ECOLOGICAL IMPACT ASSESSMENT REPORT

UMSOBOMVU 400KV LILO OHL SITUATED IN THE UMSOBOMVU LOCAL MUNICIPALITY (NORTHERN CAPE PROVINCE) AND THE INXUBA YETHEMBA LOCAL MUNICIPALITY (EASTERN CAPE PROVINCE)

CES
ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

UMSOBOMVU 400KV LILO OHL SITUATED IN THE UMSOBOMVU LOCAL MUNICIPALITY (NORTHERN CAPE PROVINCE) AND THE INXUBA YETHEMBA LOCAL MUNICIPALITY (EASTERN CAPE PROVINCE)

ECOLOGICAL IMPACT ASSESSMENT

PREPARED FOR:

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REVISIONS TRACKING TABLE

CES Report Revision and Tracking Schedule

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Ms Nicole Wienand (SACNASP Reg No. 130289) is an Environmental Consultant with over 3 years' experience based in the Port Elizabeth branch. Nicole obtained her BSc Honours in Botany (Environmental Management) from Nelson Mandela University (NMU) in December 2018. She also holds a BSc Degree in Environmental Management (Cum Laude) from NMU. Nicole's honours project focused on the composition of subtidal marine benthic communities on warm temperate reefs off the coast of Port Elizabeth and for her undergraduate project she investigated dune movement in Sardinia Bay. Since her employment with CES in January 2019, Nicole has specialised in the field of ecology and botanical specialist assessments, ensuring that these specialist assessments are undertaken and prepared in accordance with the Protocols for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity (GN R. 320), Plant Species and Animal Species (GN R. 1150). Nicole has undertaken numerous Ecological Impact Assessments for a range of developments including Wind Energy Facilities (WEFs), Overhead Lines (OHL) and infrastructure, working closely with developers to ensure a development which is environmentally sustainable as well as financially and technically feasible.

Ms Elena Reljic, Faunal Specialist and Co-Author

Elena is an ecologist specialising in restoration ecology and has extensive experience in conservation and long-term research projects across southern Africa. Elena enjoys the challenge of remote field work and has conducted field surveys for a range of species (e.g., birds, snakes, small mammals, seals) and environments (e.g., Succulent Karoo, Kalahari Desert, Indian Ocean Coastal Belt Forests). She was also part of a 14-month research expedition to the sub-Antarctic, Marion Island, where she focused on seabird research. This is complimented by her expertise in the design and management of databases, GIS, and the use of remote monitoring techniques, as well as the programming language R.

Dr Alan Carter CES Director and Report Review *(SACNASP (Pri.Sci.Nat) Reg No. 400332/04)*

Alan has extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He is a member of the American Institute of Certified Public Accountants (licensed in Texas) and holds a PhD in marine ecology. He is also a certified ISO14001 EMS auditor with Exemplar Global (formerly the American National Standards Institute). Alan has been responsible for leading and managing numerous and varied environmental and financial consulting projects over the past 30 years.

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ACRONYM LIST

AOO	Area of Occupancy
ADU	Animal Demography Unit
BA	Basic Assessment
BI	Biodiversity Importance
BSP	Biodiversity Sector Plan
CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
CES	Coastal and Environmental Services
CI	Conservation Importance
CITES	Convention on International Trade in Endangered Species
CR	Critically Endangered
DAFF	Department of Agriculture, Forestry and Fisheries
DFFE	Department of Forestry, Fisheries and the Environment
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECBCP	Eastern Cape Biodiversity Conservation Plan
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EN	Endangered
EMPr	Environmental Management Programme
ESA	Ecological Support Area
FI	Functional Integrity
GIS	Geographical Information System
GN	Government Notice
IBA	Important Bird Areas
IUCN	International Union for Conservation of Nature
kV	Kilovolt
LILO	Loop-in Loop-out
LC	Least Concern

NC NCA	Northern Cape Nature Conservation Act
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act
NEM:BA	National Environmental Management: Biodiversity Act
NFEPA	National Freshwater Ecosystem Ancillary Areas
NPAES	National Protected Areas Expansion Strategy
NT	Near Threatened
OHL	Overhead Line
PA	Protected Area
PNCO	Provincial Nature Conservation Ordinance
POSA	Plants of Southern Africa
RLE	Red List of Ecosystems
RR	Receptor Resilience
SACNASP	South African Council for Natural Scientific Professionals
SA NLC	South African National Land Cover
SCC	Species of Conservation Concern
SOTER	Soil and Terrain
SS	Substation
QDS	Quarter Degree Square
VU	Vulnerable
SANBI	South African National Biodiversity Institute
SAPAD	South Africa Protected Areas Database
SEI	Site Ecological Importance
TOPS	Threatened and Protected Species
WEF	Wind Energy Facility

DEFINITIONS

Alien Invasive Species refers to an exotic species that can spread rapidly and displace native species causing damage to the environment.

Biodiversity is the term that is used to describe the variety of life on Earth and is defined as "*the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems*" (Secretariat of the Convention on Biological Diversity, 2005).

Habitat Fragmentation occurs when large expanses of habitat are transformed into smaller patches of discontinuous habitat units isolated from each other by transformed habitats such as farmland.

Natural Habitat refers to habitats composed of viable assemblages of plant and/or animal species of largely native origin and/or where human activity has not essentially modified an area's primary ecological function and species composition.

Protected Area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values**.** *(IUCN Definition 2008).*

Species of Conservation Concern all species that are assessed according to the IUCN Red List Criteria as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Data Deficient (DD) or Near Threatened (NT), as well as range-restricted species which are not declining and are nationally listed as Rare or Extremely Rare [also referred to in some Red Lists as Critically Rare].

SPECIALIST CHECK LIST

The contents of this specialist report comply with the legislated requirements as described in the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant and Animal Species (GN R.1150).

