PROPOSED MOOKODI-MAHIKENG 400KV POWERLINE, NORTH WEST PROVINCE

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

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

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PREPARED FOR: ESKOM HOLDINGS (SOC) LTD

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Title and Approval Page

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List of Abbreviations

CBA	Critical Biodiversity Area
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GA	General Authorisation
GN	Government Notice
IAP	Interested and Affected Party
km	Kilometre
LM	Local Municipality
NEMA	National Environmental Management Act
NWA	National Water Act
NWPHRA	North West Provincial Heritage Resources Authority
OHS	Occupational Health and Safety
SAHRA	South African Heritage Resources Agency
WUL	Water Use License

Definitions

Auditing	A systematic and objective assessment of an organization's activities and services conducted and documented on a periodic basis.
Environment	The surroundings in which humans exist and which comprise: • The land, water and atmosphere of the earth. • Micro-organisms, plant and animal life. • Any part or combination of a) and b) and the interrelationships among and between them. • The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that can influence human health and well-being.
Environmental Aspect	Those components of the company's activities, products and services that are likely to interact with the environment.
Environmental Authorisation	The written statement from the relevant environmental authority in terms of the National Environmental Management Act (Act 107 of 1998), with or without conditions, that records its approval of a planned activity and the implementation thereof and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract.
Environmental Feature	Elements and attributes of the biophysical, economic and social environment.
Environmental Impact	The change to the environment resulting from an environmental aspect, whether desirable or undesirable. An impact may be the direct or indirect consequence of an activity.
Environmental Impact Assessment (EIA)	The process of examining the environmental effects of a development in terms of the National Environmental Management Act (Act 107 of 1998) and the Environmental Impact Assessment (EIA) Regulations.
Environmental Management Programme (EMPr)	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.
Environmental Objective	Overall environmental goal pertaining to the management of environmental features.
Environmental Target	Performance requirement that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.
Floodplain	A flat expanse of land bordering a river channel, formed through sediment deposition and other alluvial processes, and often characterized by frequent flooding as a result of bank overspill from the river channel.

Groundwater	Sub-surface water in the zone in which permeable rocks, and often the overlying soil, are saturated.
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.
Landscape	Land modified for human use and occupation, embracing both the natural (wilderness) environment and the urban.
Management Actions	Practical actions aimed at achieving management objectives and targets.
Management Objectives	Desired outcome of management measures for mitigating negative impacts and enhancing the positive impacts related to project activities and aspects (i.e. risk sources).
Monitoring	A systematic and objective observation of an organization's activities and services conducted and reported on regularly.
Natural Vegetation	All existing vegetation species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on the site.
Pollution	Any change in the environment caused by substances, radioactive or other waves, or noise, odours, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on 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.
Protected Plants	Plant species officially listed on the Protected Plants List (each province has one), and which may not be removed or transported without a permit to do so from the relevant provincial authority.
Reinstatement	Reinstatement is defined as the return of a disturbed area to a state, which approximates the state (where possible), which it was before disruption.
Runoff	The total water yield from a catchment including surface and subsurface flow.
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.

Sensitive Environmental Features	Environmental features protected by legislation (e.g. heritage resources), or identified during the EIA as sensitive through specialists' findings and input received from Interested and Affected Parties.
Subsoil	The soil horizons between the topsoil horizon and the underlying parent rock.
Topsoil	Topsoil can be regarded as the fertile upper part or surface of the soil.
Transplanting	The removal of plant material and replanting the same plants in another designated position.
Wastewater	Means water contaminated by the project activities.
Watercourse	A geomorphological feature characterized by the presence of a streamflow channel, a floodplain and a transitional upland fringe seasonally or permanently conveying surface water.
Weeds and Invader Plants	Weeds and invader plants are defined as undesirable plant growth that shall include, but not be limited to all declared category 1, 2 and 3 listed invader species as set out in the Conservation of Agricultural Resources Act (No 43 of 1983) regulations. Other vegetation deemed to be invasive should be those plant species that show the potential to occupy in number, any area within the defined construction area.
Wetland	Land where a surplus of water (i.e. waterlogging) is the key factor determining the nature of the soil development as well as the types of plants and animals living at the soil surface.

1 DOCUMENT ROADMAP

This document serves as the Draft Environmental Management Programme (EMPr) for the pre-construction, construction and operational phases 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 4 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.

Table 1: Document Roadmap

Chapter	Title	Correlation with Appendix 4 of G.N. No. R982	
1	**Document Roadmap**	N/A	
2	**Purpose of the Document**	N/A	
3	**Project Overview**	N/A	
4	**Environmental Assessment Practitioners**	1(a)	Details of – (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including curriculum vitae.
5	**Legislation and Guidelines Considered**	N/A	
6	**Roles & Responsibilities**	1(i)	An indication of the persons who will be responsible for the implementation of the impact management actions.
7	**Monitoring**	1(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f).
		1(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f).
		1(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f).
		1(l)	A programme for reporting on compliance, taking into account the requirements as prescribed by the Regulations.

Chapter	Title	Correlation with Appendix 4 of G.N. No. R982	
8	**Environmental Training & Awareness Creation**	1(m)	An environmental awareness plan describing the manner in which - (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment.
9	**Environmental Activities, Aspects and Impacts**	1(b)	A detailed description of the aspects of the activity that are covered by the final environmental management plan.
10	**Sensitive Environmental Features**	1 (c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers.
11	**Impact Management**	1(d)	A description of impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including – (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities.
		1(f)	A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to - (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.
		1(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented.
		1(l)	A programme for reporting on compliance, taking into account the requirements as prescribed by the Regulations.

Chapter	Title	Correlation with Appendix 4 of G.N. No. R982	
N/A		1(n)	Any specific information that may be required by the competent authority
N/A		2	Where a government notice gazetted by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.

2 PURPOSE OF THIS DOCUMENT

The EMPr contains suitable mitigation measures to manage (i.e. prevent, reduce, rehabilitate and/or compensate) the environmental impacts of the project. The EMPr is to be implemented during various phases of the project. The EMPr will be continuously updated throughout the EIA phase.

An EMPr represents 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 lifecycle of a project. The Department of Environmental Affairs (DEA) has requested that the EMPr must be clear on the commitments made on which mitigation measures will be implemented in a document that is to be enforced as part of a legal requirement during the lifespan of the proposed project.

The scope of the Mookodi-Mahikeng 400kV Powerline EMPr is as follows:

- Establish management objectives during the project lifecycle in order to enhance benefits and minimise adverse environmental impacts;
- Provide targets for management objectives, in terms of desired performance;
- Describe actions required to achieve management objectives;
- Outline institutional structures and roles required to implement the EMPr;
- Provide legislative framework; and
- Description of requirements for record keeping, reporting, review, auditing and updating of the EMPr.

The primary objectives of the EMPr are to:

- Provide mitigation measures to limit environmental impacts and improve management of activities thereby reducing the probability of impacts occurring; and
- Define organisational and administrative arrangements for environmental management and monitoring of the work contract, including defining the responsibilities of staff and co-ordination, liaison and reporting procedures.

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.

Nemai Consulting is an independent, specialist 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 in the Scoping and EIA Process for the proposed project are captured in **Table 2** below, and their respective Curricula Vitae are contained in Appendix 1 of the EIA Report.

Table 2: 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 and EIA Report, and Public Participation
Mr D. Henning	MSc – River Ecology	Assistant EAP
Mr C. Van Der Hoven	Honours – Environmental Sciences	Public Participation

4 PROJECT OVERVIEW

4.1 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 (CLSs) 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 EIA Process. The EIA Process for this project is for the proposed approximately 180km Mookodi - Mahikeng 400kV Powerline project.

4.2 Project Location

The proposed project is situated within the Naledi Local Municipality (LM), Kagisano-Molopo LM, Ratlou LM, and Mahikeng LM in the North West Province. The proposed route for the line starts in Vryburg at the existing Mookodi substation and travels in a north-east direction where the line ends near Mahikeng at the proposed Mahikeng substation site (**Figure 1**).

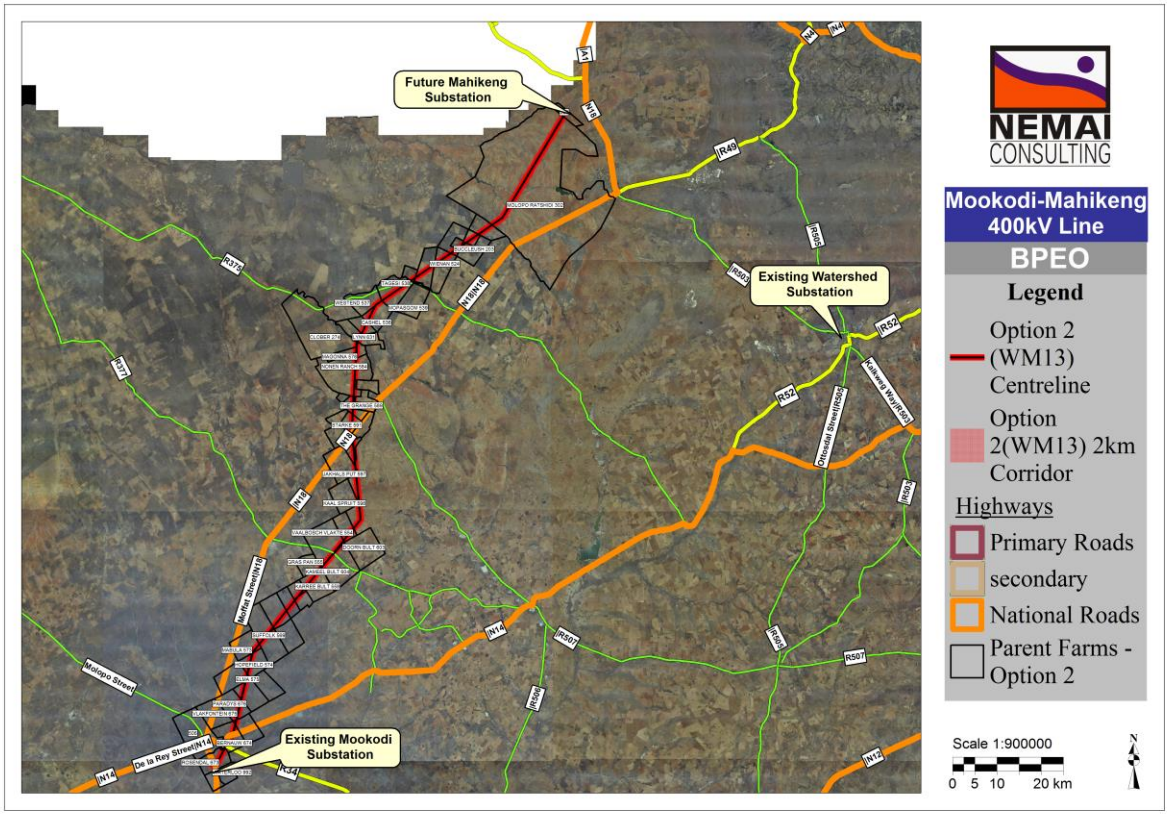

Figure 1: Locality map of the study area

4.3 Project Description

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. A 2km corridor has been applied for. 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.

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. 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.

5 LEGISLATION AND GUIDELINES CONSIDERED

5.1 Overview of Legislation

Some of the pertinent environmental legislation that has bearing on the proposed development is captured in **Table 3** below. 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 3: 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 – Environmental Authorisation (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.
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.
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.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	Management and conservation of the country's biodiversity. Protection of species and ecosystems.
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	Air quality management.

Legislation	Relevance
	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.
National Environmental Management: Waste Act (Act No. 59 of 2008)	Chapter 4 – Waste management measures Chapter 5 – licensing requirements for listed waste activities.
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.
Occupational Health & Safety Act (Act No. 85 of 1993)	Provisions for Occupational Health & Safety. Major Hazardous Installation Regulations.
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 000m2 in extent.
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	Control measures for erosion. Control measures for alien and invasive plant species.
National Forestry Act (Act No. 84 of 1998)	Section 15 – authorisation required for impacts to protected trees.
Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)	Permit required for borrow pits will be required for the project.

5.2 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.

5.2.1 2014 EIA Regulations, as amended (07 April 2017)

The EIA Regulations consist of the following:

- EIA Procedures – Government Notice (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 4**.

Table 4: 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)	The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse. excluding— (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (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; (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; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (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.	A few of the proposed tower structures may fall within watercourses. 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: ➢ **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	19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil,	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.

GN No. R.	Activity	Description as per GN	Applicability to the Project
December 2014 (as amended)		sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse. but excluding where such infilling, depositing, dredging, excavation, removal or moving— (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.	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: ➢ **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).	The Terrestrial Ecological Study confirmed that the powerline will traverse the Mafikeng Bushveld (Vulnerable), with a very small section of Alternative Route Option 2 (WM13) falling within the Western Highveld Sandy Grassland (Critically Endangered).
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 development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is - (a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometres or shorter in length;	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
		(c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development.	
GN R. 985 of 04 December 2014 (as amended)	12 (h) (iv, v and vi)	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. h. North West: 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.	The proposed development will require the clearance of more than 300 square metres within sensitive areas such as threatened ecosystems, watercourses, Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). The following areas to be cleared for the proposed development include: <u>1) Tower Footprints:</u> 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: ➢ 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**. <u>2) Powerline Footprint:</u> 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

GN No. R.	Activity	Description as per GN	Applicability to the Project
			10m on either side). **Therefore a maximum of 40m x 180 000m = 7 200 000 square metres.**
GN R. 985 of 04 December 2014 (as amended)	14 (ii)(a)(h)(iv, v and vi)	The development of— (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse h. North West 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 5 kilometres from protected areas identified in terms of NEMPAA or from the core areas of a Biosphere reserve.	The proposed development may involve tower structures within watercourses which fall within or near sensitive areas such as threatened ecosystems, CBAs and ESAs. 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: ➢ **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.

5.3 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 must 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 Department of Water and Sanitation (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 Regulations).

6 ROLES AND RESPONSIBILITIES

6.1 Department of Environmental Affairs (DEA)

DEA are the mandated authority in terms of NEMA that determine whether authorisation can be issued for the project, following a decision-making process.

DEA also fulfils a compliance and enforcement role with regards to the authorisation. The Department may perform random inspections to checks compliance. DEA will review the monitoring and auditing reports compiled by the Environmental Control Officer (ECO).

6.2 Project Proponent

Eskom Holdings SOC Limited is the applicant in terms of NEMA. Eskom is also the Project Proponent for all components of the work related to the development and is ultimately responsible for the development and implementation of the EMPr and ensuring that the conditions in the EA are satisfied. The liability associated with environmental non-compliance rests with the Project Proponent.

6.3 Project Manager

The Project Manager has overall responsibility for managing the project and for ensuring that the environmental management requirements are met with regards to the EMPr, EA, and other environmental licenses or permits. During the operational phase, it is expected that this role will be fulfilled by the Operations Manager.

