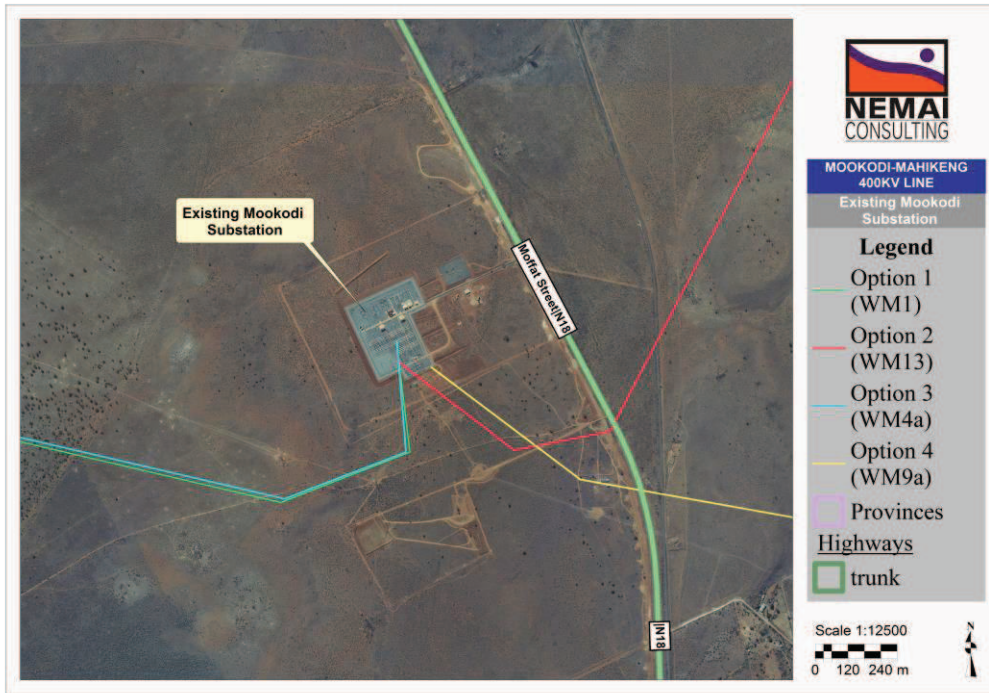


Figure 6: Existing Mookodi substation and start point for the proposed development



Figure 7: Photograph of the Mookodi substation

Figure 8 shows some photographs of the study area along the alternative route options. Refer to **Appendix 3** for additional photographs of the study area.



Figure 8: Photographs of the study area

The end point for the proposed Mookodi-Mahikeng 400kV Powerline is located in Mahikeng where the powerline will tie into the future Mahikeng substation (**Figure 9**).

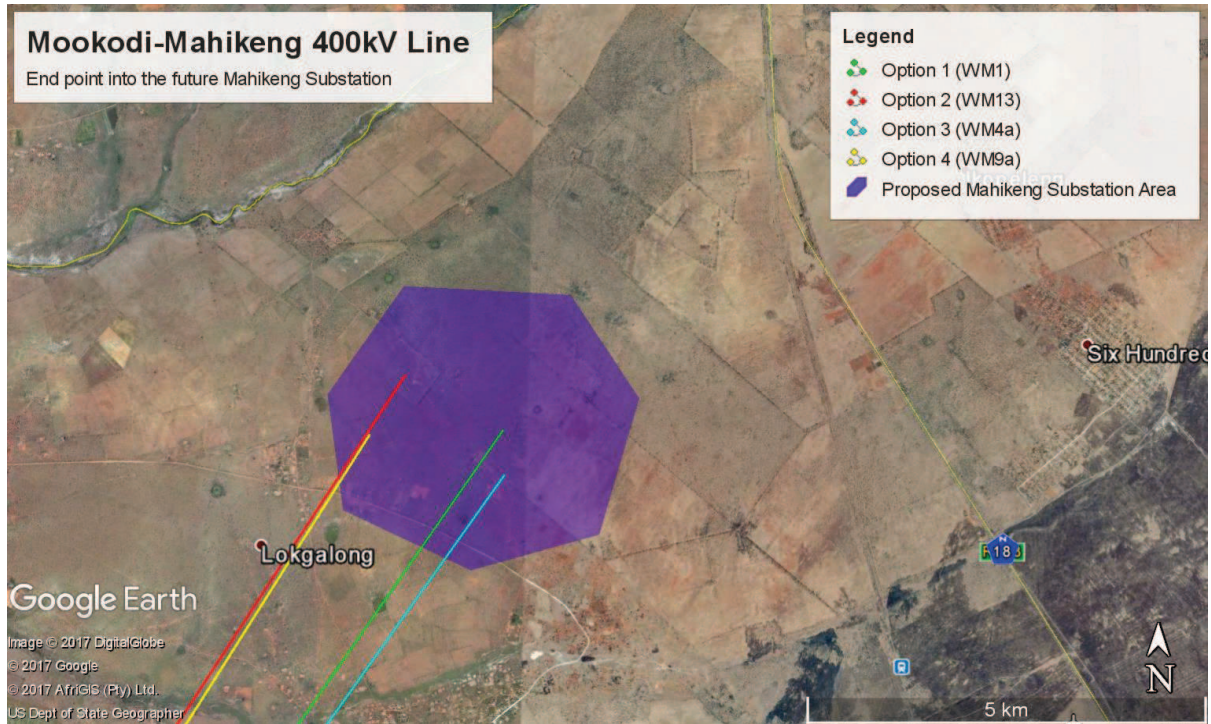


Figure 9: End point for the proposed development

5.2 Affected Properties

The proposed powerline alternative options are mostly located on privately-owned properties that are primarily used for agricultural practices. **Figure 10** shows the cadastral map for the study area, please refer to **Appendix 2** for larger maps. The study area was divided into four sections (**Figure 11**) to provide zoomed-in maps of the affected properties. **Figures 12 to 15** show the affected farm names and portions by the four proposed alternative route options.

Details of the properties that are affected by the 2km corridor for each alternative route are contained in the Landowner Database in **Appendix 5**.

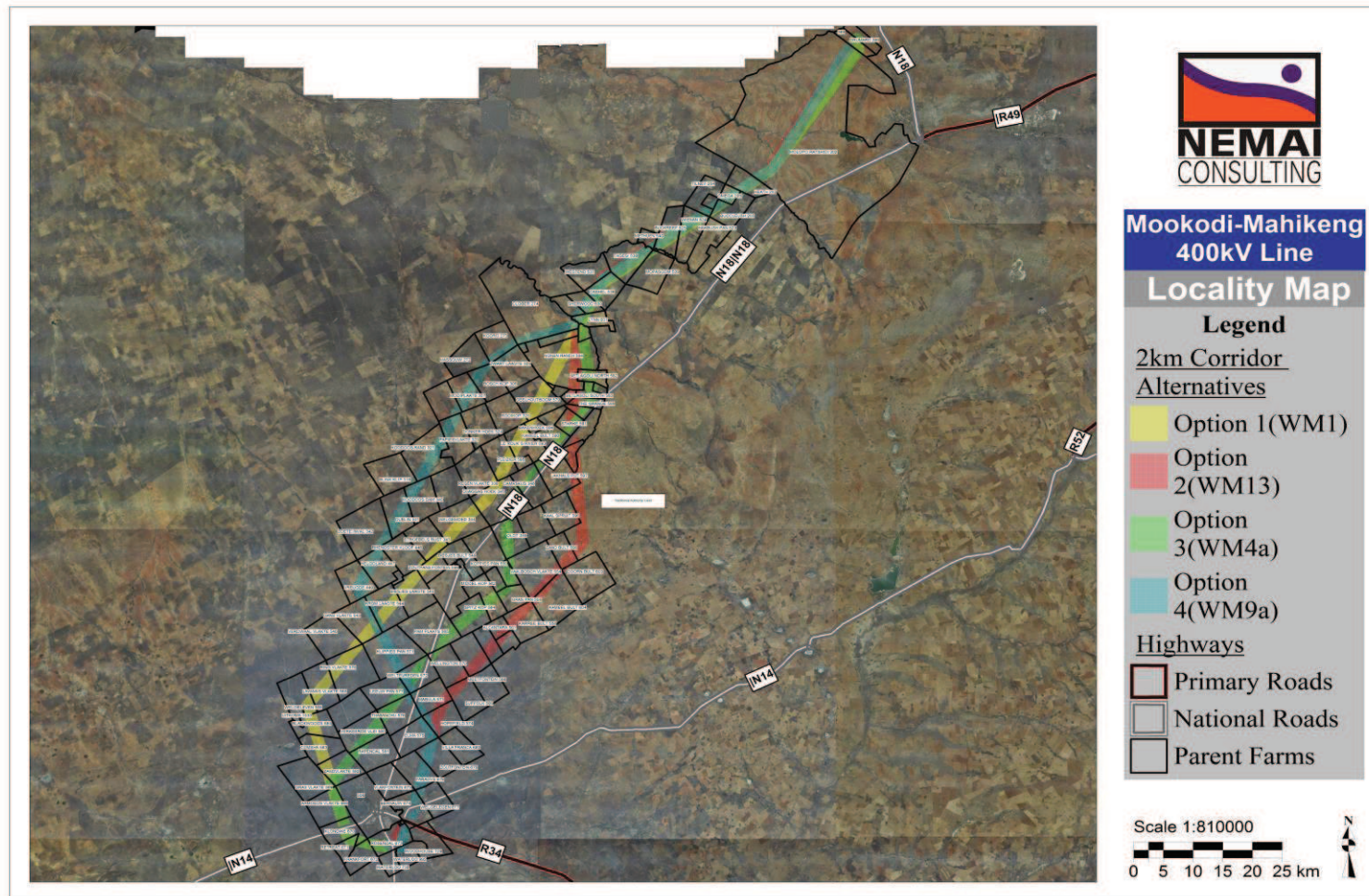


Figure 10: Cadastral map of the study area

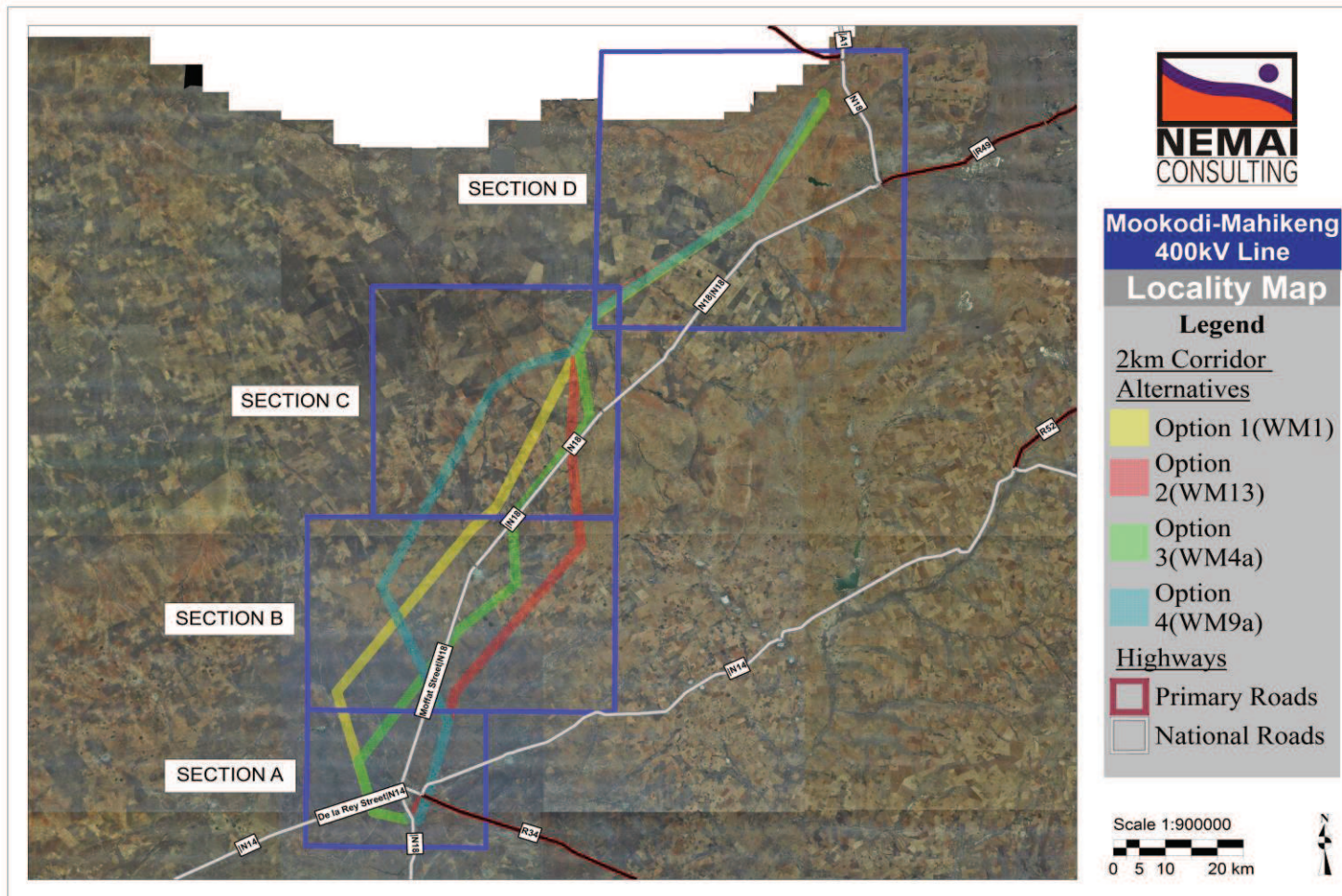


Figure 11: Sections of the study area to be zoomed-in

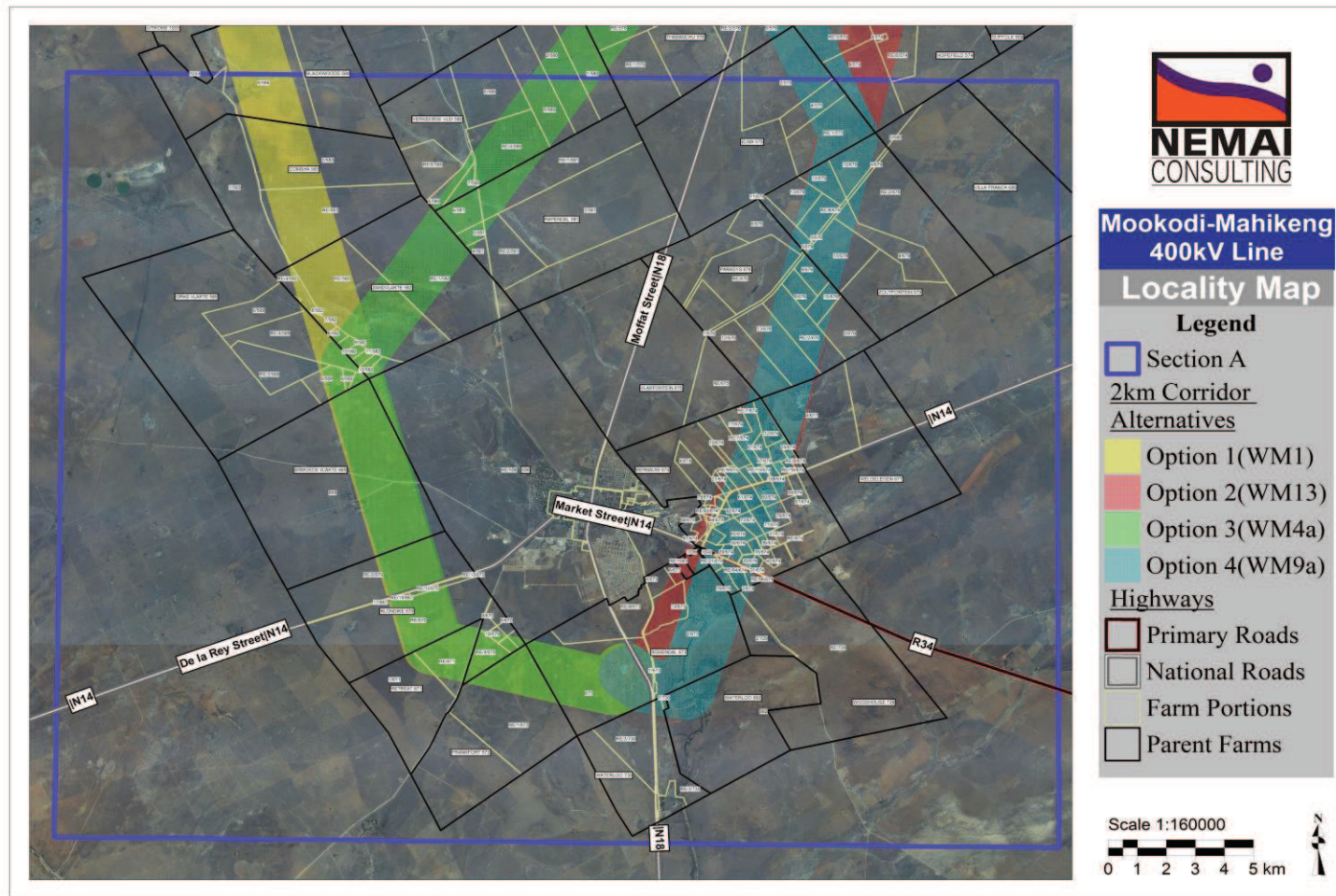


Figure 12: Section A farm portions

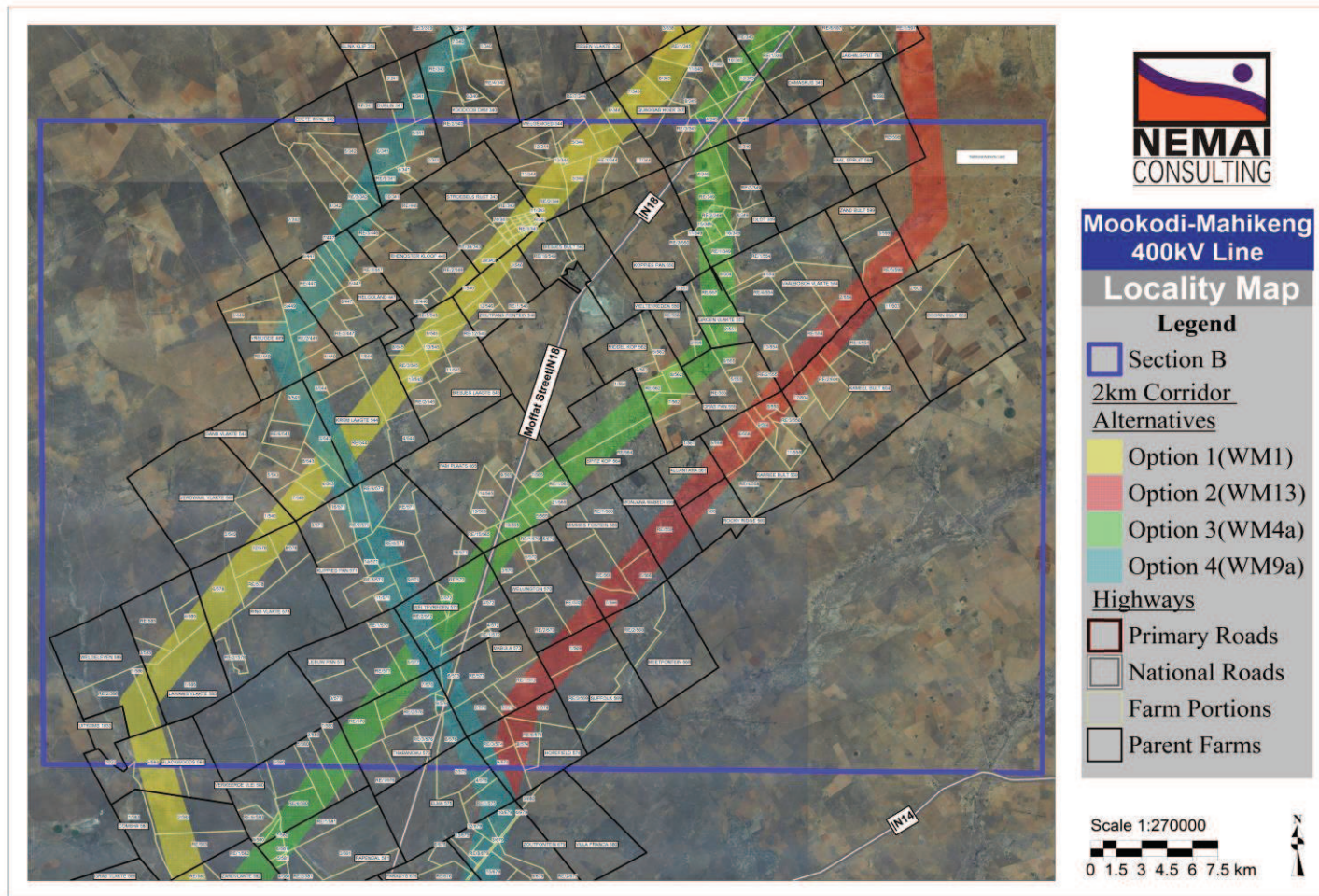


Figure 13: Section B farm portions

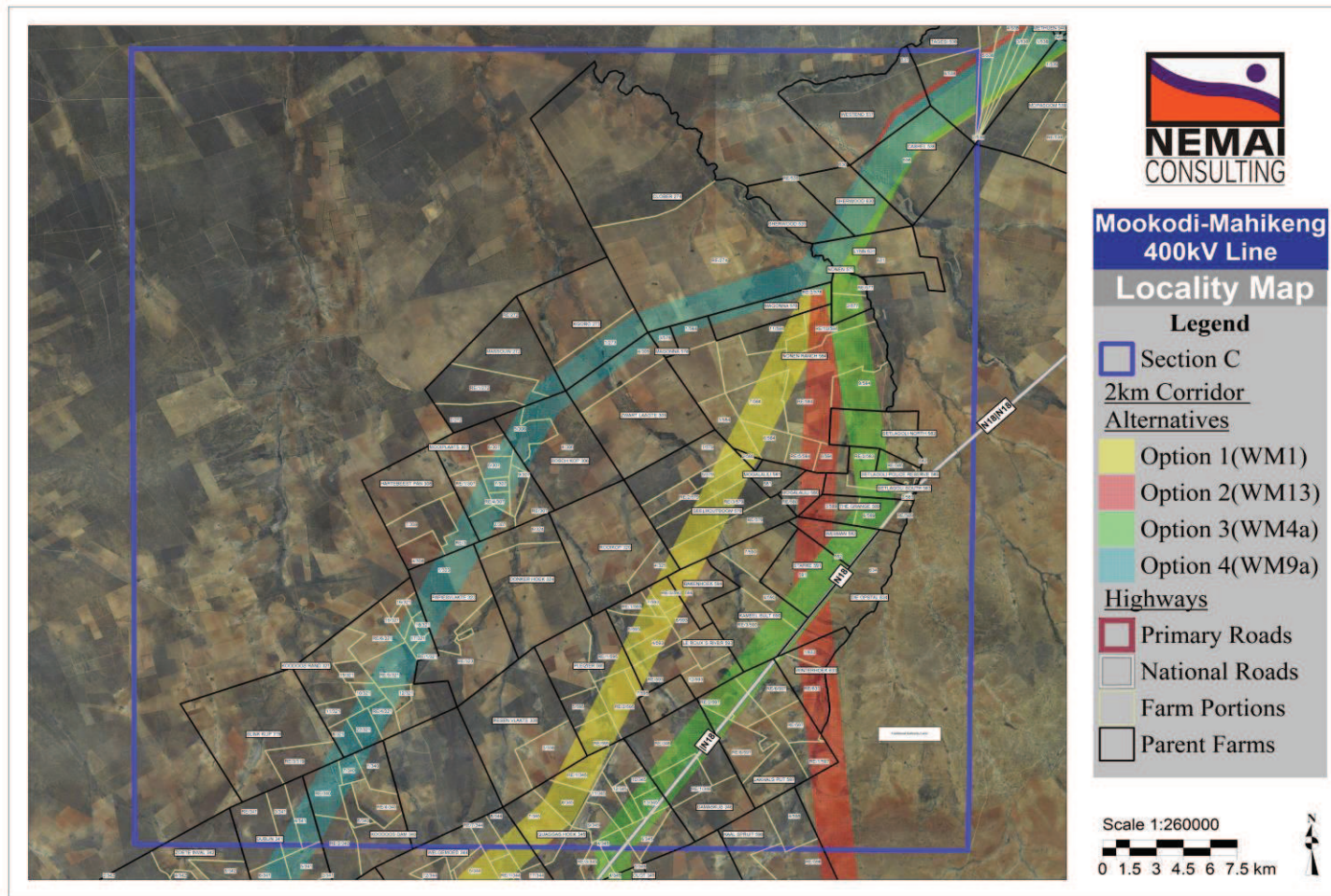


Figure 14: Section C farm portions

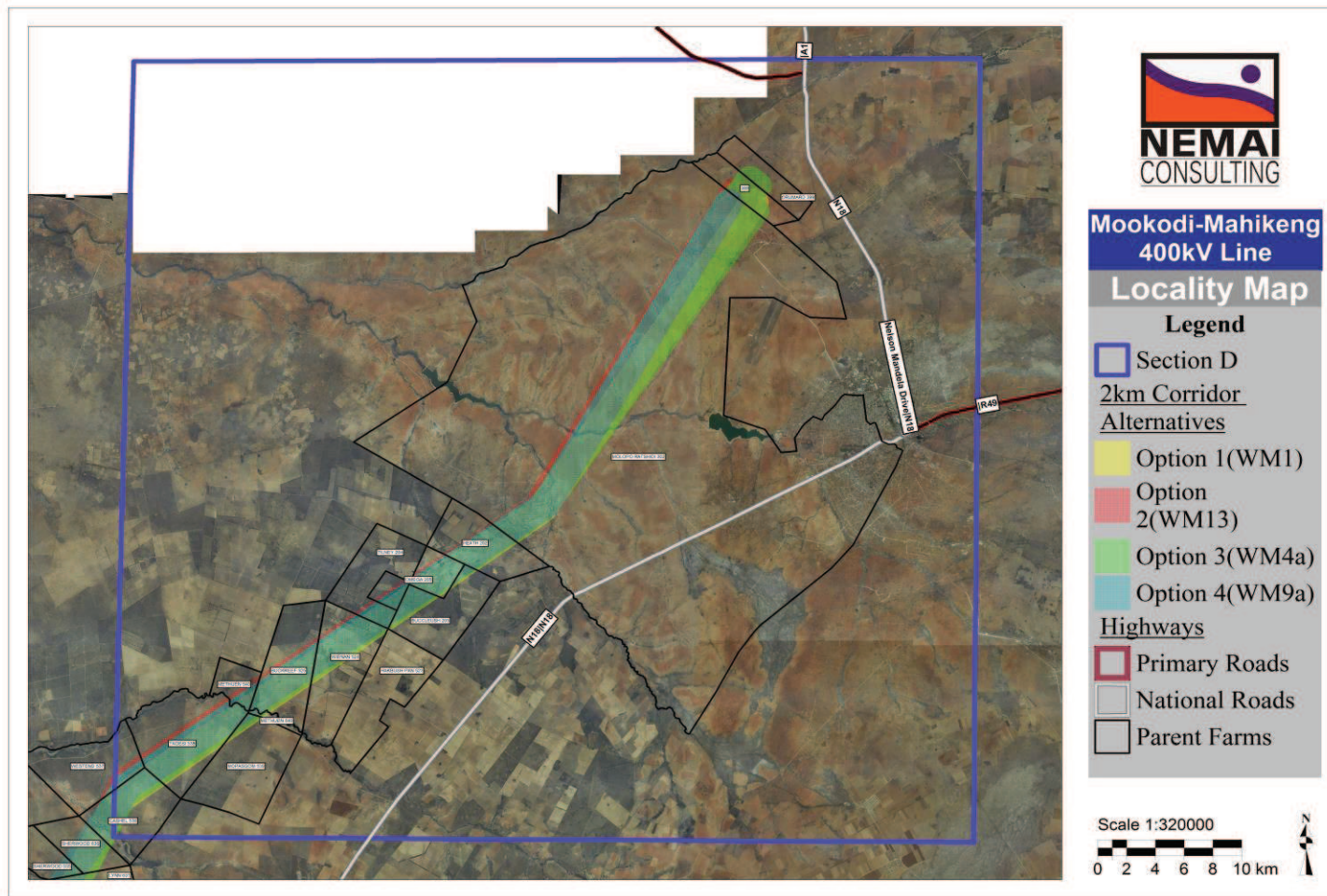


Figure 15: Section D farm portions

6 PROJECT ALTERNATIVES

The 2014 EIA Regulations (as amended) require that feasible project specific alternatives are identified (including the “do nothing” option). The Regulations define alternatives as the following:

Different means of meeting the general purpose and requirements of the activity, which may include alternatives to:

- *Property on which or location where the activity is proposed to be undertaken;*
- *Type of activity to be undertaken;*
- *Design or layout of the activity;*
- *Technology to be used in the activity; or*
- *Operational aspects of the activity; and*
- *Includes the option of not implementing the activity.*

The sub-sections to follow discuss the project alternatives considered during the Scoping Process. The EIA Process will provide a detailed comparative analysis of the feasible alternatives from environmental (including specialist input) and technical perspectives.

By conducting the comparative analysis, the Best Practicable Environmental Option (BPEO) can be selected with technical and environmental justification. Münster (2005) defines BPEO as the alternative that “provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term”.

In terms of the 2014 EIA Regulations (as amended) under NEMA, the fundamental purpose of the Scoping exercise is the consideration of viable and reasonable alternative sites, processes, and technologies of achieving the objectives of the project. The aim of this comparative environmental analysis is to make the necessary environmental input in the decision making processes in selecting a route for the powerline that is environmentally sustainable, socially acceptable, and economically viable.

6.1 Transmission Line Corridor Route Selection Process

As part of the Botswana – South Africa (BOSA) transmission interconnector project, a report was compiled on the Transmission Line Corridor Route Selection Process (2017) by Aurecon South Africa (Pty) Ltd. The transmission line corridors considered in the report include the Mahikeng substation (referred to as Watershed B in the report) to Mookodi and Pluto substations, respectively. The utilisation of this process is to deliver a common understanding of the methodology, key concepts, results and outcomes of a route selection process and provides benefit both in terms of enhancing stakeholders skills in the route selection process

methodology, and achieves an outcome of a structured and verifiable improved understanding of the Mahikeng line corridors, for application within the broader BOSA project context.

The Transmission Line Corridor Route Selection Process Report (2017) documents the route selection, Multi-criteria Decision-Making Model (MCDM) and route optimisation processes for the selected line routes. Preferred routes to link the revised general location for the Mahikeng substation to Mookodi and Pluto have been selected as a consequence of following the methodology described in the report. These preferred routes have been used for the Scoping and EIA Process as alternative routes, as required in the 2014 EIA Regulations (as amended). The route selection process undertaken by Aurecon South Africa (Pty) Ltd is discussed below.

6.1.1 Identification of Potential Routes

The selection of the best route is an optimisation exercise, which aims to minimise the impacts on the environment and people, while accommodating technical challenges in the most cost-effective way. A rigorous process was followed to identify a range of potential route alignment corridors. The best practice base information used to inform these potential route alignments included the following factors:

1. Topography and slope
 - Slope and topography affects ease of construction and access for construction and maintenance;
 - Areas with the flattest topography should be selected as far as possible, to allow the straightest line possible to reduce costs and minimise the need for angle poles;
 - Avoid areas with slope exceeding 1:10; and
 - Slopes steeper than 1:18 are fatal flaws.
2. Water bodies
 - Large bodies of water should be avoided; and
 - The maximum span between the tower structures determines the maximum allowable water crossing.
3. Existing infrastructure and other land uses
 - Line routes should run parallel to roads where possible;
 - Minimise distance that lines run parallel to pipelines and railways to reduce possibility of induced current effects;
 - Where unavoidable to cross, safe clearance distances should be ensured;
 - Ensure line crosses at the shortest route over railway or road and avoid small angles of intersection;
 - Line heights and clearance areas around airports as determined by air traffic regulations;
 - The possibility of cavity or land-falls must be considered in areas with mining activity; and

- Overhead lines are not permitted through protected areas of military installations.
4. Other power lines
 - If unavoidable, ensure crossing of new line over existing where multiple towers and spans can be installed between existing parallel lines;
 - This reduces the possibility of all power supplies being simultaneously compromised if lines collapse; and
 - Consider positioning of wind energy converter and provide suitable clearance between rotors and overhead lines.
 5. Urban or residential areas
 - Line corridors must avoid residential areas;
 - Challenging in rural areas, where residential areas are not well demarcated; and
 - Relocation of people and their homes and assets may become necessary, which is time consuming and costly.
 6. Biodiversity
 - Avoid protected areas, sensitive aquatic and terrestrial ecological areas and pristine natural vegetation; and
 - Avoid bird flight paths, Important Bird areas and bird breeding and feeding areas.
 7. Heritage resources
 - Avoid sites with known archaeological, historical, religious or cultural value; and
 - Avoid tourist attractions.

Based on the above, 16 potential linkages between the proposed Mahikeng and Mookodi substations were identified (**Figure 16**). It should be noted that these route alignment corridors include buffer areas to allow for the exact siting to be informed by detailed assessment of the study route.

6.1.2 Screening Process

The screening for potential routes identified by Aurecon South Africa (Pty) Ltd was applied at a very coarse scale to identify any routes not fatally flawed by factors such as:

- Bird sensitive areas (especially problematic for transmission lines);
- Known sites of heritage / cultural significance;
- Large areas of subsistence and formal agriculture (high levels of compensation and possible resettlement);
- Line route too close to settlements and urban areas (potential to constrain future development); and
- Slopes too steep for construction.

A total of 5 corridors as potential routes were further screened by Aurecon South Africa (Pty) Ltd for a more detailed assessment: WM1, WM4a, WM9a, WM13 and WM16a (**Figure 17**).