SPECIALIST REPORT REQUIREMENTS ACCORDING TO GN R. 320			SECTION OF REPORT
3.1	The Terrestrial Biodiversity Specialist Assessment Report must contain, as a minimum, the following information:		
	3.1.1	Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	Page iv – vi, Appendix 5
	3.1.2	A signed statement of independence by the specialist;	Appendix 6
	3.1.3	A statement of the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 2.1
	3.1.4	A description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;	Chapter 2
	3.1.5	A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;	Section 1.4 and 2.1
	3.1.6	A location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);	Chapter 4 and Chapter 6
	3.1.7	Additional environmental impacts expected from the proposed development;	Chapter 5
	3.1.8	Any direct, indirect and cumulative impacts of the proposed development;	Chapter 5
	3.1.9	The degree to which the impacts and risks can be mitigated;	Chapter 5
	3.1.10	The degree to which the impacts and risks can be reversed;	
	3.1.11	The degree to which the impacts and risks can cause loss of irreplaceable resources;	
	3.1.12	Proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	Chapter 5 and Section 6.2
	3.1.13	A motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a “low” terrestrial biodiversity sensitivity and that were not considered appropriate;	N/A
	3.1.14	A substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not; and	Chapter 6
	3.1.15	Any conditions to which this statement is subjected.	Section 6.2
3.2	The findings of the Terrestrial Biodiversity Specialist Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant.		✓
3.3	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.		✓

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1 INTRODUCTION AND PROJECT DESCRIPTION

1.1 PROJECT DESCRIPTION AND LOCALITY

Umsobomvu Wind Power (Pty) Ltd. is proposing the construction of a 400 kV turn-in system at the approved Koruson Substation (SS) (DFFE Reference: 14/12/16/3/3/2/730/2) in support of the approved Umsobomvu Wind Energy Facility (WEF) (DFFE Ref: 14/12/16/3/3/2/730) and Coleskop WEF (DFFE Ref: 14/12/16/3/3/2/730/1). The 400 kV turn-in system will include two 400 kV Overhead Lines (OHLs) of up to 6 km each in length which traverse the border of the Eastern Cape and Northern Cape Provinces near Noupoort and Middelburg (Figure 1.1). The purpose of this development is to ensure that electrical energy generated by the WEFs can be evacuated from the Eskom Koruson SS to the national electrical grid network via the existing Eskom 400 kV distribution lines.

The proposed Umsobomvu 400 kV LILO (Loop-in Loop-out) OHL will consist of two (2) 400 kV OHLs (assessed within 600m wide corridors) which will extend from the Koruson SS to the Eskom 400kV distribution lines in a northwest and southwest direction from the SS (Figure 1.2). All other infrastructure, including roads, substation (Koruson), and laydown areas, amongst others, have already received Environmental Authorisation (DFFE: 14/12/16/3/3/2/730/2) and therefore, do not form part of this assessment.

CES has been appointed by Umsobomvu Wind Power as the Environmental Assessment Practitioner (EAP) to conduct the necessary full Scoping and EIA Process, inclusive of the relevant specialist studies. This Ecological Impact Assessment report forms part of the full Scoping and EIA Process for the proposed Umsobomvu 400 kV LILO OHL.

1.2 SITE SENSITIVITY VERIFICATION AND MINIMUM REPORT CONTENT REQUIREMENTS

In terms of the Protocol for the Specialist Assessment and Minimum Reporting Content Requirements for Environmental Impacts on Terrestrial Biodiversity (GN R. 320 of 2020) and Terrestrial Animal and Plant Species (GN R. 1150), prior to the commencement of a specialist assessment, the current use of the land and the potential environmental sensitivity of the site under consideration, as identified by the screening tool, must be confirmed by undertaking a site sensitivity verification. The results of the screening tool, together with the site sensitivity verification, ultimately determines the minimum report content requirements.

According to the results of the Screening Report generated for the proposed development, the relative terrestrial biodiversity theme sensitivity is classified as VERY HIGH due to the development occurring within a Critical Biodiversity Area (CBA) 1 and 2 as well as an Ecological Support Area (ESA). The Animal Species Theme is classified as HIGH due to the presence of three (3) bird species while the Plant Species Theme is classified as LOW Sensitivity. It should be noted that a separate Avifaunal Impact Assessment has been conducted for the proposed Umsobomvu 400 kV LILO OHL and impacts associated with avifauna are therefore not assessed as part of this report.

According to Section 3 (1) of GN R. 320, '*an applicant intending to undertake an activity identified in the scope of this protocol, on a site identified on the screening tool as being of "very high sensitivity" for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment'*.

Due to the very high terrestrial biodiversity sensitivity rating of the site, a full **Terrestrial Ecological Impact Assessment** (this report) has been undertaken as part of the full Scoping and EIA Process for the proposed Umsobomvu 400 kV LILO OHL.