The Project Manager's responsibilities will include the following (amongst others):

- Management of environmental matters and compliance with environmental licenses, permits and authorisations; and
- Management of the project team including the ECO, the Contractor and the other project role players.

6.4 Environmental Control Officer (ECO)

The ECO is a competent and independent representative. The ECO will undertake inspections of the site and full compliance auditing against the EMPr and EA. The audit reports will be submitted to the project manager and also be made available to the relevant authorities, on their request.

The ECO will check the following:

- The record of environmental incidents (spills, impacts, legal transgressions, etc.) as well as corrective and preventive actions taken;
- The public complaints register in which all complaints are recorded, as well as actions taken; and
- Results from the environmental monitoring programme (air, noise, water quality).

Further duties of the ECO will be the following:

- Monitoring of compliance with the EA, EMPr and the Project Specification.
- Make recommendations on how to best apply the environmental requirements on site and advise the Contractor on the site instructions required to facilitate effective environmental compliance.
- Participate in the quality management system by issuing non-conformances when there are areas of the project environmental requirements that are not being met.

6.5 Contractor's Environmental Officer (EO)

The primary role of the competent EO is to implement the EMPr and EA during the construction phase.

Specific responsibilities of the EO will be fulltime on site, will include the following:

- Aiding the Contractor to comply with all the project's environmental management requirements;
- Assisting the Contractor in compiling Method Statements;
- Facilitating environmental activities and environmental awareness training of relevant persons on site;
- Exercise an internal compliance management system on behalf of the Contractor;

- Inspect the site as required to ensure adherence to the management actions of the Pre-construction and Construction EMPr and the Method Statements;
- Provide inputs to the regular environment report to be prepared by the ECO (as required);
- Liaise with the construction team on issues related to implementation of, and compliance with, the Pre-construction and Construction EMPr;
- Maintain a record of environmental incidents (such as spills, impacts, legal transgressions) as well as corrective and preventive actions taken; and
- Maintain a public complaint register in which all complaints are recorded, as well as action taken.

7 MONITORING

Monitoring is required to ensure that the receiving environment at the study area is suitably safeguarded against the identified potential impacts, and to ensure that the environmental management requirements are adequately implemented and adhered to during the execution of the project.

The project is to be implemented in accordance with Eskom's Environmental Management Policy and ISO 14001 based Environmental Management System (EMS).

The standard Eskom site documentation shall be used to keep records on site. All documents shall be kept on site and be made available for monitoring purposes. Site inspections by an Environmental Audit Team may require access to this documentation for auditing purposes. The documentation shall be signed by all parties to ensure that such documents are legal. Regular monitoring of site works by the ECO is imperative to ensure that all problems encountered are solved punctually and amicably. When the ECO is not available, the Site Supervisor shall keep abreast of all works to ensure no problems arise.

Weekly environmental compliance reports shall be forwarded to the Eskom PM with all information relating to environmental matters. The following Key Performance Indicators must be reported on a two-weekly basis by the ECO:

- Environmental incidents (e.g. fuel spills) and actions taken;
- Incidents that can lead to legal contraventions and litigation;
- Complaints from Interested and Affected Parties, which must be recorded and kept on file; and
- Environmental damage that needs rehabilitation.

The following documentation shall be kept on site:

- Access negotiations and physical access plan;
- Complaints register;
- Site daily diary;
- Records of all remediation / rehabilitation activities;

- Copies of two-weekly reports to the Environmental Advisor;
- Copy of the EMPr and EA; and
- Minutes of site meetings (including discussions related to environmental matters).

Environmental Audits will be carried out during and upon completion of construction.

A document handling system must be established to ensure accurate updating of the EMPr documents, and availability of all documents required for the effective functioning of the EMPr. Supplementary EMPr documentation could include:

- Method Statements;
- Site instructions;
- Emergency preparedness and response procedures;
- Record of environmental incidents;
- Non-conformance register
- Training records;
- Site inspection reports;
- Monitoring reports;
- Auditing reports; and

Public complaints register (single register for maintained for overall site).

8 Environmental Training and Awareness Creation

Training aims to create an understanding of environmental management obligations and prescriptive measures governing the execution of the project. It is generally geared towards project team members that require a higher-level of appreciation of the environmental management context and implementation framework for the project.

Awareness creation strives to foster a general attentiveness amongst the construction workforce to sensitive environmental features and an understanding of implementing environmental best practices. The various means of creating environmental awareness during the construction phase of the project may include:

- Induction course for all workers before commencing work on site;
- Refresher courses (as and when required);
- Toolbox talks, focusing on particular environmental issues (task- and area specific);
- Courses must be provided by suitably qualified persons and in a language and medium understood by the workers;
- Erect signage and barricading (where necessary) at appropriate points in the construction domain, highlighting sensitive environmental features (e.g. grave sites, protected trees); and
- Place posters containing environmental information at areas frequented by the construction workers (e.g. eating facilities).

Training and awareness creation will be tailored to the audience, based on their designated roles and responsibilities. Records will be kept of the type of training and awareness creation provided, as well as containing the details of the attendees.

9 ENVIRONMENTAL ACTIVITIES, ASPECTS AND IMPACTS

9.1 Project Lifecycle Approach

The entire lifecycle for the proposed project includes the following phases:

- Feasibility phase – This includes selecting a suitable corridor for the route of the proposed powerline following the execution of an EIA Process. Servitude negotiations are also initiated during this phase;
- Planning and design phase – This phase, which is only undertaken should environmental authorisation be obtained, includes the following –
  - Aerial survey of the route;
  - Selection of the most appropriate structures;
  - Eskom and environmental specialists (e.g. ecologist, avifauna and 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 phase – During the implementation of the project, the construction activities related to the installation of the necessary infrastructure and equipment is undertaken;
- Operational phase – This includes operational activities associated with the maintenance and control of the powerline; and
- Decommissioning – This phase will include measures for complying with regulatory requirements, rehabilitation and managing environmental impacts in order to render the affected area suitable for future desirable use.

This EMPr focusses on the pre-construction, construction and operation phases of the project.

In order to establish best management practices and prescribe mitigation measures, the following project-related information needs to be adequately understood:

- **Activities** associated with the proposed project;
- **Environmental aspects** associated with the project activities;
- **Environmental impacts** resulting from the environmental aspects; and
- The nature of the surrounding **receiving environment**.

9.2 Environmental Activities

The main project component includes the installation of the proposed powerline (including concrete foundations, towers, conductors and anchors).

For the purposes of effective and efficient monitoring, the aspects of construction are outlined separately for pre-construction and construction phases. In order to understand the impacts related to the project it is necessary to unpack the activities associated with the project life-cycle, as shown below:

Table 5: Activities associated with Pre-construction Phase

Pre-construction Phase
Project Activities
1. Obtain EA, Water Use License (WUL) if required and other relevant permits
2. Applicant to appoint an ECO
3. Negotiations and agreements with the affected landowners, stakeholders and authorities
4. Initiate legal process required for powerline servitude
5. Detailed engineering design
6. Detailed geotechnical investigations, if applicable
7. Survey and mark construction servitude
8. Survey and map topography for determination of post-construction landscape, rehabilitation and shaping (where necessary)
9. Pre-construction photographic records
10. Development and approval of method statements
11. Development of employment strategy
12. Development and approval of construction plans
Environmental Activities
13. Diligent compliance monitoring of the EMPr, EA and other relevant environmental legislation
14. Undertake a walk-down survey of the project footprint by the relevant environmental specialists to identify sensitive environmental features
15. Develop Search, Rescue and Relocation Management Plan, based on findings of walk-down survey
16. Barricading and installing barriers around buffer areas as identified in the Specialist Studies
17. Ongoing consultation with Interested and Affected Parties (IAPs)
18. Establish baseline water quality data for river crossings based on aquatic and wetland studies

Table 6: Activities associated with Construction Phase

Construction Phase
Project Activities
1. Site establishment
2. Pegging of central line and overall footprint
3. Grading of site (where necessary)
4. Construct new access road (where necessary)
5. Delivery of construction material
6. Transportation of equipment, materials and personnel
7. Storage and handling of material
8. Construction employment
9. Stormwater control mechanisms
10. Site clearing
11. Excavations for foundations and anchors of towers
12. Position premade foundation structures into excavations
13. Erection of steel structures
14. Construction works for the powerline
15. Stringing of cables
16. Management of topsoil and spoil
17. Concrete works (filling of foundations)
18. Traffic control measures
19. Mechanical and electrical works
20. Electrical Supply
21. Cut and cover activities
22. Stockpiling
23. Waste and wastewater management
24. Site security
25. Construction of powerlines and towers
26. Landscaping
27. Signing off by landowners
28. Handing over the servitude
Environmental Activities
29. Diligent compliance monitoring of the EMPr, EA and other relevant environmental legislation
30. Ongoing search, rescue and relocation of red data, protected and endangered species, medicinal plants, heritage resources (based on area of influence of the construction activities) – permits to be in place
31. Control of invasive plant species

Construction Phase
32. Conduct environmental awareness training
33. Implement EMPr
34. Reinstatement and rehabilitation of construction domain
35. On-going consultation with IAPs

Table 7: Activities associated with Operation Phase

Operation Phase
Project Activities
1. Maintenance of powerline infrastructure
2. Routine maintenance inspections
3. Servitude access arrangements and requirements
Environmental Activities
4. Stormwater management
5. Pollution control measures
6. Maintenance of servitude
7. Management of vegetation clearance
8. Management of sensitive areas or buffered areas
9. On-going consultation with IAPs

9.3 Environmental Aspects

Environmental aspects are regarded as those components of an organisation's activities, products and services that are likely to interact with the environment and cause an impact. The following environmental aspects have been identified for the proposed project, which are linked to the project activities (note that only high level aspects are provided):

Table 8: Environmental aspects associated with the Pre-construction Phase

Environmental Aspects
Pre-construction Phase
1. Insufficient construction site planning and layout
2. Poor consultation with landowners, affected parties, stakeholders and authorities
3. Site-specific environmental issues not fully understood
4. Inadequate environmental and compliance monitoring

Environmental Aspects
Pre-construction Phase
5. Absence of relevant permits
6. Lack of barricading of sensitive environmental features
7. Poor waste management
8. Absence of ablution facilities

Table 9: Environmental aspects associated with the Construction Phase

ENVIRONMENTAL ASPECTS
Construction Phase
1. Poor consultation with landowners and affected parties
2. Inaccurate walk-down survey
3. Inadequate environmental and compliance monitoring
4. Lack of environmental awareness creation
5. Construction starting without or inadequate search and rescue
6. Indiscriminate site clearing
7. Poor site establishment
8. Poor management of access and use of access roads
9. Inadequate provisions for working on steep slopes
10. Poor transportation practices
11. Poor traffic management
12. Disturbance of topsoil
13. Disruptions to existing services
14. Inadequate storage and handling of material
15. Inadequate storage and handling of hazardous material
16. Erosion
17. Poor maintenance of equipment and plant
18. Poor management of labour force
19. Pollution from ablution facilities
20. Inadequate management of construction camp
21. Poor waste management practices – hazardous and general solid, liquid
22. Poor management of pollution generation potential
23. Poor management of water
24. Damage to significant fauna and flora
25. Environmental damage of sensitive areas

ENVIRONMENTAL ASPECTS
Construction Phase
26. Disruption of archaeological and culturally significant features (if encountered)
27. Dust and emissions
28. Noise nuisance due to construction activities
29. Influence to resource quality of the affected rivers from river diversions
30. Poor reinstatement and rehabilitation

Table 10: Environmental aspects associated with the Operational Phase

Operational Phase
1. Poor consultation with landowners, affected parties, stakeholders and authorities
2. Poor implementation of Eskom standards.
3. Inadequate environmental and compliance monitoring
4. Inadequate management of access, routine maintenance and maintenance works
5. Inadequate management of vegetation

9.4 Potential Significant Environmental Impacts

Environmental impacts are the change to the environment resulting from an environmental aspect, whether desirable or undesirable. Refer to **Tables 11** and **12** for the potential significant impacts associated with the preceding activities and environmental aspects for the construction and operation phase.

Table 11: Potential significant environmental impacts during Construction Phase

Environmental Feature	Potential Impacts/Implications
Geology	• Unsuitable geological conditions • Blasting (if required)
Soil	• Soil erosion • Soil contamination
Topography	• Visual impact • Crossing topographic features (watercourses) • Erosion of affected areas on steep slopes
Surface Water	• 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: o Loss of riparian and instream vegetation within construction domain o Destabilisation of banks of watercourses o Sedimentation

Environmental Feature	Potential Impacts/Implications
Terrestrial Ecology	• 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
Land Capability	• 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
Land Use	• Loss of land used for agriculture • Servitude restrictions
Heritage	• Possible disturbance and destruction of heritage resources
Air Quality	• Excessive dust levels • Greenhouse gas emissions
Noise	• Localised increase in the noise levels during construction
Existing Infrastructure	• Crossing of existing infrastructure by powerline (including roads and railway line) • Relocation of structures
Traffic	• Increase in traffic on the local road network • Risks to road users
Visual Quality	• Visual quality and sense of place to be adversely affected by construction activities
Socio-Economic Environment	• 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

Table 12: Potential Significant Environmental Impacts during Operation Phase

Environmental Feature	Potential Impacts/Implications
Geology	• Unsuitable geological conditions – risks to structural integrity of towers
Soil	• Soil erosion at areas that were not suitably reinstated and rehabilitated
Topography	• Visual impact • Crossing topographic features (watercourses) • Erosion of affected areas on steep slopes
Surface Water	• Damage to towers from major flood events

Environmental Feature	Potential Impacts/Implications
	• Impacts to characteristics of riparian zones and wetlands at areas where they are encroached upon by the project footprint
Terrestrial Ecology	• Encroachment by exotic species through inadequate eradication programme • Clearing of vegetation along servitude and maintenance road • Risk to birds from collision with infrastructure and from electrocution
Land Capability	• Permanent loss of cultivated and grazing land within servitude • Loss of livestock and game though improper access control
Land Use	• Loss of land used for agriculture • Servitude restrictions
Heritage	• Possible disturbance and destruction of heritage resources
Traffic	• Use of permanent access and • maintenance roads
Visual Quality	• High visibility of transmission lines / towers • Inadequate reinstatement and rehabilitation of construction footprint
Socio-Economic Environment	• 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 Electromagnetic Field (EMF)

10 SENSITIVE ENVIRONMENTAL FEATURES

Figure 2 shows a zoomed in sensitivity map for Option 2 (WM13). The following sensitive environmental features were identified:

- Rivers and wetlands;
- Western Highveld Sandy Grassland Threatened Ecosystem;
- Critical Biodiversity Area (CBA) 1 and 2 ;
- Ecological Support Areas (ESA) 1 and 2;
- Plant species of conservation concern:
    - *Vachellia erioloba* (= *Acacia erioloba*) (known as Camel Thorn); and
    - *Boophane disticha* (known as Century Plant);
- Avifaunal migratory corridors; and
- Heritage sites (with recommended 20m conservation buffer).