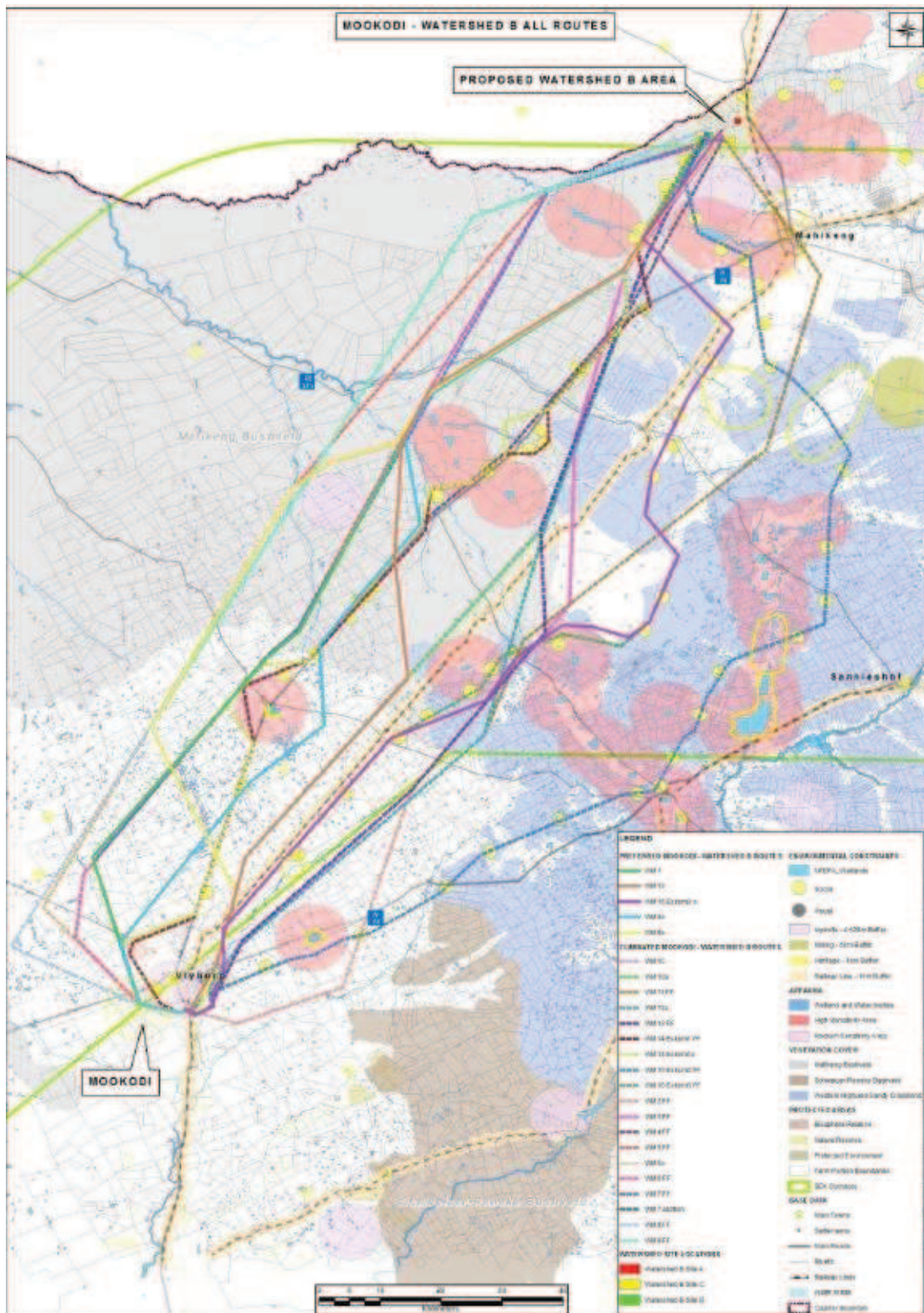


Figure 16: All route options between Mookodi and Watershed B substations, based on the outcomes of the route screening process (Transmission Line Corridor Route Selection Process Report, 2017)

6.1.3 Multi-criteria Decision-Making Model Process

The MCDM process is a discipline aimed at supporting decision makers who are faced with making numerous and conflicting evaluations. It highlights conflicts and derives a way to reach a compromise in a transparent process. The process of MCDM prioritises options against a set of criteria. This process is well-suited to address complex technical, strategic and planning challenges. The MCDM approach thus allows for technical, financial, strategic, environmental and social constraints to inform decision making at the earliest possible stages of the proposed project. This enhances the sustainability of the proposed project for its lifecycle and assists in ensuring a smoother transition through the project phases by identifying constraints early and planning for these in the design phase.

6.1.3.1 Criteria Considered in MCDM Process

The potential routes were assessed by Aurecon South Africa (Pty) Ltd against the criteria identified below. Specialist input was obtained to draw up the criteria, which are deemed to have most relevance to the selection of route alignments. While there are a number of criteria that need to be considered in the EIA phase when assessing the significance of impacts related to the proposed developments, the only criteria that are considered in route selection are those criteria that differentiate one route against another.

- **Technical category:** This relates to the impact of a specific route alignment with regards to achieving the technical goals of the project while reducing cost and increasing ease of both construction and maintenance activities
 - Slope: Avoid steep slopes more than 1:10;
 - Access: Constructability and maintainability in terms of construction and access to site;
 - Length: Line length and associated cost; and
 - Width: Width of corridor allows for more than one landowner to facilitate landowner negotiations;
- **Environmental category:** This component refers to the need to select a route that minimises the risk to ecosystem functioning and environmental integrity. Therefore, the environmental criterion prioritises the anticipated impacts on the both terrestrial and aquatic fauna (especially avifauna who are negatively impacted by high voltage transmission lines) and flora
 - Biodiversity: Aquatic and terrestrial ecology; Ecological services; and
 - Avifauna: Flight paths; Nesting areas, Focal points;
- **Social category:** This aspect considers the impact of route alignment on people. Specifically avoiding residential areas, areas where assets and livelihoods may be affected (e.g. the loss of agricultural land for tower structures, the impact on tourism activities in game farm areas) and the need for compensation. Visual impacts and the impacts on heritage resources is also an important consideration in routing power lines

- Heritage: Archaeological and cultural heritage resources;
- Compensation: Homes or other assets that will require resettlement or other compensation;
- Communities: Proximity to existing large villages or towns that will remain, distance to communities, agricultural resources; and
- Visual: Visibility on ridges, potential tourism;
- Strategic category: This aspect relates to proximity to growth areas
 - Proximity: Proximity to potential growth areas.

The criteria were weighted to ensure that criteria considered as more important in terms of site selection were given more significance in the site selection process. The weighting is detailed below:

- Technical 25%
- Environmental 35%
- Social 35%
- Strategic 5%

6.1.3.2 Results of MCDM Process

The results of the MCDM for the alignments between Mahikeng and Mookodi substation are discussed below.

- Technical:
 - Technical criteria consider the cost and ease of both construction and operation, as well as other aspects such as landowner negotiations related to the physical properties of the line, which may increase costs and length of the process involved;
 - All routes scored equally for slope, indicating that there was no preference based on this criteria. No visible slope issues on any of the possible line routes. They all cross agricultural land which would pose no major issues to construction;
 - Most routes has access via farm roads. Preference was given to route WM4a due to its proximity to major roads. WM16a (197 km). is the longest route and least preferred on this criterion, while WM13 (175 km) is weakly preferred over WM1 (185 km), WM4a (186 km) and WM9a (184 km) and there is a strong preference over WM16a. Routes WM1, 4a, 9a and 13 all scored equally in first place for the criterion of width, allowing for more landowners to be accommodated within the corridor, weakly preferred over WM16a. All routes show no issues with servitude widths and potential to shift line routes during design. Route 16a however comes within close proximity to several settlements which might restrict the corridor width; and

- Overall, Route M4a was considered the best route for the Watershed B-Mookodi corridor from an overall technical perspective, followed extremely closely by WM13. Technical considerations ensure the most cost-effective solution for the lifecycle of the project for the planning stages, through construction and operation to decommissioning;
- Environmental:
 - Consideration of this aspect early on in the project planning ensures that constraints related to the biophysical environment are incorporated into the project at the earliest possible stage, contributing to environmentally responsible development and preventing project delays at a later stage in the project;
 - Ecology
 - Potential impacts on the biophysical environment include loss and alteration of terrestrial and aquatic habitat, loss of protected species and introduction of alien invasive plant species. The significance of the impact of a proposed transmission line is influenced by current level of disturbance along the route and the degree to which the proposed line will increase the levels of disturbance, as well as the uniqueness of the environmental resources that will be affected. Due to the nature of transmission lines, the construction phase is the most environmentally disruptive and many ecological systems can continue to function under the lines once operational. Limited area is lost through the construction of the towers and access roads. Animals will return to the site following construction. Environments with trees are most compromised by overhead lines as a corridor will need to be cleared and maintained as such to ensure sufficient clearance between the lines and trees. Most wetland areas within 2 km corridors can be avoided in the detailed design;
 - WM1 and WM4a both traverse similarly degraded areas of threatened ecosystem habitats wetland clusters, but WM4a avoids an additional future and a current protected area, which WM1 affects. WM9 is similar to WM1 but does not avoid a large wetland (pan) cluster. WM4a, when compared to WM9a, avoids a larger wetland (pan) cluster when compared to the wetland cluster it traverses and both traverse similarly degraded areas of threatened ecosystem habitats. WM16a as this avoids all wetland clusters and an additional proposed protected area, while traversing smaller and degraded portions of the Threatened Ecosystem habitats. However, there is a strong preference for WM13 as this avoids all wetland clusters, while traversing degraded portions of the Threatened Ecosystem habitats;
 - Avifauna

- One of the main considerations for high voltage lines is possible bird collisions with the conductors. The collision potential is influenced by the flight behaviour of sensitive species and visibility of the conductors. Breeding areas, roosting and feeding areas and migration routes all influence where there will be high avifaunal activity and which areas will be most sensitive in terms of avifauna. The following aspects were considered when ranking the routes in order of preference:
 - Proximity to vulture breeding areas
 - Proximity to Important Bird Areas (IBA)
 - Proximity to dams (avifaunal focal points)
 - Proximity to vulture restaurants (avifaunal focal points)
 - Proximity to protected areas
- WM4a is preferred as it traverses degraded areas. WM13 is preferred next as it also passes over degraded habitats and avoids wetlands. All other routes are strongly preferred over WM16a due to bird sensitive areas;
- The preference from both an ecological and an avifaunal impact perspective was for Route WM13. Environmental considerations ensure a more environmentally sustainable solution for the lifecycle of the project for the planning stages, through construction and operation to decommissioning;
- Social:
 - Consideration of this aspect early on in the project planning ensures that constraints related to the social environment incorporated into the project at the earliest possible stage, contributing to socially responsible development and preventing project delays at a later stage in the project;
 - Heritage
 - The rating of the alignments was focussed mainly on the occurrence of possible heritage sites. Due to the homogeneous natural and geographic landscape, it is difficult to attribute a geographic suitability factor to the environment that would dictate settlement patterns. The concentration of social nodes was also taken into consideration due to the possible occurrence of grave and burial sites associated with these communities which are considered heritage sites in themselves. The possible occurrence of Stone Age sites around the natural pans in the area was also considered during the evaluation phase, WM13 is the preferred route, followed by WM1 and then WS19a, while WS16a is the least preferred route;
 - Compensation and Communities
 - Both these criteria are influenced by the numbers and density of settlements and dwellings along the route, which must be avoided, as should places of interest along route. Resettlement is considered the most severe of social

impacts and is to be avoided wherever possible and it is advisable to avoid physically dividing properties. The shorter the route the better; and

- Routes WM4a, 9a and 13 were considered to have the same preference and these were all weakly preferred over WM1 and absolutely preferred over WM116a, based on the number of towns, settlements and farm houses and placed of interest along the route, as well as cadastral boundaries, indicating density of settlement;
- Visual
- Transmission lines can affect the aesthetic quality of a landscape from a visual perspective. The visual impacts are influenced by the length of corridor, the topography (more visual on higher lying areas versus lower lying areas), as well as the proximity to national roads and tourism attractions. From a visual perspective, WM9a is weakly preferred over three of the routes and strongly preferred over WM9a, which is the least preferred route from a visual perspective;
- The social considerations included the potential impacts on heritage resources, the landscape and community-related aspects. All these aspects combined to show Route WM13 as the most preferred route for the Watershed B-Mookodi corridor. Social considerations ensure a more socially sustainable solution for the lifecycle of the project from the planning stages, through construction and operation to decommissioning;
- Strategic:
 - All line routes are equivalent as there is no major infrastructure to consider within the proximity of the lines; and
 - This criterion considered the proximity of the line to potential growth areas in the future that would allow for potential to tap into the line in the future. All routes scored the same on this criterion and this was therefore not a differentiating factor in the route selection process.

All criteria were integrated to show the best routes overall. The integrated results of the MCDM process are shown below (**Figure 18**) based on the criteria used to assess the route alignment, showing how each alignment scored. The summary result finds an overall preference for Route WM13 for the Watershed-Mookodi linkage, with WM16a least preferred. The same order of route alignment preference was achieved with all criteria having the same weighting, although the degree of preference was minimally altered.

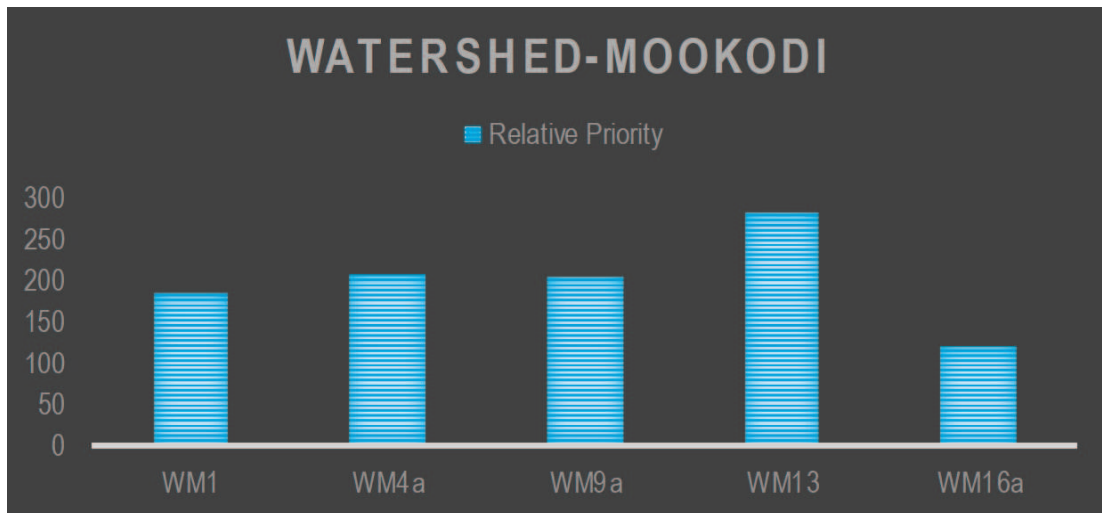


Figure 18: Watershed-Mookodi corridor overall preference

Based on the screening exercise above, Nemaï Consulting further eliminated Option WM16a (the least preferred option) as a result of the route falling within the Western Highveld Sandy Grassland which is Critically Endangered.

Nemaï Consulting will thus consider the following four alternative routes as feasible alternatives as part of the Scoping and EIA Process:

1. Option 1 (WM1);
2. Option 2 (WM13);
3. Option 3 (WM4a); and
4. Option 4 (WM9a).

Even though the summary result found an overall preference for Route WM13 for the Watershed-Mookodi linkage, all route alternatives will be assessed equally during the Scoping and EIA Process.

6.2 Feasible Route Alternatives

6.2.1 Option 1 (WM1)

Route Alternative Option 1 (WM1) is approximately 186km in length, and travels in a northwest direction from the starting point at Mookodi substation in Vryburg, where it then travels in a northeast direction passing on the western side of Stella, and runs parallel to the western side of the N18. This route involves major road crossings of the N14, R378 (also known as Molopo Street), R377, R376 and R375. All route alternatives then join and overlap the same footprint between the R376 and R375 road crossing where they run in a northeast direction to end in Mahikeng, at the proposed future substation site. Refer to **Figure 19**.

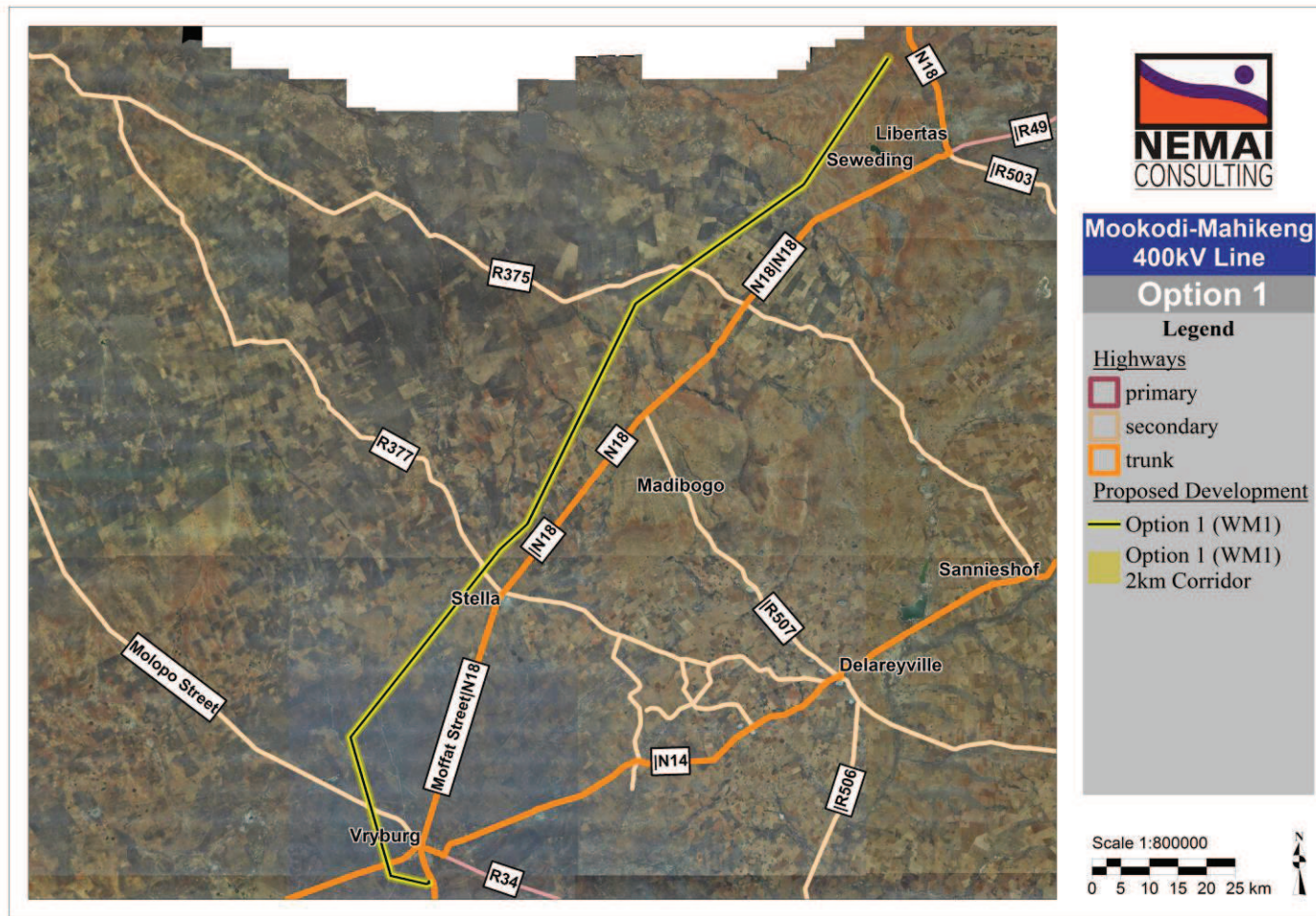


Figure 19: Route Alternative Option 1 (WM1)

6.2.2 Option 2 (WM13)

Route Alternative Option 2 (WM13) is approximately 176km in length, and travels in a northeast direction from the starting point at Mookodi substation in Vryburg, passing on the eastern side of Stella. This route runs on the eastern side of the N18 where it then crosses the N18 about half way of the route and then runs on the western side of the N18. This route involves major road crossings of the N18, R34, N14, R377, R376 and R375. All route alternatives join and overlap the same footprint between the R376 and R375 road crossing where they run in a northeast direction to end in Mahikeng at the future substation site. Refer to **Figure 20**.

6.2.3 Option 3 (WM4a)

Route Alternative Option 3 (WM4a) is approximately 187km in length, and travels in a northwest direction from the starting point at Mookodi substation in Vryburg, where it then heads in a northeast direction passing on the eastern side of Stella. This route runs parallel for a small section to the western side of the N18, where it then crosses the N18 and runs on the eastern side of the N18, where it then crosses the N18 again to run back on the western side of the N18. This route involves major road crossings of the N14, R378, N18, R377, R376 and R375. All route alternatives join and overlap the same footprint between the R376 and R375 road crossing where they run in a northeast direction to end in Mahikeng at the future substation site. Refer to **Figure 21**.

6.2.4 Option 4 (WM9a)

Route Alternative Option 4 (WM9a) is approximately 185km in length, and travels in a northeast direction from the starting point at Mookodi substation in Vryburg. This route then travels in a northwest direction where it crosses the N18. This route then runs parallel to the N18 passing on the western side of Stella. This route involves major road crossings of the N18, R34, N14, R377, R376 and R375. All route alternatives join and overlap the same footprint between the R376 and R375 road crossing where they run in a northeast direction to end in Mahikeng at the future substation site. Refer to **Figure 22**.

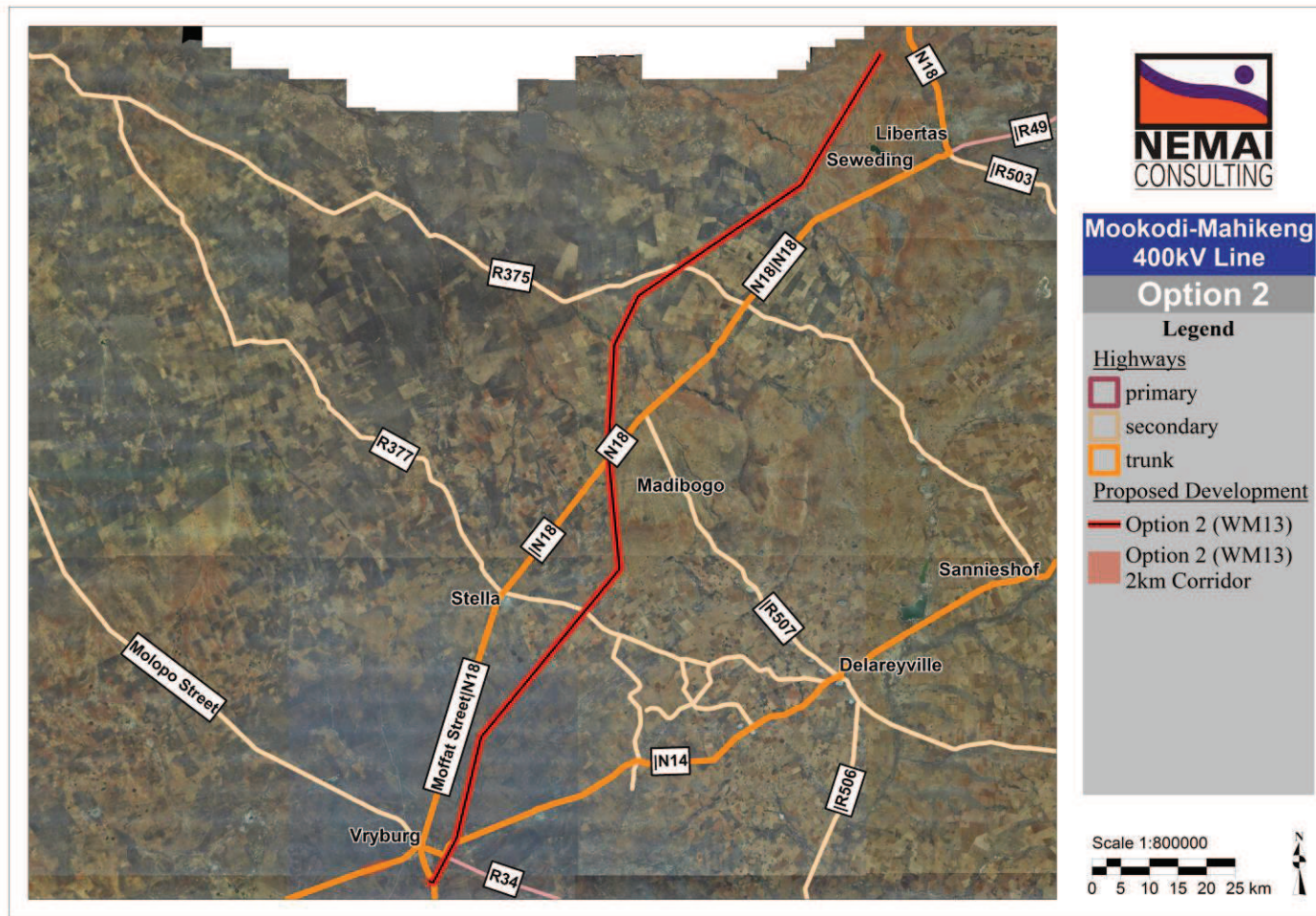


Figure 20: Route Alternative Option 2 (WM13)

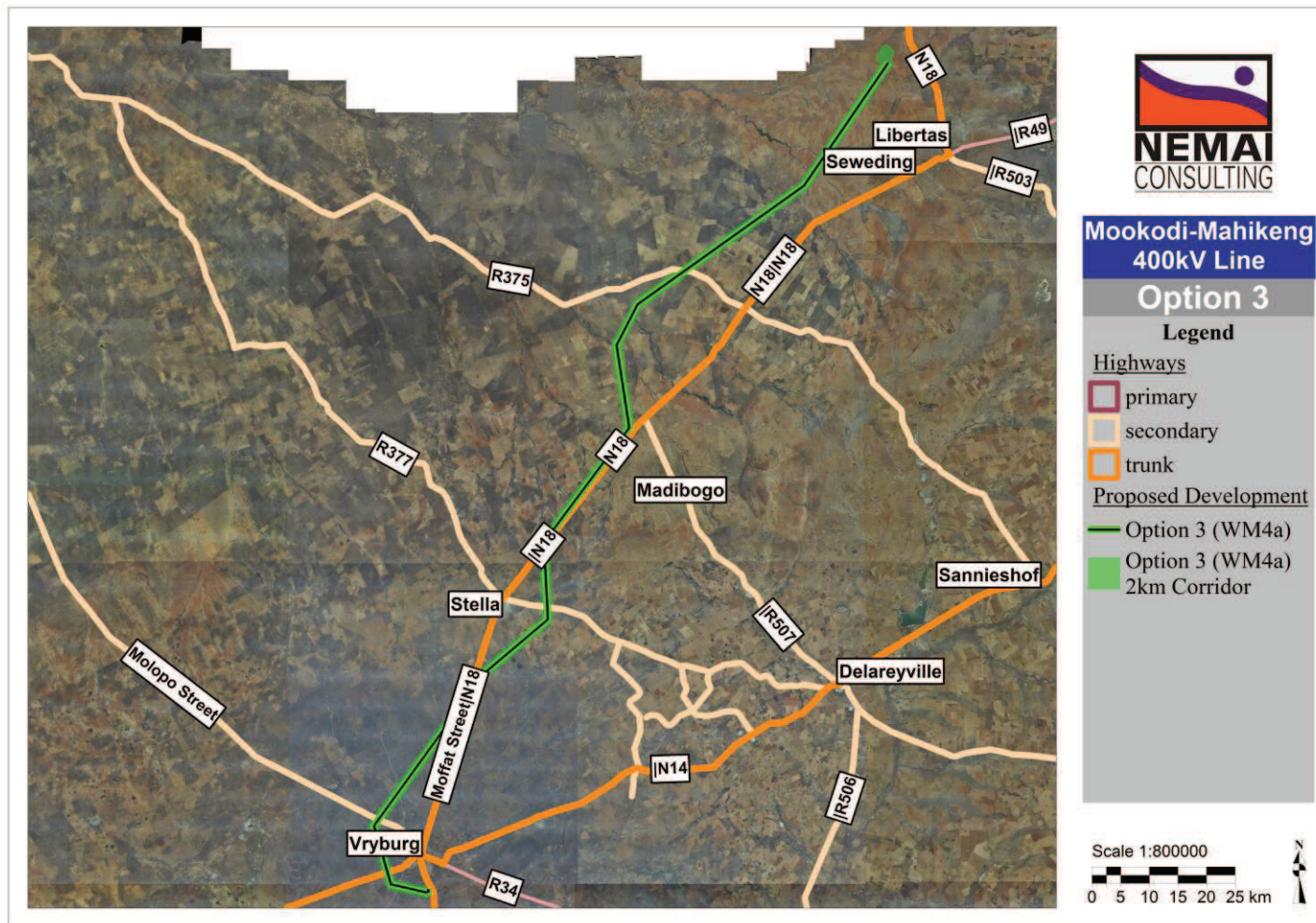


Figure 21: Route Alternative Option 3 (WM4a)

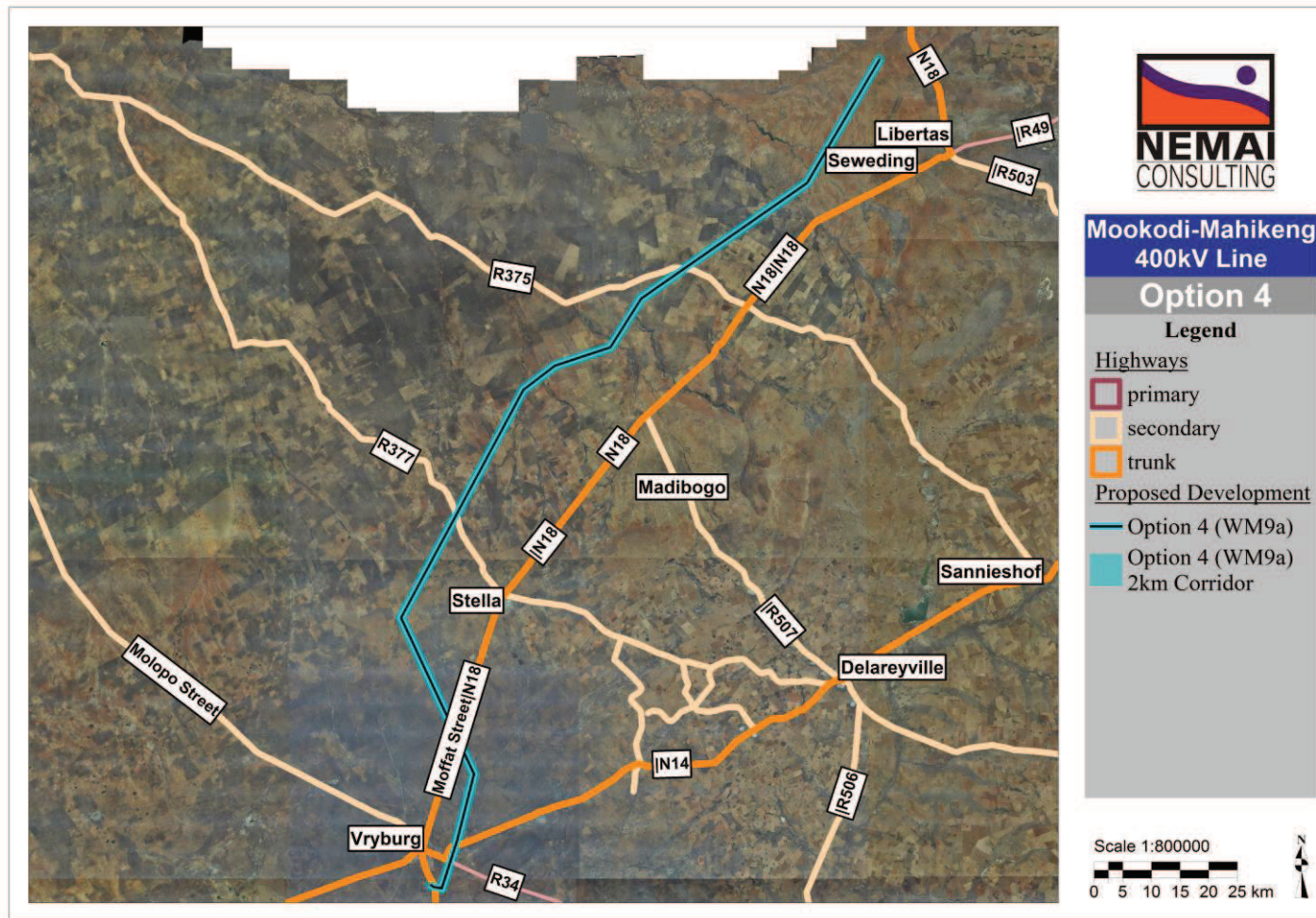


Figure 22: Route Alternative Option 4 (WM9a)

6.3 No-go alternative

The 'no-go' alternative refers to a situation where the proposed Mookodi-Mahikeng 400kV Powerline is not built. This would mean that the area where the proposed powerline is to be located would not change in any way and that the environmental conditions within the site would generally stay the same.

This would also mean that the anticipated load growth in the Mafikeng area and the resulting need for further enhancement of capacity in the area would not be met. There would be no further network expansion if the powerline and other related projects are not built. Therefore the Watershed substation would continue to struggle with constraint problems causing current areas of supply to be affected and restricting future growth in these areas.

7 PROJECT DESCRIPTION

7.1 Scope of Work

To adequately consider the impacts associated with the proposed Mookodi-Mahikeng 400kV Powerline, the major activities during each phase of the project life-cycle are discussed below.

7.1.1 Transmission Line

The scope of the project includes a transmission line, approximately 180km in length, from the existing Mookodi Substation in Vryburg and travels in a northeast direction ending near Mahikeng at the proposed Mahikeng substation site. The coordinates of the bend points for the four alternative routes are listed in **Tables 3 to 6**.

Table 3: Coordinates of bend points - route alternative option 1 (WM1)

No.	Latitude	Longitude
1	27° 0'37.52"S	24°44'38.83"E
2	27° 0'50.04"S	24°44'40.46"E
3	27° 0'55.99"S	24°44'23.54"E
4	27° 0'9.18"S	24°40'40.99"E
5	26°47'4.23"S	24°36'30.91"E
6	26°29'19.49"S	24°52'1.21"E
7	26°26'56.48"S	24°54'52.13"E
8	26° 6'6.35"S	25° 6'9.53"E
9	25°54'50.72"S	25°23'37.22"E

No.	Latitude	Longitude
10	25°42'57.59"S	25°32'23.02"E

Table 4: Coordinates of bend points - route alternative option 2 (WM13)

No.	Latitude	Longitude
1	27° 0'39.29"S	24°44'38.89"E
2	27° 0'49.79"S	24°44'54.21"E
3	27° 0'47.56"S	24°45'6.79"E
4	26°56'36.39"S	24°47'31.79"E
5	26°47'4.21"S	24°50'4.09"E
6	26°31'10.44"S	25° 4'27.91"E
7	26°20'16.17"S	25° 3'17.14"E
8	26°10'0.19"S	25° 3'56.86"E
9	26° 5'22.61"S	25° 6'27.57"E
10	25°54'51.20"S	25°23'24.61"E
11	25°42'33.99"S	25°31'35.65"E

Table 5: Coordinates of bend points - route alternative option 3 (WM4a)

No.	Latitude	Longitude
1	27° 0'36.95"S	24°44'38.78"E
2	27° 0'50.04"S	24°44'39.95"E
3	27° 0'55.56"S	24°44'24.04"E
4	27° 0'9.67"S	24°40'44.53"E
5	26°54'40.64"S	24°39'0.02"E
6	26°40'21.56"S	24°50'30.06"E
7	26°35'21.56"S	24°57'3.08"E
8	26°28'7.92"S	24°56'39.18"E
9	26°17'25.96"S	25° 5'31.21"E
10	26° 9'41.65"S	25° 4'11.89"E
11	26° 5'53.62"S	25° 6'23.29"E
12	25°54'46.68"S	25°23'39.30"E
13	25°43'16.96"S	25°32'24.00"E

Table 6: Coordinates of bend points - route alternative option 4 (WM9a)

No.	Latitude	Longitude
1	27° 0'40.03"S	24°44'43.35"E
2	27° 0'53.28"S	24°45'2.88"E
3	27° 1'1.40"S	24°45'53.77"E
4	26°50'16.49"S	24°49'15.82"E
5	26°35'33.74"S	24°41'41.45"E
6	26°14'6.53"S	24°54'22.48"E
7	26°11'50.71"S	24°57'37.83"E
8	26°10'6.45"S	25° 3'25.13"E
9	26° 5'32.02"S	25° 6'35.15"E
10	25°54'38.24"S	25°23'48.56"E
11	25°42'59.94"S	25°31'19.98"E

7.1.2 Powerline Corridor

A 2km corridor has been applied for all four route alternatives. The 2km corridor consist of 1km on each side of the centreline. This extended study area allows for any possible deviations from the current proposed alignment of the power lines within this corridor, which may be necessary due to findings of the Specialist Studies, concerns raised during the Scoping and EIA Process, technical requirements and the outcome of Eskom negotiations with landowners.

7.1.3 Powerline Servitude

Following a contractual agreement with a landowner, an application for registration of the 55m servitude is lodged with the Provincial Deeds Office against the property deed. A registered servitude grants Eskom certain defined rights for the use of the specific area of land, which include:

- Access to erect a transmission line along a specific agreed route;
- Reasonable access to operate and maintain the line inside the servitude area; and
- The removal of trees and vegetation that will interfere with the operation of the line.

The landowner is prevented from erecting any structures or carrying out activities under the line that would interfere with the safe operation of the line. However, certain standard farming practices such as some crop cultivation, grazing and the use of farm roads may continue as normal.