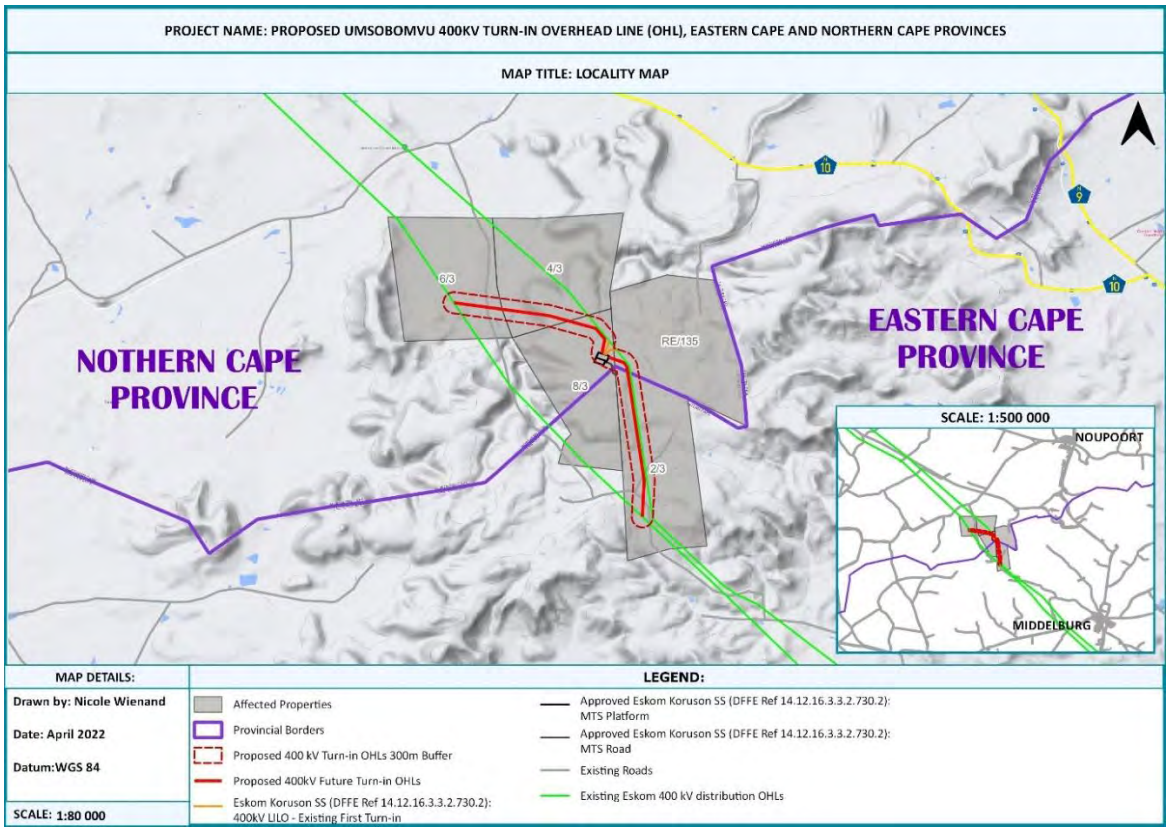

Figure 1.1: Locality Map of the proposed development.

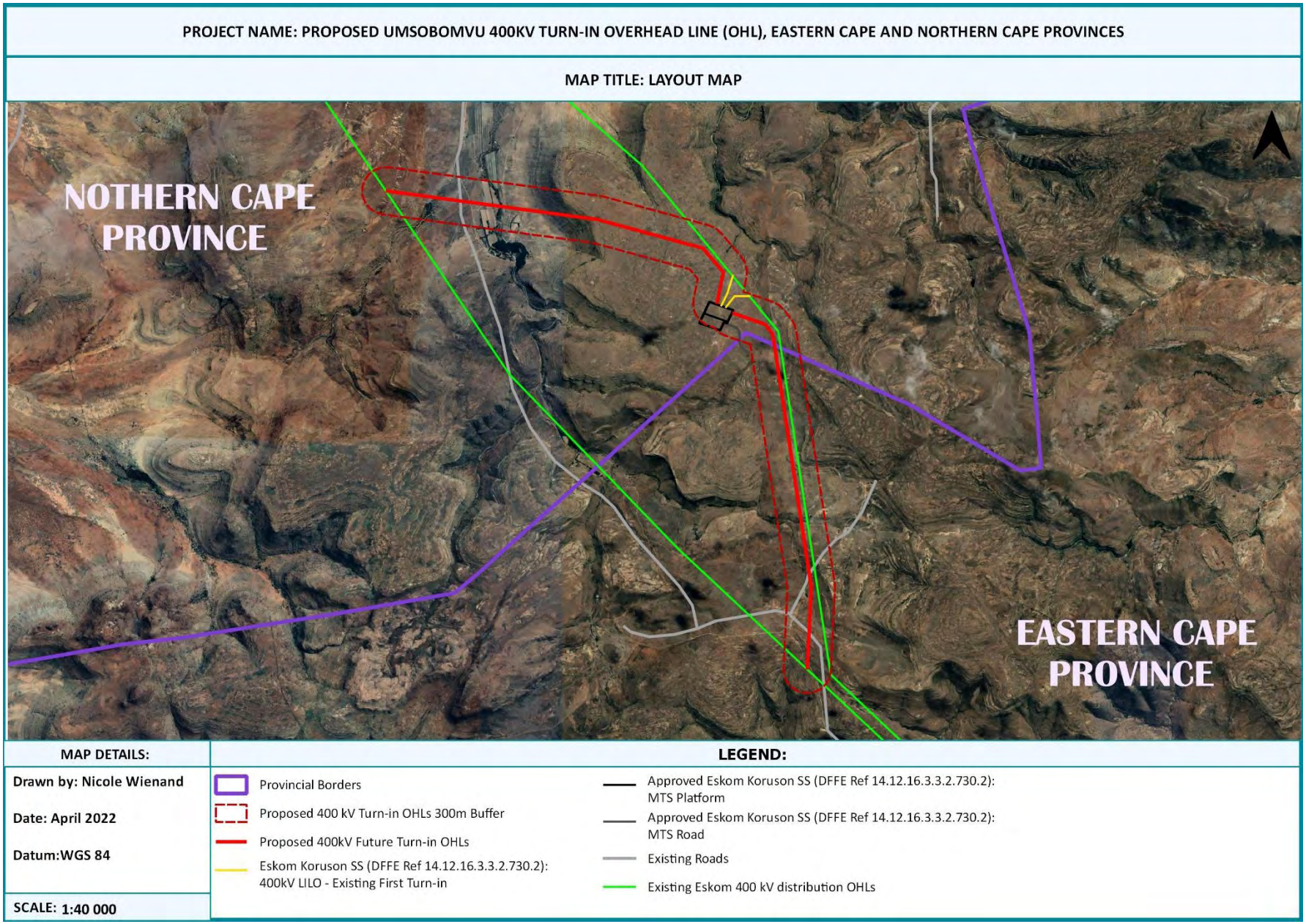

Figure 1.2: Layout Map of the proposed development.

1.3 Objectives and Terms of Reference

The objectives for the ecological assessment are as follows:

- Describe and map the vegetation types in the study area.
- Describe the biodiversity and ecological state of each vegetation unit.
- Establish and map sensitive vegetation areas showing the suitability for development and no-go areas.
- Identify plant and animal Species of Conservation Concern (SCC) (Red Data List, PNCO and TOPS lists).
- Identify alien plant species, assess the invasive potential, and recommend management procedures.
- Identify and assess the impacts of development on the site's natural vegetation and faunal species in terms of habitat loss, fragmentation and degradation of key ecosystems and, where feasible, provide mitigation measures to reduce these impacts.