The sensitivity map must be made available to the implementation team (including the Applicant, ECO and Contractor's Environmental Officer) to allow for further consideration and adequate interpretation at an appropriate scale.

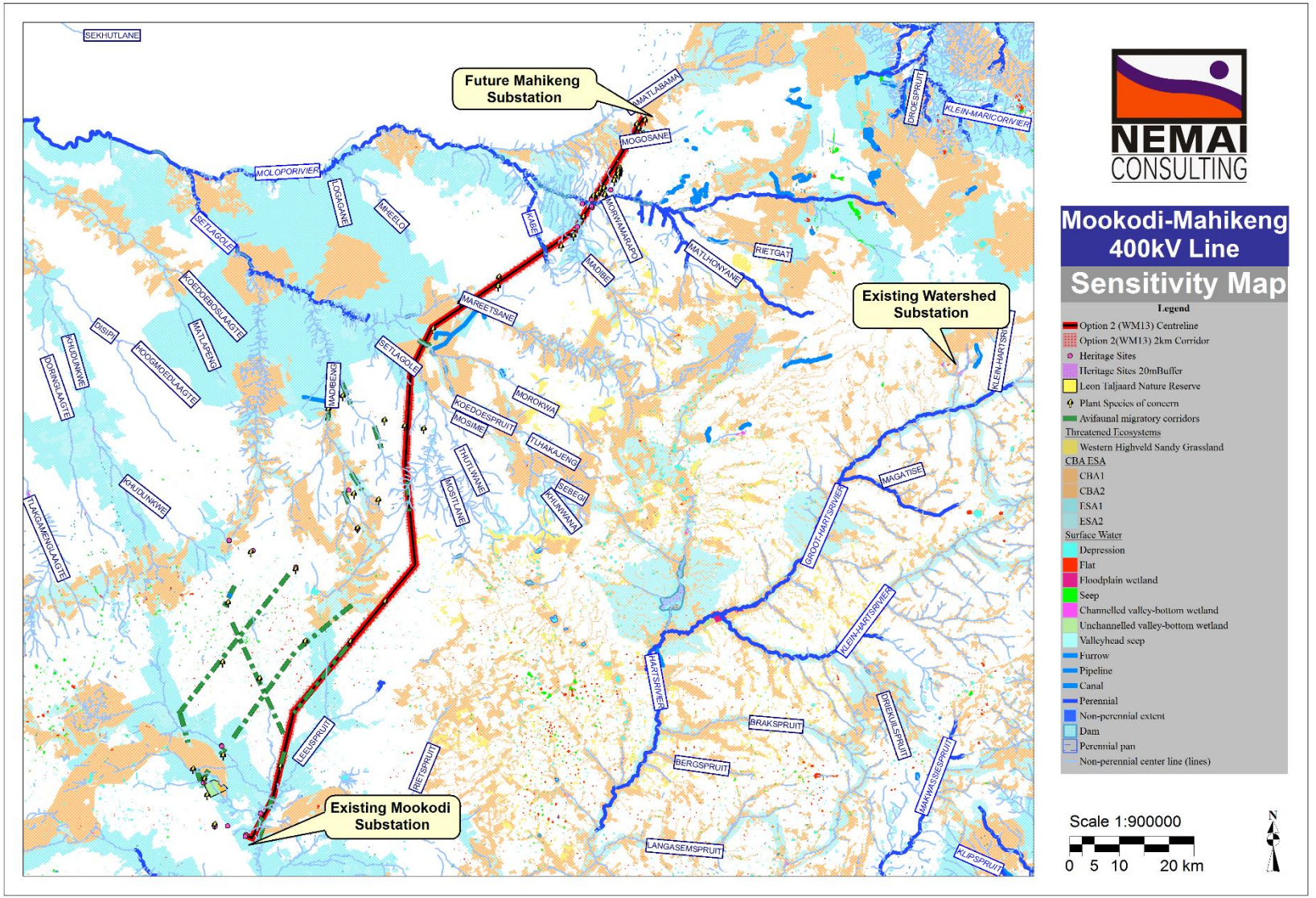

Figure 2: Sensitivity map for Option 2 (proposed route)

11 IMPACT MANAGEMENT

The impact assessment carried out for each environmental impact that may result from the proposed project, forms the basis for determining which management measures are required to prevent or minimise these impacts. The management measures are furthermore a means by which the mitigation measures, determined in the impact assessment are translated to action items required to prevent or keep those impacts that cannot be prevented within acceptable levels.

Mitigation should strive to abide by the following hierarchy (1) prevent; (2) reduce; (3) rehabilitate; and/or (4) compensate for the environmental impacts.

Figure 3: Mitigation hierarchy

The basis for the management measures which follow below comprise of the following:

- **Management objectives** – i.e. desired outcome of management measures for mitigating negative impacts and enhancing the positive impacts related to project activities and aspects (i.e. risk sources);
- **Targets** – i.e. level of performance to accomplish management objectives; and
- **Management actions**– i.e. practical actions aimed at achieving management objectives and targets;
- **Responsibilities**; and
- **Monitoring requirements**.

11.1 Environmental Principles

The following principles must be considered at all times during the construction and operational phase activities.

The environment is considered to be composed of both biophysical and social components.

- Construction is a disruptive activity and all due consideration must be given to the environment, including the social environment, during the execution of a project to minimise the impact on affected parties;

- Minimisation of areas disturbed by construction activities (i.e. the footprint of the construction area) must minimise many of the construction related environmental impacts of the project and reduce rehabilitation requirements and costs;
- As minimum requirements, all relevant standards relating to international, national, provincial and local legislation, as applicable, shall be adhered to. This includes requirements relating to waste emissions (e.g. hazardous, airborne, liquid and solid), waste disposal practices, noise regulations, road traffic ordinances, etc; and
- Every effort must be made to minimise, reclaim and/or recycle "waste" material.

11.2 Pre-construction Phase

The planning or pre-construction phase largely entailed conducting the necessary specialist studies, determining the site layout and carrying out the requisite environmental processes to obtain authorisation.

General requirements during the pre-construction phase include the following:

- Design to consider and incorporate environmental requirements.
- Define and communicate roles and responsibilities for the implementation of the EMPr.
- Develop and implement an environmental awareness programme.
- Compile and implement an employment strategy for construction labour.

11.2.1 Environmental Investigations

Management Objective:

- Identify sensitive features in addition to those that have been identified as part of the EIA Process.

Target:

- Implement findings of Search, Rescue and Relocation Plan for species of conservation concern.
- Obtain approval prior to relocation of any sensitive fauna and flora species.
- Obtain permits if any Protected Trees are to be cut or disturbed.
- All heritage sites must be demarcated.
- Obtain permits if any heritage sites are to be disturbed.

Management Actions:

- Suitable specialist(s) to identify sensitive environmental features where special care needs to be taken and implement suitable mitigation measures to safeguard these features (e.g. barricading, signage and awareness creation).

- Prior to construction, the *Boophane disticha* plant species recorded must be searched and rescued and then following construction activities, they can be re-established at the site or along the route.
- Obtain a license granted by the Minister of Department of Agriculture, Forestry and Fisheries (DAFF) if the *Vachellia (Acacia) erioloba* (Camel Thorn), which is listed as a protected tree in terms of the National Forests Act (Act No. 84 of 1998), will be cut, disturbed, damaged or destroyed.
- Migratory corridors have been identified and it is recommended that mitigation measures to make the lines more visible to birds be implemented within these areas.
- Permits must be obtained from the North West Provincial Heritage Resources Authority (NWPHRA) or South African Heritage Resources Agency (SAHRA) if heritage resources are to be removed, destroyed or altered.
- Any heritage resources found close to the construction site must be protected by a 20m buffer in which no construction can take place. The buffer material (danger tape, fencing, etc.) must be highly visible to construction crews.
- Avifaunal utilise watercourses as navigation aids during cyclic migrational movements. The identification of these main migratory routes associated with the proposed alignment routes has been undertaken. The powerlines that run through these areas must be fitted with bird flapper devices on the earth wire to increase the visibility of the line. This may be done at least at 10 m intervals.
- The appointed terrestrial ecologist, avifaunal, heritage and aquatic specialist shall perform a final walkthrough within the proposed study area to identify sensitive fauna and flora species, as well as sensitive heritage resources, and identify areas that require protection.
    - The Terrestrial Ecological Study (2018) recommended that a walk-down survey of the approved route alternative be undertaken prior to the start of the construction activities in order to survey the area in detail for any Red Data Listed species and develop a comprehensive and site-specific EMPr so as to limit the impacts imposed by the proposed development activities at each tower site and tower locations can then be adjusted accordingly. The walk-down survey must preferably be undertaken during summer season in order to have a higher probability of detecting species of special concern. This is relevant in the areas that have been labelled as ecologically sensitive;
    - The Avifauna Study (2018) recommended a walk down survey of the chosen alignment option must be undertaken to identify nests and/or important roosting areas to manage these aspect appropriately; and
    - The Heritage Study (2018) recommended a walk-down of the selected route option by a heritage specialist, preferably an archaeologist, to be undertaken prior to construction in order that all heritage sites are identified and recorded prior to construction.
- Mitigation measures shall be provided by each of the specialists in the Specialist Walk-Down Survey to address the potential impacts of the construction of the proposed project.
- Observation of the ecological sensitivity map and inclusion of the sensitive areas into planning of access routes, etc will reduce this impact.

- Place the line to avoid cultivated land.

Responsibilities:

- Applicant to appoint suitably qualified specialists.
- Specialists to execute the management actions.

Monitoring Requirements:

- Approval by relevant environmental authorities.

11.2.2 Construction Site Planning and Layout

Management Objective:

- Appropriate planning and layout of construction site to ensure environmental protection.

Target:

- No impacts to sensitive environmental features as a result of construction site planning and layout.

Management Actions:

- Based on the recommendations of the walk-down survey, the towers that fall within the demarcated sensitive areas shall be re-aligned to avoid the certain sensitive environmental features identified.
- Before construction commences, all sensitive habitats must be clearly demarcated with fencing or orange mesh netting. Barricading measures to be utilised should not restrict the movement of the fauna in the area.
- During site preparation, special care must be taken during the clearing of the works area where organic material will be stored separately from the topsoil and spoil material to ensure for the protection thereof. This topsoil must be re-used during the rehabilitation phase.
- During site preparation, topsoil and subsoil are stripped separately from each other and must be stored separately from spoil material for use in the rehabilitation phase. It must be protected from wind and rain, as well as contamination from diesel, concrete or wastewater.
- The 20m buffer zones for heritage sites mentioned in the Heritage Impact Assessment (2018) must be strictly adhered to, and the areas covered by the buffers be treated as environmentally sensitive. The buffer material (danger tape, fencing, etc.) must be highly visible to construction crews.
- Indigenous plants naturally growing along the proposed development routes that would be otherwise destroyed during clearing for development purposes, must be incorporated into landscaped areas.

- Avoid translocating stockpiles of topsoil from one place to sensitive areas in order to avoid translocating soil seed banks of alien species.
- Areas showing dense natural vegetation can be avoided/ spanned in order to reduce vegetation loss.
- No access roads onto sensitive areas, demarcated in the Specialist Studies, must be present and such areas must be fenced off during construction activities.
- Indigenous plants naturally growing along the proposed study area, but that would be otherwise destroyed during clearing for development purposes must be incorporated into landscaped areas.
- Vegetation clearing must be kept to a minimum, and this must only occur where it is absolutely necessary and the use of a brush-cutter is highly preferable to the use of earth-moving equipment.
- Rehabilitate all disturbed areas as soon as the construction is completed within the proposed development area.
- Ensure that all personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm and this can be achieved through provision of appropriate awareness to all personnel.
- Records of all environmental incidents must be maintained and a copy of these records must be made available to authorities on request throughout the project execution.
- During site preparation, special care must be taken during the clearing of the works area to minimise damage or disturbance of roosting and nesting sites.
- No access to no-go areas without the permission of the Applicant.
- The Contractor to develop method statements to be approved by the Applicant prior to construction taking place. The plan must show the following (as relevant), as a minimum:
    - Buildings and structures;
    - Contractors' camp and lay down areas;
    - Site offices;
    - Roads and access routes;
    - Gates and fences;
    - Essential services (permanent and temporary water, electricity and sewage);
    - Rubble and waste rock storage and disposal sites;
    - Solid waste storage and disposal sites;
    - Site toilets and ablutions;
    - Topsoil stockpiles;
    - Construction materials stores;
    - Vehicle and equipment stores;
    - Sensitive environmental features; and
    - Any other activities, facilities and structures deemed relevant.
- Define and communicate roles and responsibilities for the implementation of the EMPr.
- Develop and implement an environmental awareness plan.

- The appointment of an ECO.
- Records of compliance / non-compliance must be kept on site at all times for DEA on request.
- Records of all environmental incidents must be maintained and a copy of these records be made available to DEA on request throughout the project execution.
- Project Management shall allocate a laydown area for Contractor-supplied items. At all times, the Contractor shall be responsible for the safe and adequate storage of all materials and equipment on site which he is to install, whether they are supplied by himself or others. The safe handling, unloading and loading of material receipts and dispatches at site or storage areas shall be the Contractors' responsibility.

Responsibilities:

- Applicant - acquire servitude and permits.
- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Approved site plan.
- Barricading and signage.
- Records of awareness creation.
- Plant rescue, relocation and protection.

11.2.3 Environmental Awareness Creation

Management Objective:

- Ensure that the Contractor, construction workers and site personnel are aware of the relevant provisions of the EMPr, EA and other relevant permits.

Target:

- All construction workers and employees to have completed appropriate environmental training.
- A record of environmental training undertaken to be kept on site.

Management Actions:

- The Contractor must arrange that all of his employees and those of his sub-contractor go through the project specific environmental awareness training courses before the commencement of construction and as and when new staff or sub-contractors are brought on site.
- The contractor's site staff including foremen and site management staff shall attend an environmental awareness training course on the conditions of the EMPr provided by the ECO and a signed attendance register shall be kept available for confirmation. This will be a once of training session.

- Environmental training provided by the Contractor is compulsory for all employees and structured in accordance with their relevant rank, level and responsibility, as well as the Environmental Specification as they apply to the works and site.

Responsibilities:

- ECO to monitor compliance.
- ECO to conduct once-off EMPr training with Contractor's Supervisory Staff.
- Contractor to conduct Environmental induction training with all its staff.

Monitoring Requirements:

- Records of environmental training and awareness.

11.2.1 Impact owing to Land and Rights Acquisition

Management Objective:

- Undertake negotiations between the landowner and Eskom for any compensation as a result of the servitude agreements.
- Careful planning must be adopted to reduce the impact of land acquisition on the overall programme for the works.

Target:

- No deviations from agreements made with adjacent landowners and Eskom.