7.1.4 Tower Structures

The selection of a tower types depends on several factors, including terrain, costs and recommendations from specialists (where relevant). The tower types have not been finalised as yet, as the type of structure is dependent on the aforementioned factors as well as the final route of the power line. Three main tower types that are normally used for 400kV lines: Guyed- v (Figure 23), Cross- rope (Figure 24) and Bend/Strain (Figure 25).

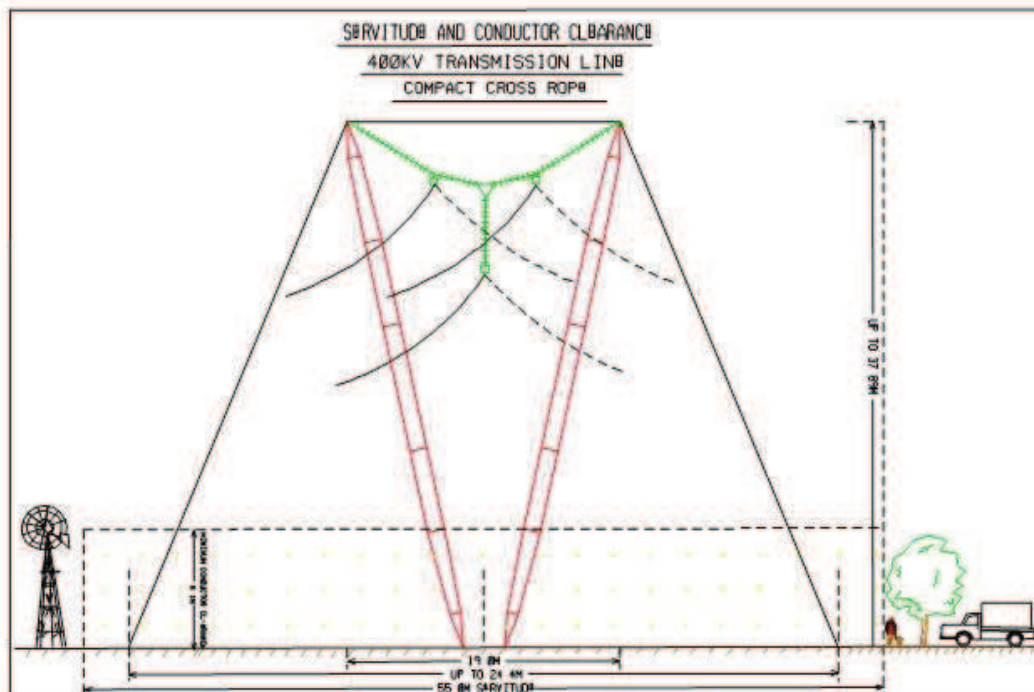


Figure 23: Guyed-Vee suspension tower type

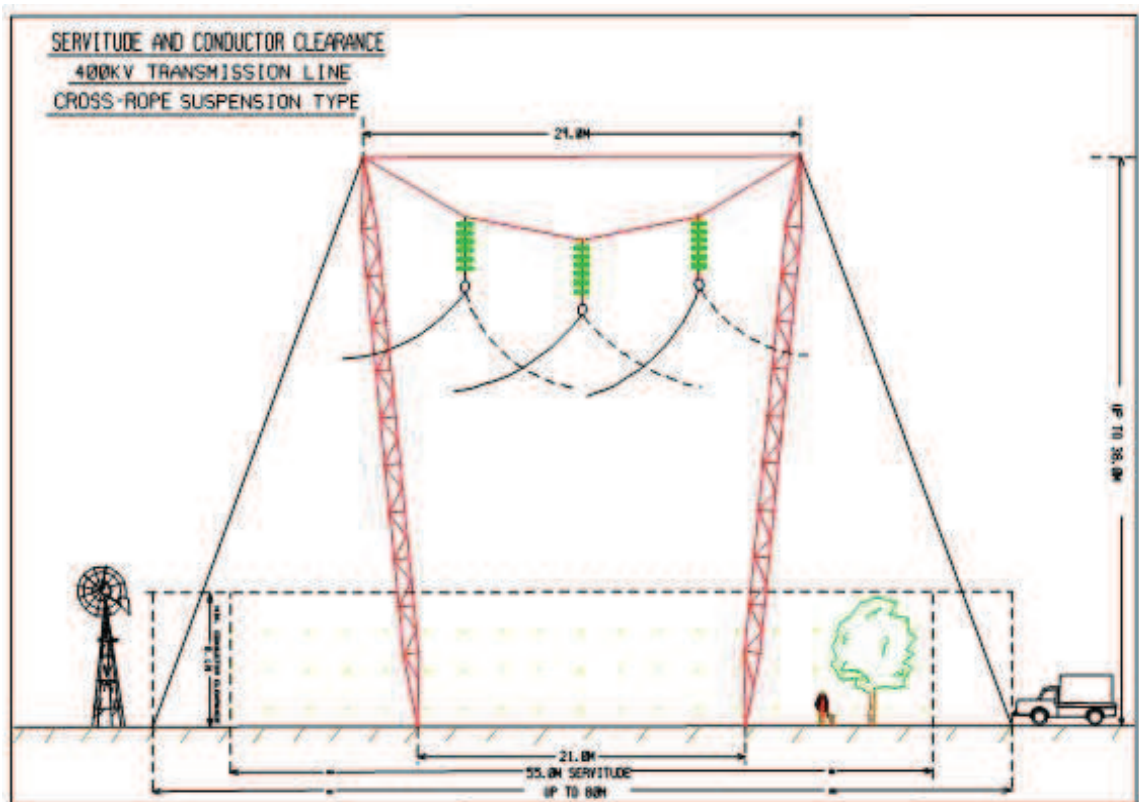


Figure 24: Cross-roped suspension tower type

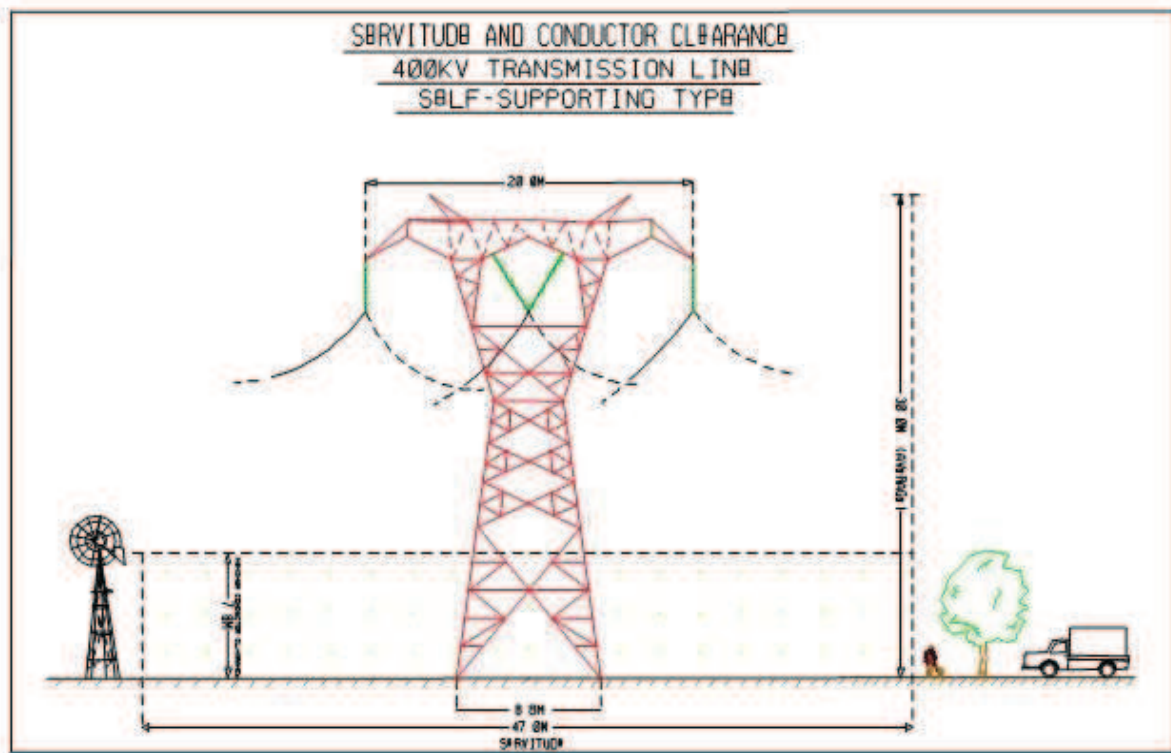


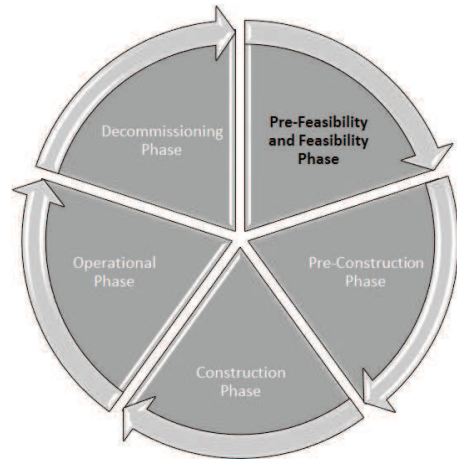
Figure 25: Self-supporting suspension tower type

7.2 Project Life-Cycle

The project life-cycle for the proposed Mookodi-Mahikeng 400kV Powerline includes the following primary activities:

Feasibility Studies

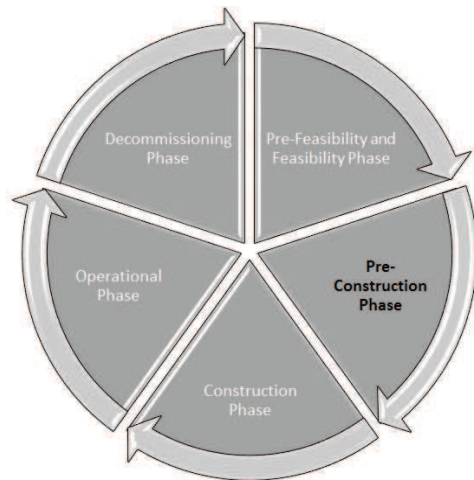
This includes selecting a suitable location for the substation and buffer as well as a corridor for the line route, which is assessed as part of the EIA. Servitude negotiations are also initiated during this phase.



Pre-Construction

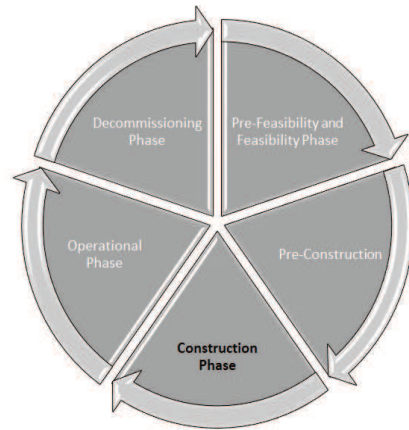
This phase, which is only undertaken should environmental authorisation be obtained, includes the following –

- Aerial survey of the route;
- Selection of the most appropriate structures;
- Eskom and environmental specialists (e.g. ecologist, heritage) conduct a walk-down survey to determine the exact locations of the towers, based on sensitive environmental features and technical criteria; and
- Preparation of relevant planning documentation, including technical and design documentation.



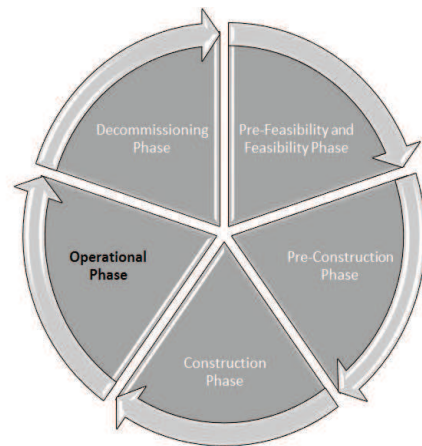
Construction

During the implementation of the project, the construction activities related to the installation of the necessary infrastructure and equipment is undertaken.



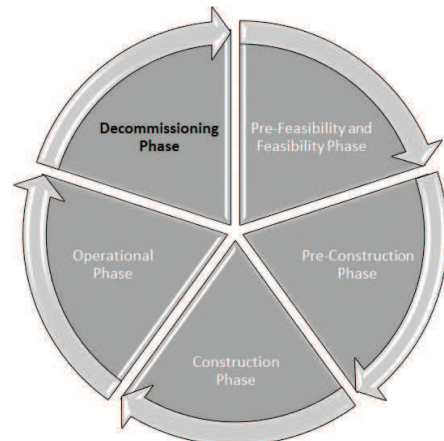
Operation

This includes operational activities associated with the maintenance and control of the transmission line.



Decommissioning

This includes operational activities associated with the maintenance and control of the transmission line.



The sub-sections to follow provide an overview of key activities during selected phases of the project life-cycle.

7.2.1 Construction

The construction period of the Mookodi-Mahikeng 400kV Powerline will take approximately 24 months. It involves the following activities, which are most often undertaken sequentially and by different crews.

7.2.1.1 Vegetation Clearance

The following shall be used as a standard for vegetation clearance for new powerlines with a nominal voltage of 220 to 765 kV for access purposes (inspection, repair and maintenance), safety clearance, and prevention of fires in Servitudes and Wayleaves:

- Servitude building restriction widths (measured from the centre line of the power line) are 22 m to 40 m;
- Clear from the centre of the power line up to the outer conductor, plus an additional 10 meters on either side; and
- Grass and scrubs will be managed in accordance with The Eskom Contract Specification for Vegetation Management Services on Eskom Networks (240-52456757) which is biome and land use dependant.

The Eskom standard Vegetation Management and Maintenance within Eskom Land, Servitudes and Rights of Way (240-70172585) will apply. The following aspects will determine the minimum standards for vegetation clearing and maintenance:

- Where the vegetation poses a safety clearance risk –
 - Vegetation should be controlled where it intrudes on the minimum vegetation clearance distance or will intrude on this distance before the next scheduled clearance as per The Eskom Contract Specification for Vegetation Management Services on Eskom Networks (240-52456757); and
 - Trees and any other vegetation, that could, if they fall over or negatively impact the safe operation of the line or damage the infrastructure, must be identified and managed.
- When access to the Eskom land is hindered –
 - Vegetation should be cleared to allow vehicles access below power lines and related infrastructure as per The Eskom Contract Specification for Vegetation Management Services on Eskom Networks (240-52456757).
- When the vegetation poses a fire risk –
 - Where vegetation poses a potential fire risk to Eskom's infrastructure or to the operation of power lines, there must be a specific fire management programme to reduce this risk and vegetation must be controlled as per The Eskom Contract Specification for Vegetation Management Services on Eskom Networks (240-52456757).
- To comply with legal imperatives –

- Eskom must clear vegetation if required by any national or provincial legislation as per The Eskom Contract Specification for Vegetation Management Services on Eskom Networks (240-52456757).

It is expected that vegetation clearance for the proposed Mookodi-Mahikeng 400kV Powerline will be minimal, as the natural vegetation is mostly disturbed by historical land use practices such as agriculture, as well as by the construction of existing infrastructure (including roads, fences and powerlines).

7.2.1.2 Tower pegging

Following the necessary access negotiations and arrangements with the affected landowners, a surveyor will peg the transmission central line and then set out the footprint of the development (i.e. transmission line and towers).

7.2.1.3 Construction camp establishment

Suitable site(s) for construction camp(s) still need to be selected. Contractors will negotiate the siting and erection of camps with landowners. These sites must strictly adhere to Eskom Transmission's Generic Environmental Management Plan – Line Construction as well as the mitigation measures contained in the Environmental Management Programme (EMPr) that will form part of the EIA Report.

7.2.1.4 Gate installation

After tower pegging, gates will be installed at the most appropriate locations to allow for future access to the servitude.

7.2.1.5 Access roads

Existing access roads will be utilised as far as possible. For the use of private roads, the requisite negotiations will be conducted with the affected landowners.

7.2.1.6 Excavation for foundations

Excavations will be made for the foundations and anchors of the towers by a team of 10 to 15 people with equipment (i.e. drilling rig, generator). Foundation sizes are dependent on inter alia the tower type and soil conditions. The foundations are ultimately filled with concrete. Contractors are required to safeguard excavations, which may include erecting a temporary wire fence around the excavations to protect the safety of people and animals.

7.2.1.7 Foundation of steelwork

Following the preparation of the excavations, a separate team will position the premade foundation structures into the holes. Thereafter these structures will be tied together for support (**Figure 26**).



Figure 26: Foundation work

7.2.1.8 Concrete works

A new team will then undertake the concrete filling of the foundation. Concrete is sourced via a 'Ready-mix' truck which accesses the site. If the access roads do not permit use by such a heavy vehicle, concrete will be mixed on site. Once the excavations have been filled, the concrete requires approximately 28 days for curing.

7.2.1.9 Erection of steel structures

Approximately 1 month after the foundation has been poured the steelwork is usually delivered to the site via trucks. The tower will then be assembled on site by a team of approximately 50 people. See examples of steel delivery and assembly shown in **Figure 27**.

A new team will then be responsible for the erection of the towers, with the use of a mobile 70-ton crane.



Figure 27: Delivery of steel (left) and assembly of tower (right)

7.2.1.10 Stringing of transmission cables

Cable drums, which carry approximately 2.5 km of cable, will then be delivered to the site. The conductors are made of aluminium with a steel core for strength. Power transfer is determined by the area of aluminium in the conductors. Conductors are used singularly, in pairs, or in bundles of three, four or six. The choice is determined by factors such as audible noise, corona, and electromagnetic field (EMF) mitigation. Many sizes of conductor are available, the choice being based on the initial and life-cycle costs of different combinations of size and bundles, as well as the required load to be transmitted.

Two cable drums, with a winch in the middle, are placed approximately 5 km apart along the route (depending on the overall length of the route). A pilot cable, which is laid with a pilot tractor that drives along the route, is pulled up on to the pylons with the use of pulleys (**Figure 28**). The line is generally strung in sections (from bend to bend). Once the tension has been exacted, the conductor cables are strung. Tension is created, the conductors clamped at the tower and the excess cable cut off.

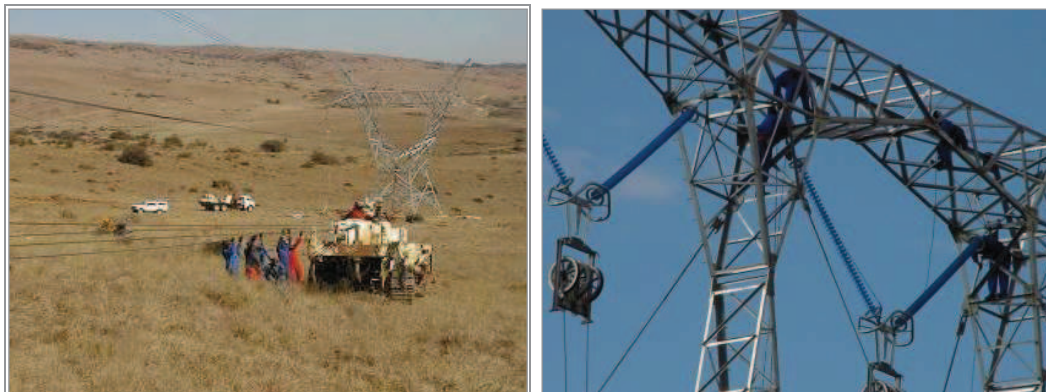


Figure 28: Stringing with pilot tractor (left) and pulleys (right)

7.2.1.11 Rehabilitation

Site reinstatement and rehabilitation are undertaken for each component of the construction phase, which include the following activities (amongst others):

- Removal of excess building material, spoil material and waste;
- Repairing any damage caused as part of the construction activities;
- Rehabilitating the areas affected by temporary access roads;
- Reinstating existing access roads; and
- Replacing topsoil and planting indigenous grass (where necessary).

7.2.1.12 Inaccessible Sites or Sensitive Areas

For a site that cannot be accessed by vehicle (e.g. kloofs) or where environmental sensitive features are encountered, the following approach is followed:

- Excavations for foundations are done by hand;
- Foundation structures, concrete filling and steel towers (pre-fabricated) are transported and delivered by helicopter; and
- Stringing is performed by helicopter.

This abovementioned approach is an expensive operation and not the preferred method of construction.

7.2.2 Operation and Maintenance

During operations, Eskom needs to reach the servitude via access roads to perform maintenance of the Transmission line. Line inspections are undertaken on an average of 1 – 2 times per year, depending on the area. The servitude will need to be cleared occasionally to ensure that vegetation does not interfere with the operation of the line. This will be conducted in terms of Eskom's Transmission Vegetation Management Guideline, which will be included in the EMPr.

7.3 Resources Required for Construction and Operation

This section briefly outlines the resources that will be required to execute the project.

7.3.1 Water

During the construction stage, the Contractor(s) will require water for potable use by construction workers and water will also be used in the construction of the foundations for the substation and towers. The necessary negotiations will be undertaken with the landowners / local authorities to obtain water from approved sources.

7.3.2 Sanitation

Sanitation services will be required for construction workers in the form of chemical toilets, which will be serviced at regular intervals by the supplier.

7.3.3 Roads

No new access roads are anticipated.

7.3.4 Waste

Solid waste generated during the construction phase will be temporarily stored at suitable locations (e.g. at construction camps) and will be removed at regular intervals and disposed of at approved waste disposal sites. All the waste disposed of will be recorded.

Wastewater, which refers to any water adversely affected in quality through construction-related activities and human influence, will include the following:

- Sewage;
- Water used for washing purposes (e.g. equipment, staff); and
- Drainage over contaminated areas (e.g. cement batching / mixing areas, workshop, equipment storage areas).

Suitable measures will be implemented to manage all wastewater generated during the construction period.

7.3.5 Electricity

Electricity will be obtained from diesel generators or temporary electricity connections during the construction phase.

7.3.6 Construction Workers

The appointed Contractor will mostly make use of skilled labour for the construction of the substation and Transmission powerlines. In those instances where casual labour is required, Eskom will request that such persons are sourced from local communities as far as possible.

8 LEGISLATION AND GUIDELINES CONSIDERED

8.1 Overview of Legislation

Some of the pertinent environmental legislation that has bearing on the proposed development is captured in **Table 7** below. More detailed information is provided in Section 8.2 to 8.16. This section aims to satisfy 2(1)(e) of Appendix 2 of GN No. R. 982: A description of the policy and legislative context within which the development is proposed including an identification of all

legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.

Table 7: Environmental legislative framework

Legislation	Relevance
Constitution of the Republic of South Africa (Act No. 108 of 1996)	Chapter 2 – Bill of Rights. Section 24 – environmental rights.
National Environmental Management Act (Act No. 107 of 1998)	Section 24 – EA (control of activities which may have a detrimental effect on the environment). Section 28 – Duty of care and remediation of environmental damage. Environmental management principles. Authority – DEA.
GN No. R. 982 of 04 December 2014 EIA Regulations	Process for undertaking Basic Assessment / Scoping and EIA process.
GNs No. R. 983 and 984 of 04 December 2014 EIA Regulations	Activities that need to be assessed through a Basic Assessment process.
GN No. R. 985 of 04 December 2014 EIA Regulations	Activities that need to be assessed through a Scoping and EIA process.
National Water Act (Act No. 36 of 1998)	Chapter 3 – Protection of water resources. Section 19 – Prevention and remedying effects of pollution. Section 20 – Control of emergency incidents. Chapter 4 – Water use. Authority – DWS.
National Environmental Management: Protected Areas Act (Act No. 57 of 2003)	Protection and conservation of ecologically viable areas representative of South Africa's biological diversity and natural landscapes. Authority – DEA.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	Management and conservation of the country's biodiversity. Protection of species and ecosystems. Authority – DEA.
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	Air quality management. Section 29 – pollution prevention plans (Notice 172 of 2014: Greenhouse gases as priority air pollutants) Section 32 – dust control. Section 34 – noise control. Section 35 – control of offensive odours. Authority – DEA.
National Environmental Management: Waste Act (Act No. 59 of 2008)	Chapter 4 – Waste management measures Chapter 5 – licensing requirements for listed waste activities. Authority – DEA.

Legislation	Relevance
Hazardous Substances Act (Act No. 05 of 1973)	Provisions for the control of substances which may cause injury or ill-health to or death of human beings. Authority – DEA.
Occupational Health & Safety Act (Act No. 85 of 1993)	Provisions for Occupational Health & Safety. Major Hazardous Installation Regulations. Authority – Department of Labour.
National Heritage Resources Act (Act No. 25 of 1999)	Section 34 – protection of structure older than 60 years. Section 35 – protection of heritage resources. Section 36 – protection of graves and burial grounds. Section 38 – Heritage Impact Assessment for linear development exceeding 300m in length; development exceeding 5 000m ² in extent. Authority – The North West Provincial Heritage Resources Authority (NWPHERA)
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	Control measures for erosion. Control measures for alien and invasive plant species. Authority – Department of Agriculture, Forestry and Fisheries (DAFF).
National Forestry Act (Act No. 84 of 1998)	Section 15 – authorisation required for impacts to protected trees. Authority – DAFF.
Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)	Permit required for borrow pits. Authority – Department of Mineral Resources (DMR).

8.2 Constitution of the Republic of South Africa (Act No. 108 of 1996)

The Constitution of the Republic of South Africa (Act No. 108 of 1996) is the supreme law of the land and provides amongst others the legal framework for legislation regulating coastal management in general. It also emphasises the need for co-operative governance. In addition, the Environmental clause in Section 24 of the Constitution provides that:

“Everyone has the right –

to an environment which is not harmful to their health or wellbeing;

to have the environment protected for the benefit of present and future generations through reasonable legislation and other measures that:

Prevent pollution and ecological degradation;

Promotes conservation;

Secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development”

The Constitution provides the overarching framework for sustainable development.

8.3 National Environmental Management Act (Act No. 107 of 1998)

The proposed Mookodi-Mahikeng 400kV Powerline requires authorisation in terms of NEMA, and the EIA will be undertaken in accordance with the 2014 EIA Regulations, as amended (07 April 2017).

Important aspects of NEMA are sustainability principles such as the “Polluter Pays” and the “Precautionary Principle” which will also be taken into account in the assessment of the impacts of the proposed development.

8.3.1 2014 EIA Regulations, as amended (07 April 2017)

The EIA Regulations consist of the following:

- EIA Procedures - GN No. R. 982;
- Listing Notice 1 - GN No. R. 983;
- Listing Notice 2 - GN No. R. 984; and
- Listing Notice 3 - GN No. R. 985.

The proposed Mookodi-Mahikeng 400kV Powerline triggered activities under Listing Notices 1, 2 and 3, and thus needs to be subjected to a Scoping and EIA Process. The Listed Activities are explained in the context of the project in **Table 8**.

Table 8: EIA Listed Activities for the proposed Mookodi-Mahikeng 400kV Powerline

GN No. R.	Activity	Description as per GN	Applicability to the Project
GN R. 983 of 04 December 2014 (as amended)	12(ii)(a)	<p>The development of—</p> <p>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>where such development occurs—</p> <p>(a) within a watercourse.</p> <p>excluding—</p> <p>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such development occurs within an urban area;</p> <p>(ee) where such development occurs within existing roads, road reserves or railway line reserves; or</p> <p>(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.</p>	<p>A few of the proposed tower structures may fall within watercourses.</p> <p>The type of towers to be used by Eskom are determined after the walk-down survey has been completed by the Specialists which is usually done only when a route is authorised by DEA so that the tower positions can be determined. However, the maximum footprint of the proposed towers can be provided at this stage, and this is based on if a cross-rope suspension tower type is used:</p> <ul style="list-style-type: none"> ➤ 80m (anchor width) x 50m (tower length) = 4000 square metres for one tower. ➤ Towers are spaced approximately 350m to 450m apart. Therefore for a 180km powerline, there would be approximately 515 to 400 towers. ➤ Thus the total project footprint for all towers would be between 1 600 000 to 2 060 000 square metres.

GN No. R.	Activity	Description as per GN	Applicability to the Project
GN R. 983 of 04 December 2014 (as amended)	19	<p>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving—</p> <ul style="list-style-type: none"> (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies. 	<p>A few of the proposed tower structures may fall within watercourses and will involve the removal of soil within a watercourse of more than 10 cubic metres.</p> <p>The type of towers to be used by Eskom are determined after the walk-down survey has been completed by the Specialists which is usually done only when a route is authorised by DEA so that the tower positions can be determined. However, the maximum footprint of the proposed towers can be provided at this stage, and this is based on if a cross-rope suspension tower type is used:</p> <ul style="list-style-type: none"> ➤ 80m (anchor width) x 50m (tower length) = 4000 square metres for one tower. ➤ Towers are spaced approximately 350m to 450m apart. Therefore for a 180km powerline, there would be approximately 515 to 400 towers. ➤ Thus the total project footprint for all towers would be between 1 600 000 to 2 060 000 square metres.
GN R. 983 of 04 December 2014 (as amended)	30	Any process or activity identified in terms of Section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).	Possible occurrence of sensitive biodiversity features at affected areas. To be confirmed as part of the Terrestrial Ecological Study.
GN R. 984 of 04 December 2014 (as amended)	9	The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the	The project involves the proposed construction of a 400kV powerline (outside the urban edge), 180km in length.

GN No. R.	Activity	Description as per GN	Applicability to the Project
		<p>development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —</p> <ul style="list-style-type: none"> (a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometres or shorter in length; (c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development. 	
<p>GN R. 985 of 04 December 2014 (as amended)</p>	<p>12 (h) (iv, v and vi)</p>	<p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>h. North West:</p> <ul style="list-style-type: none"> iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority; v. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; or vi. Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland. 	<p>The proposed development will require the clearance of more than 300 square metres within sensitive areas such as threatened ecosystems, watercourses, CBAs and ESAs.</p> <p>The following areas to be cleared for the proposed development include:</p> <p><u>1) Tower Footprints:</u></p> <p>The type of towers to be used by Eskom are determined after the walk-down survey has been completed by the Specialists which is usually done only when a route is authorised by DEA so that the tower positions can be determined. However, the maximum footprint of the proposed towers can be provided at this stage, and this is based on if a cross-rope suspension tower type is used:</p> <ul style="list-style-type: none"> ➤ 80m (anchor width) x 50m (tower length) = 4000 square metres for one tower.

GN No. R.	Activity	Description as per GN	Applicability to the Project
			<ul style="list-style-type: none"> ➤ Towers are spaced approximately 350m to 450m apart. Therefore for a 180km powerline, there would be approximately 515 to 400 towers. ➤ Thus the total project footprint for all towers would be between 1 600 000 to 2 060 000 square metres. <p>2) <u>Powerline Footprint:</u></p> <p>The Maximum Vegetation Clearance for 220 to 765kV (in this case 400kV) is between 22m to 40m (this includes clearance from the centre of the powerline up to the outer conductor, plus an additional 10m on either side). Therefore a maximum of 40m x 180 000m = 7 200 000 square metres.</p>
GN R. 985 of 04 December 2014 (as amended)	14 (ii)(a)(h)(iv, v and vi)	<p>The development of—</p> <p>(ii) infrastructure or structures with a physical footprint of 10 square metres or more;</p> <p>where such development occurs—</p> <p>(a) within a watercourse</p> <p>h. North West</p> <p>iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;</p> <p>v. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; or</p>	<p>The proposed development may involve tower structures within watercourses which fall within or near sensitive areas such as threatened ecosystems, CBAs and ESAs.</p> <p>The type of towers to be used by Eskom are determined after the walk-down survey has been completed by the Specialists which is usually done only when a route is authorised by DEA so that the tower positions can be determined. However, the maximum footprint of the proposed towers can be provided at this stage, and this is based on if a cross-rope suspension tower type is used:</p> <ul style="list-style-type: none"> ➤ 80m (anchor width) x 50m (tower length) = 4000 square metres for one tower. ➤ Towers are spaced approximately 350m to 450m apart. Therefore for a 180km powerline, there would be approximately 515 to 400 towers.

GN No. R.	Activity	Description as per GN	Applicability to the Project
		vi. Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from the core areas of a Biosphere reserve.	➤ Thus the total project footprint for all towers would be between 1 600 000 to 2 060 000 square metres.

8.4 National Water Act (Act No. 36 of 1998)

The National Water Act (Act No. 36 of 1998) (NWA) regulates water resources of South Africa. Water is considered a scarce commodity and should therefore be adequately protected. Amongst others, the act deals with the protection of water sources, water uses, water management strategies and catchment management, dam safety and general powers and functions. The purpose of the act is to ensure that South Africa's water resources are protected, used, developed, conserved, managed and controlled. The NWA includes the definition of a Water Resource.

The NWA definition for a Water Resource includes:

1. A Watercourse;
2. Surface Water;
3. An Estuary; and
4. An Aquifer.

The NWA defines a watercourse as follows:

- A river or spring;
- A natural channel in which water flows regularly or intermittently;
- A wetland, lake or dam into which, or from which, water flows; and
- Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse include, where relevant, its bed and banks.

The Act also specifies that a wetland is defined as land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil. Section 21 of the NWA provides information on what water uses require approval, i.e. a Water Use License (WUL). These include:

- a) Taking water from a water resource;
- b) Storing water;
- c) Impeding or diverting the flow of water in a watercourse;**
- d) Engaging in a stream flow reduction activity;
- e) Engaging in a controlled activity;
- f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- g) Disposing of waste in a manner which may detrimentally impact on a water resource;

- h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- i) Altering the bed, banks, course or characteristics of a watercourse;**
- j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- k) Using water for recreational purposes.

The abovementioned water uses that apply to the proposed Mookodi-Mahikeng 400kV Powerline include: 21 (c and i).

Any development within the riparian habitat or 1:100 year floodline (whichever is the greatest distance from the watercourse), will require an authorisation from the DWS. However, the only way to determine the riparian area is through a riparian habitat delineation.

A General Authorisation (GA) in terms of Section 39 of the NWA (GN No 40229 published in Government Gazette No. 509, dated 27 July 2016) states that a regulated area of a watercourse includes: “A 500 m radius from the delineated boundary (extent) of any wetland or pan”. A GA can be applied if the use of water in terms of section 21(c) or (i) of NWA within the regulated area of a watercourse has a Risk Class that is Low, as determined by the Risk Matrix (Appendix A of the GA).

8.5 National Environmental Management: Protected Areas Act (Act No. 57 of 2003)

The aim of the National Environmental Management: Protected Areas Act (Act No. 57 of 2003) is to provide for the protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and natural seascapes. The purpose of a Protected Environment is amongst others to protect a specific ecosystem outside a special nature reserve world heritage site or nature reserve and also to ensure the use of the natural resources in the area is sustainable.

The proposed development does not occur near any formal Protected Areas according to the South African National Biodiversity Institute (SANBI). This is discussed further in Section 12. This Act will be considered in the Terrestrial Ecological Assessment to be included in the EIA report.

8.6 National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) was promulgated for the management and conservation of South Africa’s biodiversity through the

protection of species and ecosystems and the sustainable use of indigenous biological resources.

The main implication of this Act is the protection of biodiversity. The potential flora and fauna as well as the terrestrial ecosystems will be discussed further in Section 12. This Act will be considered in the Terrestrial Ecological Assessment to be included in the EIA Phase.

8.7 National Environmental Management: Air Quality Act (Act No. 39 of 2004)

The National Environmental Management: Air Quality Act (Act No. 39 of 2004) provides for the setting of national norms and standards for regulating air quality monitoring, management and control and describes specific air quality measures so as to protect the environment and human health or well-being by:

- Preventing pollution and ecological degradation; and
- Promoting sustainable development through reasonable resource use.

It also includes measures for the control of dust, noise and offensive odours that may be relevant to the construction. No Air Emissions License will be required for the proposed development; however, the potential impacts on air quality will be discussed in Section 12.