1.4 Limitations and Assumptions

This report is based on current available information and, as a result, the following limitations and assumptions are implicit:

- The report is based on a project description received from the client.
- A detailed faunal survey was not conducted. The faunal survey was primarily a desktop study, using information from previous ecological surveys conducted in the area, supplemented by opportunistic recordings of animal species that were observed during the site survey.
- Species of Conservation Concern (SCC) are difficult to find and difficult to identify, thus species described in this report do not comprise an exhaustive list. It is almost certain that additional SCCs will be found during construction and operation of the development.
- Sampling could only be carried out at one stage in the annual or seasonal cycle. Due to time constraints associated with this project, the survey was conducted in late Summer (March). This falls within the optimal survey period for the Nama-Karoo and Grassland Biome in which the development is situated. However, early Summer and Spring flowering species could have been missed. Additionally, Sampling was limited to one (1) day. Access to the entire OHL was not possible due to time constraints, accessibility, and terrain. However, it should be noted that a number of surveys have been conducted within the project area for the Coleskop and Umsobomvu WEFs and the species list obtained from the site visit has been supplemented from data obtained from previous surveys.
- Sample Site 1 (S1 – refer to Figure 2.1) could not be reached due to a large troop of baboons. However, the surrounding areas were sampled and were used to inform the likely species composition of S1.
- Despite the abovementioned limitations, the time available in the field and information gathered during the survey was sufficient to provide enough information to determine the status of the affected area, the anticipated impacts associated with the proposed development, and to identify impact management actions and outcomes or any monitoring requirements for inclusion in the Environmental Management Programme (EMPr).

2 METHODOLOGY

2.1 THE ASSESSMENT

The site visit was undertaken over the course of one (1) day, the 2nd of March 2022. The purpose of the site visit was to assess the site-specific ecological state, current land-use, identify potential sensitive ecosystems and identify plant species associated with the proposed project activities. The site visits also served to identify potential impacts of the proposed development, and its impact on the surrounding ecological environment. The findings from this site visit were supplemented with data from the initial Ecological Impact Assessment undertaken for the Umsobomvu and Coleskop WEF (CES, 2018) as well as the proposed infrastructure associated therewith (CES, 2021).

In addition to the site visit, key resources that were consulted include the following:

- South African Vegetation Map (SA VEGMAP) (Mucina *et al*., 2018);
- Council for Geoscience (2013);
- Soil and Terrain (SOTER) Database of South Africa (2008);
- Eastern Cape Biodiversity Conservation Plan (ECBCP, 2019);
- Northern Cape Critical Biodiversity Areas (2016);
- The National Freshwater Ecosystem Priority Areas (NFEPA, 2011/14);
- The National Environmental Management: Biodiversity Act (NEM:BA), 2004: Publication of Lists of Species that are Threatened or Protected, Activities that are prohibited and Exemption from Restriction (2015);
- The National Protected Areas Expansion Strategy (NPAES, 2010);
- Review of the SANBI Red Data List;
- Convention on International Trade in Endangered Species (CITES);
- The National Biodiversity Assessment (NBA, 2018): Inland Aquatic Ecosystem Assessment;
- NBA (2018): Terrestrial Ecosystem Assessment;
- Terrestrial Ecosystem Threat Status Assessment (2018) – Comparison with 2011 Assessment for Provincial Agencies (Skowno *et al*., 2019);
- Red List of Ecosystems (RLE) for terrestrial realm for South Africa (SANBI, 2021);
- South African National Land Cover (SA NLC, 2020);
- The Animal Demography Unit (ADU);
- International Union for Conservation of Nature (IUCN);
- Provincial Nature Conservation Ordinance (PNCO);
- iNaturalist;
- South African Protected Areas Database (2021, Q3) and the South African Conservation Areas Data (2021, Q3);
- Plants of Southern Africa (POSA) database – Quarter degree square level;
- National Biodiversity Management: Biodiversity Act (NEM:BA) Alien and Invasive Species Lists (2014); and
- Department of Agriculture, Forestry and Fisheries (DAFF) List of Protected Trees (2014).

2.2 Species of Conservation Concern

Data on the known distribution and conservation status for each potential Species of Conservation Concern (SCC) has to be obtained to develop a list of 'Species of Conservation Concern'. According to the Species Environmental Assessment Guideline (SANBI, 2020), the term 'SCC' refers to all species that are assessed according to the IUCN Red List Criteria as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Data Deficient (DD) or Near Threatened (NT), as well as range-restricted species which are not declining and are nationally listed as Rare or Extremely Rare [also referred to in some Red Lists as Critically Rare]. These species may be impacted significantly by the proposed activity. Species that are afforded special protection, notably those that are protected by NEM:BA (Act No. 10 of 2004), PNCO (1975), the Northern Cape Nature Conservation Act (NC NCA, Act No. 9 of 2009), the List of Protected Tree Species under the National Forest Act (Act No. 84 of 1998), or which occur on the South African Red Data List as SCC fall within this category.

2.3 Sampling Protocol

The footprint of the proposed development was visually surveyed to evaluate vegetation composition and to provide detailed information on the plant communities present. The aim of the site visit was to characterise and describe the vegetation communities within the project area as well as identify areas of high sensitivity and SCC. Prior to the site visit, sampling locations representative of variation in plant communities present and different habitat types were identified (