Management Actions:

- Where impacts cannot be avoided, all negotiations and payments relating to compensating affected landowners must be conducted and concluded before construction begins.
- Those landowners who will be required to sell their property to Eskom SOC Ltd must be compensated for any business that is operating on the premises.
- All landowners whose businesses will be affected by the proposed project must be compensated to the full value of their immovable assets and any loss of income.
- Negotiations must take place between the landowner and Eskom for any compensation of potential income denied as a result of the servitude agreements.
- In the event that household relocation will be necessary, the process to be followed is as follows:
    - A relocation action plan to be drawn up providing detail on the impacted households, the households needs and how these will be catered for during and after the relocation, provides detail on the area to which they are to be relocated and the timeframes associated with the relocation;
    - The relocation action plan is to be discussed with every impacted household and agreed to in writing;
    - The relocation action plan is to be discussed with every impacted landowner (if this is not the same as the impacted household) and agreed to in writing;

- Relocation is to be effected in strict accordance with the relocation action plan; and
- An independent audit, carried out by a suitably qualified relocation expert, is to be conducted after every relocation to: determine the relocation's effectiveness and to identify shortfalls in adhering to the relocation action plan; and
- Shortfalls are to be addressed by the proponent within the duration of the construction period of the project.

Responsibilities:

- Project Manager and ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Public complaints register.

11.2.2 Ongoing Consultation with Landowners and Affected Parties

Management Objective:

- Establish and maintain a record of all complaints and claims against the project and ensure that these are timeously and effectively verified and responded to.
- Adhere to agreements made with affected landowners regarding communication.

Target:

- All complaints and claims are to be acknowledged within five (5) working days and are to be responded to within 10 working days of receipt, unless additional information and/or clarification are required.
- No deviations from agreements made with adjacent landowners and community members.

Management Actions:

- Establish lines of communications with landowners, affected parties, and the surrounding community.
- Establish processes and procedures to effectively verify and address complaints and claims received.
- Complaints or liaison with landowners, affected parties, and the surrounding community with regard to environmental aspects, compensation or disturbance to activities or animals, must be recorded, reported to the correct person and a record of the response is to be entered in the complaints register.
- Provide the relevant contact details to affected parties, adjacent landowners, and community members for queries/raising of issues or complaints.
- Continued liaison with authorities with regards to compliance with the EA.
- Access points to construction site, especially in areas where landowners will be affected must be communicated with the affected landowners and an agreement must be reached with them in terms of access roads.

- Liaison with land owners/tenants is to be done prior to construction in order to provide sufficient time for them to plan agricultural activities. If possible, construction must be scheduled to take place within the post-harvest, pre-planting season when fields are lying fallow.
- All contractors' staff must be easily identifiable through their respective uniforms.
- A security policy must be developed which amongst others requires that permission be obtained prior to entering any property and provisions controlling trespassing by contractor staff.
- Security staff must only be allowed to reside at contractor camps and no other employees.
- Contractors must establish crime awareness programmes at their site camps.

Responsibilities:

- Project Manager and ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Public complaints register.

11.3 Construction Phase

11.3.1 Site Clearing

Management Objective:

- Manage environmental impacts associated with site clearing.
- Ensure that only areas that are specifically required for the construction purposes are cleared.

Target:

- No damage is caused to sensitive environmental features outside of the demarcated construction areas, including marked and barricaded heritage resources, protected trees, structures and infrastructure.

Management Actions:

- Restrict site clearing activities to construction area / domain.
- Clearing of vegetation to be conducted in a phased manner (where possible), with due consideration of the search and rescue activities. All vegetation clearing must be kept to an absolute minimum, and must be within footprints of the servitude, laydown area, construction camp or roads to be used.
- Method Statement to be developed, which will provide the details of how site clearing will be executed. Where possible, clearing by hand is recommended in order to create employment opportunities.

- Maintain barricading around sensitive environmental features.
- Avoid any disturbance to demarcated sensitive environmental features.
- Suitably experienced personnel (relevant to the potentially affected environmental features) to monitor the clearing activities, with particular focus on heritage resources, as well as protected fauna and flora species.
- The contractor has to clear the site of all inert waste and rubble, including surplus rock, foundations and batching plant aggregates.
- The site shall be cleared of all litter/waste prior to any construction related activities and the waste shall be disposed of at a registered waste disposal facility.
- During site preparation, topsoil and subsoil are to be stripped separately from each other and must be stored separately from spoil material for use in the rehabilitation phase. It must be protected from wind and rain, as well as contamination from diesel, concrete or wastewater.
- Compliance in accordance with Eskom's existing Land and Biodiversity Standard as well as Eskom's Vegetation Management Standard.

Responsibilities:

- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- No clearing outside of construction domain.
- Intact barricading.
- Contractor's method statement.

11.3.2 Site Establishment

Management Objective:

- Minimise environmental impacts associated with site establishment.

Target:

- No damage to the environment outside construction area during site establishment.
- No access or encroachment into no-go areas.
- No justifiable complaints regarding general disturbance and nuisance received from the affected parties and community members.

Management Actions:

- The Contractor is to produce a site plan for the approval by the applicant prior to the establishment of the site, which aims to identify construction activities, facilities and structures in relation to sensitive environmental features. This plan will serve as a spatial

tool that facilitates the execution of the construction phase with due consideration of sensitive environmental features.

- Locate construction camps outside of sensitive environmental features.
- Facilities and structures shall be located with due cognisance of the terrain and geographical features of the project site.
- Positioning of the storage and laydown areas must aim to minimise visual impacts.
- Control the movement of all vehicles and plant (including suppliers), such that they remain on designated routes and comply with relevant agreements.
- Maintain barricading around sensitive environmental features until the cessation of construction works.
- Ensure noise levels are within their lawfully acceptable limits as per SANS 10103.
- Minimise disturbance from lighting of the construction camp and site.
- The extent of the site must by all means be limited, to avoid any additional clearance of vegetation.
- The Contractor shall ensure that the Contractors camp and working areas are kept clean and tidy at all times.
- The Contractor shall comply with all safety requirements enforced; these include emergency evacuation procedures, fire preventative measures, etc.
- The Contractor shall supply firefighting equipment in proportion to the fire risk presented by the type of construction and other on-site activities and materials used on site. This equipment shall be kept in good operating order. This particularly applies to welding activities, etc.
- The contractor is to provide designated safe smoking areas.
- Every precaution must be taken, to prevent pollution of air, soil, ground and surface water as a result of construction or associated activities at the construction site.
- Fuel, lubricants, transmission and hydraulic fluids shall only be stored in the designated areas that comply with the OHS Act.
- A copy of the EA must be kept at the property where the activity will be undertaken. The EA must be produced to any authorised official of the Department who requests to see it and must be made available for inspection by any employee or agent of the holder of the authorisation who works or undertakes work at the property.

Responsibilities:

- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Contractor’s method statement.
- Public complaints register.
- Site plan.

11.3.3 Management of Existing Services and Infrastructure

Management Objective:

- Prevent impacts to existing services and infrastructure, including agricultural infrastructure.
- Adhere to agreements made with owners / custodians of the services and infrastructure.

Management Target:

- No unwarranted complaints regarding adverse impacts to existing services and infrastructure.
- No adverse impacts to existing services and infrastructure.
- All relevant approvals (way leaves) to be obtained prior to working within existing servitudes (including roads, railway line, gas and water pipelines, powerlines, telephone lines, etc.).

Management Actions:

- Identify and record all existing services and infrastructure.
- If a risk existing of damage taking place on a property as a result of construction, a condition survey must be undertaken prior to construction. The contractor is to make good and acknowledge any damage that occurs on any property as a result of construction work.
- Where crops and agricultural machinery are damaged, compensation is to be paid to the farmer for the loss of these crops.
- The farmer must be compensated for any loss of income experienced at the account of the contractor.
- Negotiations and agreements with owners and landowners regarding existing services and infrastructure to be undertaken prior to construction and adhered to throughout the project lifecycle.
- Conform to requirements of relevant service providers. Agreements to be in place.
- Ensure access to infrastructure is available to service providers and owners at all times.
- Immediately notify service providers of disturbance to services. Rectify disturbance to services, in consultation with service providers. Maintain a record of all disturbances and remedial actions on site.
- Notify landowners of any disruptions to essential services and infrastructure.
- Deviate/relocate landowners' existing services and infrastructure (e.g. reticulation, irrigation lines), where possible and if necessary, to accommodate project activities.
- Land compensation (if necessary) to adhere to legal framework.
- Adequate reinstatement and rehabilitation of environment affected as a result of the project.

11.3.4 Management of Construction Camp and Eating Areas

Management Objective:

- Minimise environmental impacts associated with the construction camp and eating areas.

Target:

- No environmental contamination associated with the construction camp.
- Minimise visual impact associated with the construction camp.
- No complaints regarding the construction camp.

Management Actions:

- Construction camp to be screened to minimise the visual impact, where practicable.
- The Contractor shall provide eating areas for all staff. Eating areas be cleaned on a daily basis and shall provide adequate temporary shade.
- Open uncontrolled fires will be forbidden at the site camp. Rather, 'contained' cooking mechanisms will be used (e.g. gas stoves or an enclosed braai facility).
- Eating areas will be designated and demarcated.
- Refuse bins must be placed at all eating areas.
- The feeding, or leaving of food for animals, is strictly prohibited.
- Sufficient vermin / weatherproof bins will be present in this area for all waste material.
- Dishwashing facilities will be provided to ensure that wastewater is disposed of appropriately.
- Failure to comply with the general code of conduct, or the rules and procedures implemented at the construction camp will result in disciplinary actions.
- Provide safe potable water for food preparation, drinking and bathing.
- Prohibit the felling of trees for firewood.
- Provide medical and first aid facilities at the camp area.

Responsibilities:

- ECO – monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Public complaints register.
- Waste disposal certificates.

11.3.5 Management of Ablution Facilities

Management Objective:

- Minimise environmental impacts associated with ablution facilities.

Target:

- No environmental contamination associated with ablution facilities.
- Minimise visual impact associated with ablution facilities.

Management Actions:

- Provide sufficient ablution facilities (e.g. mobile / portable / VIP toilets) at the construction camp and along construction sites, which conform to all relevant health and safety standards and codes.
- No pit latrines, trench drain systems or soak away systems shall be allowed along the powerline construction servitude. The location of conservancy tanks is to be approved by the Applicant.
- A sufficient number of toilets shall be provided to accommodate the number of personnel working in any given area. Toilets may not be further than 100 m from any working area. Toilet facilities supplied by the Contractor for the workers shall occur at a maximum ratio of 1 toilet per 15 workers.
- All staff to use the provided toilets at all times.
- All temporary / portable / mobile toilets shall be secured to the ground to prevent them from toppling over due to wind or any other cause.
- Separate changing facility must be provided separately for each sex.
- Ablutions are to be cleaned/emptied on a regular basis, before they are full and contaminate the environment.
- Informal ablutions within the all riparian areas are prohibited.
- The entrances to the toilets will be adequately screened from public view.
- Sanitary hygiene bins will be provided for female staff.
- The Contractor will ensure that no spillage occurs when the toilets are cleaned or emptied and that a licensed service provider removes the contents from site.
- Toilet paper shall be provided.
- Should shower facilities be provided on site, the following controls must be imposed:
    - Positioning of the shower, and specifically its discharge point, will be carried out to ensure that erosion and build-up of detergents does not occur.
    - All discharge from the shower and other washing facilities must be managed to prevent environmental contamination.
    - Use of the shower facilities must be limited to staff or authorised persons only.

Responsibilities:

- ECO - to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Public complaints register.

- Maintenance register for ablution facilities.

11.3.6 Management of Workshop and Equipment

Management Objective:

- Minimise environmental impacts associated with workshops and equipment use*.*

Target:

- No environmental contamination associated with workshops and equipment use*.*

Management Actions:

- Vehicles must be maintained and serviced according to the manufacturers' standards
- Daily checklists must be completed by drivers and operators before the vehicles and equipment are used.
- Vehicles and equipment must be turned off when not in use.
- Maintenance of equipment and vehicles will be performed in such a manner so as to avoid any environmental contamination (e.g. use of drip trays).
- Leaking equipment to be repaired immediately or removed from the site.
- Suitable storage and disposal of hydraulic fluids and other vehicle oils.
- All diesel powered equipment and vehicles used in construction activities must be suitably serviced, maintained and repaired in order to minimise the emission of diesel particulate matter and reduce subsequent worker exposure to this carcinogenic substance.
- All vehicles and equipment will be kept in good working order and serviced regularly. Leaking equipment will be repaired immediately or removed from the site.
- Emergency on-site maintenance must be done over appropriate drip trays and all oil or fuel must be disposed of according to waste regulations. Drip-trays must be placed under vehicles and equipment when not in use.
- No washing of plant may occur near a watercourse. Plant to be washed in dedicated areas.

Responsibilities:

- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Recorded evidence of spillages.
- Vehicle and equipment checklists
- Training register.
- Contractor's method statement.

11.3.7 Fencing and Barricades

Management Objective:

- To ensure and assist with controlled fencing and barricades in the working environment.
- Prevent animals from falling into and being trapped in open trenches.
- Limit the entry to sensitive environments and private property.

Target:

- No direct harm to fauna due to inadequate fencing arrangements.
- Provide a clearly demarcated and safe working area.
- No unauthorised access to private property.
- No impact in buffer zone areas.

Management Actions:

- No pedestrian or vehicular access shall be allowed outside fenced off areas.
- Ensure compliance with Eskom's 'Transmission Servitude Gates Standard and Access to Farms' Guidelines, such as the Agri North West Access to Farms protocol.
- In places where temporary fencing is required, the Contractor shall erect such fencing when and where required and re-erect and maintain temporary fencing as necessary. Temporary fencing shall remain in position either until it is replaced by permanent fencing or until completion of the works.
- Any private fences damaged by the Contractor shall be repaired as soon as possible at his/her cost, and shall be of the standard of the original fence.
- Fences must be constructed to meet the following requirements:
    - The fence must be straight and vertical;
    - All the straining posts must be firmly and vertically anchored;
    - All the posts must extend to the same height above ground level by corresponding to the terrain form;
    - The straining posts and droppers must not be too far apart – the closer they are, the firmer the fence;
    - Each wire strand must be firmly attached to the standards or line posts at a specific height above ground level and must be a certain distance apart from each other;
    - The droppers must be neatly and evenly spaced between the standards. The wire strands must be firmly attached to maintain the proper space between the strands and to prevent vertical movement; and
    - Comply with Nature and Environmental Conservation Ordinance (Act No. 19 of 1974) with regards to the accommodation of relevant large mammal species.
- All fences erected for construction purposes (e.g. fences around camp sites, fencing around trenches, etc.) must be inspected on a daily basis to detect whether any damage has occurred. Damaged fences / barricading to be repaired immediately.

Responsibilities:

- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Public complaints register.
- Agreements with landowners.

11.3.8 Management of Labour Force

Management Objective:

- Ensure suitable management of labour force to prevent security-related issues.
- Optimise the use of local labour.
- Provide a work environment that is conducive to effective labour relations.

Target:

- No complaints from adjacent landowners and community members regarding trespassing or misconduct by construction workers.
- All unskilled labour to be sourced from local communities.