8.8 The National Environmental Management Waste Act (Act No. 59 of 2008)

The National Environmental Management Waste Act (Act No. 59 of 2008) (NEM:WA) regulates waste management in order to protect the health and environment of South African citizens. This is achieved through pollution prevention, institutional arrangements and planning matters, national norms and standards and the licensing and control of waste management activities.

The latest list of waste management activities that have or are likely to have a detrimental effect (GN No. 921 of 29 November 2013) contains activities listed in Categories A and B that would require licensing from the provincial or national authorities and activities contained in Category C which would require meeting the requirements of various Norms and Standards.

No authorisation will be required in terms of the NEM:WA, as the project will not include any of the listed waste management activities.

8.9 Hazardous Substances Act (Act No. 05 of 1973)

The Hazardous Substances Act (Act No. 05 of 1973) provides for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances, and for the control of certain electronic products; to provide

for the division of such substances or products into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products; and to provide for matters connected therewith.

8.10 Occupational Health & Safety Act (Act No. 85 of 1993)

The Occupational Health and Safety Act (Act No. 85 of 1993) provides for the health and safety of people at work as well as the health and safety of persons using plant and machinery.

8.11 National Heritage Resources Act (Act No. 25 of 1999)

The National Heritage Resources Act (Act No. 25 of 1999) was promulgated for the protection of National Heritage Resources and the empowerment of civil society to conserve their heritage resources.

The proposed construction of the Mookodi-Mahikeng 400kV Powerline will trigger certain categories as listed below that require a Heritage Impact Assessment in terms of Section 38 of the National Heritage Resources Act. These categories are:

- (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50m in length;
- (c) any development or other activity which will change the character of a site
 - (i) exceeding 5 000 m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the rezoning of a site exceeding 10 000 m² in extent; or

any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

The Act also makes provision for General Protections, which apply automatically to certain categories of heritage resources such as archaeological and paleontological sites, cemeteries and graves, and structures older than 60 years.

Heritage resources in the study area will be discussed further in Section 12. This Act will be considered in the Heritage Impact Assessment to be included in the EIA Report.

8.12 Conservation of Agricultural Resources Act (Act No. 43 of 1983)

The Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA) requires the maintenance of riparian vegetation and provides a list of invasive alien vegetation that must be controlled or eradicated.

The proposed Mookodi-Mahikeng 400kV Powerline may traverse high agricultural potential land. The potential impacts of the proposed development will be assessed in the EIA phase as there will be a complete loss of agricultural land. Land Capability is discussed further in Section 12. This Act will be considered in the Agricultural Impact Assessment to be included in the EIA Report.

8.13 National Forests Act (Act No. 84 of 1998)

In terms of the National Forests Act (Act No. 84 of 1998), trees in natural forests or protected tree species (as listed in Government Gazette Notice 1012 of 27 August 2004) may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold - except under licence granted by the DAFF.

This Act will be considered during the Terrestrial Ecological Assessment if any Protected Trees are found.

8.14 Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)

The Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA) sets out the requirements with which applicants for prospecting rights, mining rights and mining permits must comply in Sections 16, 22 and 27 of the MPRDA.

A Mining Permit will not be required as there will be no material required from newly opened borrow pits for the proposed Mookodi-Mahikeng 400kV Powerline.

8.15 Guidelines

- Integrated Environmental Management Information Series, in particular Series 2 – Scoping (DEAT, 2002);
- Guideline on Alternatives, EIA Guideline and Information Document Series (DEA&DP, 2010a);
- Guideline on Need and Desirability, EIA Guideline and Information Document Series (DEA&DP, 2010b);
- Integrated Environmental Management Guideline Series 5: Companion to the EIA Regulations 2010 (DEA, 2010a);
- Integrated Environmental Management Guideline Series 7: Public Participation in the EIA Process (DEA, 2010b);
- Guidelines for Involving Specialists in the EIA Processes Series (Brownlie, 2005);

8.16 Regional Plans

The following regional plans were considered during the execution of the EIA (amongst others):

- Municipal Spatial Development Frameworks (SDF) (where available);
- Municipal Integrated Development Plans (IDP);
- Relevant provincial, district and local policies, strategies, plans and programmes; and
- North West Biodiversity Sector Plan (2015).

9 SCOPING AND EIA PROCESS

9.1 2014 EIA Listed Activities (as amended)

The proposed Mookodi-Mahikeng 400kV Powerline entails certain activities that require authorisation in terms of NEMA. Refer to Section 8 for a further discussion on the legal framework.

The process for seeking authorisation is undertaken in accordance with the 2014 EIA Regulations, as amended (07 April 2017), promulgated in terms of Chapter 5 of NEMA.

Based on the types of activities involved, which include activities listed in GN No. R. 983, R. 984 and R. 985 (see **Table 8**), the requisite environmental assessment for the project is a Scoping and EIA Process.

9.2 Formal Process

The environmental assessment process is divided into two phases, namely: 1) Scoping; and 2) EIA. An outline of the Scoping and EIA Process for the proposed Mookodi-Mahikeng 400kV Powerline is provided in **Figure 29**.

9.3 Competent Authority

In terms of the Regulations, the lead decision-making authority for the Scoping and EIA is DEA, as the project proponent is Eskom Holdings (SOC) Ltd, which is a state-owned entity.

9.4 Application Form

The Application for EA for the proposed Mookodi-Mahikeng 400kV Powerline was submitted to DEA with the DSR on 08 February 2018. The Acknowledgement Letter of the Application Form is included in **Appendix 12**. The Application Form has been amended and will be submitted to DEA with the FSR, refer to **Appendix 4** for a copy of the Amended Application Form.

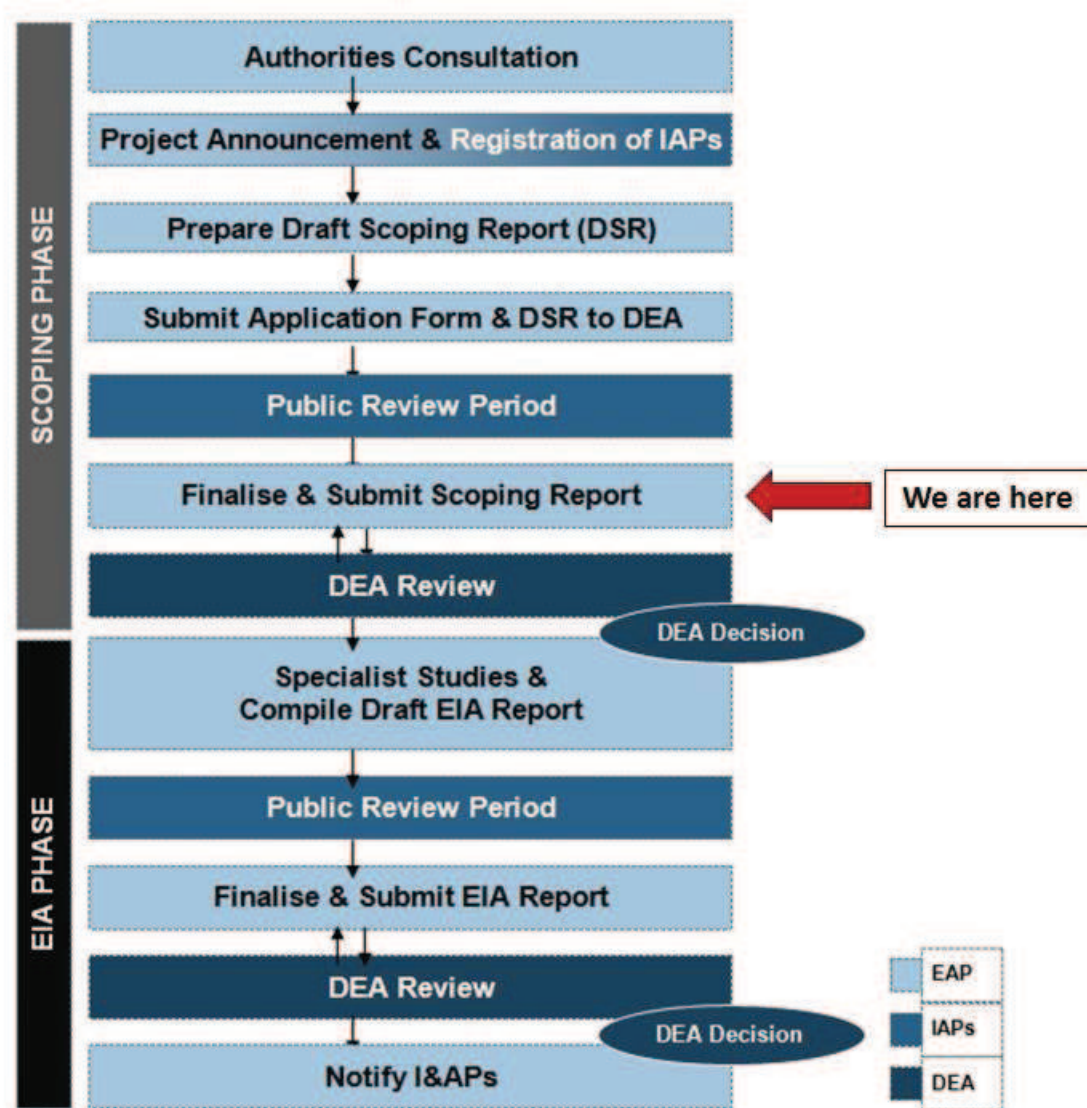


Figure 29: Scoping and EIA Process

9.5 Scoping Phase

The purpose of Scoping, which constitutes the first phase of the formal EIA Process, is as follows:

1. Introduce the proposed project to all IAPs;
2. Engage with IAPs to allow for participation in the process that is transparent, cooperative, informative and robust. Allow for informed decision-making with regard to the EIA process;
3. Identify the significant issues and impacts to be investigated further during the execution of the EIA phase;
4. Consider suitable and feasible alternatives for achieving the project's objectives; and

5. Determine the scope of the ensuing EIA phase in terms of specialist studies, public participation, assessment of impacts and appraisal of alternatives.

In order to meet the above, the DSR provides the following information:

- Motivation on the Need and Desirability of the proposed development;
- Clarity on the roles and responsibilities of the various stakeholders in the project;
- Information on the Public Participation Process;
- Information on the Scoping and EIA processes;
- Description on how the proposed development will be undertaken (if approved);
- Information on the legislation that has been considered;
- Information on the Receiving Environment that could be affected by the proposed project;
- Information on Alternatives which are being considered;
- Proposed methodology of assessing the potential impacts during the EIA Phase;
- Findings on the type of Specialist Studies required in the pending EIA Phase; and
- Proposed Plan of Study for the pending EIA Phase of the project.

9.6 EIA Phase

The EIA phase, which constitutes the second phase of the formal EIA Process, serves to follow from the Scoping phase and will provide the following:

- A detailed description of the proposed development and location;
- A description of the environment that may be affected by the activity and the manner in which physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed development;
- The methodology of the stakeholder engagement process will be described;
- The CRR and Stakeholder Database will be provided as an appendix to the EIA Report;
- A description of the need and desirability of the proposed development and the identified potential alternatives to the proposed activity;
- A summary of the methodology used in determining the significance of potential impacts;
- A description and comparative assessment of the project alternatives;
- A summary of the findings of the specialist studies (Copies of all specialist reports appended to the EIA Report);
- A detailed assessment of all identified potential impacts;
- A list of the assumptions, uncertainties and gaps in knowledge;

- An opinion by the consultant as to whether the development is suitable for approval within the proposed site;
- An EMPr that complies with Appendix 4 of GN No. R. 982 of the 2014 EIA Regulations (as amended); and
- Any further information that will assist in decision making by the authorities.

9.7 Landowner Consent

According to Regulation 39(1) of GN No. 982 of the 2014 EIA Regulations, as amended, if the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land.

This requirement does not apply inter alia for linear developments (e.g. pipelines, power lines, roads). Landowner consent was thus not required.

9.8 Landowner Notification

The details of the various properties affected by the project, as well as the details of the affected landowners are included in the IAP Database contained in **Appendix 5**.

Proof of written notification to the landowners / persons in control of the land is included in **Appendices 9 and 10**.

10 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations apply to this Scoping exercise:

- In accordance with the purpose of Scoping, the report does not include detailed specialist investigations on the receiving environment, which will only form part of the EIA Phase. The environment in the project area was primarily assessed in the Scoping Phase through site visits, desktop screening, incorporating existing information from previous studies, and input received from IAPs;
- The GIS versions of data available for the public are assumed to be the latest information provided by the Departments (such as NWREAD and SANBI); and
- As the design of the project components is still in feasibility stage, and due to the dynamic nature of the planning environment, the dimensions and layout of the

infrastructure may change during the detailed design phase. Provision is made for a 2km corridor around the powerline alternative options.

11 NEED AND DESIRABILITY

In terms of 2(1)(f) of Appendix 2 of GN No. R. 982 of the 2014 EIA Regulations, as amended, this section discusses the need and desirability of the project. The format contained in the Guideline on Need and Desirability (DEA&DP, 2009) has been used in **Table 9**.

Table 9: Need and Desirability of the Mookodi-Mahikeng 400kV Powerline

No.	Question	Response
Need (Timing)		
1.	Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority? (i.e. is the proposed development in line with the projects and programmes identified as priorities within the IDP).	<p>The Transmission Development Plan (TDP) 2014 – 2023 indicated that the Watershed Strengthening Phase 1, 2 and 3 is one of the major schemes planned. The proposed Mookodi-Mahikeng 400kV Powerline falls part of Phase 3 which states:</p> <p><i>“Beyond 2020, further network enhancements are required to address the Watershed insufficient transformation capacity and the poor voltage profile under N-1 contingency of the Pluto- Watershed 275 kV line. There is an additional load of 180 MW expected, approximately 60 km west of Watershed, in Mafikeng. This scheme deloads Watershed substation and introduces 400 kV injection in Mafikeng, via establishment of Pluto-Mafikeng and Mookodi-Mafikeng 400 kV lines and the new Mafikeng (Watershed B) 2 x 500 MVA 400/132 kV substation.”</i></p> <p>Electricity provision is one of the key development priorities of the IDPs for Naledi LM, Kagisano-Molopo LM, Ratlou LM, and Mahikeng LM in the North West Province.</p>
2.	Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?	Yes. The Watershed Strengthening Scheme requires that a powerline be constructed between the existing Mookodi substation (in Vryburg) to the future substation in Mahikeng in order to deload the existing Watershed substation.
3.	Does the community/area need the activity and the associated land use concerned (is it a societal priority)? This refers to the	The existing Watershed substation is currently un-firm and has insufficient capacity to support the forecasted load in the area, which includes

No.	Question	Response
	strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate)	Lichtenburg and extends to Mahikeng town. The Watershed substation has technical constraints as it has insufficient transformation capacity and poor voltage profile in the 20 year planning horizon, starting from year 2016 till year 2036. The substation experiences capacity and voltage regulation constraints on the 275kV in-feeds to the Watershed substation. There is also anticipated load growth in the Mafikeng area, the forecast shows potential for other economic drivers in Carletonville (particularly in the Watershed/Mafikeng area) such as industrial, commercial and electrification to re-introduce positive load growth trends, thus indicating a need for further enhancement of capacity in the area.
4.	Are the necessary services with appropriate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?	This project is reliant of the Watershed Strengthening Scheme projects. The proposed powerline is part of a much larger transmission network and associated substations in the North West Province.
5.	Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services)?	Yes. See response to Item 1.
6.	Is this project part of a national programme to address an issue of national concern or importance?	The development is intended to address North West power requirements.
Desirability (Placing)		
7.	Is the development the best practicable environmental option (BPEO) for this land/site?	<p>The Watershed Strengthening Scheme requires that a powerline be constructed between the existing Mookodi substation (in Vryburg) to the future substation in Mahikeng in order to deload the existing Watershed substation.</p> <p>A number of factors were considered in selecting the alternative routes for the powerline (refer to Section 6.1 of the EIA Report)</p> <p>The BPEO will be selected during the EIA Phase by equally assessing the four alternative routes for the powerline.</p>
8.	Would the approval of this application compromise the integrity of the existing approved municipal IDP and Spatial	It is not anticipated that the proposed project will contradict or be in conflict with the municipal IDPs and SDFs.

No.	Question	Response
	Development Framework (SDF) as agreed to by the relevant authorities?	
9.	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	The compatibility of the project with the North West Biodiversity Sector Plan (2015) and other environmental management and planning tools will be considered in detail during the EIA Phase, following the undertaking of the relevant Specialist Studies.
10.	Do location factors favour this land use (associated with the activity applied for) at this place? (this relates to the contextualisation of the proposed land use on this site within its broader context).	<p>Yes, as part of the technical analysis a number of locational factors were considered in selecting the alternative routes for the powerline.</p> <p>The Specialist Studies, as part of the EIA Phase, will further investigate the location based on sensitive environmental features and receptors.</p> <p>See response to no. 7.</p>
11.	How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	See compilation of significant environmental issues associated with the proposed project contained in Section 14.2.
12.	How will the development impact on people's health and wellbeing (e.g. i.t.o. noise, odours, visual character and sense of place, etc)?	
13.	Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	Opportunity costs, which are associated with the net benefits forgone for the development alternative, will be considered in the Socio-Economic Study during EIA Phase. The affected land is rural in nature and primarily used for agricultural purposes.
14.	Will the proposed land use result in unacceptable cumulative impacts?	Cumulative impacts, as considered in Section 14.3 will be evaluated in the EIA Phase.

12 PROFILE OF THE RECEIVING ENVIRONMENT

This section provides a general description of the status quo of the receiving environment in the project area. This serves to provide the context within which the Scoping exercise was conducted. It also allows for an appreciation of sensitive environmental features and possible receptors of the effects of the four route alternatives for the proposed Mookodi-Mahikeng 400kV Powerline.

The study area includes a 2 km corridor around each route alternative (i.e. 1 km on either side of the centre line). This allows for possible relocation or deviation within the corridor, respectively (e.g. avoidance of sensitive features and technical constraints). Where necessary, the regional context of the environmental features is also explained, with an ensuing focus on the local surrounding environment. More in-depth discussions on the receiving environment will be provided in the EIA Report, where the findings of the requisite Specialist Studies will be incorporated into the document.

A brief overview is also provided of the manner in which the environmental features may be affected (positively or negatively) by the proposed Mookodi-Mahikeng 400kV Powerline during the project life-cycle. Key environmental issues are discussed further in Section 14. These preliminary effects are only discussed concisely on a qualitative level, as part of the Scoping phase. The EIA Report will provide a comprehensive evaluation of the potential impacts, and will quantify the effects to the environment based on the methodology presented in Section 15.

The following environmental features have been considered:

- | | |
|--------------------|-----------------------------|
| 1. Climate | 9. Land Use |
| 2. Geology | 10. Heritage |
| 3. Soil | 11. Air Quality |
| 4. Topography | 12. Noise |
| 5. Surface Water | 13. Visual Quality |
| 6. Flora | 14. Existing Infrastructure |
| 7. Fauna | 15. Traffic |
| 8. Land Capability | 16. Socio-Economic |

12.1 Climate

12.1.1 Status Quo

The climate in Vryburg (start point of the powerline) is influenced by the local steppe climate. During the year there is little rainfall. This location is classified as BSk by Köppen and Geiger. The average annual temperature in Vryburg is 17.9 °C and precipitation averages 477 mm (**Figure 30**).

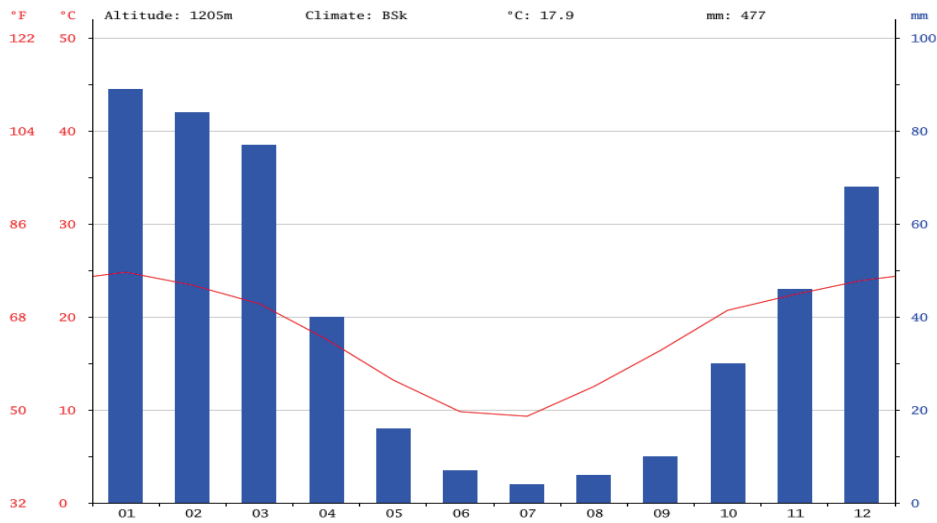


Figure 30: Climate graph – Vryburg (<https://en.climate-data.org/region/501/>)

The climate in Stella (approximately midpoint of the powerline) is known as a local steppe climate. During the year, there is little rainfall in Stella. This location is classified as BSk by Köppen and Geiger. The average annual temperature is 17.8 °C in Stella and the average annual rainfall is 474 mm (Figure 31).

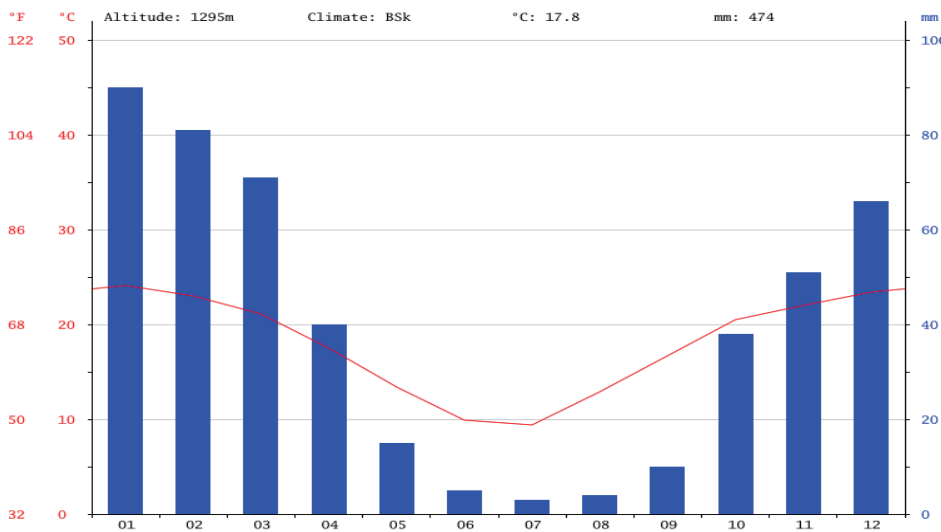


Figure 31: Climate graph – Stella (<https://en.climate-data.org/region/501/>)

The climate in Mahikeng (end point of the powerline) a local steppe climate. During the year there is little rainfall. This location is classified as BSh by Köppen and Geiger. The temperature here averages 18.5 °C and the average annual rainfall is 541 mm (Figure 32).

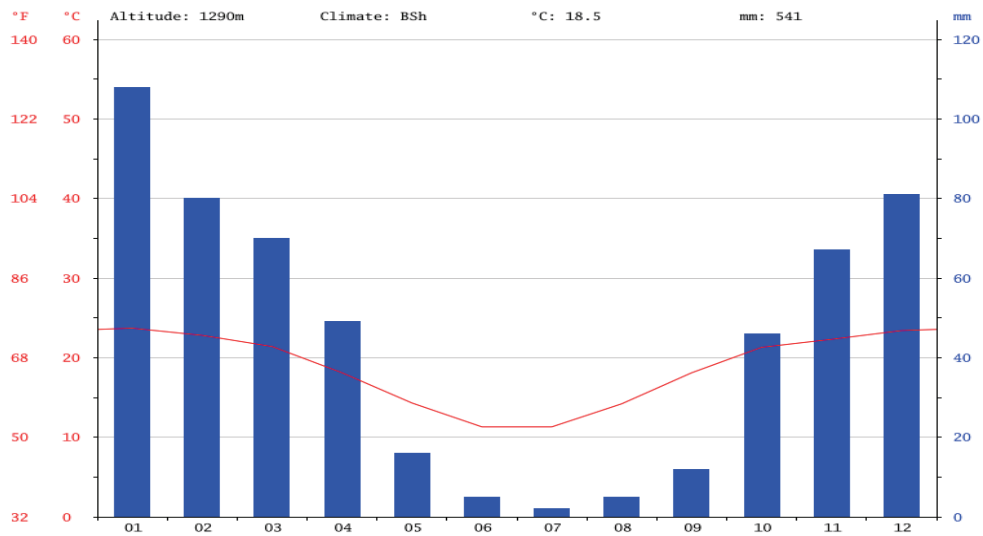


Figure 32: Climate graph – Mahikeng (<https://en.climate-data.org/region/501/>)

12.1.2 Potential Impacts/Implications

There are no direct adverse impacts foreseen in terms of the project to climate. However, measures to reduce the project's carbon footprint will be considered further in the EIA phase.

Climate change may impact on the project through extreme floods, which may pose a risk to the electrical infrastructure.

12.1.3 Specialist Studies Required

Electrical infrastructure to be safeguarded against flooding. The EMPr will contain measures to minimise the carbon footprint.

12.2 Geology

12.2.1 Status Quo

The proposed Mookodi-Mahikeng 400kV Powerline is underlain by several types of geology (Refer to **Figure 33**) including:

1. Barberton,murchison,giyani,beit bridge;
2. Kalahari;
3. Meinhardskraal granite,sand river gneiss;
4. Dwyka; Transvaal,rooiberg,griqualand-west; and
5. Ventersdorp.

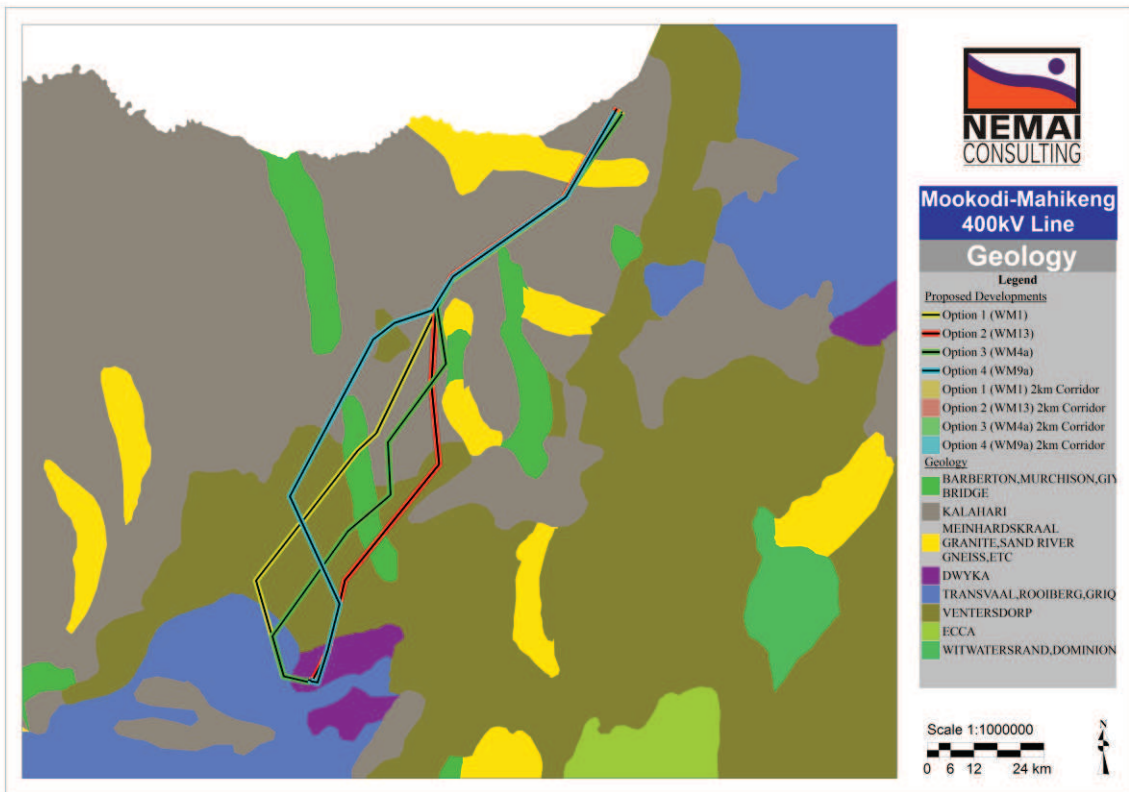


Figure 33: Geology

12.2.2 Potential Impacts/Implications

The geotechnical characteristics determine the suitability of the tower foundations. In order to lay these foundations excavations and drilling would be required.

Other potential impacts during the construction phase include:

- Blasting (depending on geotechnical conditions);
- Erosion on steep slopes; and
- Disposal of spoil material (i.e. excess soil and rock) from excavations.

12.2.3 Specialist Studies Required

As part of the final design, a detailed geotechnical investigation will be conducted to provide design parameters and confirm the findings of the desktop investigation.

12.3 Soils

12.3.1 Status Quo

The soil types and depths vary between and along the powerline route alternatives (**Figure 34**). The soil types encountered constitute of:

1. Freely drained, structureless soils;
2. Lithosols (shallow soils on hard or weathering rock); and
3. Red or yellow structureless soils with a plinthic horizon.

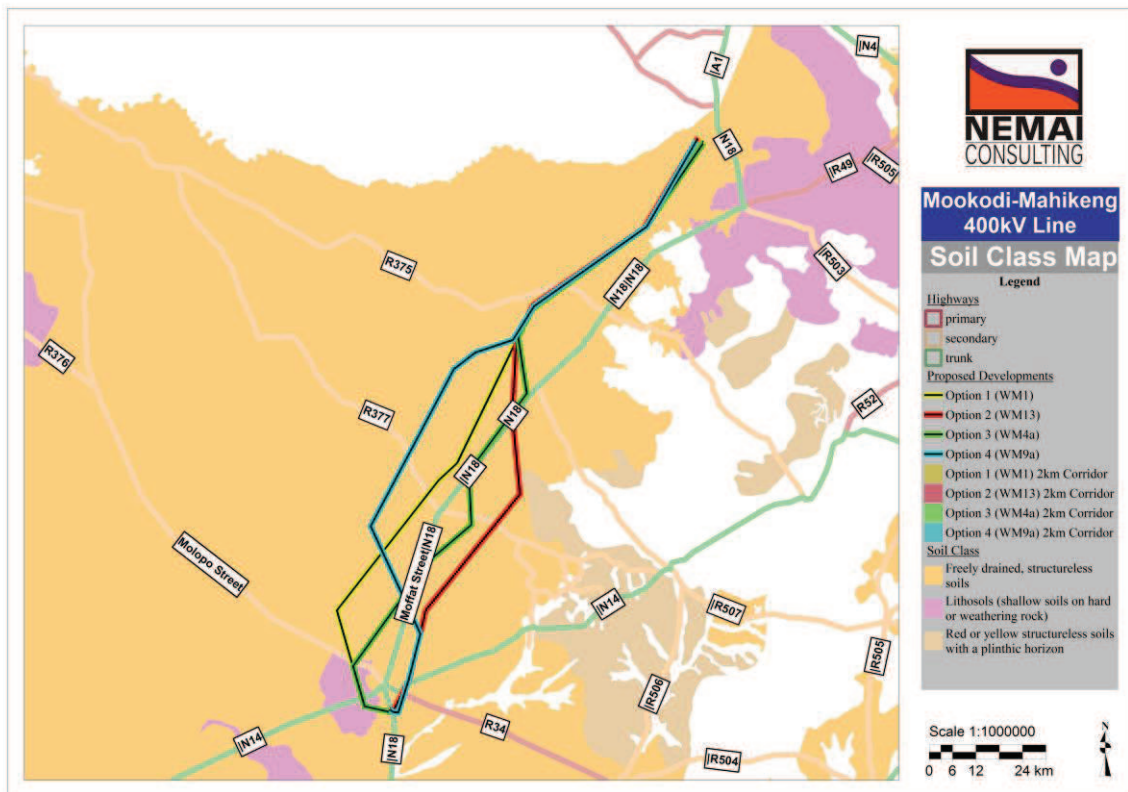


Figure 34: Soil class

12.3.2 Potential Impacts/Implications

Prior to commencement of construction activities Eskom will undertake the following:

- A final route alignment will be determined by Eskom. This will involve bush clearing to enable surveyors to determine the exact position of each pylon and bend tower. Bush clearing will leave soil bare and susceptible to erosion;
- Once the exact power line route has been determined, the servitude will be surveyed and demarcated. The servitude will be cleared. The location of the construction camp, materials lay down areas, and construction roads will be determined and demarcated.

- Vegetation clearing will leave soil bare and susceptible to erosion.

During the construction phase the following activities will be undertaken which may impact on soil:

- Construction material (Pylons, cables, conductors, bird flappers, concrete, etc) will be placed at various locations along the route, at demarcated materials lay down areas. Vegetation cover within this demarcated materials lay down area will be damaged, which could leave soil bare and susceptible to erosion;
- Vehicles travelling on the construction roads, as well as materials stored in the lay down area will cause compaction of soil, which decreases soil fertility;
- Oil or fuel leakages from construction equipment will contaminate soils;
- Accidental spillages of grease and oils used during the construction phase may pollute soils.

Maintenance activities during the operational phase will include:

- Annual / bi-annual inspection of the power line by an Eskom technician;
- Replacement of conductors when necessary;
- Annual burning of the servitude / Bush clearing within servitude in natural veld areas.
 - Burning of vegetation in the servitude should be done shortly prior to the commencement of the rainy season to ensure re-establishment of vegetation cover;
 - No soil impacts are expected during routine maintenance; however, should any repairs be required, impacts as described during the construction phase above will apply.

12.3.3 Specialist Studies Required

The EMPr will contain measures to mitigate against impacts to soil, for example the management of topsoil, preventing soil contamination during construction, etc. A Geotechnical Study will be required prior to construction commencing so as to inform detailed design.

12.4 Topography

12.4.1 Status Quo

The terrain of the study area is generally flat with undulating plains (**Figures 35 and 36**).



Figure 35: Photograph of relatively flat terrain on site

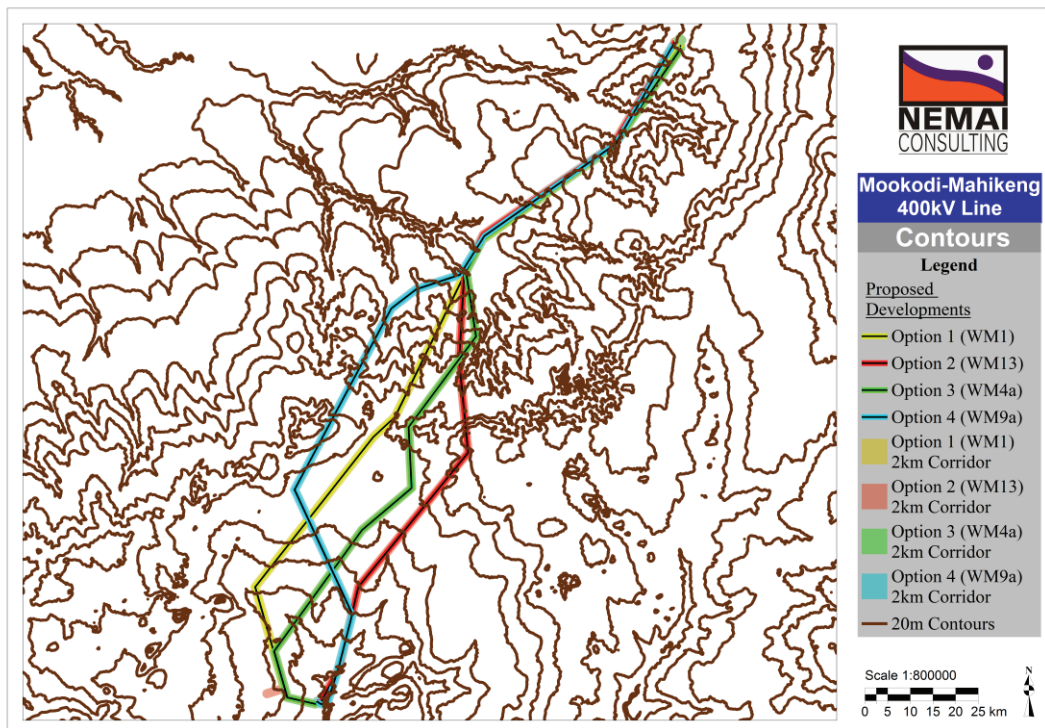


Figure 36: 20m Contour lines

12.4.2 Potential Impacts/Implications

During construction, only the pylon foundations will result in a hard impact footprint which will require excavations and drilling. There could be a visual impact caused by proposed project infrastructure and erosion of areas cleared for construction purposes.