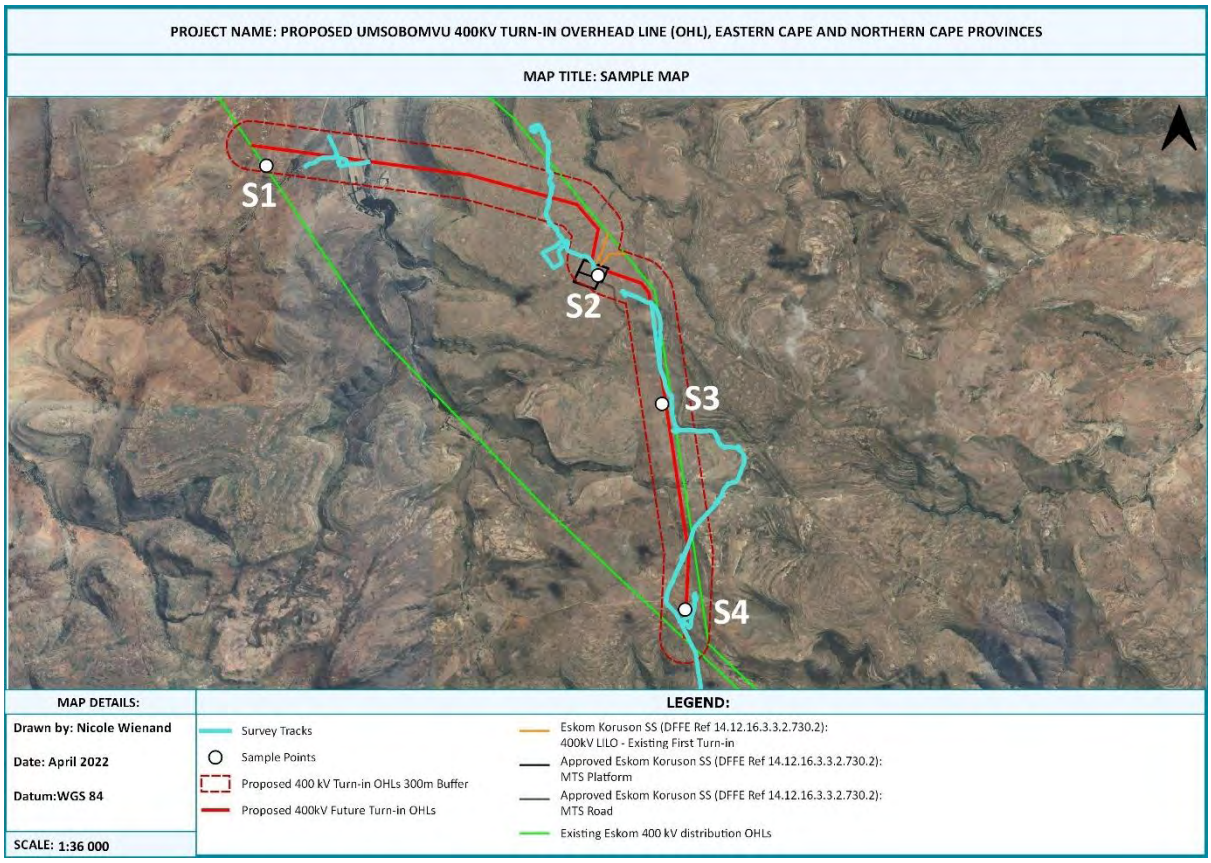

Figure 2.1). At these sampling locations, vegetation types within the study area were assessed and surveyed using plant identification guides and other published literature. Although sampling was focused around the sampling sites, additional plant species identified along the

specialist's random meander within the site were also recorded. Sampling along the meander was undertaken until no new species were observed. Based on the findings from the field survey, vegetation communities were then described according to the dominant set of species recorded from each vegetation type. These were mapped and assigned a sensitivity score using the methodology outlined in the Species Environmental Assessment Guideline Document. All species recorded on site have been uploaded to iNaturalist (www.inaturalist.org).

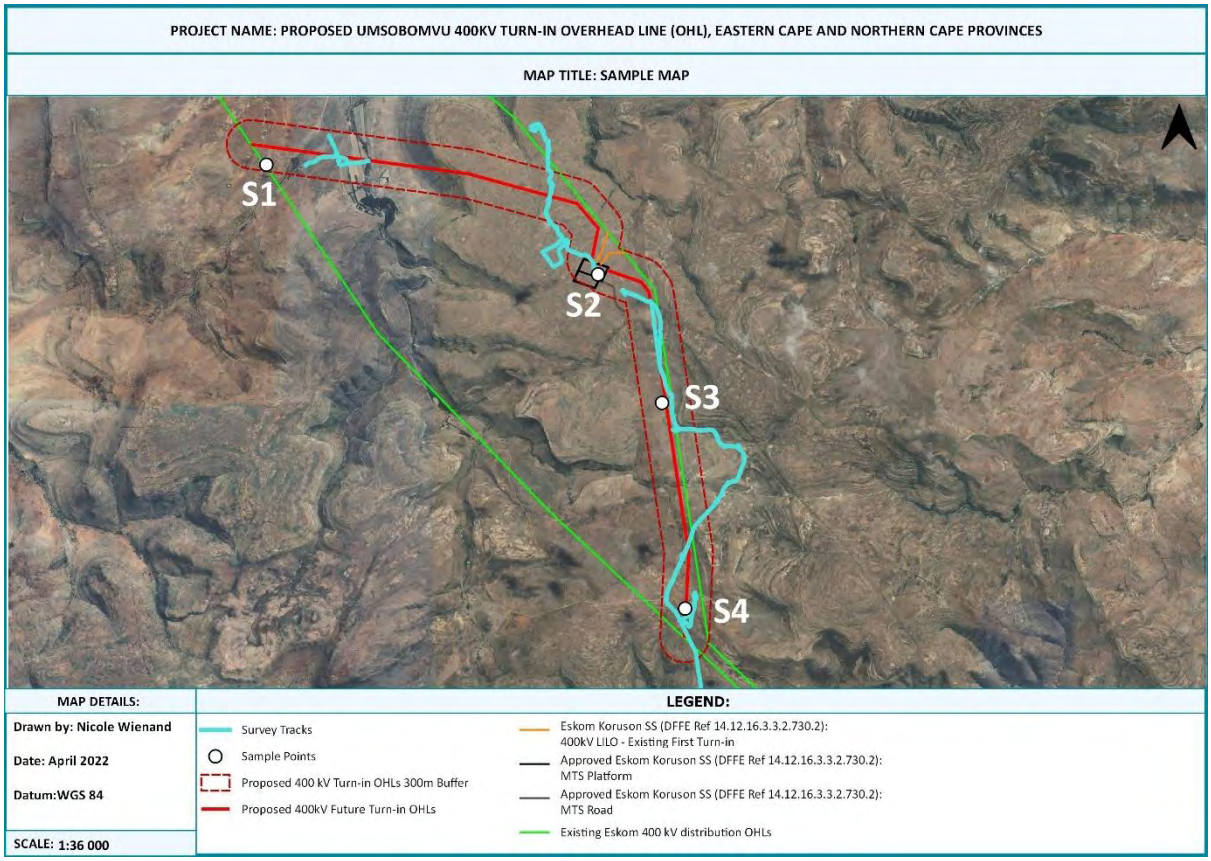

Figure 2.1: Sampling locations for the proposed Umsobomvu 400 kV LILO OHL.