Management Actions:

- All employment of locally sourced labour must be controlled on a contractual basis. If possible, and if the relevant Ward Councillors deem it necessary, the employment process must include the affected Ward Councillors.
- People in search of work may move into the area, however, the project will create a limited number of job opportunities. Locally based people must be given opportunities and preferences over others;
- No staff accommodation must be allowed on site;
- Influx of workers could may lead to increased diseases and HIV/AIDSs & STI as well as STD infections, therefore awareness programmes must be implemented through the local educational institutions and for the workers as well.
- Prevent trespassing of construction workers onto private property.
- Workers must be provided with identity cards and must wear identifiable clothing.
- Make suitable provision for transport of workforce.
- Creating nuisances and disturbances in or near communities shall be prohibited.
- Machine / vehicle operators shall receive clear instructions to remain within demarcated access routes and construction areas.
- Designated and demarcated smoking areas must be provided, with special bins for discarding of cigarette butts.
- Create opportunities for the employment of women and the youth in line with national government priorities.
- Local SMMEs must be given an opportunity to participate in the construction of the project through the supply of services, material or equipment.
- The main contractor must employ non-core labour from the Main places as far as possible during the construction phase.

- The principles of Expanded Public Works Programme can be used for guiding the construction.
- Spaza/informal trader shops may open next to the site as a consequence of construction. These must be controlled by the contractor to limit their footprint and to ensure that the local Municipalities – Informal Trading By-laws are complied with.

Responsibilities:

- Applicant – employment targets.
- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Public complaints register.
- Labour-related targets.

11.3.9 Management of Health and Safety

Management Objective:

- Provide a safe and healthy working environment to construction workers and the public.

Target:

- Approved Health and Safety Plan.
- No reportable health and safety incidents.
- Compliance with the Occupational Health and Safety Act (Act No. 85 of 1993), Construction Regulations (2014) and other relevant regulations.

Management Actions:

- The Contractor must submit a Health and Safety Plan, prepared in accordance with the Health and Safety Specification, for the Health and Safety Agent's approval prior to the commencement of work.
- The Contractor shall ensure compliance to the requirements of the Health and Safety Specification and approved Health and Safety Plan throughout construction.

Health –

- The Construction Regulations (OHS Act 85 of 1993) require that all contractors conduct an initial health risk assessment of their workers activities prior to initiating any work on site.
- Ready access to drinking water must be provided at all work locations.
- Issuing of appropriate protective wear (jackets, hats and gloves)

Safety –

- First aid officers must be trained on site (levels 1 to 3) to deal with construction related injuries.
- When working in the area of encroachment is prevalent all open excavated trenches and foundations must be clearly marked and secured to keep people and fauna from falling in.
- Storage areas, assembling areas where construction material is stored on site must similarly be secured. No stacking and storing of material will be allowed underneath any operational power lines.
- The Contractor must establish site access rules and implement and maintain these throughout the construction period. Access control must, amongst other, include the rule that non-employees will not be allowed on site unaccompanied.
- Access by non-construction staff into any construction related sites must be restricted and clearly indicated as such by signposts.
- Maintain access control to prevent access of the public to the construction areas.
- The requirements of the Occupational Health and Safety Act (Act 85 of 1993) and related regulations shall be adhered to.
- Speed limits shall be enforced in all areas, including public roads and private properties. All drivers of the construction teams shall be sensitised to this effect and courteous behaviour is expected from everybody in this regard.
- Fencing and barriers will be in place in accordance with the Occupational Health and Safety Act (Act No. 85 of 1993) and comply with the provisions of the Fencing Act (Act No. 31 of 1963).
- Applicable notice boards and hazard warning notices will be put in place and secured. Night hazards will be indicated suitably (e.g. reflectors, lighting, and traffic signage).
- Emergency contact details will be prominently displayed.
- All construction personnel must be clearly identifiable. All employees must also be issued with employee cards for identification purposes.
- All workers will be supplied with the required Personal Protective Equipment as per the Occupational Health and Safety Act (Act No. 85 of 1993).
- Appropriate signage must be posted to this effect and all employees on site must be instructed to ensure that non-employees are protected at all times. All non-employees entering the site must receive induction into the hazards and risks of the site and the control measures to be observed.
- All complaints and/or problems related to impacts on man-made facilities and activities must be promptly addressed by the Contractor and documented.

Responsibilities:

- ECO – to monitor compliance.
- Dedicated Occupational Health and Safety system to be implemented by Contractor's Safety Officer. To be monitored and audited by the Client's Safety Agent, in terms of the Construction Regulations (2014).

- Contractor to implement management actions.

Monitoring Requirements:

- Occupational Health and Safety system – audited by Safety Agent at least on a monthly interval.

11.3.10 Management of Emergency Procedures

Management Objective:

- Minimise environmental impacts associated with emergency procedures.

Target:

- No site fires to be caused by construction activities and workers.
- Approved emergency response procedures, where relevant.
- Emergency Preparedness.

Management Actions:

Fire –

- Comply with the National Veld and Forest Fire Act (Act No. 101 of 1998).
- Proper emergency response procedure to be in place for dealing with fires.
- Burning of waste is not permitted.
- Suitable precautions will be taken (e.g. suitable fire extinguishers, water bowsers, welding curtains) when working with welding or grinding equipment.
- Firefighting equipment to be strategically positioned throughout the site.
- All fire control mechanisms (firefighting equipment) shall be serviced annually and inspected monthly.
- All staff on site will be made aware of general fire prevention and control methods, and the name of the responsible person to alert to the presence of a fire.
- No fires are allowed on site, unless in dedicated areas approved by the Applicant.
- Dedicated smoking areas to be provided. Cigarette butts may not be disposed of onsite.
- No internal or external access roads shall be obstructed.

Accidental Leaks and Spillages –

- Proper emergency response procedure to be in place and communicated to designated persons for dealing with spills and leaks.
- Ensure that the necessary materials and equipment for dealing with spills and leaks are available on site in the form of a Spill Kit/s.
- Remediation of the spill areas will be undertaken to the satisfaction of the Applicant and ECO.

- In the event of a hydrocarbon spill, the source of the spillage will be isolated and contained. The area will be cordoned off and secured. The Contractor will ensure that there is always a supply of an appropriate absorbent material readily available to absorb, breakdown and where possible, encapsulate a minor hydrocarbon spillage.
- All staff on site will be made aware of actions to be taken in case of a spillage.
- Provide contact details of person to be notified in a case of spillages – signage to be displayed at strategic points within the construction domain (e.g. workshop, fuel storage area, hazardous material containers).
- Construction vehicles and mobile plant to be maintained in a safe operating condition to prevent any possible hydrocarbon leakages resulting in spillages.
- Drip trays to be positioned underneath the hydrocarbon substance containment components of all stagnant construction vehicles and mobile plant.

Responsibilities:

- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Approved Emergency Response Plan.
- Training and awareness creation records.
- Signage displayed.
- Contractor's method statement.

11.3.11 Management of Access and Traffic

Management Objective:

- Ensure that all construction vehicles use only dedicated access routes to construction sites.
- Ensure that the community have reasonable access to the land during construction.
- Ensure proper access control.
- Prevent unlawful access to construction domain.
- Adhere to agreements made with stakeholders regarding access.
- Ensure the safety of all road users by implementing proper signage and traffic control measures.
- Limit construction-related nuisance to service nodes.
- Ensure that the necessary signage and traffic measures are implemented for safe and convenient access to the site;
- Additional creation of routes and access roads must be implemented to reduce heavy traffic flow.
- Restrictions on the Contractor and its sub-contractors related to minimising impacts on the safety of road users. Restrictions must include appropriate speed limitations, restricting

travel times to daylight hours, communication measures and the establishment of haul routes.

- Measures must be put in place to prevent construction vehicles from entraining dirt onto public roads.
- Traffic control personnel must be assigned where deemed necessary, this will be to control the movement of construction vehicles in relation to local vehicles to ensure maximum safety and coherence.
- A continuous condition survey of the local roads to be used during the construction phase must be made prior to construction.
- Delivery routes must be defined and adhered to during the construction phase.
- Maintenance of local roads must take place during the construction phase, ensuring that the local roads used by the contractor are left in the same or better condition than they were prior to the start of construction.

Target:

- No reports of construction vehicles using other unauthorised routes.
- No transporting of unsafe loads. Permits are to be obtained for abnormal loads.
- No speeding.
- No accidents.

Management Actions:

- The applicant must obtain a wayleave from the Free State Department of Police, Roads and Transport prior to construction.
- Undertake negotiations and confirm arrangements with the adjacent landowners regarding the use of traffic arrangements.
- Site access must be controlled and no unauthorised persons must be allowed onto the site.
- Any clearing for access or haul roads outside the demarcated works area shall only be undertaken after approval from the Project Manager.
- Ensure appropriate traffic safety measures are implemented.
- The Contractor must comply with all driving, vehicle, licensing and driver ability requirements.
- Permission required from the Project Manager for the movement of any vehicles and/or personnel outside of designated working areas.
- Existing roads shall be used as far as possible for construction purposes.
- Contractor to ensure safe access for adjacent landowners on all roads.
- Wet suppression of unpaved areas must be applied during dry windy periods, using a water cart and/or fixed sprinklers.
- Chemical suppression can also be used in conjunction with wet suppression. This involves the use of chemical additives in the water, which help to form a crust on the surface and bind the dust particles together. Chemical stabilisation reduces watering requirements, but

any savings can be offset by the cost of the additives. Repeat treatments are usually required at intervals of 1-4 weeks. The method is best suited to permanent site roads and usually not cost-effective on temporary roads, which are common in construction sites.

- Provide hard-standing areas for vehicles and regularly inspect and clean these areas.
- The Contractor shall organise the site in such a manner that pedestrians and vehicles can move safely and without risks to health, including sufficient and suitable traffic routes and safe walkways with relevant signage.
- Access roads to be maintained in a suitable condition.
- Suitable erosion protective measures to be implemented for access roads during the construction phase.
- Traffic safety measures (e.g. traffic warning signs, flagmen) to be implemented.
- Consult with adjacent landowners, local authorities and communities to ensure that all affected parties are informed of the timing and extent of any disruptions.

Responsibilities:

- Health and Safety Agent, and ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Signage displayed and maintained.
- Public complaints register.
- Contractor's method statement.

11.3.12 Management of Waste

Management Objective:

- Minimise environmental impacts associated with waste.
- Apply waste management principles of prevent, minimise, recycle or re-use, with disposal as a last option.

Target:

- No littering on construction site.
- Maintain a clean and tidy construction site.
- 100% record of all waste generated and disposed at waste disposal facilities.
- Valid disposal certificates for all waste disposed.
- Provision of adequate waste containers that are easily accessible and maintained.
- Waste bins to be removed and cleaned weekly.

Management Actions:

- Waste management activities must comply with the National Environmental Management: Waste Act (Act No. 59 of 2008).

- Vermin / weatherproof bins will be provided in sufficient numbers and capacity to store domestic waste. These bins must be kept closed to reduce odour build-up and emptied regularly to avoid overfilling and other associated nuisances.
- Where possible, waste must be separated at source (e.g. containers for glass, paper, metals, plastics, organic waste and hazardous wastes).
- Provide waste skips at the construction areas. These skips must be sufficient in number, the skip storage area must be kept clean, skips must be emptied and replaced before overflowing or spillage occurs.
- Ensure daily site clean-ups to prevent the build-up of litter
- The Contractor will ensure that no burying, dumping or burning of waste materials, vegetation, litter or refuse occurs. All waste will be disposed of at suitable licensed disposal sites, based on the waste type (general versus hazardous).
- Ensure that solid waste is transported so as to avoid waste spills en-route.
- The following requirements shall be incorporated into the waste management programme:
    - Solid Waste:
        - Littering on site and the surrounding areas is prohibited.
        - Clearly marked litterbins must be provided on site. The Contractor must monitor the presence of litter on the work sites as well as the construction campsite.
        - All bins must be cleaned of litter regularly.
        - All waste removed from site must be disposed at a municipal/permitted waste disposal site.
        - Excess concrete, building rubble or other material must be disposed of in areas designated specifically for this purpose and not indiscriminately over the construction site.
        - The entire works area and all construction sites must be swept of all pieces of wire, metal, wood or other material foreign to the natural environment.
        - Contaminated soil must be treated and disposed of at a permitted waste disposal site, or be removed and the area rehabilitated immediately.
        - Waste must be recycled wherever possible.
    - Liquid Waste
        - The Contractor must install and maintain mobile toilets at work sites.
        - The Contractor must provide adequate and approved facilities for the storage and recycling of used oil and contaminated hydrocarbons. Such facilities must be designed and sited with the intention of preventing pollution of the surrounding area and environment.
        - All vehicles must be regularly serviced in designated area within the Contractors camp such that they do not drip oil. Where required, vehicles will be serviced in bunded areas and drip trays will be provided.
        - All chemical spills must be contained and cleaned up by the supplier or professional pollution control personnel. Run-off from wash bays must be intercepted.

- Hazardous Waste:
  - No hazardous materials must be disposed of in the veld or anyplace other than a registered landfill for hazardous material. Hazardous waste must be stored in containers with tight lids that must be sealed and must be disposed at an appropriately permitted hazardous waste disposal site. Such containers must not be used for purposes other than those originally designed for.
  - The Contractor must maintain a hazardous material register.

Responsibilities:

- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Public complaints register.
- Waste register.
- Recycling targets.
- Disposal certificates.
- Contractor's method statement.

11.3.13 Management of Storage and Handling of Non-Hazardous Material

Management Objective:

Ensure the protection of the natural environment and the safety of personnel on site, by the correct management and handling of hazardous substances.

Target:

- No pollution due to handling, use and storage of hazardous material.
- In the event of a spill, appropriate containment, clean up and disposal of contaminated material. Spills to be cleaned within 24 hours.

Management Actions:

- Hazardous substances must be stored and handled in accordance with the appropriate legislation and standards, which include the Hazardous Substances Act (Act No. 15 of 1973), the Occupational Health and Safety Act (Act No. 85 of 1993), relevant associated Regulations, and applicable SANS and international standards. Where required, the Contractor shall ensure he obtain the necessary authorisation/s or permit/s for the storage of hazardous chemical substances, including flammable substances.
- A copy of the Material Safety Data Sheet (MSDS) for each hazardous chemical substance stored or used on site must be available on site and communicated to the relevant persons who might be exposed to the hazards thereof.
- Storage and use of hazardous materials will be strictly controlled to prevent environmental contamination, and must adhere to the requirements stipulated on the MSDS.