12.4.3 Specialist Studies Required

A Visual Impact Assessment will be undertaken.

12.5 Surface Water

12.5.1 Status Quo

The proposed Mookodi-Mahikeng 400kV Powerline route alternatives fall within the C32B, C32A, D41B, and D41A quaternary catchments and within the Vaal Water Management Area (WMA) (Figure 37).

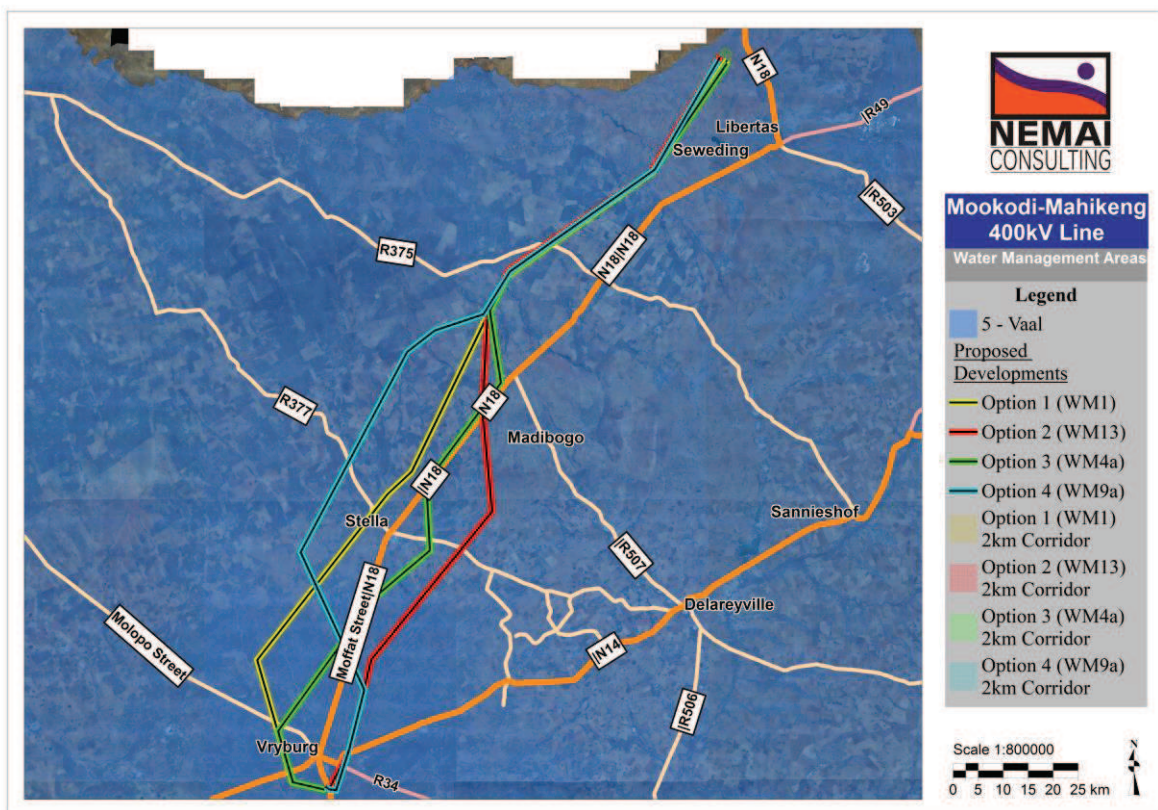


Figure 37: Water management areas

The proposed powerline route alternatives traverse several non-perennial rivers but very few perennial rivers or tributaries (**Figure 38**). There are several wetlands located within 500m of the route alternatives.

The pylons are proposed to not be placed within the 1:100 year floodline of any watercourse, or within any wetlands and their buffer zones.

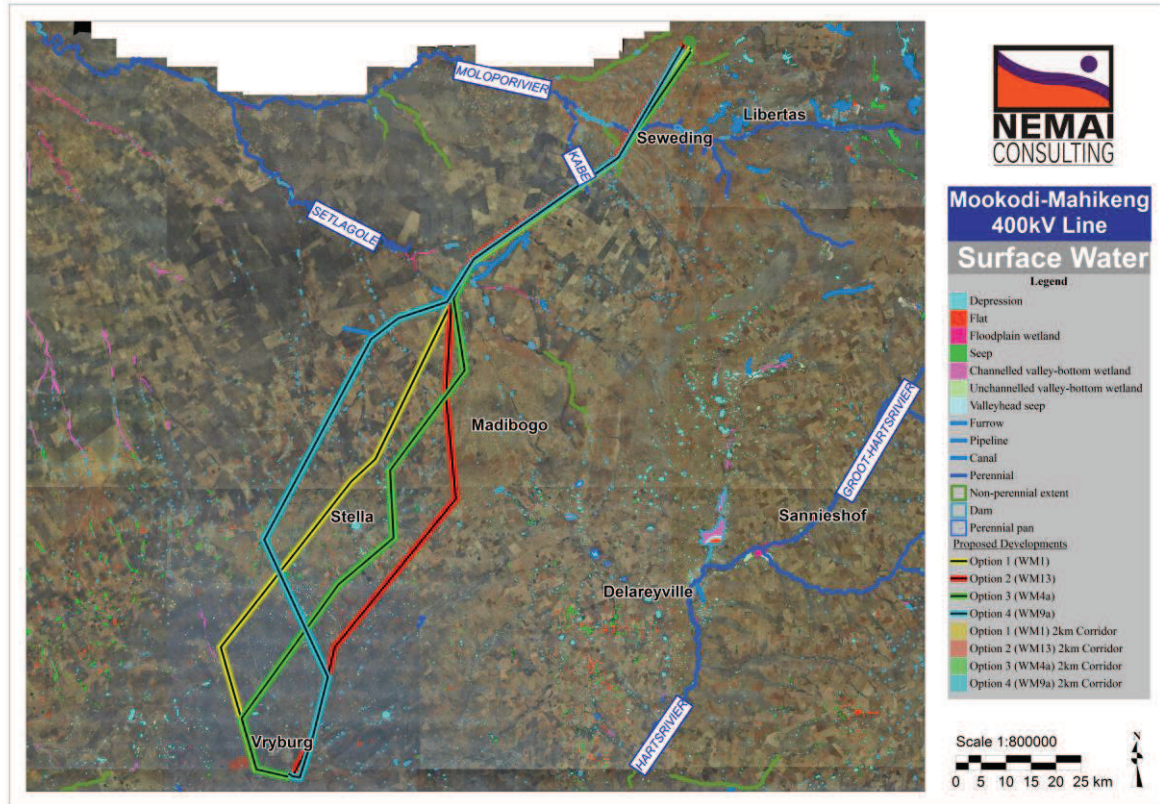


Figure 38: Surface water

12.5.2 Potential Impacts/Implications

Impacts to the resource quality of the affected watercourses during the construction phase could include:

- Damage to riparian habitat as part of the clearing of the servitude;
- Destabilisation of morphology (i.e. river structure);
- Reduction of water quality through sedimentation (e.g. access roads over watercourses, silt from the construction site transported via runoff) and poor construction practices (e.g. Improper management of wastewater, incorrect storage of material, spillages);

- Temporary alteration of flow and the structure (i.e. bed and banks) of watercourses at river crossings for access roads; and
- Reduction in biodiversity of aquatic biota as a result of the abovementioned drivers.

Potential impacts during the operational phase include:

- Sedimentation through silt-laden runoff, caused by inadequate stormwater management on access roads and at the substation; and
- Damage to towers from major flood events.

During the siting of the towers, the locations are selected to prevent impacts to watercourses. The towers will also be located outside of the 1:100 year floodlines at the river crossings.

Should construction activities encroach upon the regulated area of a watercourse (i.e. 1:100 year floodline / delineated riparian or 500 m of a wetland habitat) water use authorisation will be required in terms of Section 21 of the National Water Act (Act No. 36 of 1998). In accordance with Section 27 of this Act, the following factors need to be taken into consideration by DWS before an authorisation may be issued:

1. Existing lawful water uses;
2. The need to redress the results of past racial and gender discrimination;
3. Efficient and beneficial use of water in the public interest;
4. The socio-economic impact of the water use or uses if authorised; or of the failure to authorise the water use or uses;
5. Any catchment management strategy applicable to the relevant water resource;
6. The likely effect of the water use to be authorised on the water resource and on other water users;
7. The class and the resource quality objectives of the water resource;
8. Investments already made and to be made by the water user in respect of the water use in question;
9. The strategic importance of the water use to be authorised;
10. The quality of water in the water resource which may be required for the Reserve and for meeting international obligations; and
11. The probable duration of any undertaking for which a water use is to be authorised.

12.5.3 Specialist Studies Required

A desktop assessment of the affected watercourses will only be undertaken during the Scoping and EIA Process. A detailed River Health Impact Assessment and Wetland/Riparian Habitat Delineation will be undertaken as part of the Water Use License Application (WULA) once the exact positions of the towers have been identified as part of the pre-construction walk-down survey to ensure no towers are placed in any watercourses.

12.6 Flora

12.6.1 Status Quo

12.6.1.1 Biome and Vegetation

The proposed Mookodi-Mahikeng 400kV Powerline route alternatives fall within the Savanna biome. However, a very small section of Alternative Route Option 2 (WM13) also falls within the Grassland biome (**Figure 39**).

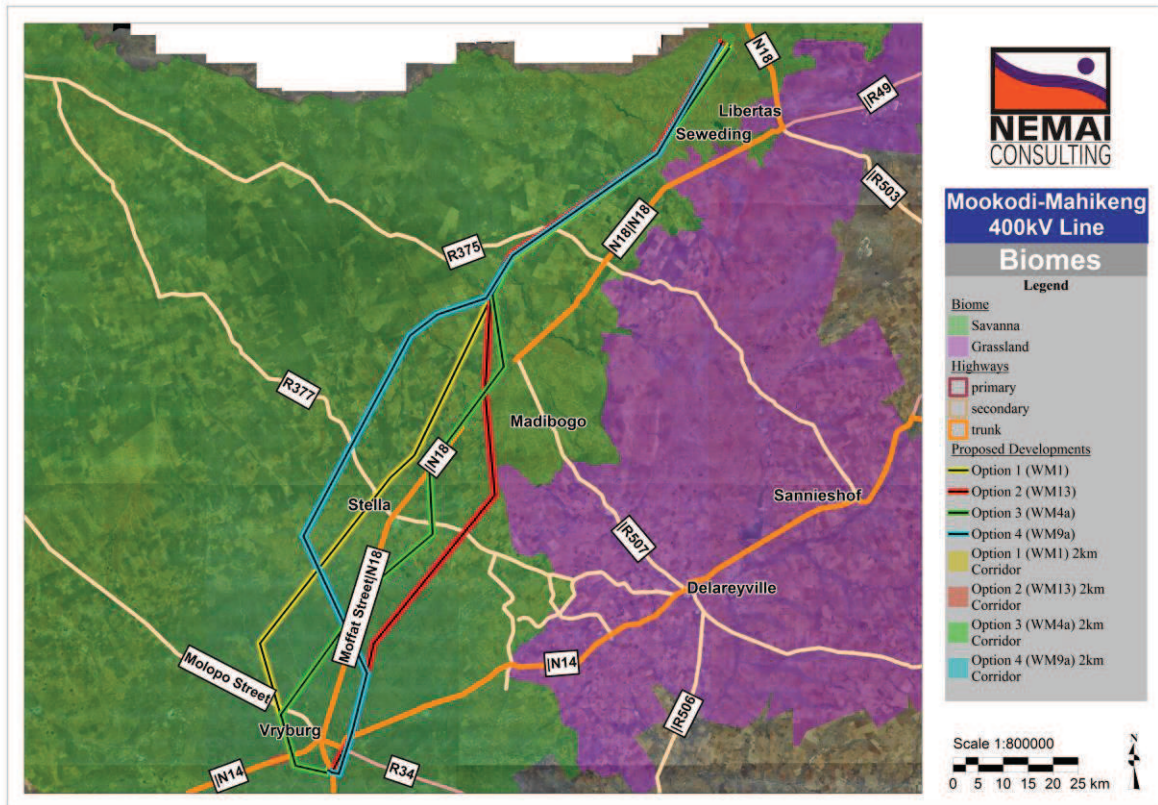


Figure 39: Biomes

According to Mucina and Rutherford, the Savanna and Grassland biomes are the two largest biomes in South Africa. 33% of the vegetation in South Africa is part of the Savanna biome and 27.9% is Grassland (Mucina and Rutherford, 2006).

The Savanna Biome consists of 87 different vegetation units and the Grassland Biome consists of 72. The following vegetation types are affected (**Figure 40**):

- Ghaap Plateau Vaalbosveld (Savanna biome);
- Stella Bushveld (Savanna biome);
- Mafikeng Bushveld (Savanna biome); and

- Very small portion of Western Highveld Sandy Grassland (Grassland biome).

These vegetation units are described in more detail below.

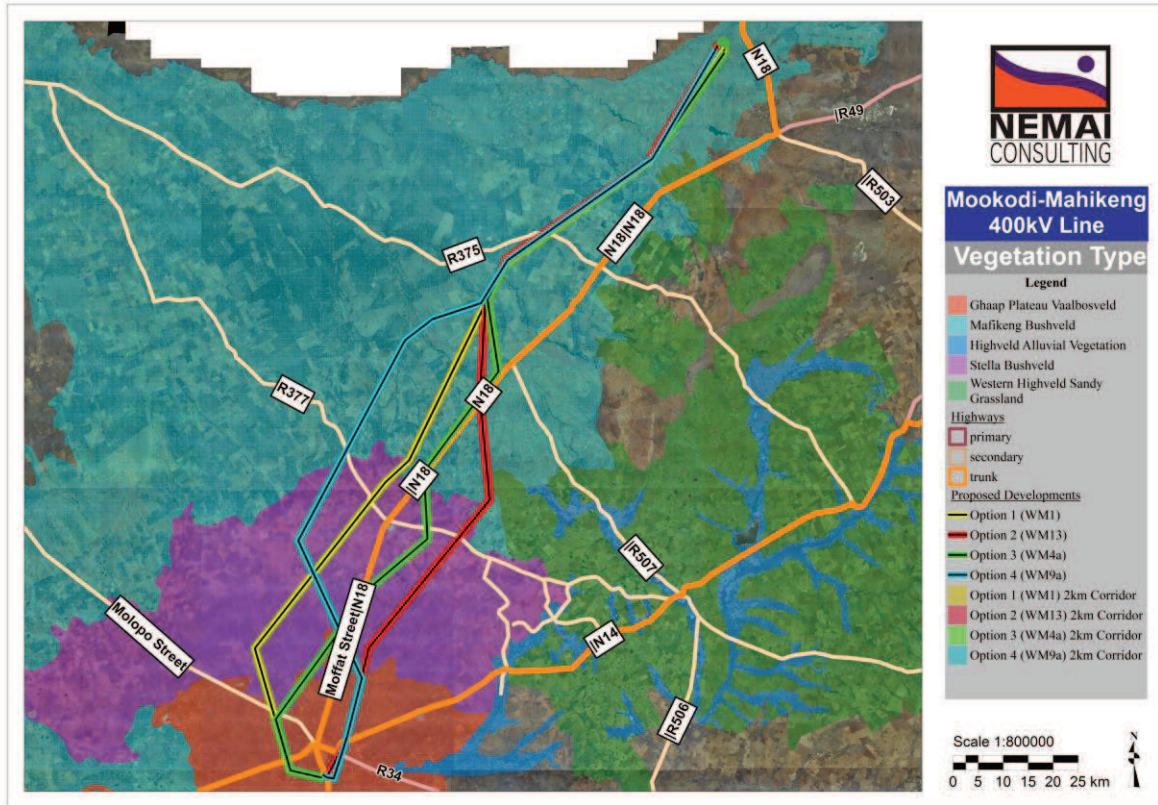


Figure 40: Vegetation type

Ghaap Plateau Vaalbosveld:

This vegetation type is found in Northern Cape and North-West Provinces. It occurs in flat plateau from around Campbell in the south, east of Danielskuil through Reivilo to around Vryburg in the north. It is listed as Least threatened, with a national target of 16%. None of this vegetation type is conserved in statutory conservation areas. Only about 1% is already transformed.

Stella Bushveld:

This vegetation type is found in North-West Province. It occurs in North of Vryburg around Stella westwards to Louwna and eastwards to about 20 km west of Delareyville. It is listed as Vulnerable, with a national conservation target of 16%. None of this vegetation type is conserved in statutory conservation areas. Some 21% is transformed, almost all by cultivation.

Mafikeng Bushveld:

This vegetation type is found in North-West Province. It occurs West of Mafikeng and south of the Botswana border westwards to around Vergeleë, southwards to Piet Plessis and

Setlagole. It is listed as Vulnerable, with a national conservation target of 16%. None of this vegetation type is conserved in statutory conservation areas but very small area conserved in the Mmabatho Recreation Area. About 25% is already transformed, mainly for cultivation and urban development.

Western Highveld Sandy Grassland:

This vegetation type is found in North-West Province. It is found in Mafikeng to Schweizer-Reneke in the south and from Broedersput and Kameel in the west to Lichtenburg and Ottosdal in the east. It is listed as Endangered, with a national conservation target of 24%. Only a very small portion is statutorily conserved (Barberspan Nature Reserve). More than 60% has been ploughed. Nonarable parts are on shallow aeolian soils which become easily overutilised through grazing. About 95% of this land is suitable for cultivation, but the low rainfall makes it a high-risk area for agriculture. Therefore the natural vegetation is often restricted to nonarable bush clumps, shallow soils, aeolian sands and pans.

12.6.1.2 Terrestrial Threatened Ecosystems

The South African National Biodiversity Institute (SANBI), in conjunction with the Department of Environmental Affairs (DEA), released a draft report in 2009 entitled “Threatened Ecosystems in South Africa: Descriptions and Maps”, to provide background information on the above List of Threatened Ecosystems (SANBI, 2009). The purpose of this report was to present a detailed description of each of South Africa’s ecosystems and to determine their status using a credible and practical set of criteria. The following criteria were used in determining the status of threatened ecosystems:

- Irreversible loss of natural habitat;
- Ecosystem degradation and loss of integrity;
- Limited extent and imminent threat;
- Threatened plant species associations;
- Threatened animal species associations; and
- Priority areas for meeting explicit biodiversity targets as defined in a systematic conservation plan.

In terms of Section 52(1) (a), of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), a national list of ecosystems that are threatened and in need of protection was gazetted on 9 December 2011 (Government Notice 1002). The list classified all threatened or protected ecosystems in South Africa in terms of four categories; Critically Endangered (CR), Endangered (EN), Vulnerable (VU), or Protected. The purpose of categorising these ecosystems is to prioritise conservation areas in order to reduce the rates of ecosystem and species extinction, as well as preventing further degradation and loss of structure, function, and composition of these ecosystems. It is estimated that Threatened Ecosystems make up 9.5% of South Africa, with critically endangered and endangered

ecosystems accounting for 2.7%, and vulnerable ecosystems 6.8% of the land area. It is therefore vital that Threatened Terrestrial Ecosystems inform proactive and reactive conservation and planning tools, such as Biodiversity Sector Plans, municipal Strategic Environmental Assessments (SEAs) and Environmental Management Frameworks (EMFs), EIAs and other environmental applications (Mucina *et al.* 2006).

The proposed Mookodi-Mahikeng 400kV Powerline route alternatives fall within the Mafikeng Bushveld (Vulnerable), with a very small section of Alternative Route Option 2 (WM13) falling within the Western Highveld Sandy Grassland (Critically Endangered) (**Figure 41**).

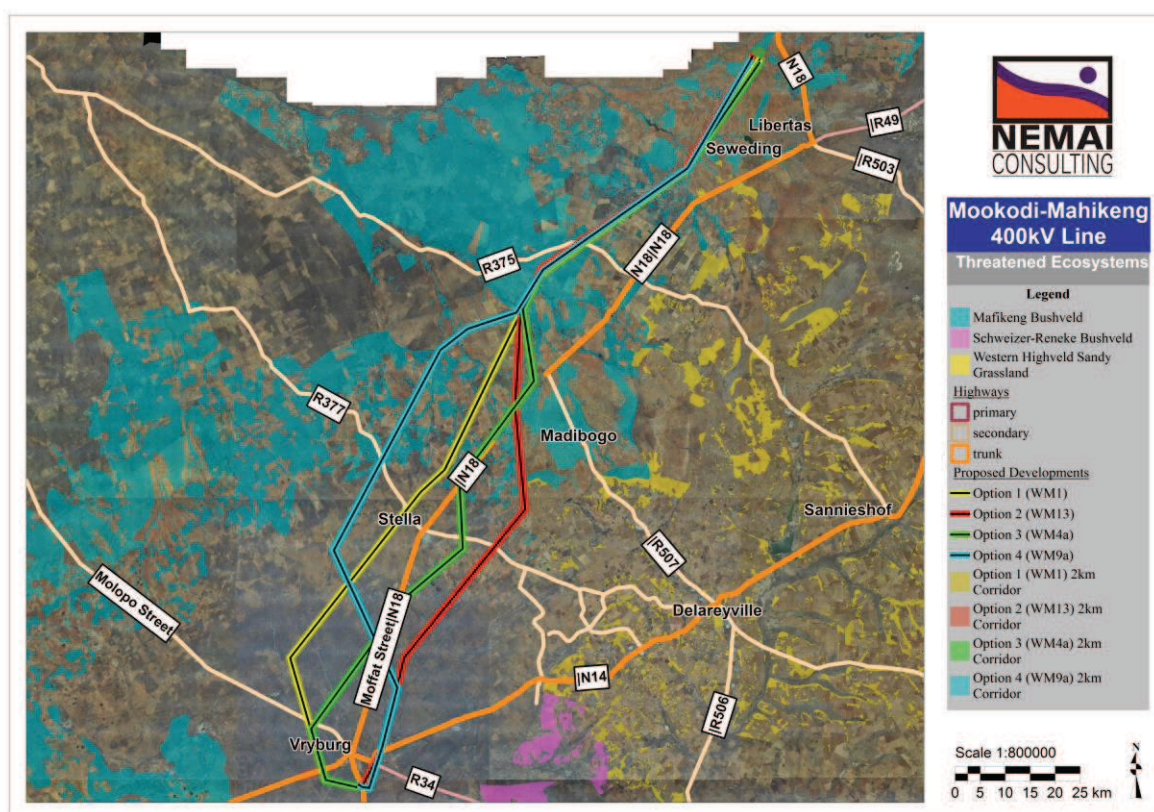


Figure 41: Threatened terrestrial ecosystems

12.6.1.3 North West Biodiversity Sector Plan (2015)

The North West Province's biodiversity provides an important basis for economic growth and development, in ways such as providing rangelands that support commercial and subsistence farming, horticulture and agriculture industry based on indigenous species, tourism industry, aspects of film industry, commercial and non-commercial medicinal applications of indigenous resources, and provision of clean water.

Critical biodiversity areas (CBAs) are terrestrial and aquatic features the landscape that are critical for retaining biodiversity and supporting continued ecosystem functioning and services

(Anon, 2008). The primary purpose of CBA's is to inform land-use planning and the land-use guidelines attached to CBA's aim to promote sustainable development by avoiding loss or degradation of important natural habitat and landscapes in these areas and the landscape as a whole. CBA's can also be used to inform protected area expansion and development plans. The use of CBA's here follows the definition laid out in the guideline for publishing bioregional plans (Anon, 2008):

- CBAs are areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near-natural state then biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity-compatible land uses and resource uses.
- Ecological support areas (ESAs) are areas that are not essential for meeting biodiversity representation targets/thresholds but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The degree of restriction on land use and resource use in these areas may be lower than that recommended for critical biodiversity areas.

The map of CBAs includes five categories: Protected Areas, Critical Biodiversity areas, Ecological Support Areas, Other Natural Areas and Areas with no natural habitat remaining. The biodiversity criteria used to define Critical Biodiversity Areas (CBAs) in the North West Province are listed in **Table 10** below.

The proposed Mookodi-Mahikeng 400kV Powerline route alternatives fall within CBA2, ESA1 and ESA2 (**Figure 42**).

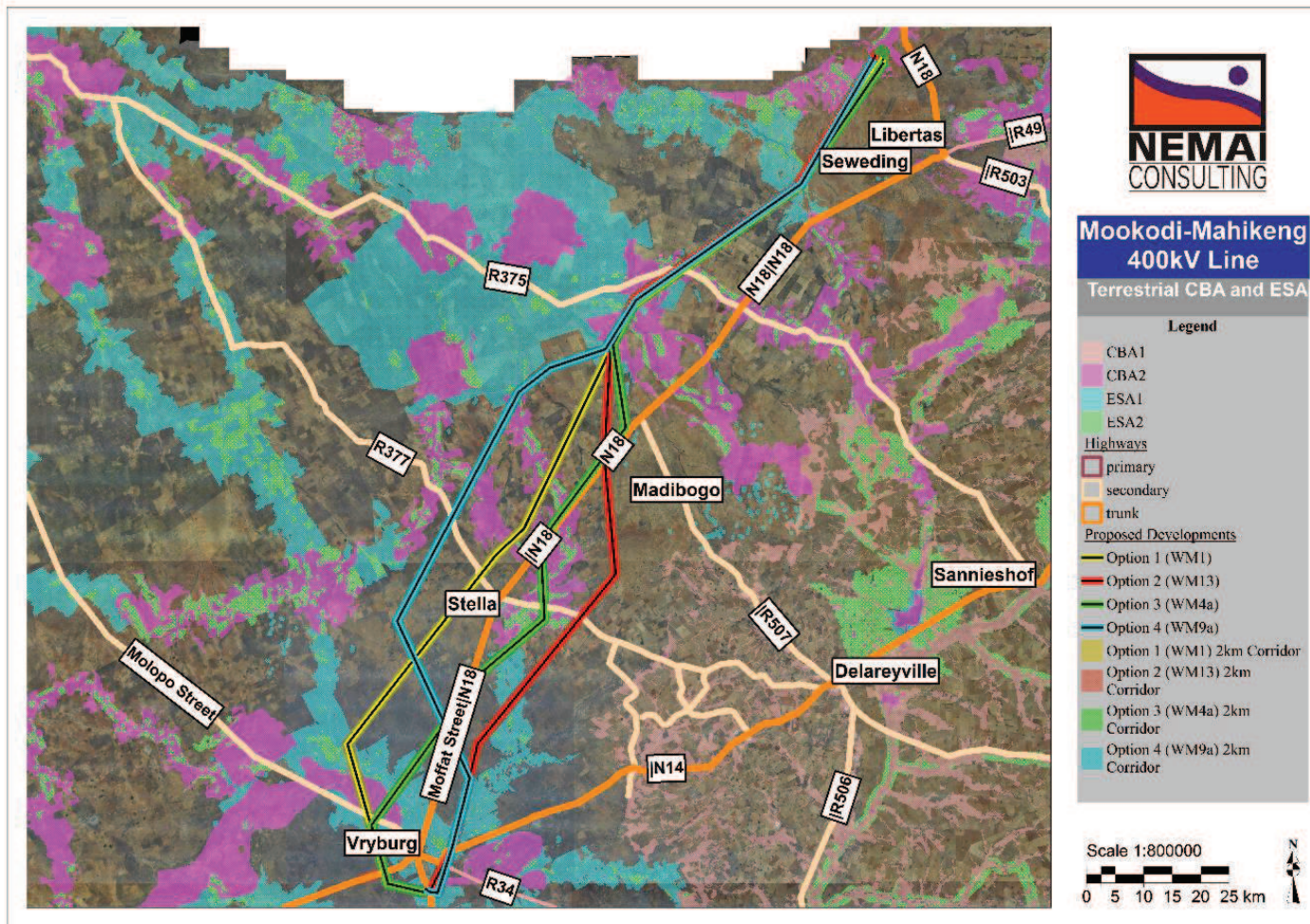


Figure 42: CBA and ESA

Table 10: Criteria used to define CBA map categories (Desmet and Schaller, 2015)

CBA MAP CATEGORY AND CRITERION NAME	DESCRIPTION OF BIODIVERSITY FEATURES USED TO DEFINE CBA MAP CATEGORY	MAP CODES
Protected Areas		
Protected Areas	Protected areas recognised in the Protected Areas Act including South African National Parks and North West Provincial Parks.	PA
Conservation Areas	Conservation areas not recognised in the Protected Areas Act (e.g. conservancies and private nature reserves or game farms where there is no legal agreement)	CA
Terrestrial Critical Biodiversity Area Level 1		
Critical Patches: Ecosystem Status –Critically Endangered Ecosystems	Remaining patches larger than 3 ha of provincially Critically Endangered ecosystems (vegetation types), i.e. the amount of vegetation remaining intact (of these ecosystems) is less than the representation/biodiversity target, therefore all remaining patches of these vegetation units are of the highest conservation priority and further impacts on natural habitat should be avoided.	CBA1
Irreplaceable Sites	Planning units with high irreplaceability values based on the provincial MARXAN analysis, i.e. areas or sites that are mandatory if biodiversity targets are to be achieved.	
Critical Biodiversity Corridors Linkages	Critical linkages in the provincial biodiversity corridor network where existing conversion of natural landscapes to other land uses has severely restricted options for maintaining connectivity in the natural landscape. Critical linkages that are not in a natural state are categorised as ESA 2	
Important Terrestrial Habitats: Expert Areas	Areas in the terrestrial environments less than 10 000 ha in extent identified by experts as being important for biodiversity conservation.	
Important Terrestrial Habitats: Kloofs	All medium to large kloofs identified as an important habitat for climate change adaptation.	
Aquatic Critical Biodiversity Areas Level 1		
FEPA Rivers	All FEPA river lines (FEPA rivers, fish sanctuary and free-flowing rivers) buffered by 100 m as identified in NFEPA and modified by DWS National River Ecstatus Monitoring Program (REMP) and experts.	CBA1
Important Habitats: Peat Wetlands	Peat wetlands as mapped by experts.	
Important Habitats: Dolomitic Eyes	Dolomitic eyes as mapped by experts.	
Terrestrial Critical Biodiversity Areas Level 2		
Critical Patches: Ecosystem Status –Endangered and Vulnerable Ecosystems	Remaining patches larger than 5 ha of provincially Endangered and Vulnerable ecosystems (vegetation types), i.e. the amount vegetation remaining intact (of these ecosystems) is less than 60%. Any further modification of these vegetation types should be limited to existing irreversibly modified or heavily degraded areas.	CBA2

CBA MAP CATEGORY AND CRITERION NAME	DESCRIPTION OF BIODIVERSITY FEATURES USED TO DEFINE CBA MAP CATEGORY	MAP CODES
Critical Patches: Endemic Vegetation Types	Remaining patches larger than 10 ha of endemic vegetation types to the province. These are vegetation types whose biodiversity target can only be achieved in the NW Province.	
Important Habitats: Features	Important natural features (habitats, springs, scenic landscapes) used in the 2008 biodiversity conservation assessment (DACERD, 2009).	
Important Habitats: Focus Wildlife Areas	Areas identified as being important for maintaining species of conservation concern (free-ranging red hartebeest (<i>Alcelaphus buselaphus</i>), black-footed cat (<i>Felis nigripes</i>), vulture nesting areas, Important Bird Areas).	
Aquatic Critical Biodiversity Areas Level 2		
Modelled Wetlands	Pans, instream wetlands and riparian areas modelled from a digital terrain model.	CBA2
Terrestrial Ecological Support Areas Level 1 and Level 2		
Important Habitats: Hills and Ridges	Hills and ridges identified as sensitive habitats in the existing provincial SDF dataset. The hill and ridges layer was developed to address the special biodiversity significance of these topographic features in the province. The layer was re-developed from scratch using the GIS modelling approach used in Gauteng Province and modified for the North West.	ESA1 if natural ESA2 if not natural

12.6.1.4 Protected Areas

The aim of the National Environmental Management: Protected Areas Act (Act No. 57 of 2003) is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and natural seascapes. The purpose of a Protected Environment is amongst others to protect a specific ecosystem outside a special nature reserve world heritage site or nature reserve and also to ensure the use of the natural resources in the area is sustainable.

The proposed Mookodi-Mahikeng 400kV Powerline route alternatives fall near the Botsalano Game Reserve, Mafikeng Game Reserve and Barberspan Bird Sanctuary (**Figure 43**).

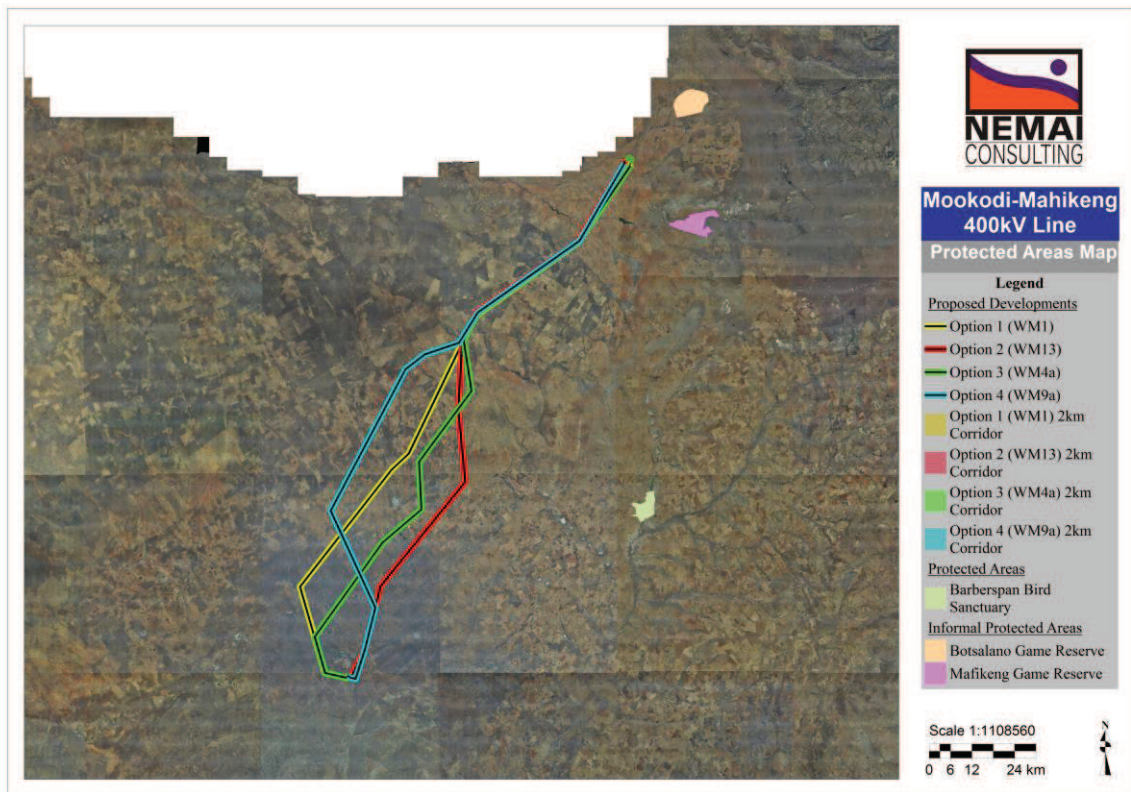


Figure 43: Protected areas

12.6.1.5 Plant Species of Conservation Concern

The proposed development is located within the following quarter degree squares in terms of the 1:20 000 grid of South Africa:

- | | | | |
|-----------|------------|------------|------------|
| 1. 2724BB | 6. 2624DB | 11. 2625AA | 16. 2525DA |
| 2. 2724BA | 7. 2624DA | 12. 2624BB | 17. 2525CB |
| 3. 2624DD | 8. 2625AC | 13. 2625AB | |
| 4. 2624DC | 9. 2624BD | 14. 2525CD | |
| 5. 2625CA | 10. 2624BC | 15. 2525DC | |

The Pretoria Computerised Information System (PRECIS) list of Red Data plants was obtained from SANBI (<http://posa.sanbi.org/searchsp.php>). The list was consulted to verify the record of occurrence of the plant species seen in the vicinity of the proposed development. The site sampled is also only a very small portion of all the grids and so habitats suitable for certain species in the PRECIS list may not be present at the areas sampled. A list of the threatened plant species is provided in **Table 11** below. Conservation status and definitions of each status is listed next to each species in **Table 12**.