2.4 VEGETATION MAPPING

The revised SA VEGMAP (2018) was established in order to "*provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before*." The map was developed using a wealth of data provided by a network of ecologists, biologists and conservation planners that make periodic contributions to the project. These contributions have allowed for the best national vegetation map to date, the last being that of Acocks developed over 50 years ago. The SANBI Vegetation map informs finer scale bioregional plans and includes an additional 47 new vegetation units since its refinement in 2012.

The SA VEGMAP project has two main aims:

1. To determine the variation in and units of Southern African vegetation based on the analysis and synthesis of data from vegetation studies throughout the region, and

2. To compile a vegetation map. The aim of the map was to accurately reflect the distribution and variation on the vegetation and indicate the relationship of the vegetation with the environment. For this reason, the collective expertise of vegetation scientists from various universities and state departments were harnessed to make this project as comprehensive as possible.

The map and accompanying book describes each vegetation type in detail, along with the most important species, including endemic species and those that are biogeographically important.

The SA VEGMAP is compared to actual conditions of vegetation observed onsite during the site assessment through mapping from aerial photographs, satellite images, literature descriptions (e.g. SANBI and ECBCP) and related data gathered on the ground.

2.5 SENSITIVITY ASSESSMENT

The Species Environmental Assessment guideline (SANBI, 2020) was applied to assess the Site Ecological Importance (SEI) of the project area. The habitats and the species of conservation concern in the project area were assessed based on their conservation importance, functional integrity and receptor resilience (Table 2.1). The combination of these resulted in a rating of SEI and interpretation of mitigation requirements based on the ratings.

The sensitivity map was developed using available spatial planning tools as well as by applying the SEI sensitivity based on the field survey.

Table 2.1: Criteria for establishing Site Ecological importance and description of criteria.

Criteria	Description
Conservation Importance (CI)	*The importance of a site for supporting biodiversity features of conservation concern present e.g. populations of IUCN Threatened and Near-Threatened species (CR, EN, VU & NT), Rare, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes.*
Functional Integrity (FI)	*A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.*
Biodiversity Importance (BI) is a function of Conservation Importance (CI) and the Functional Integrity (FI) of a receptor.	
Receptor Resilience (RR)	*The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.*
Site Ecological Importance (SEI) is a function of Biodiversity Importance (BI) and Receptor Resilience (RR)	

2.6 ECOLOGICAL IMPACT ASSESSMENT

2.6.1 Impact rating methodology

To ensure a balanced and objective approach to assessing the significance of potential impacts, a standardized rating scale was adopted which allows for the direct comparison of specialist studies. This rating scale has been developed in accordance with the requirements outlined in Appendix 1 of the NEMA EIA Regulations (2014 and subsequent 2017 & 2021 amendments).

The details of this rating scale are included in Appendix 4.

3 DESCRIPTION OF THE ENVIRONMENT

3.1 DESCRIPTION OF THE BIOPHYSICAL ENVIRONMENT

3.1.1 Climate

The information provided herewith is based on the climate data for Middleburg and Noupoort – the nearest urban areas in proximity to the project area. The climate of Middleburg is classified as "BSk" (Tropical and Subtropical Steppe Climate) by Köppen and Geiger. The average monthly temperature in Middleburg ranges from 8.2°C in June and July to 21.7°C in January. On average, Middleburg receives approximately 396.2 mm of rain per annum, with the highest rainfall received during the month of March and the lowest rainfall received during the month of July (Table 3.1).

The climate of Noupoort is classified as "semi-arid". The average monthly temperatures range from 5.2° C in July to 20.6° C in January. Noupoort receives an average of around 353 mm of rain per annum, with the highest rainfall received during the month of March (72 mm) and the lowest rainfall received during the month of July (11 mm) (Table 3.2).

Table 3.1: Climate data for Middleburg (Source en.climate-data.org in CES, 2018).

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Avg. Temperature (°C)	21.7	20.8	18.7	14.7	11.1	8.2	8.2	10.1	13.1	15.6	18.1	20.3
Min. Temperature (°C)	13.1	13	11.2	7.3	3.6	0.7	0.2	1.8	4.5	7	9.5	11.6
Max. Temperature (°C)	30.3	28.7	26.2	22.2	18.6	15.8	16.2	18.4	21.8	24.2	26.7	29.1
Precipitation / Rainfall (mm)	47	56	62	31	16	12	11	14	13	27	36	41

Table 3.2: Climate data for Noupoort (Source en.climate-data.org in CES, 2018).

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Avg. Temperature (°C)	20.6	19.9	17.6	13.6	9.6	5.5	5.2	7.8	11.6	14.7	17.1	19.5
Min. Temperature (°C)	12.2	12.2	10.3	6.2	2.3	-1.8	-2.4	-0.4	3.2	6.2	8.6	10.9
Max. Temperature (°C)	29	27.7	24.9	21	17	12.9	12.8	16.1	20.1	23.2	25.6	28.1
Precipitation / Rainfall (mm)	59	58	72	40	23	14	11	15	14	27	41	43

3.1.2 Topography, Soils and Geology

Vegetation types are influenced by a range of biotic and/or abiotic factors at different spatial and temporal scales, which together influence the distribution, composition, structure, and diversity of plant communities (Rodrigues *et al.*, 2018). Among the abiotic factors influencing vegetation types, topography (landform), geology, and soils are considered three of the major factors determining habitat heterogeneity and species diversity.

Topography

The topography of the broader area is characterised by moderate to steep sloped rocky hills and outcrops, koppies and gorges surrounded by flat to gently sloping plains. The proposed Umsobomvu 400 kV LILO OHL originates from the Eskom Koruson Substation on a relatively flat plateau before traversing a fairly steep slope to the northwest and undulating topography cut by drainage lines to the southeast of the substation (Figure 3.1). The altitude ranges from 1526 m to 1782 m (Figure 3.2).