- Where flammable liquids are being used, applied or stored the workplace must be effectively ventilated.
- No person may smoke in any place in which flammable liquid is used or stored.
- Install an adequate number of fire-fighting equipment in suitable locations around the flammable liquids store.
- Where flammable liquids are decanted, the metal containers must be bonded or earthed.
- No flammable material (e.g. paper, cleaning rags or similar material) may be stored together with flammable liquids.
- Staff that will be handling hazardous materials must be trained to do so.
- Any hazardous materials (apart from fuel) must be stored within a lockable store with an impermeable floor. Suitable ventilation to be provided.
- All storage tanks containing hazardous materials must be placed in bunded containment areas with impermeable surfaces. The bunded area must be able to contain 110% of the total volume of the stored hazardous material.
- Fully stocked spill kits must be available for the clean-up of hazardous material spillages.
- Provide secondary containment where a risk of spillage exists.
- Drip trays to be placed under parked construction vehicles, equipment and other receptacles of hazardous material to prevent spillages.
- In the event of spillages of hazardous substances, the appropriate clean up and disposal measures are to be implemented.
- Spill reporting procedures to be displayed at all locations where hazardous substances are being stored.
- Hazardous materials will be disposed of at registered sites or handed to registered hazardous waste disposal facilities for disposal / recycling.
- Proper and timeous notification of any pollution incidents associated with hazardous materials.
- Hazardous chemical substances containers be clearly labelled with the contents and main hazardous category e.g. “Flammable” or “Corrosive”.

Responsibilities:

- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Evidence of spillages.
- MSDS register.
- Training register.
- Disposal certificates.
- Contractor’s method statement.

11.3.14 Management of Pollution Generation Potential

Management Objective:

- Ensure that all possible causes of pollution are mitigated as far as possible to minimise impacts to the surrounding environment.

Target:

- No complaints regarding pollution.
- No measurable signs of pollution.
- Noise – Comply with SANS 10103:2008.

Management Actions:

General –

- Accidental pollution incidents shall be reported to the ECO immediately. The pollution incident to be cleaned-up by the Contractor or a nominated clean-up organization immediately.

Water –

The following requirements for water pollution management shall apply:

- Adequate sedimentation control measures must be instituted at any river crossings when excavations or disturbance of a riverbanks or riverbeds takes place.
- Adequate sedimentation control measures must be implemented where excavations or disturbance of drainage lines of a wetland may take place.
- All fuel, chemical, oil, etc. spills must be confined to areas where the drainage of water can be controlled. Use appropriate structures and methods to confine spillages such as the construction of berms and pans, or through the application of surface treatments that neutralise the toxic effects prior to the entry into a watercourse.
- Oil absorbent fibres must be used to contain oil spilt in water.
- Water shall not be pumped directly from excavations into municipal stormwater drains. Such water must first be pumped into a filtration structure e.g. silt sock, to filter through prior to release.
- During construction through a wetland, the majority of the flow of the wetland must be allowed to pass downstream.
- Vehicular traffic across wetland areas must be avoided.
- No dumping of foreign material in streams, rivers and/or wetland areas is allowed.
- The wetland area and/or river must not be drained, filled or altered in any way including alteration of a bed and/or, banks, without prior consent from the DWA. The necessary licenses must be obtained in terms of Section 21 and 22 of the National Water Act, 36 of 1998 from DWAF.
- No fires or open flames are allowed in the vicinity of the wetland, especially during the dry season.

- No swimming, washing (including vehicles and equipment), fishing or related activity is permitted in a wetland or river without written permission from the Applicant.
- No disturbances to nesting, breeding and roaming sites of animals in or adjacent to wetland areas and sensitive areas.

Air –

The following requirements for air pollution management shall apply:

- Speed limits must be implemented in all areas, including public roads and private property to limit the levels of dust pollution.
- Dust must be suppressed on access roads and construction sites during dry periods by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in quantities that must not result in the generation of run-off.
- Waste must be disposed of, as soon as possible at a municipal transfer station, skip or on a permitted landfill site. Waste must not be allowed to stand on site to decay, resulting in malodours.
- No loud music is allowed on site and in construction camps.
- No fires are allowed if smoke from such fires will cause a nuisance to IAPs.
- Cognisance must be taken of adjacent landowners in terms of the site layout. Ablution facilities or eating areas must ideally not be located directly adjacent to the site boundary where houses/ offices as situated in a close proximity where odour or noise may become a nuisance.

Soil –

The following requirements for soil pollution management shall apply:

- Topsoil must be temporarily stockpiled, separately from (clay) subsoil and rocky material, when areas are cleared. If mixed with clay sub-soil the usefulness of the topsoil for rehabilitation of the site will be lost.
- Stockpiled topsoil must not be compacted and must be replaced as the final soil layer. No vehicles are allowed access onto the stockpiles after they have been placed.
- Topsoil stockpiles must not be contaminated with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and microorganisms in the soil.
- Limited vehicular access is allowed across rocky outcrops.
- All cut and fill surfaces need to be stabilized with appropriate material or measures when major civil works are complete.
- Erosion and donga crossings must be dealt with as river crossings. Appropriate soil erosion and control procedures must be applied to all embankments that are disturbed and destabilized.
- All equipment must be inspected regularly for oil or fuel leaks before it is operated. Leakages must be repaired on mobile equipment or containment trays placed underneath immobile equipment until such leakage has been repaired.

- Soil contaminated with oil must be appropriately treated and disposed of at a permitted landfill site or the soil can be regenerated using bio-remediation methods.
- Channelling water into existing surface drainage system must reduce runoff.

Noise –

- The provisions of SANS 10103:2008 will apply to all areas at the perimeter of the site, within audible distance of residents.
- Working hours to be agreed upon with Applicant, so as to minimise disturbance to landowners and community members.
- No amplified music will be allowed on the site. The use of radios, tape recorders, compact disc players, television sets etc. will not be permitted unless at a level that does not serve as an intrusion to adjacent land-owners.
- Construction activities generating output levels of 85 dB or more will be confined to the hours during normal working hours, unless adjacent landowners have been given adequate notice.
- The Contractor will take preventative measures (e.g. screening, muffling, timing, pre-notification of affected parties) to minimise complaints regarding noise and vibration nuisances from sources such as power tools.
- Cognisance must be taken of adjacent landowners in terms of the site layout. Ablution facilities or eating areas must ideally not be located directly adjacent to the site boundary where houses/ offices as situated in a close proximity where odour or noise may become a nuisance.
- Noise control measures must be implemented. All noise levels must be controlled at the source. All employees must be given the necessary ear protection gear. Interested and affected parties must be informed of the excessive noise factors.
- The Contractor must inform all adjacent landowners of any after-hour construction activities and any other activity that could cause a nuisance. Normal working hours must be clearly indicated to adjacent landowners.

Dust –

- Appropriate dust suppression measures or temporary stabilising mechanisms to be used when dust generation is unavoidable (e.g. dampening with water, chemical soil binders, straw, brush packs, chipping), particularly during prolonged periods of dry weather. Dust suppression to be undertaken for all bare areas, including construction area, access roads, borrow pits, site yard, etc.
- Fine materials must be covered during transportation
- Speed limits to be strictly adhered to.
- The Contractor will take preventative measures to minimise complaints regarding dust nuisances (e.g. screening, dust control, timing, and pre-notification of affected parties).

- Where bulk hauling of spoil material is required to or from the site the Contractor must ensure loading bays of trucks used are covered with tarpaulins to prevent dust along driving routes to and from site.

Lights –

- Prior to construction the position and type of lighting will be planned to ensure unnecessary light pollution will be eliminated.
- All lighting installed on site must not lead to unacceptable light pollution to the surrounding community and natural environment (e.g. use of down-lighters).

Erosion–

- Protect areas of the construction site that are susceptible to erosion through suitable measures (e.g. watering, planting, retaining structures, commercial anti-erosion compounds).
- Particular care must be taken to prevent carrying of sediment onto roadways and watercourses.
- Any erosion channels caused by construction activities to be suitably stabilised and rehabilitated.
- All efforts to prohibit ponding on surface and ensure stormwater runoff is channelled from the site must be made. The method used will be appropriate to the expected stormwater flows and the topography and geology of the site.

Cement and Concrete Batching –

- Cement mixing to take place on an impervious surface (e.g. cement mixing pit).
- Batching operations to take place in a designated area, which will be kept clean at all times.
- Location of batching plant to be approved by the Applicant, with due consideration of the relevant management measures.
- Ensure separation of clean and dirty water from batching plant.
- Wastewater from batching operations to be suitably disposed of.
- Waste concrete and cement sludge to be removed on a regular basis (to prevent overflowing) and to be disposed of at a suitable facility.
- Unused cement bags will be stored in an area not exposed to the weather and packed neatly to prevent hardening or leakage of cement.
- Used cement bags will be stored so as to prevent windblown dust and potential water contamination. Used bags will be disposed of adequately at a licenced waste disposal facility.
- Limit concrete batching to single sites where possible.
- Concrete transportation must not result in spillage.
- Cleaning of equipment and flushing of mixers will not result in pollution, with all contaminated wash water entering the waste water collection system.

- Suitable screening and containment will be in place to prevent windblown contamination from cement storage, mixing, loading and batching operations.
- All contaminated water and fines from exposed aggregate finishes will be collected and stored in sumps and will be adequately disposed of.
- All visible remains of excess concrete will be physically removed on completion of the plastering or concrete pouring and disposed of in an acceptable manner.
- Any spilled concrete to be cleaned up immediately.

In practice all wastes arising from construction activities are to be handled; transported and disposed of in accordance with the relevant regulations. All efforts must be made to minimise, reclaim or recycle waste, and failing that, dispose of it in a manner licensed by the government for that purpose.

Pollution control –

- Remove from site all pollution containment structures.
- Remove from site all temporary sanitary infrastructure and waste water disposal systems. Take care to avoid leaks, overflows and spills and dispose of any waste in the approved manner.

Sewage –

- The Contractor shall provide sanitation facilities at all camps, offices, workshops and construction sites for staff and visitors.

Wastewater –

- All runoff from fuel depots, workshops, truck washing areas and wash water from concrete vehicles and other equipment shall be collected and directed through oil traps before discharging into a watercourse.
- The Contractor shall provide suitable retention and filtration structures (which shall be properly maintained) for the collection of wastewater.

Solid waste –

Definition: "Refuse" refers to all construction waste (such as rubble, cement bags, waste cement, timber, can, other containers, wire and nails), household and office waste.

- Refuse shall be collected and stored in demarcated, fenced areas in skips and/or bins. The fenced areas or containers must be designed to prevent refuse from being blown out by wind and must be strategically and conspicuously placed throughout the site.
- Wherever possible waste that is recyclable is to be recycled.
- Refuse which cannot be recycled shall be disposed of at a landfill site approved by the ECO. Refuse may not be burned nor buried on site.
- Construction rubble shall be disposed of in demarcated spoil dumps or at disposal sites approved by the ECO.

Hazardous substances –

The Contractor must ensure that:

- Employees receive the necessary information and training to be able to use and store hazardous chemical substances safely.
- Employees obey lawful instructions regarding:
    - The wearing and use of protective equipment
    - The use and storage of hazardous chemical substances
    - The prevention of the release of hazardous chemical substances
    - The wearing of exposure monitoring and measuring equipment
    - The cleaning up and disposal of materials containing hazardous chemical substances
    - Housekeeping, personal hygiene and the protection of the environment
- The risk assessments required in terms of Construction Regulations include employee exposure to hazardous chemical substances and that the necessary measures be taken to protect persons from being detrimentally affected by hazardous chemical substances present or used in the workplace.
- Suppliers provide the necessary information in the form of a material safety data sheet regarding a hazardous chemical substances required to ensure the safe use and storage of that substances.
- An up-to-date list is kept on site of hazardous chemical substances stored and used together with the material safety data sheet of the hazardous chemical substances.
- Hazardous chemical substances containers be clearly marked with the contents and main hazardous category e.g. “Flammable” or “Corrosive” and the reference number of the hazardous chemical substances on the list indicated above.
- Hazardous chemical substances, for example asbestos dust, are not cleared by using compressed air but must be vacuumed.
- No person eats or drinks in a hazardous chemical substances workplace.
- Hazardous chemical substances waste is disposed of safely in terms of hazardous waste disposal requirements.

Responsibilities:

- Project Manager and ECO – to monitor compliance.
- Contractor to implement management actions.
- Contractor to conduct environmental monitoring for air quality (dust), noise and water quality.

Monitoring Requirements:

- Public complaints register.
- Evidence of pollution.

- Contractor's method statement.

11.3.15 Management of Topsoil

Management Objective:

- Ensure suitable removal, storage, transportation of topsoil for reuse during rehabilitation.

Target:

- Adequate volume of recovered topsoil from disturbed areas to be stored for future use.
- No visual evidence of erosion from topsoil stockpiles.
- No visual evidence of erosion from areas where topsoil has been reinstated.

Management Actions:

- Topsoil from the construction camp must be stored for post-construction rehabilitation and landscaping work and should not be disturbed more than is absolutely necessary.
- The Contractor shall calculate the quantity of topsoil required for rehabilitation and landscaping and ensure sufficient topsoil is stored and preserved for such purpose. The depth of topsoil to be replaced shall be approved by the landscape architect.
- Topsoil should also be stored in such a way that does not compromise its plant-support capacity.
- Determine the average depth of the topsoil prior to excavations.
- Identify suitable areas to store topsoil.
- Stockpiled topsoil must not be compacted and must be replaced as the final soil layer. No vehicles are allowed access onto the stockpiles after they have been placed.
- Remove topsoil from areas to be affected by construction activities.
- Topsoil to be adequately protected from contamination from construction activities and by aggregate, cement, concrete, fuels, litter, oils, domestic and industrial waste.
- Protect stored topsoil from compaction.
- Wind and water erosion-control measures to be implemented to prevent loss of topsoil.
- Do not store topsoil in drainage lines or areas exposed to strong winds or heavy rain.
- Following the construction phase, the topsoil must be used in rehabilitation and landscaping of affected areas and landscaping around the development.
- Vehicles and construction workers must under no circumstances be allowed outside the site boundaries to prevent impact on the surrounding vegetation.
- Where possible, natural vegetation must not be cleared and encouraged to grow.
- All stockpiles, construction vehicles, equipment and machinery must be situated away from the natural vegetation.
- Disturbance of vegetation must be limited only to areas of construction.
- Prevent contamination of natural grasslands by any pollution.
- Areas cleared of vegetation must be re-vegetated prior to contractor leaving the site.

- Proliferation of alien and invasive species is expected within the disturbed areas and they must be eradicated and controlled to prevent further spread into the ridge.
- The buffer zones mentioned in the various specialist studies must be strictly adhered to, and the areas covered by the buffers be treated as environmentally sensitive. No storage of building materials or rubbles are allowed in the sensitive and buffer areas.
- Avoid translocating stockpiles of topsoil from one place to sensitive areas in order to avoid translocating soil seed banks of alien species.
- Protect topsoil in order to avoid erosion loss on steep slopes.
- Protect topsoil from contamination by aggregate, cement, concrete, fuels, litter, oils, domestic and wastes.
- An ecologically-sound storm water management plan must be implemented during construction and appropriate water diversion systems put in place.

Responsibilities:

- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Topsoil stockpiles.
- Dust monitoring.
- Rehabilitated areas.
- Contractor's method statement.

11.3.16 Management of Excavations

Management Objective:

- Minimise environmental impacts associated with excavations.

Target:

- No damage to sensitive environmental features outside construction area during excavations.