Table 11: Red Data Plant species recorded which could potentially occur in the study area (SANBI data)

Family	Genus	Species	Common Name	Red List category
Mesembryanthemaceae	<i>Lithops</i>	<i>lesliei</i>		NT
Asteraceae	<i>Rennera</i>	<i>stellate</i>		VU
Apocynaceae	<i>Brachystelma</i>	<i>canum</i>		CR
Anacardiaceae	<i>Searsia</i>	<i>maricoana</i>		VU
Hyacinthaceae	<i>Drimia</i>	<i>sanguinea</i>	Rooislangkop	NT
Fabaceae	<i>Acacia</i>	<i>erioloba</i>		Declining

Table 12: Definitions of Red Data plant status (Raimondo et al. 1999)

Symbol	Status	Description
EN	Endangered	A taxon is Endangered when the best available evidence indicates that it meets any of the International Union for Conservation of Nature (IUCN) criteria for Endangered, and is therefore facing a very high risk of extinction in the wild.
VU	Vulnerable	A taxon is Vulnerable when the best available evidence indicates that it meets any of the five) an IUCN criterion for Vulnerable and it is therefore considered to be facing a high risk of extinction in the wild.
NT	Near Threatened	A taxon is Near Threatened when available evidence indicates that it is close to meeting any of the five IUCN criteria for Vulnerable, and is therefore likely to qualify for a threatened category in the near future.

12.6.2 Potential Impacts/Implications

The main reasons for managing the vegetation under power lines include the following:

- Ensuring safe clearances under and around power lines;
- Ensuring adequate access for inspection, maintenance and repair activities; and
- Reduction of fuels for fires under power lines that cause flashovers.

Potential impacts to vegetation resulting from the construction of the proposed powerline includes the clearance of vegetation in accordance with The Eskom Contract Specification for Vegetation Management Services on Eskom Networks (240-52456757).

During the operational phase, vegetation that could possibly interfere with the operation and/or reliability of the power line must be trimmed or completely cleared. Invasive alien species in the servitude is cleared and chemically treated for the total width of the servitude.

12.6.3 Specialist Studies Required

The Terrestrial Ecological Impact Assessment in the EIA phase will assess the status of the sensitive ecological features. Areas to be affected by project activities and infrastructure will be surveyed to identify sensitive and significant floral species. Suitable mitigation measures will be identified and recommendations will be made to address potential impacts.

The compatibility of the project with the North West Biodiversity Sector Plan (2015) and other environmental management and planning tools will be considered further during the EIA phase.

Mitigation measures will be established during the EIA phase to manage the potential impacts to vegetation, removal of protected trees and medicinal plants, encroachment by exotic species and to address the overall reinstatement and rehabilitation of the area affected within the construction domain (outside of the permanent infrastructure footprint).

12.7 Fauna

12.7.1 Status Quo

12.7.1.1 Mammals

According to the Animal Demography Unit (http://vmus.adu.org.za/vm_sp_list.php) there are a few sensitive species that occur in the grids mentioned in Section 12.6.1.5. A list of the sensitive mammal species found in these grid cells can be seen in **Table 13**.

Table 13: Mammal species recorded which could occur in the study area

Family	Genus	Species	Common name	Red List Category
Bovidae	<i>Hippotragus</i>	<i>niger</i>	Sable Antelope	VU
Bovidae	<i>Hippotragus</i>	<i>equinus</i>	Roan Antelope	VU
Canidae	<i>Lycaon</i>	<i>pictus</i>	African wild dog	EN
Felidae	<i>Acinonyx</i>	<i>jubatus</i>	Cheetah	VU
Hyaenidae	<i>Hyaena</i>	<i>brunnea</i>	Brown Hyena	NT
Manidae	<i>Smutsia</i>	<i>temminckii</i>	Ground Pangolin	VU
Mustelidae	<i>Mellivora</i>	<i>capensis</i>	Honey Badger	NT
Rhinolophidae	<i>Rhinolophus</i>	<i>denti</i>	Dent's Horseshoe Bat	NT
Vespertilionidae	<i>Miniopterus</i>	<i>schreibersii</i>	Schreibers's Long-fingered Bat	NT

Note: VU=Vulnerable; EN=Endangered; NT=Near Threatened; CR=Critically Endangered

12.7.1.2 Reptiles

According to the Reptile Atlas of Southern African (http://vmus.adu.org.za/vm_sp_list.php), no red data reptile species occur in the grids mentioned in Section 12.6.1.5.

12.7.1.3 Amphibians

According to the Frog Atlas of Southern African (http://vmus.adu.org.za/vm_sp_list.php), the frog species that was recorded in the grids mentioned in Section 12.6.1.5 is shown in **Table 14** below. According to Frog Atlas of Southern Africa, Giant Bull Frog is expected to be found within the site.

Table 14: Amphibian species recorded which could occur in the study area

Family	Genus	Species	Common name	Red List Category
Pyxicephalidae	<i>Pyxicephalus</i>	<i>adpersus</i>	Giant Bull Frog	NT

Note: NT=Near Threatened

12.7.1.4 Avifauna

Important Bird and Biodiversity Areas (IBAs) form a network of sites, at a bio-geographic scale, which are crucial for the long-term viability of naturally occurring bird populations (Barnes, 2000). Conservation and planning tools were consulted for relevancy for this project, and found that the proposed Mookodi-Mahikeng 400kV Powerline route alternatives fall near the (Figure 44).

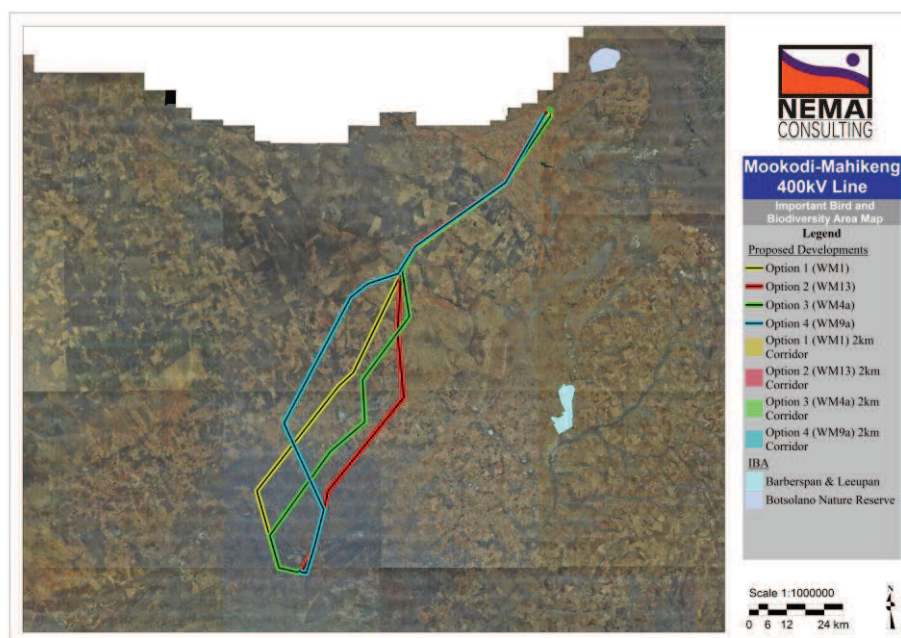


Figure 44: Important bird and biodiversity area

According to the Southern African Bird Atlas Project 2 (SANBAP 2), a list of threatened bird species occur in the grids mentioned in Section 12.6.1.5 (**Table 15**).

Table 15: List of threatened bird species which could occur in the study area

Family	Genus	Species	Common name	Red List Category
Phoenicopteridae	<i>Phoenicopterus</i>	<i>roseus</i>	Greater Flamingo	NT
Phoenicopteridae	<i>Phoeniconaias</i>	<i>minor</i>	Lesser Flamingo	NT
Sagittariidae	<i>Sagittarius</i>	<i>serpentarius</i>	Secretarybird	NT
Accipitridae	<i>Polemaetus</i>	<i>bellicosus</i>	Martial Eagle	VU
Falconidae	<i>Falco</i>	<i>naumanni</i>	Lesser Kestrel	VU
Gruidae	<i>Anthropoides</i>	<i>paradiseus</i>	Blue Crane	VU
Ciconiidae	<i>Ciconia</i>	<i>nigra</i>	Black Stork	NT
Otididae	<i>Ardeotis</i>	<i>kori</i>	Kori Bustard	VU
Ciconiidae	<i>Mycteria</i>	<i>ibis</i>	Yellow-billed Stork	NT
Accipitridae	<i>Gyps</i>	<i>coprotheres</i>	Cape Vulture (Griffon)	VU
Accipitridae	<i>Gyps</i>	<i>africanus</i>	White-backed Vulture	VU
Accipitridae	<i>Torgos</i>	<i>tracheliotos</i>	Lappet-faced Vulture	VU
Accipitridae	<i>Circus</i>	<i>ranivorus</i>	African Marsh-Harrier	VU
Falconidae	<i>Falco</i>	<i>biarmicus</i>	Lanner Falcon	NT
Alaudidae	<i>Mirafra</i>	<i>cheniana</i>	Melodious (Latakoo) Lark	NT
Alaudidae	<i>Certhilauda</i>	<i>chuana</i>	Short-clawed Lark	NT
Pelecanidae	<i>Pelecanus</i>	<i>rufescens</i>	Pink-backed Pelican	VU
Rostratulidae	<i>Rostratula</i>	<i>benghalensis</i>	Greater Painted-snipe	NT
Buphagidae	<i>Buphagus</i>	<i>erythrorhynchus</i>	Red-billed Oxpecker	NT
Pelecanidae	<i>Pelecanus</i>	<i>onocrotalus</i>	Great White Pelican	NT
Accipitridae	<i>Aquila</i>	<i>rapax</i>	Tawny Eagle	VU

Note: VU=Vulnerable; NT=Near Threatened

12.7.2 Potential Impacts/Implications

The proposed Mookodi-Mahikeng 400kV Powerline may negatively impact fauna currently occurring in and around the four route alternatives. Threatened species could occur within the study area and the construction of the proposed powerline will have a negative impact on the habitats of such species. The flora and fauna specialist will be expected to establish whether these species are found on site and whether a search and rescue operation should be instituted prior to construction.

Potential impacts which could occur during the construction phase include:

- Habitat loss due to vegetation clearing; and
- Disturbance to fauna during the construction phase that will result in fauna leaving the project area.

Potential impacts which could occur during the operational phase include:

- Loss of habitat (e.g. removal of trees);

12.8.2 Potential Impacts/Implications

Eskom will need to register a servitude for the powerline, following compensation of the landowner. The proposed powerline will not result in the sterilisation of all the land within the servitude, and certain agricultural practices (e.g. some grazing and the use of farm roads) are still permissible.

Potential impacts to agriculture during the construction phase include:

- Loss of arable land;
- Risk of harm to livestock from construction activities (e.g. open excavations);
- Loss of livestock through improper access control; and
- Theft of farming produce during construction.

Potential impacts to agriculture during the operational phase include:

- Loss of livestock through improper access control;
- The potential of magnetic radiation affecting pregnant cattle;
- Power cables influencing the GPS signals used for precision farming;
- Farms with power lines are charged extra for crop spraying;
- Introduction of exotic weed species; and
- Limitation of the height of trees.

12.8.3 Specialist Studies Required

An Agricultural Impact Assessment will be undertaken to quantify the agricultural areas lost as a result of the proposed project and consider possible mitigation measures.

12.9 Land Use

12.9.1 Status Quo

The 2013-14 South African National Land-cover dataset produced by GEOTERRAIMAGE shows that the proposed Mookodi-Mahikeng 400kV Powerline route alternatives fall within various land uses such as low shrubland, grassland, low cultivated fields, woodland/open bush, cultivated pivots, low cultivated subsistence and urban residential (dense trees/bush) (**Figure 46**). The legend for interpreting the South African National Land-cover is provided in **Figure 47**.

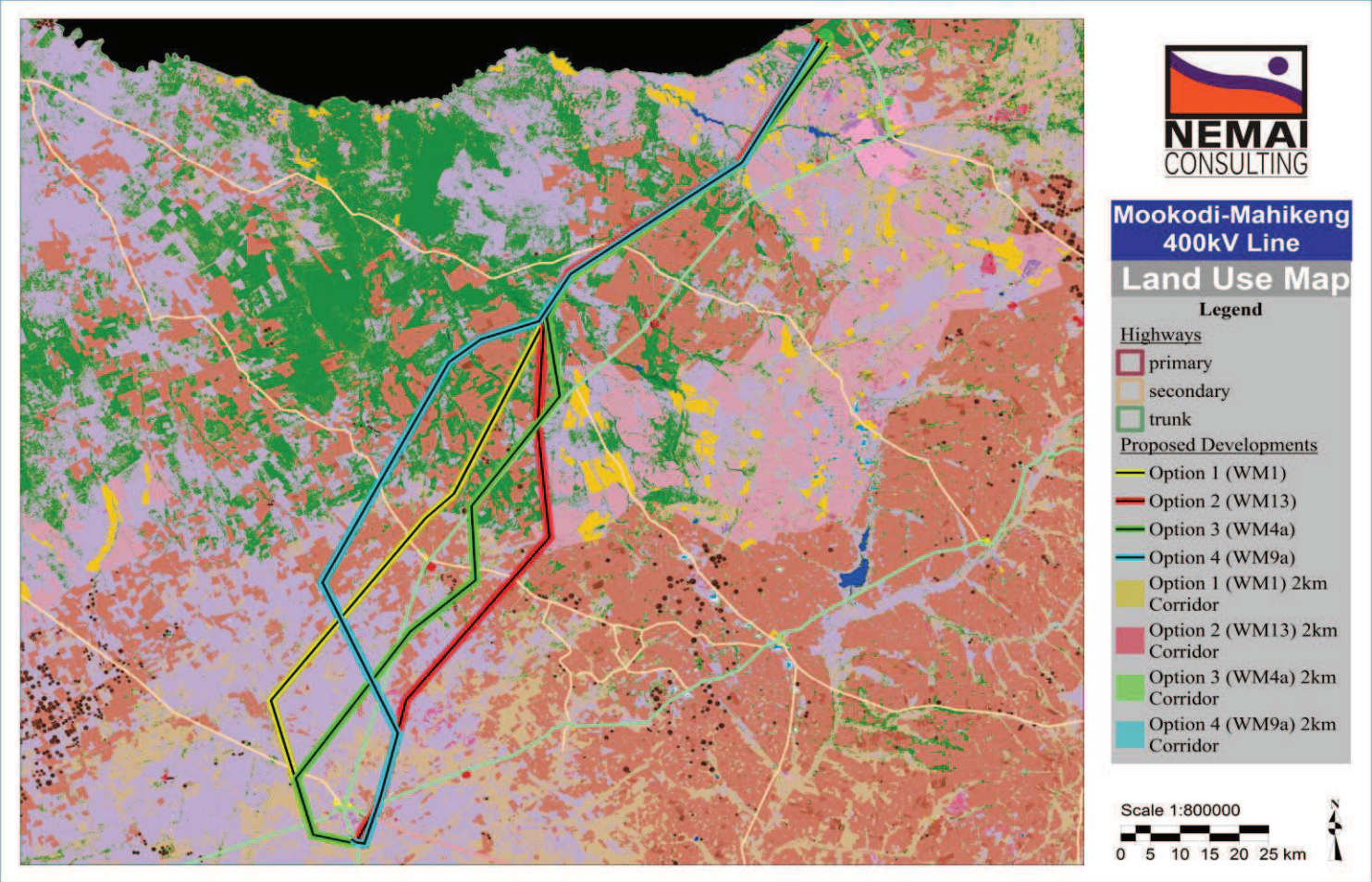


Figure 46: Land use

lcov22_final_gri_utm35n_sa_2014_snap.png

Row	Color	Class Names
0		
1		Water seasonal
2		Water permanent
3		Wetlands
4		Indigenous Forest
5		Thicket / Dense bush
6		Woodland / Open bush
7		Grassland
8		Shrubland / sbrb
9		Low shrubland
10		Cultivated corn fields (high)
11		Cultivated corn fields (med)
12		Cultivated corn fields (low)
13		Cultivated corn plots (high)
14		Cultivated corn plots (med)
15		Cultivated corn plots (low)
16		Cultivated orchards (high)
17		Cultivated orchards (med)
18		Cultivated orchards (low)
19		Cultivated vines (high)
20		Cultivated vines (med)
21		Cultivated vines (low)
22		Cultivated permanent pineapple
23		Cultivated subsistence (high)
24		Cultivated subsistence (med)
25		Cultivated subsistence (low)
26		Cultivated cane ploth - crop
27		Cultivated cane ploth - fallow
28		Cultivated cane commercial - crop
29		Cultivated cane commercial - fallow
30		Cultivated cane emerging - crop
31		Cultivated cane emerging - fallow
32		Plantations / Woodlots mature
33		Plantations / Woodlots young
34		Plantations / Woodlots cleared
35		Mines 1 bare
36		Mines 2 semi-bare
37		Mines water seasonal
38		Mines water permanent
39		Mine buildings
40		Erosion (long)
41		Bare rocks vegetated
42		Urban commercial
43		Urban industrial
44		Urban informal (dense trees / bush)
45		Urban informal (open trees / bush)
46		Urban informal (low veg / grass)
47		Urban informal (bare)
48		Urban residential (dense trees / bush)
49		Urban residential (open trees / bush)
50		Urban residential (low veg / grass)
51		Urban residential (bare)
52		Urban school and sports ground
53		Urban smallholding (dense trees / bush)
54		Urban smallholding (open trees / bush)
55		Urban smallholding (low veg / grass)
56		Urban smallholding (bare)
57		Urban sports and golf (dense tree / bush)
58		Urban sports and golf (open trees / bush)
59		Urban sports and golf (low veg / grass)
60		Urban sports and golf (bare)
61		Urban township (dense trees / bush)
62		Urban township (open trees / bush)
63		Urban township (low veg / grass)
64		Urban township (bare)
65		Urban village (dense trees / bush)
66		Urban village (open trees / bush)
67		Urban village (low veg / grass)
68		Urban village (bare)
69		Urban built-up (dense trees / bush)
70		Urban built-up (open trees / bush)
71		Urban built-up (low veg / grass)
72		Urban built-up (bare)

Figure 47: 2013-14 South African National Legend

12.9.2 Potential Impacts/Implications

- Temporary interruptions to agricultural activities during the construction period along the powerline;
- Permanent loss of agricultural land at transmission line towers; and

- During the operational phase, the landowner will have permitted access and certain use of the servitude area (depending on the limitations specified in the servitude agreement).

12.9.3 Specialist Studies Required

No direct Specialist Studies associated with land use to be conducted. Indirect studies associated with the loss of the land include Terrestrial Ecological Study, Heritage Impact Assessment, Agricultural Impact Assessment, and Social and Economic Impact Assessment.

The EMPr will contain measures to mitigate impacts to existing land uses.

12.10 Heritage

12.10.1 Status Quo

The proposed Mookodi-Mahikeng 400kV Powerline route alternatives do not appear to traverse any heritage sites. Some provincial heritage sites occur in Vryburg and Delareyville but these are not within close proximity to the route alternatives. These provincial heritage sites include the Old Police Station and churches. It is unknown at this stage if graves may occur along the route alternatives.

12.10.2 Potential Impacts/Implications

There could be heritage resources (such as stone age / iron age tools or objects) of significance, archaeological and palaeontological sites, graves or any other heritage and cultural artefacts on the proposed Mookodi-Mahikeng 400kV Powerline route alternatives.

12.10.3 Specialist Studies Required

Due to the length of the proposed Mookodi-Mahikeng 400kV Powerline route alternatives, a Phase 1 Heritage Impact Assessment will be required as the development triggers Section 38 (1) of the National Heritage Act (Act No. 25 of 1999). Any heritage resources will need to be identified and protected (if any). The site will also be screened further against the Fossil Sensitivity Map on SAHRIS. All the relevant protocols need to be abided by and permits will need to be obtained with regard to heritage resources (where necessary).

12.11 Air Quality

12.11.1 Status Quo

Current air pollution sources in the region include the following:

- Agricultural activities;
- Biomass burning (veld fires);

- Domestic fuel burning;
- Vehicle tailpipe emissions;
- Vehicle entrainment of dust from paved and unpaved roads; and
- Other fugitive dust sources such as wind erosion of exposed areas.

12.11.2 Potential Impacts/Implications

Potential impacts to air quality during the construction phase include:

- Dust from the use of dirt roads;
- Dust from bare areas that have been cleared for construction purposes;
- Emissions from construction equipment and machinery; and
- Tailpipe emissions from construction vehicles.

Potential impacts to air quality during the operational phase include:

- Dust from the use of dirt roads; and
- Tailpipe emissions from maintenance vehicles.

12.11.3 Specialist Studies Required

No air quality study will be undertaken as it is not deemed necessary for the type of activities associated with this project. Mitigation measures will be included in the EMP to ensure that the air quality impacts during the construction phase are suitably managed and that regulated thresholds are not exceeded.

12.12 Noise

12.12.1 Status Quo

Noise in the region emanates primarily from farming operations (e.g. use of farming equipment) and vehicles on the surrounding road network.

12.12.2 Potential Impacts/Implications

During construction, localised increases in noise may be caused by:

- Blasting (if required);
- Construction equipment, machinery and vehicles;
- Construction material delivery vehicles; and
- General activities at the construction camp.

Potential sources of noise during the operational phase include:

- Maintenance vehicles and activities; and
- “Crackling” noise (called “corona”) from transmission lines.

12.12.3 Specialist Studies Required

Noise that emanates from construction and operational activities will be addressed through targeted best practices for noise monitoring and management in the EMPr. The associated regulated standards need to be adhered to.

12.13 Visual Quality

12.13.1 Status Quo

The sense of place for proposed Mookodi-Mahikeng 400kV Powerline route alternatives can be associated with a natural and rural state consisting of game farms and cattle farms (**Figure 48**). There are some existing powerlines within the area (**Figure 49**).



Figure 48: Game farm along the N18



Figure 49: Existing powerlines along the N18

12.13.2 Potential Impacts/Implications

Potential visual impacts during the construction phase include:

- Clearing of vegetation;
- Construction-related activities;
- Inadequate waste management and housekeeping; and
- Inadequate reinstatement and rehabilitation of construction footprint.

Potential visual impacts during the operational phase include:

- High visibility of transmission lines and substation;
- Loss of “sense of place”; and
- Inadequate reinstatement and rehabilitation of construction footprint.

12.13.3 Specialist Studies Required

The potential impacts to the aesthetics as a result of the proposed project activities and infrastructure will be assessed in the Visual Impact Assessment in the EIA Phase. The sensitive receptors (e.g. residences) that could potentially be influenced by any visual impacts will also be considered.

The EMPr will further include measures to manage visual impacts and to rehabilitate areas affected by construction activities.

12.14 Existing Infrastructure

12.14.1 Status Quo

Several structures and infrastructure may occur within the 2km corridors for the four route alternatives such as roads, households, existing powerlines, boreholes, cattle kraals, railway lines. The Lidar Survey that will be undertaken by Eskom once a route is authorised, which will mark the exact footprint of any existing infrastructure that affect the centreline and 55m servitude.

12.14.2 Potential Impacts/Implications

The centreline of the BPEO will attempt to avoid direct impact to structures. However, certain linear infrastructure (e.g. road and railway line) is not avoidable. Eskom will need to comply with the requirements of the custodians of existing linear infrastructure and the appropriate wayleave procedures will need to be followed.

Certain restrictions associated with the power line servitude will need to be adhered to during the operational phase of the project.

12.14.3 Specialist Studies Required

All structures and buildings that will be affected by the project will be identified and suitable compensation measures need to be established.

Mitigation measures to be identified during the EIA phase to safeguard or relocate existing structures and agricultural infrastructure on private farms or to compensate the owners.

12.14.4 Specialist Studies Required

All structures and buildings that will be affected by the project will be identified and suitable compensation measures need to be established.

Mitigation measures to be identified during the EIA phase to safeguard or relocate existing structures and agricultural infrastructure on private farms or to compensate the owners.

12.15 Traffic

12.15.1 Status Quo

Noteworthy roads in the immediate study area include N18, N14, R34, R378 (also known as Molopo Street), R377, R376 and R375.

12.15.2 Potential Impacts/Implications

The proposed route alternatives cross several road crossings.

12.15.3 Specialist Studies Required

No traffic impact study will be undertaken for proposed Mookodi-Mahikeng 400kV Powerline as it is not deemed necessary for the type of activities associated with this project. Suitable mitigation measures in terms of traffic and the use of roads will be included in the EMPr.

12.16 Socio-Economic

12.16.1 Status Quo

The directly affected Ward boundaries and the affected sub places within the wards for proposed Mookodi-Mahikeng 400kV Powerline route alternatives are described below (**Table 16** and **Figure 50**):

Table 16: Local Municipalities, Wards and Sub Places

Local Municipality	Wards	Sub Places
Naledi	1, 2, 5, 7, 9 and 10	Naledi NU
Kagisano-Molopo	1	Kagisano NU
Ratlou	4, 7, 9, 11 and 13	Ratlou NU
Mahikeng	1, 2, 3 and 6	Makgabana (Madibe) SP, Masuthe SP, Modimola SP, Motsumorwane SP (no data available), Lekung SP, Tlapeng SP, Mogosane SP, Lokgalong SP, and Mafikeng NU

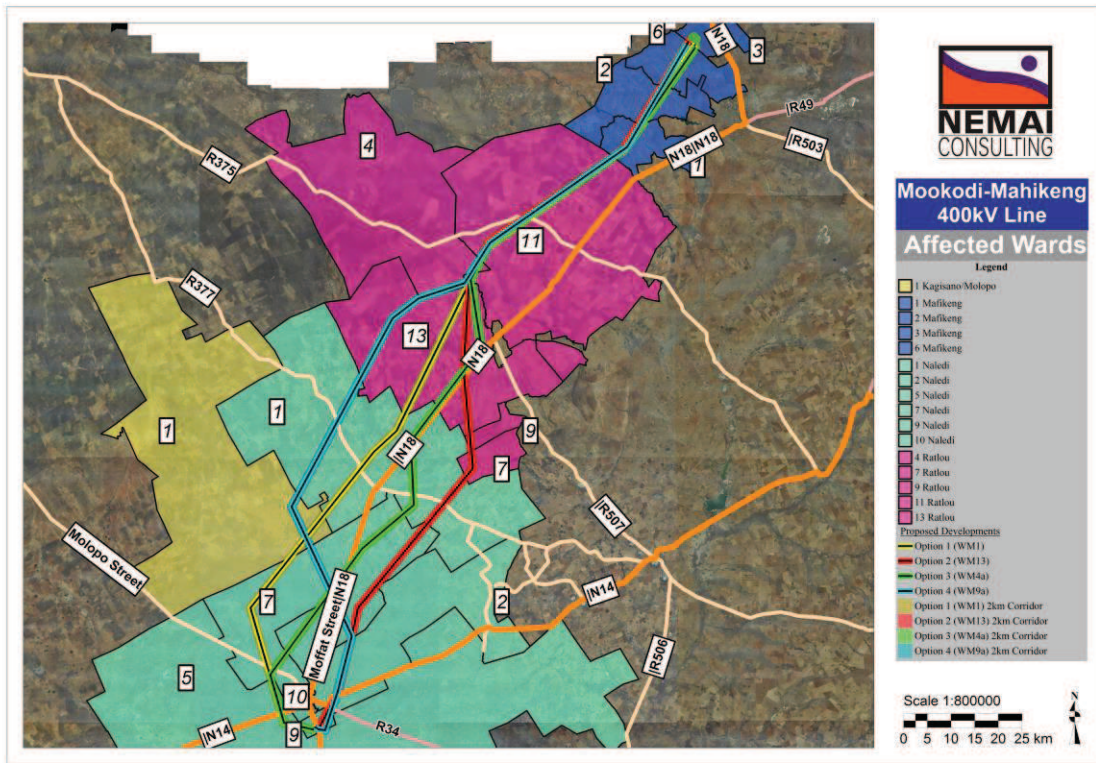


Figure 50: Wards

Data pertaining to the socio-economic profile of the above mentioned sub places (based on Census 2011) is presented in the tables to follow.