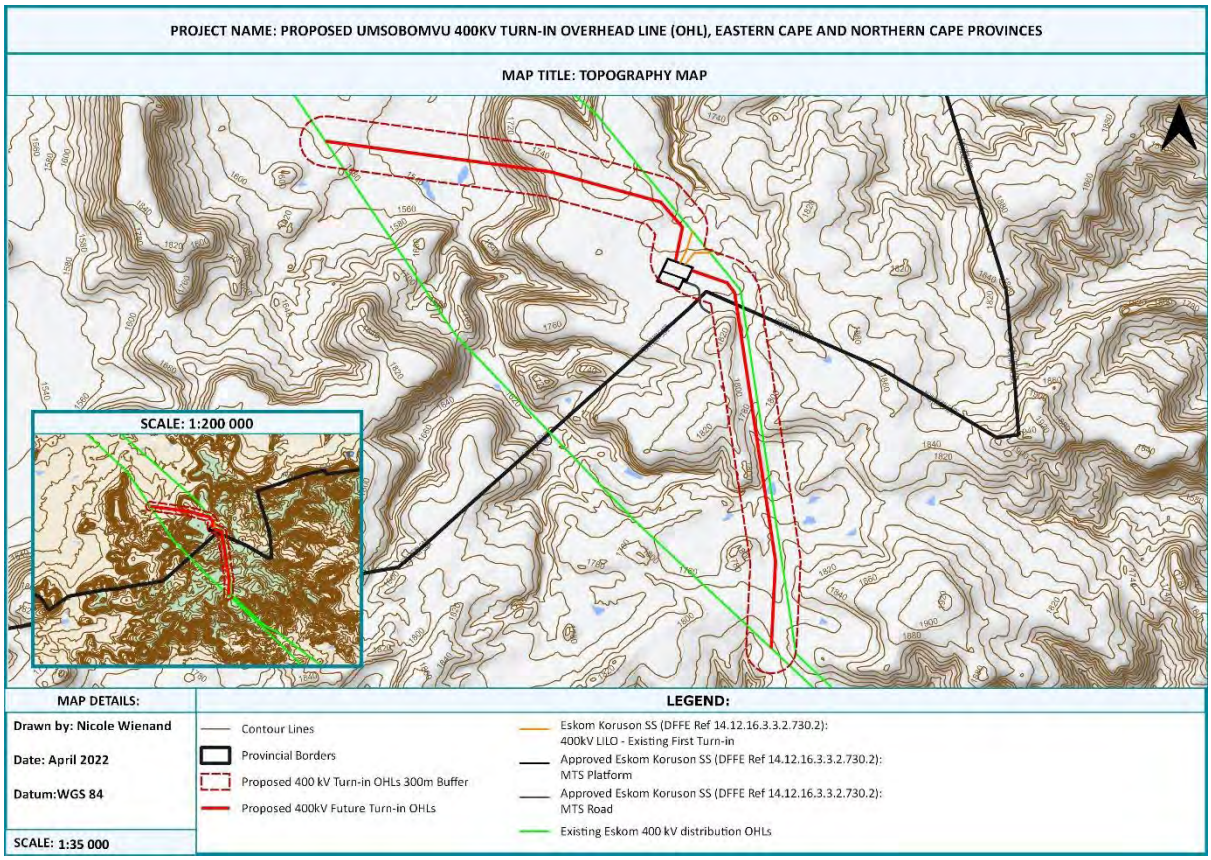

Figure 3.1:Contour Map of the study area.

Figure 3.2: Elevation profile of (a) the north-western half of the proposed OHL and (b) the south-eastern half of the proposed OHL.

Geology

The study site is underlain by sedimentary deposits of the Tarkastad Subgroup, the upper layer of the two subdivisions forming the Beaufort Group of the Karoo Supergroup (Figure 3.3). The Tarkastad Subgroup sedimentary deposits consist of fluvial sandstones and red mudstones which are rich in fossil heritage, with the most abundant Early Triassic Freshwater Fauna in the world (Lavin *via* SAHRIS, 2013).

Soils

The soils within the project area consist of shallow profiles with minimal development overlying rock. Steeper elevations are characterised by minimal soil development which grades into rocky outcrops. The water holding capacity is low (≤20 to 40 mm) on the low-lying plains to very low in the steeper areas (<20 mm) while the potential for water erosion is moderate on the plains to high on the mountainous landscapes (CES, 2018). According to SOTER (1995), the soils within the study area are classified as Lithic Leptosols and Eutric Leptosols (Figure 3.4). Leptosols as very shallow soils which overly continuous rock. These soils are usually extremely gravelly and/or stony and the parent material consists of various types of continuous rock or of unconsolidated materials with less than 20 % fine earth. Leptosols generally occur in areas of high or medium altitude, with strongly dissected topographies (Nachtergaele, 2010).