Management Actions:

- Construction activities to remain within the designated construction areas.
- Subsoil and overburden must be stockpiled separately to be returned for backfilling in the correct soil horizon order.
- Suitable barricading to be erected around open excavations/trenches, as per the Construction Regulations (2014). Provide signage as a warning of open excavations.
- Divert runoff away from excavations, where necessary.
- Trench lengths will be kept as short as practically possible.

- Trench walls are to be stabilised using battering, shoring and bracing or similar techniques depending on the stability of the trench sides (where relevant).
- Inspect open trenches at least daily basis to ensure that animals have not become trapped. Such animals will be safely removed and released, where possible. Special equipment for handling of venomous snakes must be available on site to ensure safe removal.
- Filing of trenches to make provision for subsidence.

Responsibilities:

- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Barricading of excavations.
- Excavation register.
- Contractor's method statement.

11.3.17 Management of Visual Aspects

Management Objective:

- Minimise impacts to the aesthetics / visual quality.
- Ensure that the visual appearance of the construction site is not an eyesore the adjacent areas.

Target:

- No complaints regarding impacts to visual quality.

Management Actions:

- Advertising and lighting will be in accordance with relevant standards.
- Lighting must not constitute an eyesore / hazard to users of the road and the surrounding communities.
- Lighting will be sufficient to ensure security but will not constitute 'light pollution' to the surrounding areas.
- The site will be shielded / screened to minimise the visual impact, where practicable.
- Where practicable, development designs to compliment the natural surroundings in order to preserve a sense of place.
- On-going housekeeping to maintain a tidy construction area.
- Discourage the unnecessary usage of high voltage lights during through-night construction. Lighting must be kept to an acceptable minimum and designed in position and height to minimise negative impact on surrounding inhabitants.
- The extent of unnecessary damage to natural surrounds must be kept to a minimum.
- Create an extremely low degree of visual obstruction for the suspension towers.
- Rehabilitation of the construction areas by re-vegetation of the sites and surrounding area.

- Painting / coating of the pylons to a darker colour than Galvanized steel.
- Building the Powerlines and pylons next to existing linear structures as far as possible.
- Clear vegetation only by cutting and not earth moving equipment.
- Use of existing roads for access roads.

Responsibilities:

- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Public complaints register.

11.3.18 Management of Flora

Management Objective:

- Preserve protected flora species outside of construction areas.
- Control alien plants and noxious weeds.

Target:

- No unpermitted disturbance to protected flora species.
- Ongoing eradication of alien plants and noxious weeds.

Management Actions:

- Comply with the requirements of the National Environmental Management: Biodiversity Act (No. 10 of 2004), National Forests Act (No. 84 of 1998) and National Veld and Forest Fire Act (No. 101 of 1998).
- Indigenous plants naturally growing along the proposed development routes, but that would be otherwise destroyed during clearing for development purposes must be incorporated into landscaped areas.
- Vegetation clearing must be kept to a minimum, and this must only occur where it is absolutely necessary and the use of a brush-cutter is highly preferable to the use of earth-moving equipment.
- Rehabilitate all disturbed areas as soon as the construction is completed along the proposed development route.
- Ensure that all personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm and this can be achieved through provision of appropriate awareness to all personnel.
- Vehicles and construction workers must under no circumstances be allowed outside the site boundaries to prevent impact on the surrounding vegetation.
- Where possible, natural vegetation must not be cleared and encouraged to grow.
- Disturbance of vegetation must be limited only to areas of construction.

- Prevent contamination of natural grasslands by any pollution.
- Areas cleared of vegetation must be re-vegetated prior to contractor leaving the site.
- Proliferation of alien and invasive species is expected within the disturbed areas and they must be eradicated and controlled to prevent further spread.
- No trapping or any other method of catching of any animal or bird may be performed on site
- No storage of building materials or rubbles are allowed in the sensitive areas.
- Avoid translocating stockpiles of topsoil from one place to sensitive areas in order to avoid translocating soil seed banks of alien species.
- Areas showing dense natural vegetation can be avoided/ spanned in order to reduce vegetation loss.
- The most significant way to mitigate the loss of habitat is to limit the footprint within the natural habitat areas remaining.
- No structures must be built outside the area demarcated for the development.
- Although it is unavoidable that sections of the powerline will need to traverse areas of potential sensitivity, the powerline construction must be constructed in such cases so as to avoid further impact to these areas.
- Where possible, the proposed linear infrastructure (powerline) must be aligned with existing linear infrastructure or routed through already transformed/degraded areas.
- All stockpiles, construction vehicles, equipment and machinery must be situated away from the natural vegetation.
- Appropriate measures must be implemented in order to prevent potential soil pollution through fuel and oil leaks and spills and then compliance monitored by an appropriate person.
- Make sure construction vehicles are maintained and serviced to prevent oil and fuel leaks.
- Emergency on-site maintenance must be done over appropriate drip trays and all oil or fuel must be disposed of according to waste regulations. Drip-trays must be placed under vehicles and equipment when not in use.
- During construction, the construction area and immediate surroundings must be monitored regularly for emergent invasive vegetation.
- Promote awareness of all personnel.
- The establishment of pioneer species must be considered with the natural cycle of rehabilitation of disturbed areas, which assists with erosion control, dust and establishment of more permanent species. This can be controlled during construction phase and thereafter more stringent measures must be implemented during the rehabilitation and post rehabilitation.
- Larger exotic species that are not included in the Category 1b list of invasive species could also be allowed to remain for aesthetic purposes.
- All alien seedlings and saplings must be removed as they become evident for the duration of construction phase
- Manual / mechanical removal is preferred to chemical control.

- Where possible, natural vegetation must not be cleared and encouraged to grow.
- Disturbance of vegetation must be limited only to areas of construction.
- Areas cleared of vegetation must be re-vegetated prior to contractor leaving the site Vehicles and construction workers must under no circumstances be allowed outside the site boundaries to prevent impact on the surrounding vegetation.
- All stockpiles, construction vehicles, equipment and machinery must be situated away from the natural vegetation.
- Prevent contamination of natural areas by any pollution.
- No unauthorised vehicles must be allowed to drive through the site during the construction activities.
- No dumping of any form is permitted.
- No damage and/or removal/trapping/snaring of indigenous plants for cooking and other purposes will be allowed.

Responsibilities:

- Applicant – acquire permits
- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Permits.
- Successful rehabilitation.
- Contractor's method statement.

11.3.19 Management of Fauna

Management Objective:

- Ensure the protection of animals

Target:

- No direct / indirect harm to animals from construction activities.

Management Actions:

- Training of construction workers to recognise threatened animal species will reduce the probability of fauna being harmed unnecessarily.
- The contractor must ensure that no faunal species are disturbed, trapped, hunted or killed during the construction phase.
- Vehicles must adhere to a speed limit, 30-40 km/h is recommended for light vehicles and a lower speed for heavy vehicles.
- All construction and maintenance vehicles must stick to properly demarcated and prepared roads. Off-road driving must be strictly prohibited.

- No fires must be allowed at the site
- No dogs or other domestic pets must be allowed at the site.
- No structures must be built outside the area demarcated for the development.
- Where possible, the proposed linear infrastructure (powerline) must be aligned with existing linear infrastructure or routed through already transformed/degraded areas.
- Any fauna (mammal, reptile and amphibian) that becomes trapped in the trenches or in any construction or operational related activity may not be harmed and must be placed rescued and relocated by an experienced person.
- No unauthorised vehicles must be allowed to drive through the site during the construction activities.
- No trapping or any other method of catching of any animal may be performed on site.
- Illegal hunting is prohibited.
- No dumping of any form is permitted.
- No damage and/or removal/trapping/snaring of indigenous plant or animal material for cooking and other purposes will be allowed.
- Animals residing within the designated area shall not be unnecessarily disturbed.
- During construction, refresher training can be conducted to construction workers with regards to littering and poaching.
- The Contractor and his/her employees shall not bring any domestic animals onto site.
- Toolbox talks must be provided to contractors regarding disturbance to animals. Particular emphasis must be placed on talks regarding snakes.
- Poles should be fitted with bird perches on top of the poles to draw birds, particularly vultures, away from potentially risky insulators.
- Habitat units that are considered to be particularly important to avifaunal conservation such as watercourses, riparian zones and wetlands should be impacted as little as possible.
- As much of the natural vegetation, including larger trees, within servitude areas should be allowed to remain as practically possible for birds. Only larger trees that pose a direct risk to the overhead lines should be removed.

Responsibilities:

- Applicant – acquire permits (if applicable)
- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Permits (if applicable).
- Contractor's method statement.

11.3.20 Management of Archaeological and Cultural Features

Management Objective:

- To have no adverse impact on the historical inheritance of the area.
- To avoid damage to or destruction of previously unknown or excavated archaeological artefacts during construction.
- The preservation and appropriate management of new findings must these be discovered during construction.

Management Target:

- No archaeological and cultural resources or graves to be damaged during construction.
- All identified heritage resources on site to be demarcated and barricaded.

Management Actions:

- For any chance finds of heritage resources, all work must cease in the area affected and the Contractor must immediately inform the Project Manager. A heritage specialist must be called to site to inspect the finds. The NWPHRA / SAHRA must also be informed about any chance finds. The heritage specialist will assess the significance of the heritage resource/s found and provide guidance on the way forward.
- Any heritage resources found close to the construction site must be protected by a 20m buffer in which no construction can take place. The buffer material (danger tape, fencing, etc.) must be highly visible to construction crews.
- Under no circumstances may any heritage material be destroyed or removed from site unless under direction of a heritage specialist.

Responsibilities:

- ECO - to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Permits (if applicable).

11.3.21 Management of Water on Site

Management Objective:

- Minimise environmental impacts associated with storm water as well as water services for construction workers.
- Minimise stormwater runoff from the site onto neighbouring roads.
- Minimise water use through recycling and water efficient practices.

Target:

- No visual evidence of erosion caused by wastewater or stormwater practices.
- No environmental contamination associated with wastewater or stormwater practices.

Management Actions:

- All construction activities to comply with the National Water Act (Act No. 36 of 1998).
- During the construction stage, water will be required for various purposes, such as concrete batching, washing of plant and equipment in dedicated areas, dust suppression, potable use by construction workers, etc. Water tankers will supply water to the site.
- Manage stormwater from construction site to avoid environmental contamination and erosion.
- Establish a dedicated vehicle maintenance area and wash-bay, where suitable storm water management measures are in place to prevent pollution.
- Manage stormwater from construction site to avoid environmental contamination and erosion.
- Stormwater runoff from workshops, vehicle maintenance area, wash-bays and other potential pollution sources shall be collected and treated in hydrocarbon separation pits/tanks before discharged to drains and waterways.
- Measures must be taken to divert unpolluted water and runoff away from the site.
- All discharges to comply with legal requirements associated with the National Water Act (Act No. 36 of 1998).
- Ensure proper storage of material (including fuel, paint) that could cause water pollution. Ensure proper storage and careful handling of hazardous substances with spill prevention materials at hand.
- Visual inspections for the occurrence of erosion must be undertaken on a weekly basis.
- Reduce sediment loads in water from dewatering operations. All dewatering must be done through temporary sediment traps (e.g. straw bales). These are to be serviced regularly and removed when no longer in use. Materials can be re-used.

Responsibilities:

- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Public complaints register.
- Disposal certificates
- Contractor's method statement.

11.3.22 Management of Watercourses

Management Objective:

- Ensure that the watercourses (including affected rivers, natural channels, and drainage lines) are protected and incur minimal negative impact to resource quality (i.e. flow, water quality, riparian habitat, morphology, and aquatic biota).
- Existing water use entitlements not to be affected.

Target:

- Minimise the habitat unit destruction and potential loss of wetland/aquatic-dependent biodiversity.
- Unaltered downstream flow regime.
- Ecological category not to be influenced by construction activities.

Management Actions:

- Minimise influence to downstream flow regime when diverting and impeding flow (temporary river crossings etc.).
- Prevent erosion caused by temporary in-stream diversion. Install suitable buttressing / stabilisation structures to prevent future erosion, if required.
- Select appropriate crossing points (geotechnical conditions, sensitivity of riparian habitat and in-stream habitat), depending on technical feasibility.
- Conduct water quality monitoring (baseline and during construction) at suitable up- and downstream sites.
- All diffuse pollution sources to be managed to prevent pollution of the watercourses in the project area.
- Storage area and ablution facilities to be located 50m from edge of riparian habitat.
- Where necessary, install in-stream silt traps during construction within the watercourse channel and along the riparian habitat. The style of silt trap will depend on materials used and the water movement patterns.
- Implement suitable stormwater measures during construction to manage ingress of runoff into watercourses.
- Ensure proper storage of material (including fuel, paint) that could cause water pollution. Ensure proper storage and careful handling of hazardous substances with spill prevention materials at hand.
- Reduce sediment loads in water from dewatering operations. All dewatering must be done through temporary sediment traps (e.g. constructed out of geo-textiles and hay bales).
- All construction activities to comply with the National Water Act (Act No. 36 of 1998).
- Ensure that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage.
- Regularly inspect all vehicles for leaks.
- Re-fuelling of vehicles must take place off-site.
- Littering must be prohibited by providing adequate number of rubbish bins during the construction and operational phases to ensure proper disposal of rubbish.
- Staff must be trained to deal with fuel/chemical spills and spill kits must be easily available at all times.
- Existing stormwater infrastructure must be maintained during construction activities to prevent the deterioration and subsequent failure of current infrastructure.

- Temporary berms must be constructed on the downstream perimeter of the site to channel runoff containing silt to a location where silt is allowed to settle prior to discharging into the existing stormwater infrastructure or natural watercourse.
- The main contractor is to control stormwater during construction by installing berms at the top of all cut and fill embankments.
- Runoff is to be diverted into the site and, either discharged by gravity or, if required, pumped to the Municipal stormwater network.

Responsibilities:

- ECO – to monitor compliance.
- Contractor to implement management actions.

Monitoring Requirements:

- Public complaints register.
- Disposal certificates
- Contractor's method statement.
- Water Use License, if required.

11.3.23 Management of Agricultural Resources

Management Objective:

- To have no adverse impact on agricultural potential of the area.
- To ensure adequate compensation to farmers that may suffer a loss of income.
- The protection of existing agricultural and farming activities and livestock.

Management Target:

- No agricultural resources are damaged during construction.
- Interruption of farming activities during construction is minimised.
- The loss of income is minimised.

Management Actions:

- Farmers must be compensated for the loss of income that they will suffer during construction and the period that the land takes to recover.
- Loss of income from the affected land can only be minimised by keeping the construction period as short as possible. Construction can be scheduled to take place after the crops are harvested.
- Employ dust reducing practices to protect adjoining grazing land.
- Theft and vandalism can be reduced by providing security to farmers.

Responsibilities:

- Proponent – acquire permits.
- Project Manager and ECO – to monitor compliance.

- Contractor to implement management actions.

Monitoring Requirements:

- Permits (if applicable).
- Contractor's method statement.