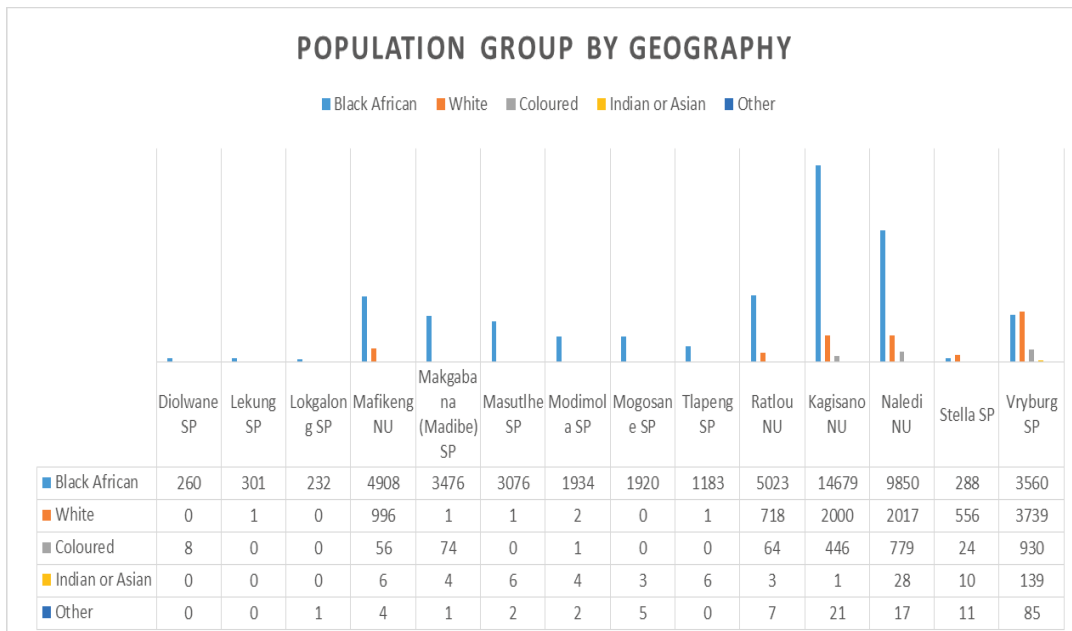


Figure 51: Population

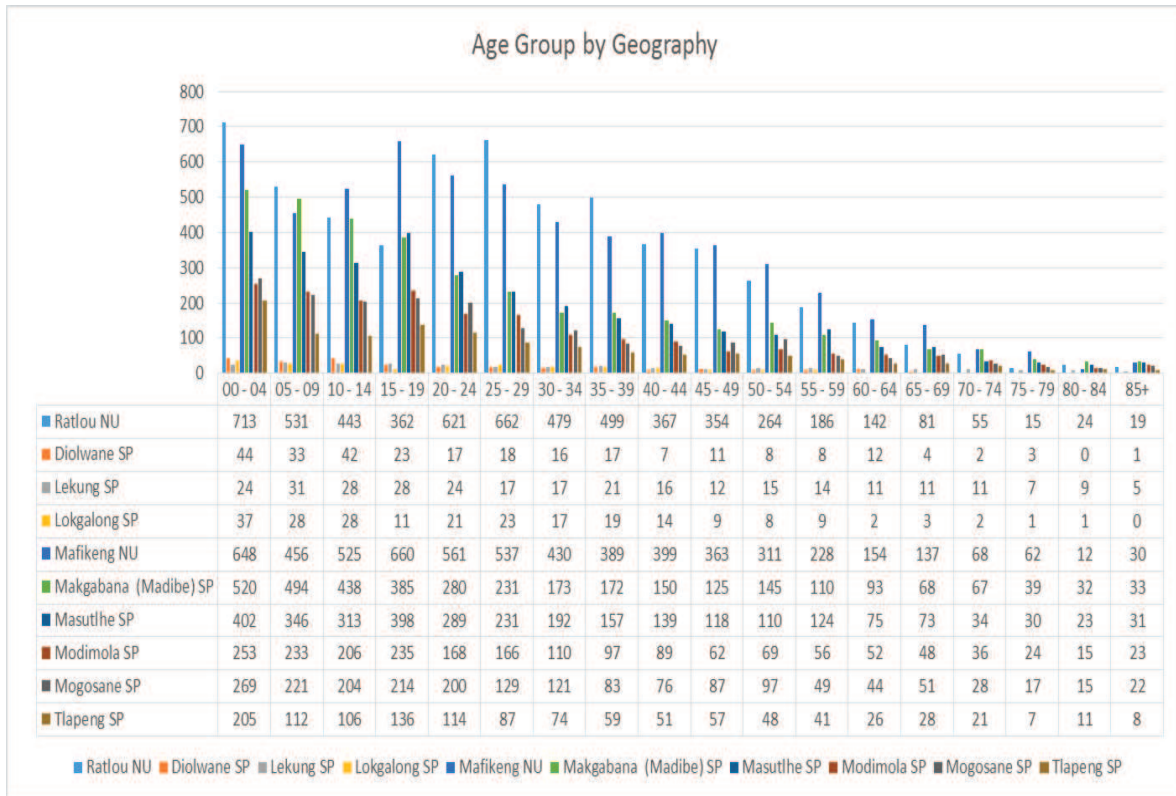


Figure 52: Age

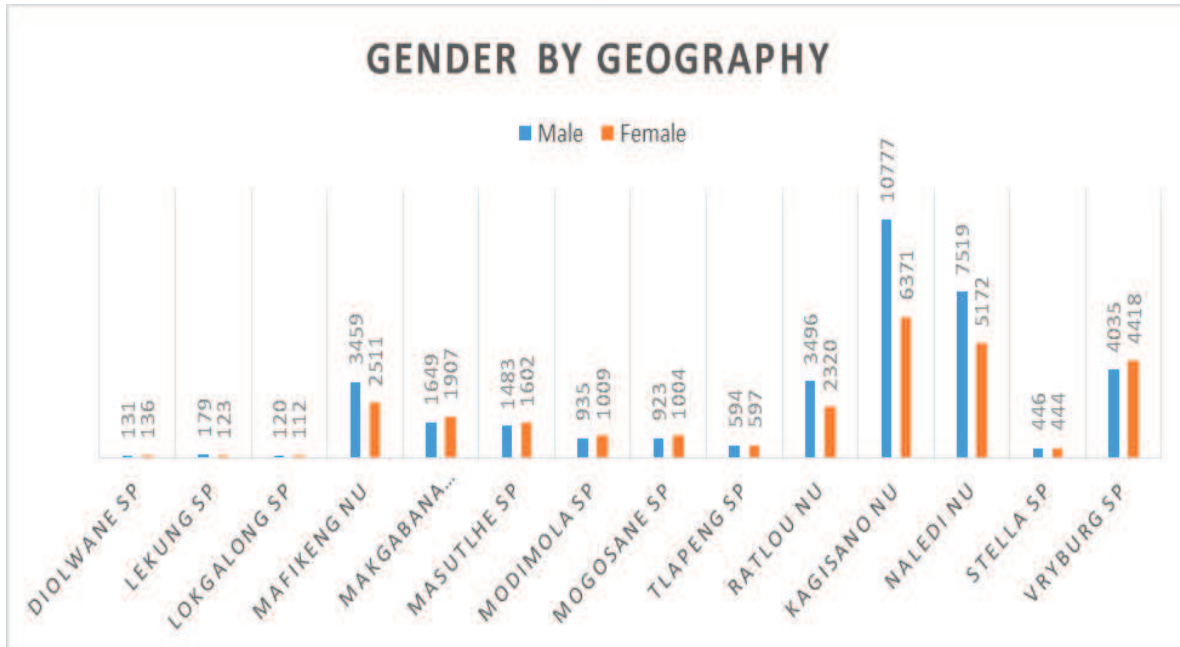


Figure 53: Gender

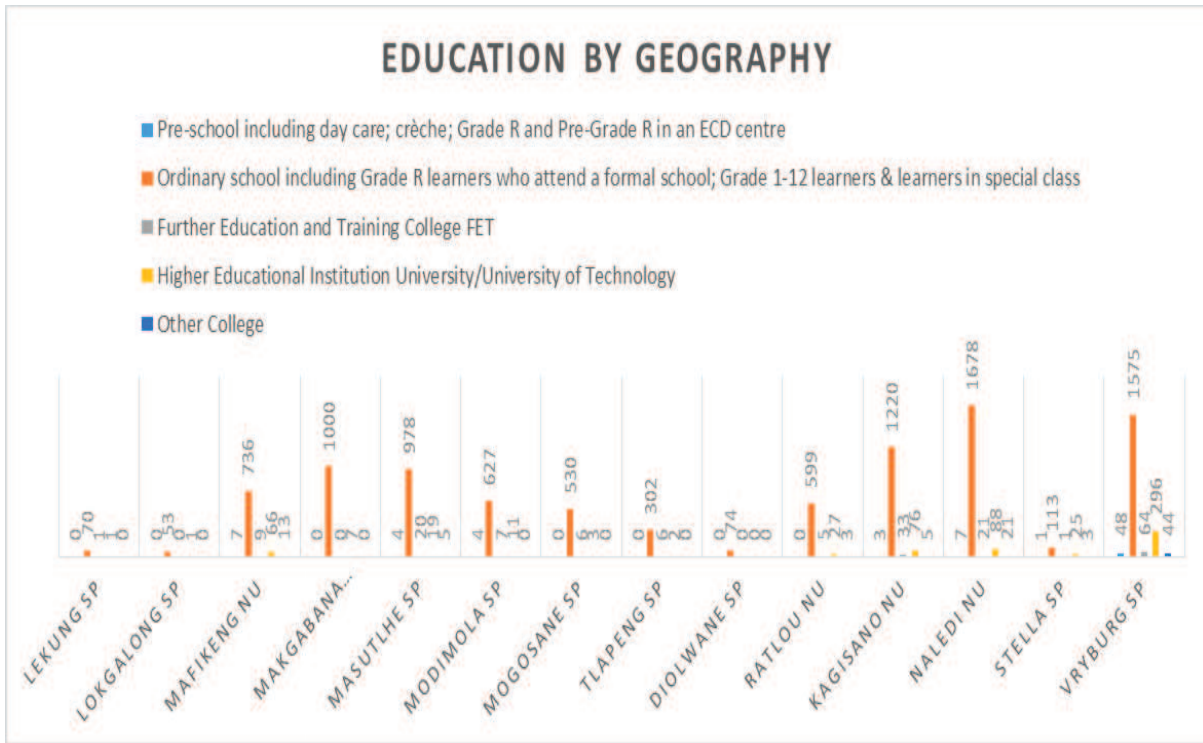


Figure 54: Education

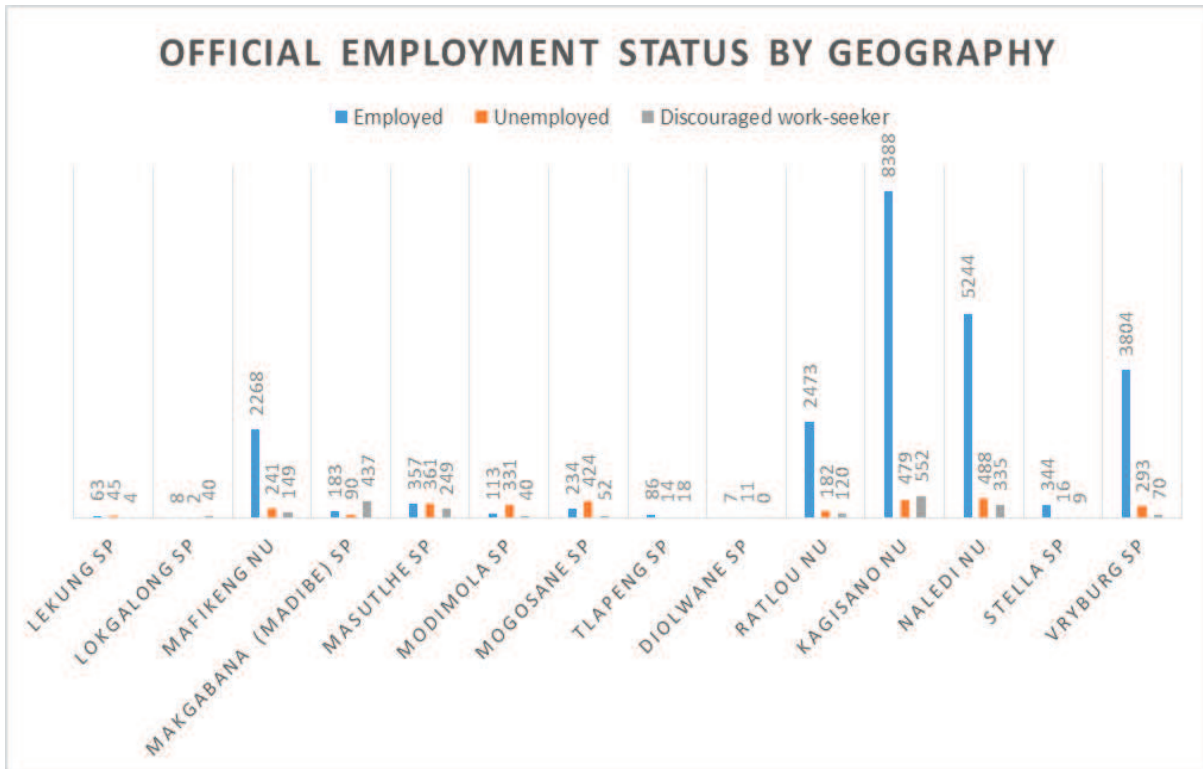


Figure 55: Employment

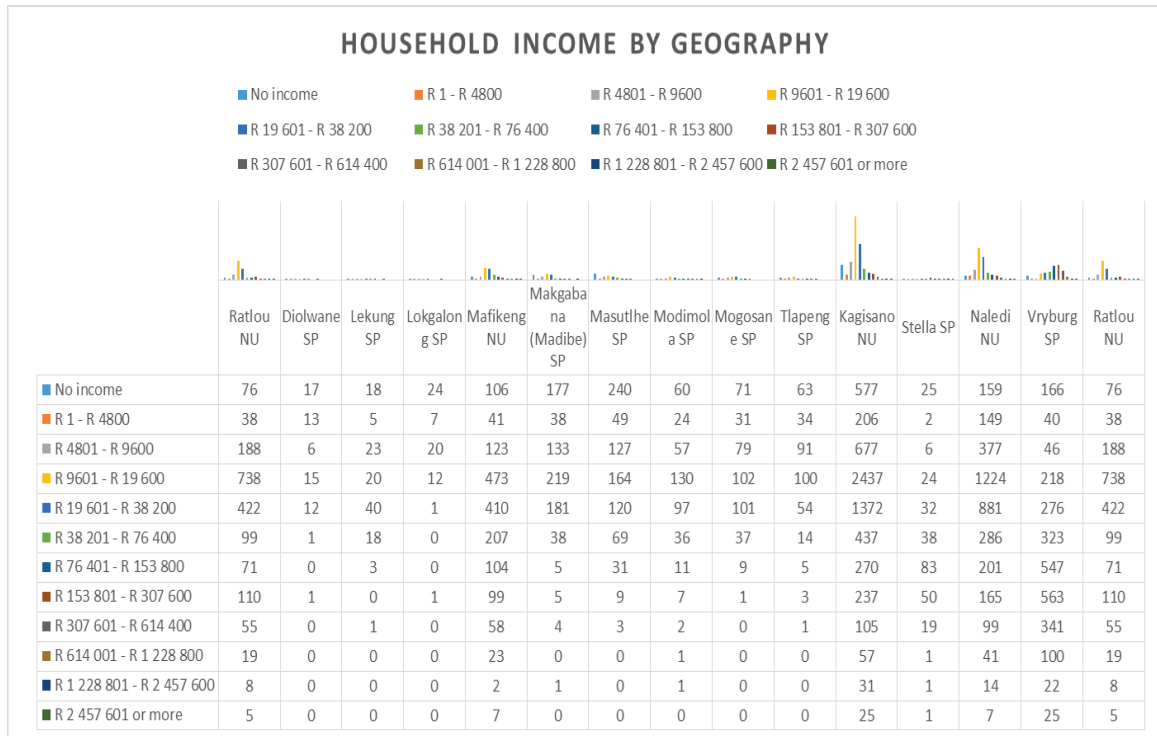


Figure 56: Annual household income

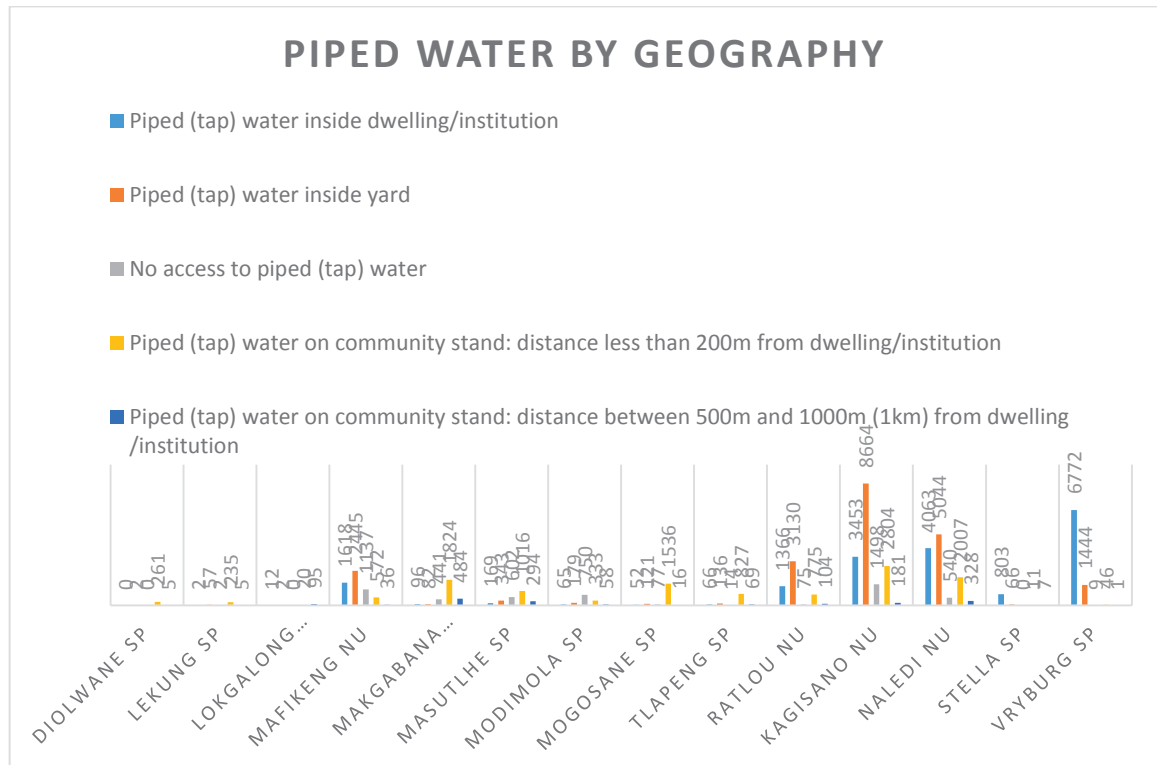


Figure 57: Access to water

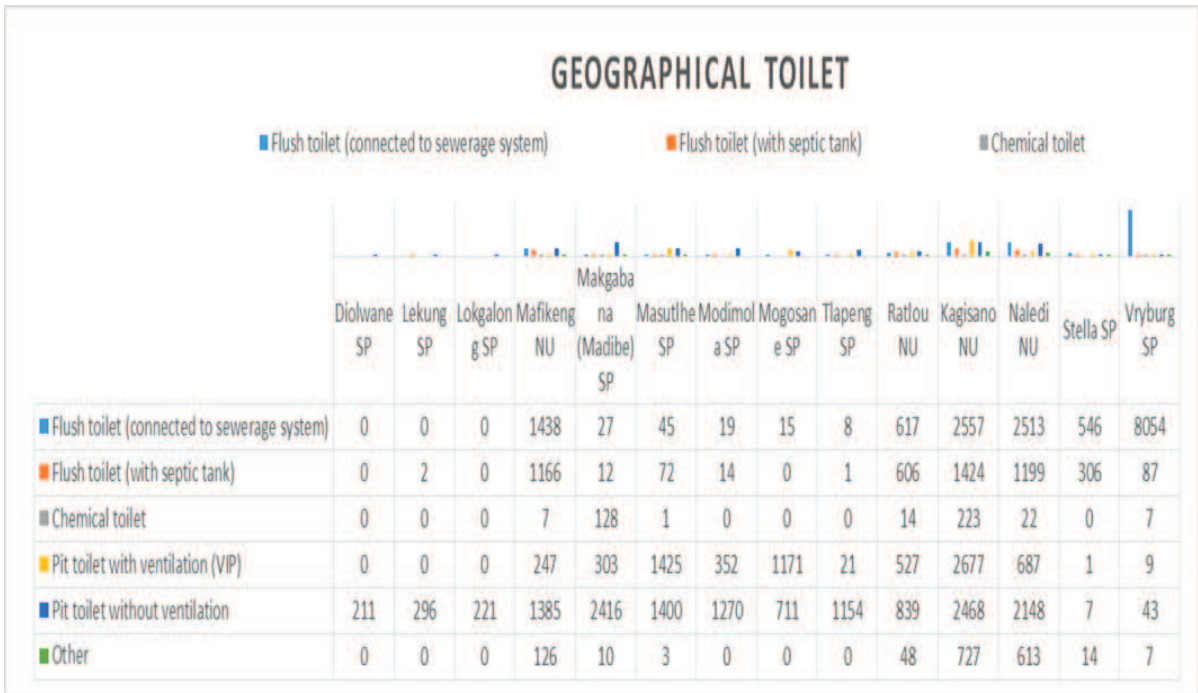


Figure 58: Access to sanitation

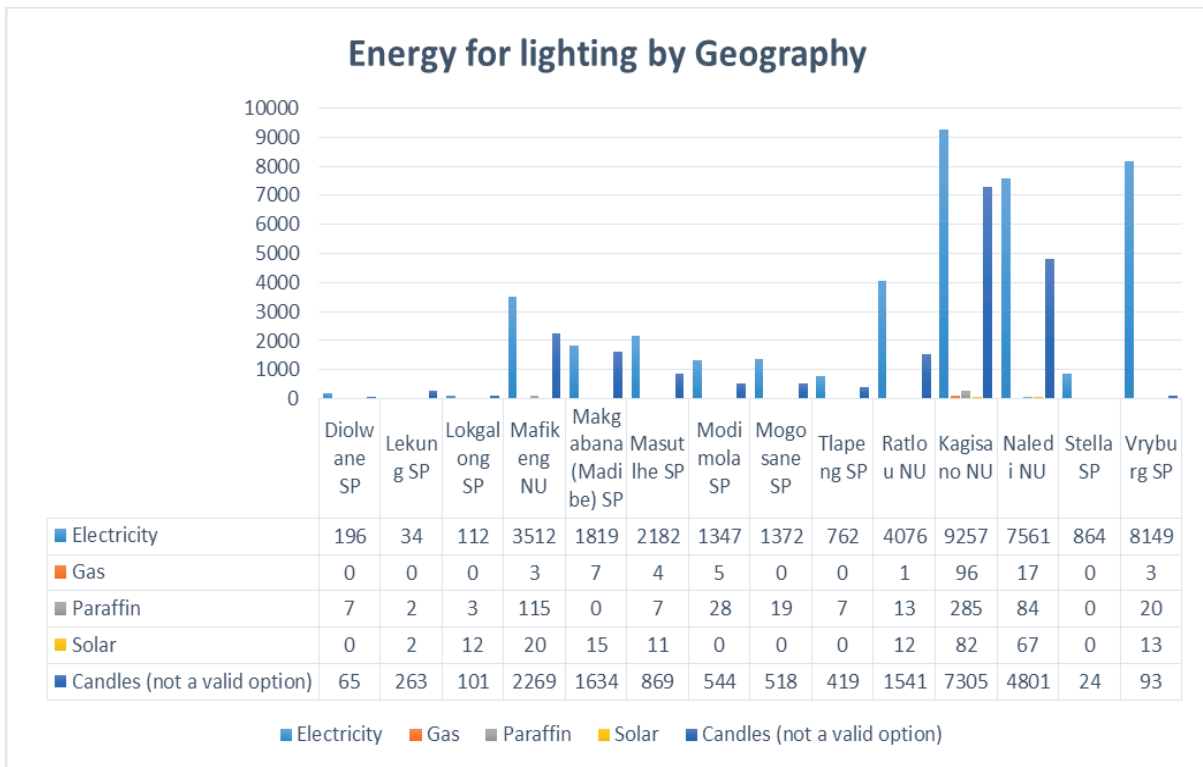


Figure 59: Energy for lighting

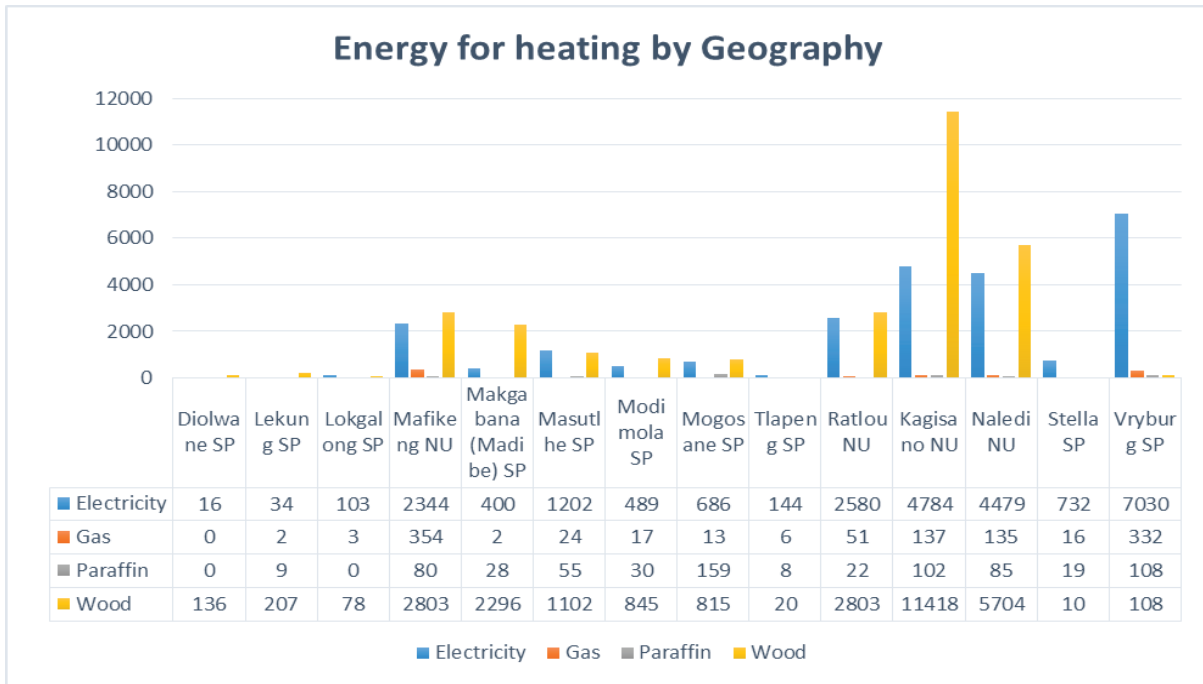


Figure 60: Energy for heating

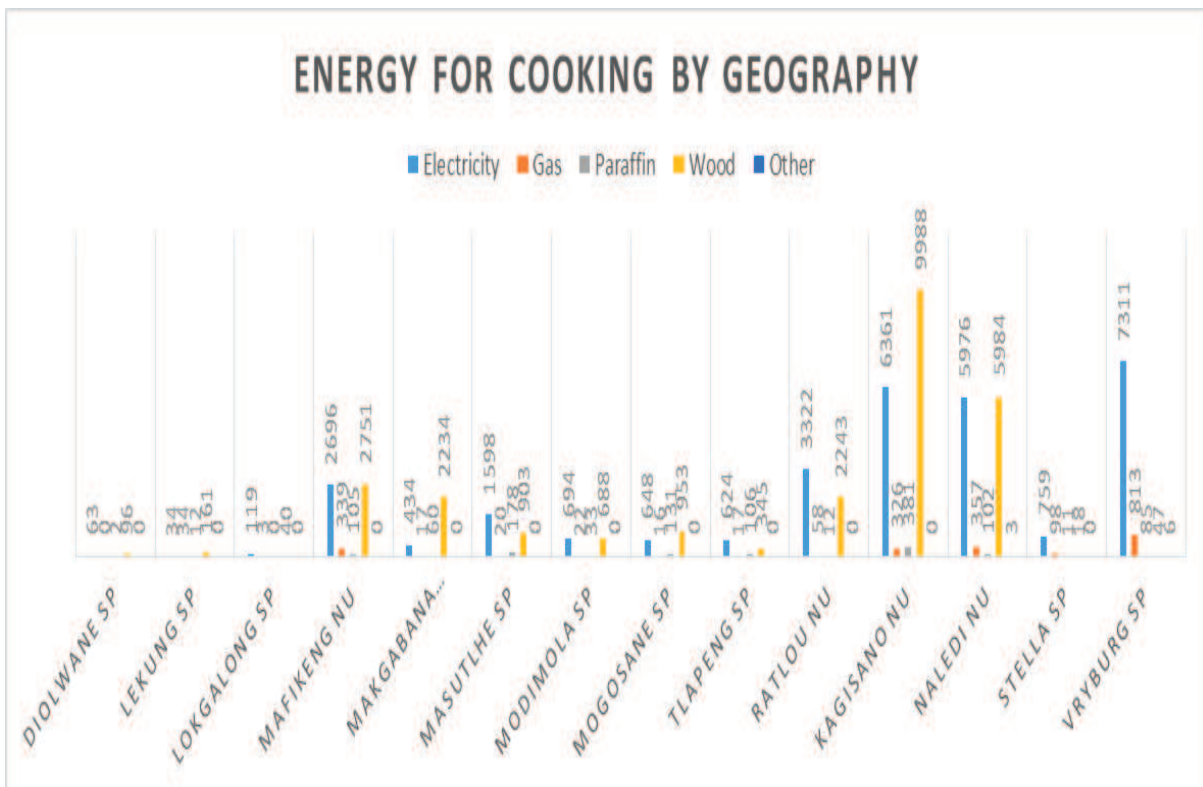


Figure 61: Energy for cooking

12.16.2 Potential Impacts/Implications

Possible impacts to the socio-economic environment during the construction phase include (amongst others):

- Loss of land through project infrastructure (affects landowners future plans to develop their property);
- Change in demographics due to the influx of employment seekers;
- Risk to livestock and game as a result of construction-related hazards;
- Damage to property (e.g. gates, fences, structures);
- Loss of income from crop production during construction;
- Influx of people seeking employment and associated impacts (e.g. foreign workforce, cultural conflicts, squatting, demographic changes);
- Safety and security;
- Reduction in property value;
- Use of local road network;
- Nuisance from dust and noise;
- Consideration of local labourers and suppliers in area – stimulation of local economy (positive impact);
- Transfer of skills (positive impact); and
- Relocation of structures situated within servitude.

Potential impacts associated with the operational phase include:

- Loss of livestock and game though improper access control;
- Land use restrictions associated with the powerline servitude; and
- Threats to human and animal health from EMF.

12.16.3 Specialist Studies Required

A Social and Economic Impact Assessment will be undertaken as part of the EIA Phase, and mitigation measures will need to be identified to manage the impacts to the local social and economic environments.

13 PUBLIC PARTICIPATION

The purpose of the public participation process for the proposed development includes:

- Providing IAPs with an opportunity to obtain information about the project;
- Allowing IAPs to express their views, issues and concerns with regard to the project;

- Granting IAPs an opportunity to recommend measures to avoid or reduce adverse impacts and enhance positive impacts associated with the project; and
- Enabling the project team to incorporate the needs, concerns and recommendations of IAPs into the project, where feasible.

The public participation process that was followed for the proposed project is governed by NEMA and GN No. R. 982 of the 2014 EIA Regulations, as amended.

13.1 Landowner Notification

The details of the various properties affected by the project, as well as the details of the affected landowners are included in the IAP Database contained in **Appendix 5**.

Proof of written notification to the landowners / persons in control of the land is included in **Appendices 9** and **10**.

13.2 Public Participation Notification – Initial IAP Registration Period

Nemai Consulting commenced with initial public notification in October and November 2017 in which the direct and adjacent landowners/occupiers, key regulatory authorities, stakeholders and the public were informed of the proposed Mookodi-Mahikeng 400kV Powerline project.

13.2.1 Identification of IAPs and Compilation of IAP Database

IAPs were identified based on regulatory requirements and the specific site/project requirements. However, in summary, the database includes the following:

- Direct Landowners
- Adjacent Landowners
- Key Organs of State/Authorities – the Organs of State that will be given the opportunity to provide comment on the Scoping and EIA reports, including:
 - North West Department of Rural, Environment and Agricultural Development (NWREAD)
 - DWS – North West Regional Office
 - DAFF – North West Regional Office
 - North West Provincial Heritage Resources Authority (NWPHRA)
 - Department of Mineral Resources (DMR) - North West Regional Office
 - Department of Energy - North West Regional Office
 - North West Parks Board
 - Municipalities (Naledi, Kagisano/Molopa, Ratlou and Mahikeng LM)
 - Municipal Manager

- Environmental Unit
- Ward Councillors
- Other Organs of State that may bear interest in the project
- Stakeholders and the affected service providers affected by the development
- Conservancies and recreation organisations near the site
- Farms, estates and rate payer's associations in the surrounding area
- Businesses in the surrounding area
- Any other organisations or people that may be interested in this development

A copy of the IAP database to date is available in **Appendix 5**.

13.2.2 Initial IAP Registration

The notification process undertaken is detailed in the sections to follow:

13.2.2.1 Background Information Document (BID)

BIDs (**Appendix 6**), which included a Reply Form, were distributed by email or hand delivered to IAPs contained in the IAP Database. SMS's were also sent to IAPs. BIDs contained a brief background and description of the project, as well as the EIA Process, and listed the details for submitting comments regarding the proposed development. The BID was available in both English and Afrikaans. The BID served to notify IAPs of the project and the details on how to register as an IAP.

Notification of the proposed Mookodi-Mahikeng 400kV Powerline took place in October and November 2017. Proof of initial notification is provided in **Appendix 9**. All reply forms and comments from registered IAPs to date are included in **Appendix 12**.

13.2.2.2 Site Notices

Twelve site notices were placed at strategic points along the proposed Mookodi-Mahikeng 400kV Powerline route alternatives (**Table 17**).

Table 17: Locations of site notices during registration period

No.	Coordinates	Description
1	27° 0'32.22"S; 24°44'42.62"E	Mookodi Substation Entrance
2	26°58'29.56"S ;24°44'23.13"E	Huhudi Library
3	26°57'22.98"S;24°43'33.43"E	Vryburg Public Library
4	26°57'7.69"S;24°43'21.48"E	DRSM District Library
5	26°59'5.46"S;24°40'8.26"E	N14 (Roadside)
6	26°58'47.10"S;24°47'29.66"E	R34 (Roadside)
7	26°24'31.28"S;24°46'39.76"E	R377 (Roadside)
8	26°32'58.06"S;24°52'52.86"E	Roadside
9	26°36'2.33"S;25° 1'54.50"E	R377 (Roadside)
10	26°16'3.65"S;25° 2'3.64"E	R378 (Roadside)
11	25°51'44.99"S;25°27'15.32"E	Modimolo Clinic
12	26°37'29.9"S;25°04'15.05"E	Inaccessible Road

Figure 62 provides the locations of each site notice. Proof of site notices are provided in **Appendix 7**. Notification of the proposed development and how to register as an IAP were provided on the site notice.

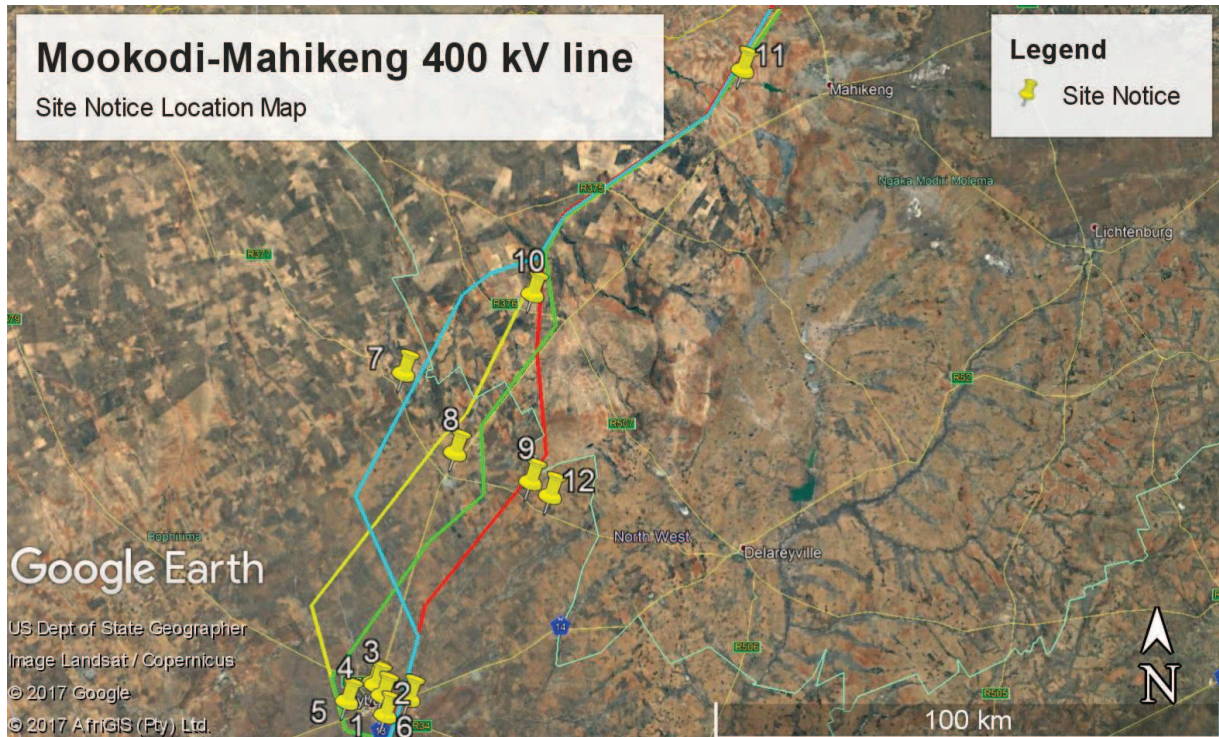


Figure 62: Location of site notices during registration period

13.2.2.3 Newspaper Notice

Six notices were also placed in the following newspapers:

- The Business Ink (published 31 October 2017) – Tswana;
- The Mahikeng Mail (published 27 October 2017) – English and Afrikaans;
- The Noordwester (published 27 October 2017) – Afrikaans;
- Stellander (published 25 October 2017) – English; and
- Vrystaat Nuus (published 25 October 2017) – Afrikaans.

These notices provided information on the proposed development and details on how to register as an IAP. A copy of the newspaper notices are provided in **Appendix 8**.

13.2.2.4 Update of IAP Database

The IAP Database was updated throughout the registration period.

13.2.3 Focus Group Meetings

Focus group meetings were undertaken. The purpose of these meetings was to engage on a one-on-one level with specific groups affected by the proposed project so that concerns by

these groups could be captured and understood upfront in the initial stage of the EIA Process. The concerns and issues from these meetings would then be brought to the attention of the project team to ensure they are addressed at the stage of the first public meeting during the Scoping Phase.

Refer to **Appendix 11** for the minutes of the below meetings.

13.2.3.1 Focus Group Meeting 01 – Agri North West and Agri Stella

A meeting was held with the representatives of both Agri North West and Agri Stella. These two organisations represent farmers within the project area. The purpose of this focus group meeting was to understand the view and concerns that farmers may have for the proposed Mookodi-Mahikeng 400kV Powerline.

13.2.3.2 Focus Group Meeting 02 – Affected Landowner

A meeting was held with an affected landowner, Mr. D. Van Rensburg. The landowner raised concerns about being negatively impacted from the proposed Mookodi-Mahikeng 400kV Powerline.

13.2.3.3 Focus Group Meeting 03 – Ramatlhamba Traditional Authority (Mahikeng)

A meeting was held with the Khosi and members of the Ramatlhamba Traditional Council. A combined meeting was held for the proposed Mookodi-Mahikeng 400kV Powerline project as well as for the proposed Mahikeng substation and Pluto – Mahikeng 400kV line project as the projects overlap at the future substation site and this is the land owned by the Ramatlhamba Traditional Authority.

Focus Group Meetings were organised with Ward Councillor Ms Grace Gamma (Naledi Municipality: Ward 1) and Ward Councillor Butiyane J.Moholo (Naledi Municipality: Ward 9). However, there was no attendance at the meetings by the Councillors.

13.3 Public Participation – Scoping Phase

Public Participation during the Scoping phase serves to identify and prioritise issues for further assessment during the EIA phase. This report documents all correspondence to date (mostly received during the registration periods) and will be available for the public and authorities to review and provide comments on.

The DSR was made available for the public and authorities to review and provide comments on during a 30-Day review period which took place from 12 February 2018 to 13 March 2018. The Application Form for EA was submitted at the same time as the DSR to the Competent Authority: The DEA.

The comments received from registered IAPs during the DSR review period (as well as the minutes of the Public Meetings) have been incorporated into the FSR. Refer to the updated CRR in **Appendix 13**. The FSR will be available for registered IAPs to ensure their comments

have been addressed and will also be submitted to the DEA. Comments received by IAPs will help shape the subsequent EIA Phase to ensure the relevant studies are in place to assess specific impacts.

13.3.1 Scoping Phase Notification

13.3.1.1 Background Information Document (BID)

BIDs were distributed to further landowners by email and fax in February 2018. SMS's were also sent to IAPs. BIDs contained a brief background and description of the project, as well as the EIA Process, and listed the details for submitting comments regarding the proposed development. The BID was available in both English and Afrikaans. The BID served to notify IAPs of the project and how to provide comments.

Proof of scoping phase notification is provided in **Appendix 10**. All reply forms and comments from registered IAPs to date are included in **Appendix 12**.

13.3.1.2 Site Notices

A further seven site notices were placed at strategic points along the proposed Mookodi-Mahikeng 400kV Powerline route alternatives during the scoping phase (**Table 18**).