11.3.24 Management of Rehabilitation

Management Objective:

- Adequate reinstatement and rehabilitation of construction areas
- Conduct concurrent or progressive rehabilitation of areas affected by construction activities that are situated outside of the construction footprint.

Target:

- Complete site clean-up.
- Reinstate and rehabilitate areas disturbed by construction activities that are located outside of the construction area.
- Landscaping of the finished development to complement the surrounding area.

Management Actions:

Removal of structures and infrastructure

- After the construction phase, the area disturbed outside of the servitude must be rehabilitated by appropriate landscaping, levelling, topsoil dressing, land preparation, alien plant eradication and vegetation establishment.
- Clear and completely remove from site all construction plant, equipment, storage containers, temporary fencing, temporary services, and fixtures.
- Ensure that all access roads utilised during construction which are outside of the powerline servitude and not earmarked for use during the operational phase, are returned to a state no worse than prior to construction.

Inert waste and rubble

- Clear the site of all inert waste and rubble, including surplus rock, foundations and batching plant aggregates. After the material has been removed, the site shall be re-instated and rehabilitated.
- Load and haul excess spoil and inert rubble to fill in borrow pits/dongas or to dump sites indicated/approved by the Project Manager.
- Remove from site all domestic waste and dispose of in the approved manner at a registered waste disposal site.

Hazardous waste and pollution control

- Remove from site all pollution containment structures.
- Remove from site all temporary sanitary infrastructure and wastewater disposal systems. Take care to avoid leaks, overflows and spills and dispose of any waste in the approved manner.
- Comply with relevant provisions under the following EMPr sections: Management of Storage and Handling of Hazardous Material, Management of Water, Management of Waste, Management of Pollution Generation Potential.

Landscaping

- Programme the backfill of excavations so that subsoil is deposited first, followed by the topsoil. Compact in layers for best results.
- Monitor backfilled areas for subsidence (as the backfill settles) and fill depressions using available material.
- Ensure that no excavated material or stockpiles are left on site and that all material remaining after backfill is landscaped or removed from site and disposed of at a suitable licensed waste disposal site.

Topsoil replacement and soil amelioration

- Execute top soiling activity prior to the rainy season or any expected wet weather conditions.
- Execute topsoil placement only after all construction work has ceased.
- Replace and redistribute stockpiled topsoil together with herbaceous vegetation, overlying grass and other fine organic matter in all disturbed areas of the construction site, including temporary access routes. Replace topsoil to the original depth.
- Place topsoil in the same area from where it was stripped. If there is insufficient topsoil available from a particular soil zone to produce the minimum specified depth, topsoil of similar quality may be brought from other areas of similar quality.
- The suitability of substitute material will be determined by means of a soil analysis addressing soil fraction, fertility, pH and drainage.
- Do not use topsoil suspected to be contaminated with the seed of alien vegetation (e.g. black wattle). Alternatively, the soil is to be appropriately treated.
- Ensure that stormwater run-off is not channelled alongside the gentle mounding, but that it is taken diagonally across it.
- Shape remaining stockpiled topsoil not utilised elsewhere in an acceptable manner so as to blend in with the local surrounding area.
- After topsoil placement is complete, spread available stripped vegetation randomly by hand over the top-soiled area.
- Newly cleared soils will have to be re-vegetated and stabilised as soon as construction has been completed and there must be an on-going monitoring program to control and/or eradicate newly emerging invasives.

- Machines must remove the stone material and transported to another location and re-used if it is required, removed correctly to a licensed facility, or offered to the landowner.
- The geotextile base material, and other foreign material must also then removed during rehabilitation.

Ripping and scarifying

- Rip and / or scarify all areas following the application of topsoil to facilitate mixing of the upper most layers. Whether ripping and/or scarifying is necessary will be determined based on the site conditions immediately before these works begin.
- Rip and / or scarify all disturbed (and other specified) areas of the construction site, including temporary access routes and roads, compacted during the execution of the works.
- Rip and / or scarify along the contour to prevent the creation of down-slope channels.
- Do not rip and / or scarify areas under wet conditions, as the soil will not break up.
- The area must be ripped to an appropriate depth (at least 300 mm) to remove any minor compaction.

Planting

- The areas that have been denuded and disturbed as a result of the construction on site must be vegetated with indigenous vegetation as soon as possible.
- No exotic plants may be used for rehabilitation purpose, only indigenous plants of the area may be utilised.
- Plants must be located from other undisturbed areas, and this along with the original seed-bank within the replaced topsoil will assist with stabilising soils and re-vegetation of the area.
- All planting work is to be undertaken by suitably experienced personnel, making use of the appropriate equipment.
- Transplanting entails the removal of plant material and replanting the same plants in another designated position.
- Transplant trees and shrubs into designated positions.
- Establish further specifications for transplanted plants.
- Plant all trees, shrubs and individual plants in designated positions.
- Planting must preferably be done during the rainy season.
- After planting, each plant must be well watered, adding more soil upon settlement if necessary.
- Establish further specifications for nursery plants.
- Tree seedling material must be fresh and of local origin. Resist using plants from far afield as they may not be best suited to local climatic or soil conditions.
- Small seedlings are likely to transplant more successfully than will large ones. These must be potted and kept under nursery conditions until they are large enough to plant out.
- Establish further specifications for seeds and seedlings.

Grassing

- Suitably trained personnel must undertake grassing by making use of the appropriate equipment and grass species as specified by the terrestrial ecologist.
- Sodding may be done at any time of the year, but it is recommended that seeding be done during the summer when the germination rate is better.
- Hydroseeding with a winter mix will only be specified where regrassing is urgent, and cannot wait for the summer.
- Establish further specifications for sods, runners and hand seeding.

Maintenance

- Monitor the re-growth of invasive vegetative material.
- Cordon off areas that are under rehabilitation as no-go areas.
- Revegetation must match the vegetation type, which previously existed, unless otherwise indicated by a suitable specialist.
- Control invasive plant species and noxious weeds by means of extraction, cutting or other approved methods.
- For planted areas that have failed to establish, replace plants with the same species as originally specified.
- Establish further specifications for maintenance.

11.4 Operational Phase

11.4.1 General Maintenance and Management

Eskom standard documents are to be applied during the operational phase of the Mookodi-Mahikeng 400kV Powerline, including the following:

- Bird Nesting Guidelines;
- EMP Procedure Requirement;
- Line Towers and Line Construction;
- Transmission Environmental Policy;
- Bird Collision Prevention Guideline;
- Monitoring for bird collisions must be routinely undertaken and bird flappers must be retro-fitted to sections of the line where collisions are occurring (identified collision hotspots).
- Tree Felling Guideline;
- Transmission Servitude Gates Standard;
- Soil Erosion Assessment Table;
- Standard for Bush Clearance and Maintenance within Overhead Power Line Servitudes;
- Eskom's standard Transmission Vegetation Management Guideline;
- Safe Use of Pesticides and Herbicides;

- Access to Farms Guidelines;
- Maintenance within Eskom Land, Servitudes and Rights of Way;
- Vegetation Management Services on Eskom Networks;
- Bio-Remediation Register;
- Guideline on Operating and Maintenance of Oil Containment Structures, Oil Traps and Oil Dams;
- Oil Clean-Up and Rehabilitation Standards;
- Waste Handling and Disposal Standard; and
- Fire Protection Association Guideline.

11.4.2 General Environmental Management

Note that where any activity and aspect associated with the operational phase of the project coincides with the receiving environment and activities of the construction phase (see **Section 11.3**), the same management requirements will apply.

11.4.3 Ongoing Consultation with Landowners, and Affected Parties and Communities

Management Objective:

- Establish and maintain a record of all complaints and claims against the project and ensure that these are timeously and effectively verified and responded to.
- Adhere to agreements made with affected parties, landowners, human settlements, and community members regarding communication.

Target:

- All complaints and claims are to be acknowledged within five (5) working days and are to be responded to within 10 working days of receipt, unless additional information and / or clarification are required.
- No deviations from agreements made with affected parties, landowners, human settlements, and community members.
- Adhere to servitude agreements.

Management Actions:

- Establish lines of communications with affected parties, landowners, human settlements, and community members.
- Establish processes and procedures to effectively verify and address complaints and claims received.
- Complaints or liaison with affected parties, landowners, human settlements, and community members with regard to environmental aspects, compensation or disturbance to activities or animals, must be recorded, reported to the correct person and a record of the response is to be entered in the complaints register.

- Provide the relevant contact details to affected parties, adjacent landowners, and community members for queries / raising of issues or complaints.
- Provide all information, especially technical findings, in a language that is understandable to the general public.
- Continued liaison with authorities with regards to compliance with the EA.
- Access points to construction site, especially in areas where landowners will be affected must be communicated with the affected landowners and an agreement must be reached with them in terms of access roads.
- Liaison with land owners/farm managers is to be done prior to construction in order to provide sufficient time for them to plan agricultural activities. If possible, construction must be scheduled to take place within the post-harvest, pre-planting season when fields are lying fallow.

Responsibilities:

- Applicant – monitor compliance and implement management actions

Monitoring Requirements:

- Public complaints register.

11.4.4 Management of Reinstatement and Rehabilitation

Management Objective:

- Adequate reinstatement and rehabilitation of areas affected by operational and maintenance activities.

Target:

- Complete site clean-up.
- Reinstate and rehabilitate entire affected area.
- No justifiable complaints received.

Management Actions:

- Entire footprint of area affected by operation and maintenance activities to be reinstated and rehabilitated.
- Stabilise area to prevent erosion. Determine need to eradication programme to control alien plants and noxious weeds.
- Ensure that all access roads are returned to a usable state and / or a state no worse than prior to construction.
- Clear the area of all inert waste and rubble.
- Remove all domestic waste for disposal at a registered waste disposal site, reuse or recycling.
- Remove all temporary ablution facilities.

- Incorporate findings of specialists from walk-down survey (if applicable).

Responsibilities:

- Applicant – monitor compliance and implement management actions.

Monitoring Requirements:

- Public complaints register.
- Staff-related targets.
- Waste register.
- Recycling targets.
- Disposal certificates.

11.4.5 Management of Maintenance Staff

Management Objective:

- Ensure suitable management of staff (including sub-contractors) to prevent security-related issues or disturbance to landowners and community members.
- Provide a work environment that is conducive to effective labour relations.

Target:

- No complaints from landowners and community members regarding trespassing or misconduct by staff.

Management Actions:

- Prohibit trespassing of staff on private property.
- Staff must be provided with identity cards which must be displayed at all times.
- Designated smoking areas must be provided, with special bins for discarding of cigarette butts.
- Use local labour as far as possible, where necessary (e.g. unskilled labour during maintenance).

Responsibilities:

- Applicant – monitor compliance and implement management actions.

Monitoring Requirements:

- Public complaints register.
- Staff-related targets.

11.4.6 Routine Maintenance and Access of Servitude

Management Objective:

- Manage environmental impacts associated with servitude maintenance.
- Restrict operation and maintenance activities to the powerline servitude.
- Safeguarding of sensitive environmental features and existing services.

Target:

- Access control in place for maintenance activities.
- No damage to be caused to sensitive environmental features (including heritage resources, protected trees, watercourses, cultivated areas, structures and infrastructure) outside of the powerline servitude.
- Ensure all affected landowners and IAPs are notified.

Management Actions:

- Affected landowners must be notified in advance.
- During maintenance related activities, damage to access gates, access roads, fencing and/or private property, will be restored to its original condition.
- Restrict operation and maintenance activities to the servitude.
- All vehicle traffic will be restricted to access roads and tracks only, where this is not possible the landowner will need to be notified.
- Ensure compliance with 'Vegetation Management Services on Eskom Networks' Report, and 'Vegetation management and maintenance within Eskom land, servitudes and rights of way' Report.
- Maintenance of the servitude must remain within the designated servitude only and no indiscriminate habitat destruction outside of the designated area must be allowed.

Responsibilities:

- Applicant – monitor compliance and implement management actions.

Monitoring Requirements:

- No movement outside of servitude, unless the landowner has been notified.
- Public complaints register.

11.4.7 Management of Agricultural Land

Management Objective:

- Ensure that agricultural features and land are protected.

Target:

- No damage to agricultural features during the operation and maintenance of the substation, powerlines and towers.

Management Actions:

- Negotiate with landowners the timing of the maintenance activities within agricultural properties / land.
- Suitable access arrangements to be made with landowners (refer to *Ongoing Consultation with Landowners, and Affected Parties and Communities*).
- Safeguarding of livestock / game against maintenance activities (e.g. barricading excavations).
- Proper reinstatement and rehabilitation of disturbed areas.
- Where relevant, air traffic (helicopter inspections) associated with the operation of the transmission line to take cognisance of aerial irrigation and spraying activities in agricultural areas.

Responsibilities:

- Applicant – monitor compliance and implement management actions.

Monitoring Requirements:

- Public complaints register.

11.4.8 Management of Health and Safety

Management Objective:

- Provide and maintain a safe and healthy working environment to workers and the public.

Target:

- No reportable health and safety incidents.
- Compliance with the Occupational Health and Safety Act (Act No. 85 of 1993) and relevant accompanying regulations.

Management Actions:

- Applicable notice boards and hazard warning notices will be put in place and secured.
- The Applicant shall ensure compliance to the requirements of the Health and Safety Specifications.

Responsibilities:

- Applicant – monitor compliance and implement management actions.

Monitoring Requirements:

- Occupational Health and Safety System

11.4.9 Management of Stormwater

Management Objective:

- Minimise environmental impacts associated with stormwater.

Target:

- No visual evidence of erosion caused by stormwater practices.
- No environmental contamination associated with wastewater or stormwater practices.

Management Actions:

- Implement stormwater management plan for the development.
- Prevent water quality deterioration of the receiving watercourses from stormwater discharges.
- Prevent erosion associated with stormwater runoff.
- No illegal discharges into the stormwater system to be allowed.

Responsibilities:

- Applicant – monitor compliance and implement management actions.

Monitoring Requirements:

- Public complaints register.

11.4.10 Management of Waste

Management Objective:

- Minimise environmental impacts associated with waste during operation and maintenance activities.
- Apply waste management principles of prevent, minimise, recycle or re-use, with disposal as a last option.

Target:

- No littering on site.
- Clean and tidy construction site and servitude.
- 100% record of all waste generated and disposed at waste disposal facilities.
- Valid disposal certificates for all waste disposed.
- Provision of adequate waste containers that are easily accessible and maintained.
- Waste bins to be removed and cleaned weekly.

Management Actions:

- Implement a waste management hierarchy of reduce, re-use, recycle, treatment and disposal.
- All occupants must be encouraged to apply best practice in terms of waste management.
- Recycling facilities to be provided on site (bins for organic, plastic, tins, paper, garden waste and composting).

Responsibilities:

- Applicant – monitor compliance and implement management actions.

Monitoring Requirements:

- Public complaints register.
- Waste register.
- Recycling targets.
- Waste disposal certificates.

11.5 Decommissioning

Post to the economic lifespan of the Mookodi-Mahikeng 400kV Powerline, decommissioning and rehabilitation will comply with the appropriate environmental legislation and best practices at that time.