Table 18: Locations of site notices during scoping phase

No.	Coordinates	Description
1	26°58'33.38"S; 24°46'58.09"E	On R34
2	26°49'37.03"S; 24°50'53.38"E	Unnamed road
3	26°38'34.82"S; 24°40'52.02"E	Unnamed road
4	26°32'2.47"S; 24°49'31.82"E	Unnamed road, close to Stella town
5	26°18'10.67"S; 24°52'38.54"E	Unnamed road, near house and agriculture fields
6	26° 2'45.66"S; 25°11'11.13"E	On R375
7	25°56'33.78"S; 25°19'34.90"E	Unnamed road

Figure 63 provides the locations of each site notice. Proof of site notices are provided in **Appendix 7**. Notification of the proposed development and how to provide comments as an IAP were provided on the site notice.

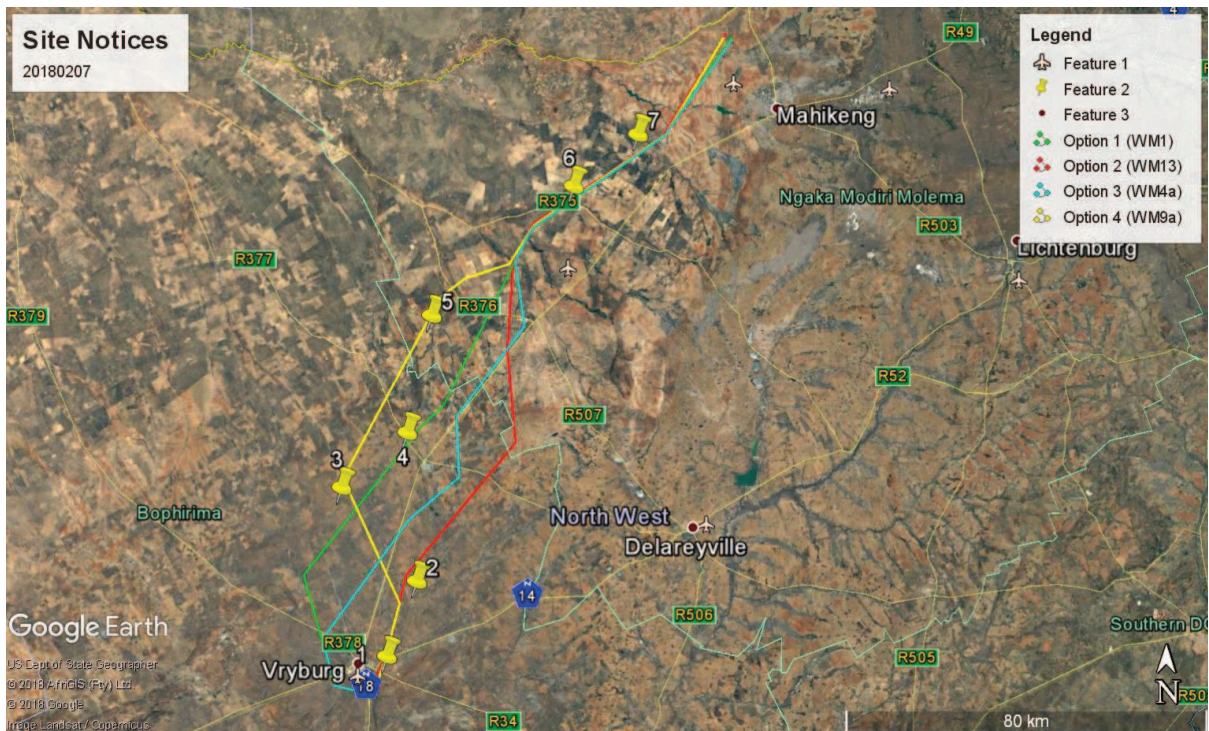


Figure 63: Location of site notices during scoping phase

13.3.1.3 Update of IAP Database

The IAP Database was updated throughout the scoping phase.

13.3.2 Public Review

In accordance with G.N. No. R. 982 of the 2014 EIA Regulations (as amended), IAPs were granted an opportunity to review and comment on the DSR. Hard copies and of the document were placed at venues along the proposed routes and an electronic copy of the report was made available on the Nema Consulting website. Emails and SMS's were sent to all registered IAPs which included the details of the review period of the DSR. Proof of the notification of the public review period is included in **Appendix 10**.

The public review of the DSR took place for a 30-Day review period from **12 February 2018 to 13 March 2018**.

13.3.3 Authority Review

Hard/Electronic copies of the document were also provided to the key regulatory and commenting authorities mentioned in Section 13.2.1.

The authority review of the DSR took place for a 30-Day review period from **12 February 2018 to 13 March 2018**.

13.3.4 Scoping Phase Meetings

Meetings were scheduled in locations around the proposed route alternatives. The aim of the meetings was to present the DSR and to provide IAPs with a platform for project related discussions. All registered IAPs were notified of the public meetings via email or SMS. Proof of notification of the public meetings is included in **Appendix 10**.

Refer to **Appendix 11** for the minutes of the meetings in **Table 19** below.

Table 19: Details of meetings during scoping phase

No.	Meeting Type	Date and Time	Venue	Meeting With
1	Public Meeting 01	05/03/2018 11H00 – 13H00	Mmabana Arts and Culture foundation (Mahikeng)	Public
2	Authority Meeting 01 <i>Meeting did not take place due to no attendance</i>	05/03/2018 13H30 – 14H30	Mmabana Arts and Culture foundation (Mahikeng)	Ramatlabama Traditional Authority
3	Public Meeting 02	05/03/2018 17H00 – 19H00	R507 Delareyville Road, Next to Setlagole Library (Setlagole Village)	Public
4	Focus Group Meeting 01 <i>Meeting did not take place due to no attendance</i>	06/03/2018 08H30 – 09H30	Vryburg Banquet Hall	Rosendal Country Estate
5	Public Meeting 03	06/03/2018 10H00 – 13H00	Vryburg Banquet Hall	Public
6	Focus Group Meeting 02	06/03/2018 14H00 – 15H30	Vryburg Banquet Hall	Mr. Coetzee Joubert (Affected Landowner)
7	Focus Group Meeting 03 <i>Nemai were invited to meeting</i>	07/03/2018 09H00-10H00	Vryburg	Agri Vryburg
8	Authority Meeting 02	07/03/2018 11H00-12H00	Ratlou Municipality (Setlagole)	Ratlou Municipality
9	Focus Group Meeting 04	07/03/2018 12H30-13H30	Farm (Setlagole)	Agri North West (Eric van Wyk)

13.3.5 Comments and Responses Report

The CRR summarises the correspondence received by IAPs and Organs of State completed via the Reply Forms, Comments Sheets, letters, faxes and emails. This report also includes a summary of the discussions from Focus Group Meetings and Stakeholder Meetings held to date, during the Public Participation phase. Refer to **Appendix 13**. This report captures all the

significant issues and queries raised, any statements that were made, and a record of all IAPs that registered. This report also attempts to address every comment through responses and input provided by the project team.

13.4 Public Participation – EIA Phase

The CRR is continuously updated throughout the process and thus registered IAPs will have a chance to review this CRR during the 30-Day public and authority review period of the Draft EIA Report. There will be Public Meetings during this period as well. Again, DEA will take the CRR into consideration when making the decision to grant EA or not.

14 ENVIRONMENTAL ISSUES

In accordance with the purpose of the Scoping exercise as part of the overall environmental assessment, this section aims to identify potentially significant environmental issues for further consideration and prioritisation during the EIA stage. This allows for a more efficient and focused impact assessment in the ensuing EIA Phase, where the analysis is largely limited to significant issues and reasonable alternatives.

14.1 Approach

14.1.1 Predicting Significant Environmental Issues

The potential environmental issues associated with the proposed Mookodi-Mahikeng 400kV Powerline route alternatives were identified during the Scoping Phase through an appraisal of the following:

- Project-related components and infrastructure (see Section 7);
- Activities associated with the project life-cycle (i.e. pre-construction, construction, operation and decommissioning) (see Section 7);
- Proposed alternatives (see Section 6);
- Nature and profile of the receiving environment and potential sensitive environmental features and attributes (see Section 12), which included a desktop evaluation (via literature review, GIS, topographical maps and aerial photography) and site investigations; and
- Legal and policy context (see Section 8).

Apart from explaining the receiving environment, Section 12 discusses possible impacts during primarily the construction and operational phases of the project. The significant

environmental issues were distilled from the aforementioned section and are summarised in Section 14.2. Cumulative impacts are briefly explained in Section 14.3.

14.1.2 Mitigation of Impacts

During the EIA stage, a detailed assessment will be conducted to evaluate all potential impacts (paying particular attention to the significant issues listed in the Scoping Report), with input from the project team and requisite Specialist Studies and through the application of the impact assessment methodology contained in Section 15.

Suitable mitigation measures will be identified to manage the environmental impacts according to the following hierarchy:

- Initial efforts should strive to prevent the occurrence of the impact;
- If this is not possible, mitigation should include measures that reduce or minimise the significance of the impact to an acceptable level;
- Remediation and rehabilitation should take place if measures cannot suitably prevent or reduce the impacts, or to address the residual impacts; and
- As a last measure, compensation should be employed as a form of mitigating the impacts associated with a project.

The mitigation measures will be incorporated into the EMPr, which will form part of the EIA Report. This deliverable, together with the EA, can act as a standalone document that can be used inter alia to monitor against compliance of the project with its pre-determined objectives, targets and management actions.

14.2 Summary of Environmental Issues

Pertinent environmental issues, which will receive specific attention during the EIA Phase, are listed in **Tables 20** and **21** which follow, as well as the Specialist Studies or resolutions to determine the extent of the impact and the propose mitigation measures:

Table 20: Pertinent issues (construction phase) for prioritisation during the EIA Phase

Environmental Feature	Potential Impacts/Implications	Specialist Study Required/Proposed Resolution
Geology	<ul style="list-style-type: none"> • Unsuitable geological conditions • Blasting (if required) 	<ul style="list-style-type: none"> • Geotechnical Study • EMPr
Soil	<ul style="list-style-type: none"> • Soil erosion • Soil contamination 	<ul style="list-style-type: none"> • EMPr
Topography	<ul style="list-style-type: none"> • Visual impact • Crossing topographic features (watercourses) 	<ul style="list-style-type: none"> • Visual Impact Assessment • EMPr

Environmental Feature	Potential Impacts/Implications	Specialist Study Required/Proposed Resolution
	<ul style="list-style-type: none"> Erosion of affected areas on steep slopes 	
Surface Water	<ul style="list-style-type: none"> Surface water pollution due to spillages and poor construction practices Encroachment of construction activities into riparian zones / wetlands Impacts where the powerline crosses watercourses, such as: Loss of riparian and instream vegetation within construction domain Destabilisation of banks of watercourses Sedimentation 	<ul style="list-style-type: none"> River Health Impact Assessment and Wetland/Riparian Habitat Delineation 1:100 Year Floodline Analysis EMPr
Terrestrial Ecology	<ul style="list-style-type: none"> Impacts to sensitive terrestrial ecological features Potential loss of significant flora and fauna species Damage / clearance of habitat of conservation importance in construction domain Proliferation of exotic vegetation 	<ul style="list-style-type: none"> Terrestrial Ecological Assessment Avifauna Impact Assessment Search, Rescue and Relocation Plan of Flora/Fauna, if necessary EMPr
Land Capability	<ul style="list-style-type: none"> Loss of cultivated land within construction domain Loss of grazing land within construction domain Risk to livestock and game from construction activities Disruptions to farming operations Loss of fertile soil through land clearance 	<ul style="list-style-type: none"> Agricultural Impact Assessment Social and Economic Impact Assessment EMPr
Land Use	<ul style="list-style-type: none"> Loss of land used for agriculture Servitude restrictions 	<ul style="list-style-type: none"> Agricultural Impact Assessment Social and Economic Impact Assessment EMPr
Heritage	<ul style="list-style-type: none"> Possible disturbance and destruction of heritage resources 	<ul style="list-style-type: none"> Phase 1 Heritage Impact Assessment EMPr
Air Quality	<ul style="list-style-type: none"> Excessive dust levels Greenhouse gas emissions 	<ul style="list-style-type: none"> EMPr
Noise	<ul style="list-style-type: none"> Localised increases in noise during construction 	<ul style="list-style-type: none"> EMPr
Existing Infrastructure	<ul style="list-style-type: none"> Crossing of existing infrastructure by powerline (including roads and railway line) Relocation of structures 	<ul style="list-style-type: none"> Relocation of affected infrastructure and structures (where necessary) Compensation (where necessary)

Environmental Feature	Potential Impacts/Implications	Specialist Study Required/Proposed Resolution
		<ul style="list-style-type: none"> Satisfy requirements of infrastructure owners EMPr
Traffic	<ul style="list-style-type: none"> Increase in traffic on the local road network Risks to road users 	<ul style="list-style-type: none"> EMPr
Visual Quality	<ul style="list-style-type: none"> Visual quality and sense of place to be adversely affected by construction activities 	<ul style="list-style-type: none"> Visual Impact Assessment EMPr
Socio-Economic Environment	<ul style="list-style-type: none"> Loss of land within construction domain (affects landowners future plans to develop their property) Risk to livestock and game from construction activities Nuisance from dust and noise Influx of people seeking employment and associated impacts (e.g. foreign workforce, cultural conflicts, squatting, demographic changes, anti-social behaviour, and incidence of HIV/AIDS) Safety and security Use of local road network 	<ul style="list-style-type: none"> Social and Economic Impact Assessment Economic Impact Assessment EMPr

Table 21: Pertinent issues (operational phase) for prioritisation during the EIA Phase

Environmental Feature	Potential Impacts/Implications	Specialist Study Required/Proposed Resolution
Geology	<ul style="list-style-type: none"> Unsuitable geological conditions – risks to structural integrity of towers 	<ul style="list-style-type: none"> Geotechnical Study EMPr
Soil	<ul style="list-style-type: none"> Soil erosion at areas that were not suitably reinstated and rehabilitated 	<ul style="list-style-type: none"> EMPr
Topography	<ul style="list-style-type: none"> Visual impact Crossing topographic features (watercourses) Erosion of affected areas on steep slopes 	<ul style="list-style-type: none"> Visual Impact Assessment EMPr
Surface Water	<ul style="list-style-type: none"> Damage to towers from major flood events Impacts to characteristics of riparian zones and wetlands at areas where they are encroached upon by the project footprint 	<ul style="list-style-type: none"> River Health Impact Assessment and Wetland/Riparian Habitat Delineation 1:100 Year Floodline Analysis EMPr
Terrestrial Ecology	<ul style="list-style-type: none"> Encroachment by exotic species through inadequate eradication programme 	<ul style="list-style-type: none"> Terrestrial Ecological Assessment Avifauna Impact Assessment

Environmental Feature	Potential Impacts/Implications	Specialist Study Required/Proposed Resolution
	<ul style="list-style-type: none"> Clearing of vegetation along servitude and maintenance road Risk to birds from collision with infrastructure and from electrocution 	<ul style="list-style-type: none"> Search, Rescue and Relocation Plan of Flora/Fauna, if necessary EMPr
Land Capability	<ul style="list-style-type: none"> Permanent loss of cultivated and grazing land within project footprint Loss of livestock and game through improper access control 	<ul style="list-style-type: none"> Agricultural Impact Assessment Social and Economic Impact Assessment EMPr
Land Use	<ul style="list-style-type: none"> Loss of land used for agriculture Servitude restrictions 	<ul style="list-style-type: none"> Agricultural Impact Assessment Social and Economic Impact Assessment EMPr
Traffic	<ul style="list-style-type: none"> Use of permanent access and maintenance roads 	<ul style="list-style-type: none"> EMPr
Visual Quality	<ul style="list-style-type: none"> High visibility of transmission lines Inadequate reinstatement and rehabilitation of construction footprint 	<ul style="list-style-type: none"> Visual Impact Assessment EMPr
Socio-Economic Environment	<ul style="list-style-type: none"> Use of local road network for operation and maintenance purposes Safety and security issues through improper access control during inspections and maintenance activities Threats to human and animal health from EMF 	<ul style="list-style-type: none"> Social Impact Assessment Economic Impact Assessment Compensation EMPr

Although impacts in the decommissioning phase are not included, it will nonetheless receive appropriate attention in the impact assessment during the EIA Phase.

14.3 Cumulative Impacts

According to GN No. R. 982, a “cumulative impact”, in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

Cumulative impacts can be identified by combining the potential environmental implications of the proposed project with the impacts of projects and activities that have occurred in the past, are currently occurring, or are proposed in the future within the project area.

The following potential cumulative impacts will be considered as part of the EIA:

- There are existing powerlines located on farms in the project area. This will increase the overall visual impact of the powerlines and may lead to an incremental increase in

the EMF. However, the alignment of infrastructure along existing linear disturbances may be preferred, as it limits the fragmentation of the affected land.

- The proposed powerline crosses over properties that are already traversed by existing linear infrastructure. These properties will thus have a network of infrastructure with the associated servitude restrictions.
- The construction period may cause traffic-related impacts in terms of the local road network, which will be associated with heavy vehicle construction traffic for the delivery of material and the transportation of construction workers. This may compound traffic impacts if other large scale projects are planned during the same period.
- Land clearing activities and other construction-related disturbances could lead to the proliferation of exotic vegetation. The associated cumulative impact in relation to other activities in the affected areas, such a livestock grazing and farming, will need to be considered further.
- The Terrestrial Ecological Impact Assessment will need to identify species of conservation significance that could be adversely affected by the project activities. This study will need to consider the existing local impacts to the biodiversity and the incremental loss of conservation-worthy species, within the context of the provincial conservation goals and targets.

The project was initiated to strengthen the local power network based on future demands and current constraints of the existing electrical infrastructure. In turn, this will have a positive impact on the macro socio-economic environment.

15 METHODOLOGY TO ASSESS THE IDENTIFIED IMPACTS

Information provided by specialists will be used to calculate an overall impact score by multiplying the product of the nature, magnitude and the significance of the impact by the sum of the extent, duration and probability based on the following equation:

$$\text{Overall Score} = (N \times M \times S) \times (E + D + P)$$

- Where:
- N = Nature
 - M = Magnitude
 - S = Significance
 - E = Extent
 - D = Duration
 - P = Probability

Table 22: Impact methodology

Nature				
Negative		Neutral		Positive
-1		0		+1
Extent				
Local	Regional	National	International	
1	2	3	4	
Magnitude				
Low		Medium	High	
1		2	3	
Duration				
Short Term (0-5yrs)	Medium Term (5-11yrs)	Long Term	Permanent	
1	2	3	4	
Probability				
Rare/Remote	Unlikely	Moderate	Likely	Almost Certain
1	2	3	4	5
Significance				
No Impact/None	No Impact Mitigation/Low	After	Residual Impact Mitigation/Medium	After Impact Cannot be Mitigated/High
0	1	2	3	

For example, the worst possible impact score of -117 would be achieved based on the following ratings:

N = Nature = -1

M = Magnitude = 3

S = Significance = 3

E = Extent = 4

D = Duration = 4

P= Probability = 5

Worst impact score = $(-1 \times 3 \times 3) \times (4+4+5) = -117$

On the other hand, if the nature of an impact is 0 (neutral or no change) or the significance is 0 (no impact), then the impact will be 0.

Impact Scores will therefore be ranked in the following way:

Table 23: Ranking of overall impact score

Impact Rating	Low/Acceptable impact	Medium	High	Very High
Score	0 to -30	-31 to -60	-61 to -90	-91 to -117

16 PLAN OF STUDY FOR EIA

This Plan of Study, which explains the approach to be adopted in the EIA Phase for the proposed Mookodi-Mahikeng 400kV Powerline, was prepared in accordance with 2(1)(h) of Appendix 2 of GN No. R. 982 of the 2014 EIA Regulations, as amended.

16.1 Key Environmental Issues Identified During Scoping Phase

The Scoping exercise aims to identify and qualitatively predict significant environmental issues for further consideration and prioritisation during the EIA stage. These include issues raised by IAPs to date. Further comments from IAPs during the Scoping Phase will also guide the identification of significant issues.

During the EIA stage, a detailed quantitative impact assessment will be conducted via contributions from the project team and requisite Specialist Studies, and through the application of the impact assessment methodology contained in Section 15. Suitable mitigation measures will be identified to manage (i.e. prevent, reduce, rehabilitate and/or compensate) the environmental impacts, and will be included in an EMPr.

Key environmental issues identified during Scoping, which will receive specific attention during the EIA Phase are listed in **Table 20** (construction phase) and **Table 21** (operation phase).

16.2 Environmental Specialist Studies

According to Münster (2005), a 'trigger' is "*a particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an issue and/or potentially significant impact associated with that proposed development that may require specialist input*".

Further, the 2014 EIA Regulations (as amended) define a specialist as: "*A person that is generally recognised within the scientific community as having the capability of undertaking, in conformance with generally recognised scientific principles, specialist studies or preparing specialist reports, including due diligence studies and socio-economic studies.*"

The requisite specialist studies 'triggered' by the findings of the Scoping process, aimed at addressing the key issues and compliance with legal obligations, include:

1. Terrestrial Ecological Impact Assessment;
2. Avifaunal Impact Assessment;
3. Agricultural Impact Assessment;
4. Phase 1 Heritage Impact Assessment;
5. Social Impact Assessment;
6. Economic Impact Assessment; and
7. Visual Impact Assessment.

The Terms of Reference (ToR), both general and specific, for the abovementioned specialist studies follow in the sub-sections below. Amongst others, the Guideline for determining the scope of specialist involvement in EIA processes (Münster, 2005) was used in compiling the general Terms of Reference for the Specialist Studies. The following guidelines were also employed to prepare the specific ToR for the respective specialists (where appropriate):

- Guideline for involving biodiversity specialists in EIA processes (Brownlie, 2005);
- Guideline for involving social assessment specialists in EIA processes (Barbour, 2007); and
- Guideline for involving heritage specialists in EIA processes (Winter & Baumann, 2005).

In addition to the above guidelines, the relevant specialists need to satisfy specific requirements stipulated by the following key environmental authorities:

- NWREAD and DEA;
- DWS;
- DAFF; and
- NWPHERA.

For the inclusion of the findings of the Specialist Studies into the EIA Report, the following guideline will be used: Guideline for the review of specialist input in EIA processes (Keatimilwe & Ashton, 2005). Key considerations will include:

- Ensuring that the specialists have adequately addressed IAPs' issues and specific requirements prescribed by environmental authorities;
- Ensuring that the specialists' input is relevant, appropriate and unambiguous; and
- Verifying that information regarding the receiving ecological, social and economic environment has been accurately reflected and considered.

16.2.1 General Terms of Reference

1. Address all triggers for the specialist studies contained in the subsequent specific ToR.

2. Address issues raised by IAPs, as contained in the CRR, and conduct an assessment of all potentially significant impacts.
 3. Ensure that the requirements of the environmental authorities that have specific jurisdiction over the various disciplines and environmental features are satisfied.
 4. Approach to include desktop study and site visits, as deemed necessary, to understand the affected environment and to adequately investigate and evaluate salient issues. Indigenous knowledge (i.e. targeted consultation) should also be regarded as a potential information resource.
 5. Assess the impacts (direct, indirect and cumulative) in terms of their significance (using suitable evaluation criteria) and suggest suitable mitigation measures. In accordance with the mitigation hierarchy, negative impacts should be avoided, minimised, rehabilitated (or reinstated) or compensated for (i.e. offsets), whereas positive impacts should be enhanced. A risk-averse and cautious approach should be adopted under conditions of uncertainty.
 6. Consider time boundaries, including short to long-term implications of impacts for project life-cycle (i.e. pre-construction, construction, operation and decommissioning).
 7. Consider spatial boundaries, including:
 - a. Broad context of the proposed project (i.e. beyond the boundaries of the specific site);
 - b. Off-site impacts; and
 - c. Local, regional, national or global context.
 8. The provision of a statement of impact significance for each issue, which specifies whether or not a pre-determined threshold of significance (i.e. changes in effects to the environment which would change a significance rating) has been exceeded, and whether or not the impact presents a potential fatal flaw or not. This statement of significance should be provided for anticipated project impacts both before and after application of impact management actions.
 9. Recommend a monitoring programme to implement mitigation measures and measure performance. List indicators to be used during monitoring.
 10. Appraisal of alternatives (including the No-Go option) by identifying the Best Practicable Environmental Option (BPEO) with suitable justification.
 11. Advise on the need for additional specialists to investigate specific components and the scope and extent of the information required from such studies.
 12. Engage with other specialists whose studies may have bearing on your specific investigation.
 13. Information provided to the EAP needs to be signed off and a Specialist Declaration form of Independence will need to be signed.
 14. The appointed specialists must take into account the policy framework and legislation relevant to their particular studies.
 15. Attend one specialist integration meeting.
-

16. Present findings at the public meeting.

17. All specialist reports must adhere to Appendix 6 of GN No. R. 982 of the 2014 EIA Regulations, as amended (07 April 2017).

16.2.2 Specific Terms of Reference

16.2.2.1 Terrestrial Ecological Impact Assessment

Summary of Key Issues & Triggers Identified During Scoping:

- Potential loss of significant flora and fauna species;
- Impacts to sensitive terrestrial ecological features; and
- Management actions for controlling exotic vegetation.

Approach:

- Undertake baseline survey and describe affected environment within the project footprint from a biodiversity perspective;
- Take into consideration the provincial conservation goals and targets;
- Assess the current ecological status and the conservation priority within the project footprint and adjacent area (as deemed necessary). Provide a concise description of the importance of the affected area to biodiversity in terms of pattern and process, ecosystem goods and services, as appropriate;
- A complete potential biodiversity list must be provided;
- The conservation status of each species listed must be determined;
- Undertake sensitivity study to identify protected and conservation-worthy species. Prepare a terrestrial ecological sensitivity map with the use of GIS, based on the findings of the study;
- Recommend any conservation buffer zones;
- Assess impacts to fauna and flora, associated with the project. Consider cause-effect-impact pathways for assessing impacts to biodiversity related to the project;
- Identify potential fatal flaws associated with the project and its alternatives from a biodiversity perspective;
- Comply with specific requirements and guidelines of DEA and NWREAD; and
- Consider the North West Biodiversity Sector Plan (2015) and other relevant policies, strategies, plans and programmes.

Nominated Specialist:

Name:	Mr. Avhafarei Phamphe
Organisation:	Nemai Consulting

Qualification:	MSc – Botany Pri.Sci.Nat
----------------	-----------------------------

16.2.2.2 Avifaunal Impact Assessment

Summary of Key Issues & Triggers Identified During Scoping:

- Impacts to avifauna associated with the powerline; and
- Possible occurrence of sensitive avifauna species in project area.

Approach:

- Determine ecological status of the receiving environment from an avifauna perspective, including the identification of endangered or protected avifauna species.
- A complete potential avifaunal list must be provided.
- The conservation status of each species listed must be determined.
- Prepare an avifauna sensitivity map, based on the findings of the study.
- Assess impacts to avifauna population as a result of the project.
- Provide suitable mitigation measures to protect avifauna during project life-cycle.
- Make recommendations on preferred options from an avifauna perspective.
- Recommend monitoring programme and indicators for project life-cycle, where findings from survey would serve as baseline data.
- Comply with specific requirements and guidelines of mandated authorities.

Nominated Specialist:

Name:	Mr. Mathew Ross
Organisation:	EnviRoss CC
Qualification:	MSc Aquatic Health Pr Sci Nat

16.2.2.3 Agricultural Impact Assessment

Summary of Key Issues & Triggers Identified During Scoping:

- Loss of fertile soil, cultivated areas and grazing land in project footprint.
- Disruptions to farming practices during construction.
- Loss of farming-related infrastructure.

Approach:

- Address potential issues which may include:
 - Loss of agricultural land.

- Viability of remaining farming operations.
- Loss of fertile soil, cultivated areas and grazing land.
- Disruptions to farming practices during construction.
- Determine agricultural potential in project footprint;
- Determine impacts of project from an agricultural perspective; and
- Suggest suitable mitigation measures to address the identified impacts.

Nominated Specialist:

Name:	Dr Andries Gouws
Organisation:	Index
Qualification:	<ul style="list-style-type: none"> ● Council of Natural Sciences.No:400036/93, Category: Agricultural sciences. ● Member of the Soil Science Society of South Africa

16.2.2.4 Phase 1 Heritage Impact Assessment

Summary of Key Issues & Triggers Identified During Scoping:

- Due to the size of the development for the powerline, a Phase 1 Heritage Impact Assessment is required; and
- Potential occurrence of heritage resources, graves and structures older than 60 years within project footprint.

Approach:

- Undertake a Heritage Impact Assessment in accordance with the South African Heritage Resources Act (Act No. 25 of 1999);
- The identification and mapping of all heritage resources in the area affected, as defined in Section 2 of the National Heritage Resources Act, 1999, including archaeological and palaeontological sites on or close (within 100 m) of the proposed developments;
- Undertake a desktop palaeontological assessment (evaluate site in terms of SAHRIS);
- The assessment of the significance of such resources in terms of the heritage assessment criteria as set out in the regulations;
- An assessment of the impact of development on such heritage resources;
- An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- Prepare a heritage sensitivity map (GIS-based), based on the findings of the study.
- Identify heritage resources to be monitored;
- Comply with specific requirements and guidelines of NWPHRA; and
- The Specialist must submit the Heritage Impact Assessment to NWPHRA.

Nominated Specialist:

Name:	Ms. Jean Beater
Organisation:	JLB Consulting
Qualification:	MA (Heritage Studies)

16.2.2.5 Social Impact Assessment

Summary of Key Issues & Triggers Identified During Scoping:

- Loss of land in project footprint; and
- Construction-related impacts.

Approach:

- Determine the specific local social, land utilisation and acquisition implications of the project;
- Collect baseline data on the current social environment;
- Assess social impacts (positive and negative) of the project, and quantify the economic impacts;
- Undertake a thorough review of the following:
 - Minutes of public meetings and focus group meetings; and
 - Comments and Response Report.
- Suggest suitable mitigation measures to address the identified impacts; and
- Make recommendations on preferred options from a social perspective.

Nominated Specialist:

Name:	Ciaran Chidley
Organisation:	Nemai Consulting
Qualification:	BSc Eng (Civil) and MBA

16.2.2.6 Economic Impact Assessment

Summary of Key Issues & Triggers Identified During Scoping:

- Loss of land in project footprint; and
- Construction-related impacts.

Approach:

- Determine the specific macro-economic analysis of the project;
- Calculation of the secondary impacts on the game farming, tourism, population and social sectors.
- Assess macro-economic impacts (positive and negative) of the project, and quantify the economic impacts;
- Undertake a cost-benefit analysis;
- Undertake a thorough review of the following:
 - Minutes of public meetings and focus group meetings; and
 - Comments and Response Report.
- Suggest suitable mitigation measures to address the identified impacts; and
- Make recommendations on preferred options from an economic perspective.

Nominated Specialist:

Name:	Peter Walther Baur
Organisation:	University of Johannesburg
Qualification:	PH.D. (Economics)

16.2.2.7 Visual Impact Assessment

Summary of Key Issues & Triggers Identified During Scoping:

- The proposed powerline may have impacts on the aesthetics and sense of place.

Approach:

- Determine the visibility of the proposed project components. This analysis should also take into account the existing visual characteristics of the project area in relation to the surrounding areas as well as whether or not the project is compatible with the visual characteristics of the area;
- Determine the specific aesthetic implications of the project;
- Identify important viewpoints and view corridors, including sensitive receptors. The sensitive receptors that are to be impacted upon need to be identified;
- Suggest suitable mitigation measures to address the identified impacts; and
- Compile a report that reflects the above and includes appropriate mapping.

Nominated Specialist:

Name:	Vernon Siemelink
Organisation:	Ecoelementum
Qualification:	MSc (Environmental Management)

16.2.2.8 River Health Impact Assessment and Wetland/Riparian Habitat Delineation

A desktop assessment of the affected watercourses will only be undertaken during the Scoping and EIA Process. A detailed River Health Impact Assessment and Wetland/Riparian Habitat Delineation will be undertaken as part of the WULA once the exact positions of the towers have been identified as part of the pre-construction walk-down survey to ensure no towers are placed in any watercourses.

16.3 Public Participation – EIA Phase

16.3.1 Notification – Approval of Scoping Report and Notification of Public Review of Draft EIA Report

IAPs will be notified of the approval of the Scoping Report and the public review period of the Draft EIA Report at the same time.

Registered IAPs will be notified of the approval and review period by emails or SMS. These notices will also include information on the public meeting for the EIA Phase.

16.3.2 EIA Public Meeting

The public meeting details during the EIA Phase will be available in the Draft EIA.

All registered IAPs will be invited to attend the public meeting.

16.3.3 Review of Draft EIA Report

A 30-day review period will be provided to registered IAPs and authorities to review the Draft EIA Report, and details of the venues will be available in the Draft EIA.

All comments received from IAPs and the responses thereto will be included in the Final EIA Report for submission to DEA.

16.3.4 Updating of IAP Database and Comments and Responses Report

The IAP Database and CRR is continuously updated throughout the process and thus registered IAPs will have a chance to review this CRR during the 30-Day public and authority review period of the Draft EIA Report. Again, DEA will take the CRR into consideration when making the decision to grant EA or not.

16.3.5 Notification of DEAs Decision

All registered IAPs will be notified via email or SMS after having received written notice from DEA on the final decision. Advertisements will also be placed in local and regional newspapers regarding the Department’s decision. These notifications will include the appeal procedure to the decision.

16.4 Proposed Timeframes

The proposed timeframes for the Scoping and EIA Phase is provided in **Table 24**.

Table 24: Scoping and EIA timeframes

Scoping Phase	Proposed Timeframe
Initial Notification	October and November 2017
Submit Application Form to DEA	09 February 2018
DSR Review Period	12 February 2018 – 13 March 2018
Public Meetings	05 March 2018 – 07 March 2018
Submit Final Scoping Report to DEA	23 March 2018
DEA Decision on Scoping Report	26 March 2018 – 07 May 2018
Notify Registered IAPs of DEAs Decision	08 May 2018
Draft EIA Report Review Period	04 July 2018 – 06 August 2018
EIA Phase Public Meetings	TBC
Submit Final EIA Report to DEA	27 August 2018
DEA Decision on Authorisation	12 December 2018
Notify Registered IAPs of DEAs Decision	13 December 2018 – 07 January 2019
Allow Appeal Period	08 January 2019 – 29 January 2019

17 OATH OF THE EAP AND DECLARATION OF INDEPENDENCE

I (name and surname) KRISTY ROBERTSON
At (address) 147 BRAM FISCHER DRIVE, FERNOALE
ID No. 8910110148089

Hereby make an oath and state that:

In Accordance with Appendix 2 of G.N. R. 982 (04 December 2014), this serves as an affirmation by the Environmental Assessment Practitioner (EAP) in relation to:

Section 2(j)

- i. The correctness of the information provided in this report;
- ii. The inclusion of comments and inputs from stakeholders and interested and affected parties (IAPs);
- iii. The inclusion of inputs and recommendations from the Specialist Reports where relevant; and
- iv. Any information provided by the EAP to IAPs and any responses by the EAP to comments or inputs made by IAPs.

1. I know and understand the contents of this declaration.
2. I do not have any objection in taking the prescribed oath.
3. I consider the prescribed oath to be binding on my conscience.

Signature  Date 20/03/2018

I certify the deponent has acknowledged that he/she knows and understands the contents of the statement and the deponent signature was placed there in my presence.

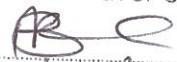
Commissioner of Oath

Full name

CERTIFIED A TRUE COPY OF THE ORIGINAL DOCUMENT
GESERTIFIKASIE VAN 'N WERKELIKHEIDSKOPIE VAN
OORSPRONKLIKE DOKUMENT
BRENDA PERUMAL
MALANI PADAYACHEE AND ASSOCIATES (PTY) LTD
REG No: 1997/009813/07
JOHANNESBURG NORTH MAGISTERIAL DISTRICT,
HANDBURG
REF No: 12 04/2016
EX OFFICIO COMMISSIONER OF OATHS



March 2018

SIGNED/TLKEN. 
DATE DATUM 20/03/2018