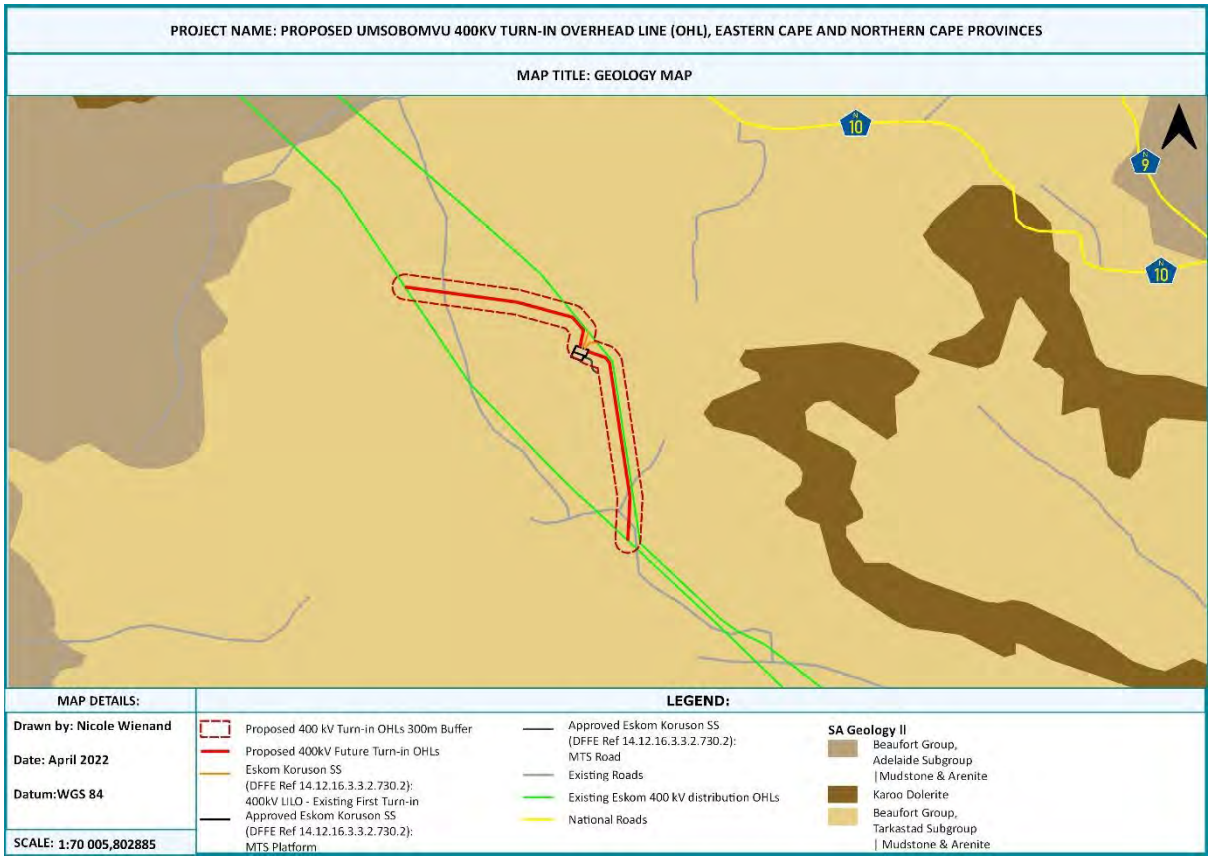

Figure 3.3: Geology Map of the study site.

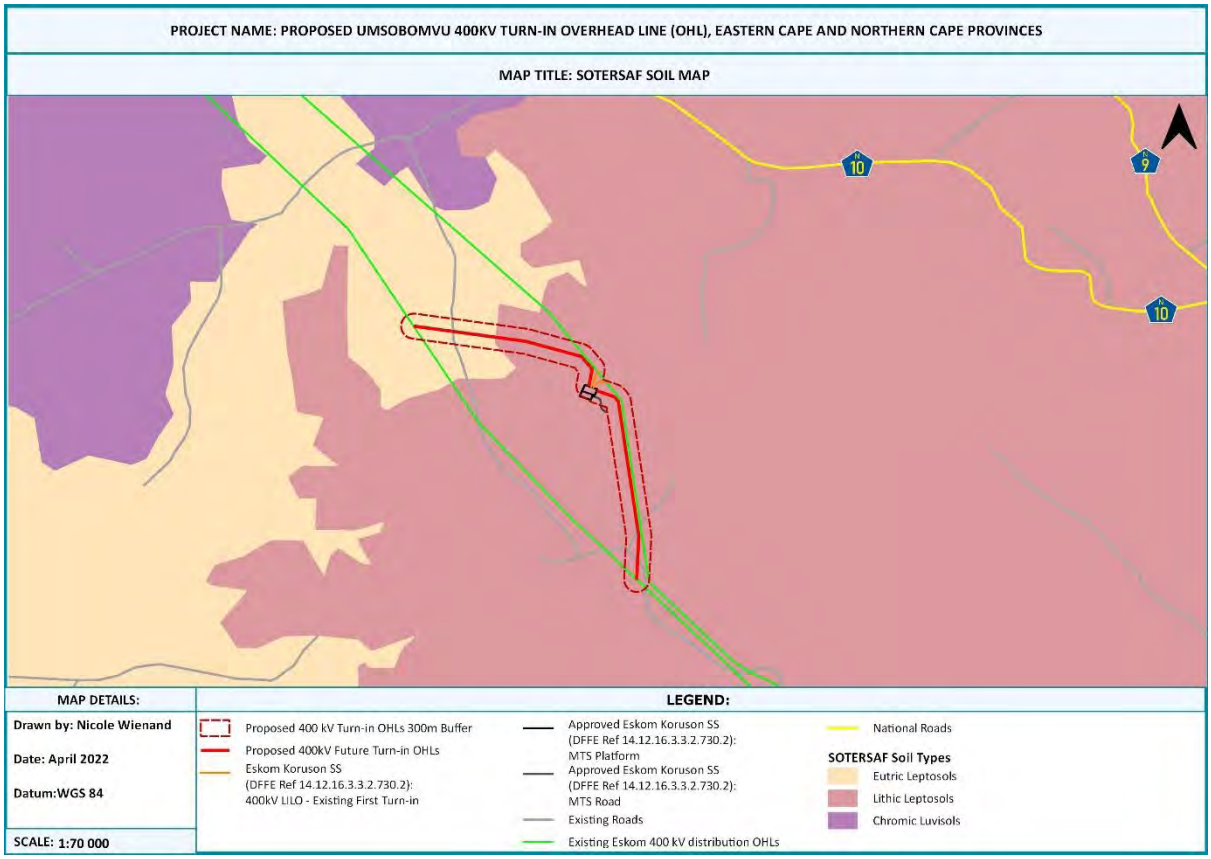

Figure 3.4: SOTER SAF Soil Map of the project area.

3.1.3 Surface Water Features

The aquatic sensitivity of the proposed site is classified as LOW in the Screening Report. The majority of the proposed Umsobomvu 400 kV LILO OHL falls within the D32C quaternary catchment of the Orange Water Management Area (WMA) while a small section of the southern portion of the OHL falls within the Q14B quaternary catchment of the Mzimvubu - Tsitsikamma WMA (WMA 7). The proposed development traverses a river identified by the NBA (2018) Inland Aquatic Ecosystem Assessment (Plate 3.1) as well as various non-perennial drainage lines. Although the NBA (2018) does not recognise any wetlands within 500 m of the proposed development, according to the NFEPA (2011/14) the proposed development occurs within 500 m of five (5) natural wetlands and eight (8) artificial wetlands (Figure 3.5). It should be noted that a number of wetlands were observed during the site visit as a result of the recent significant rain received in the region.

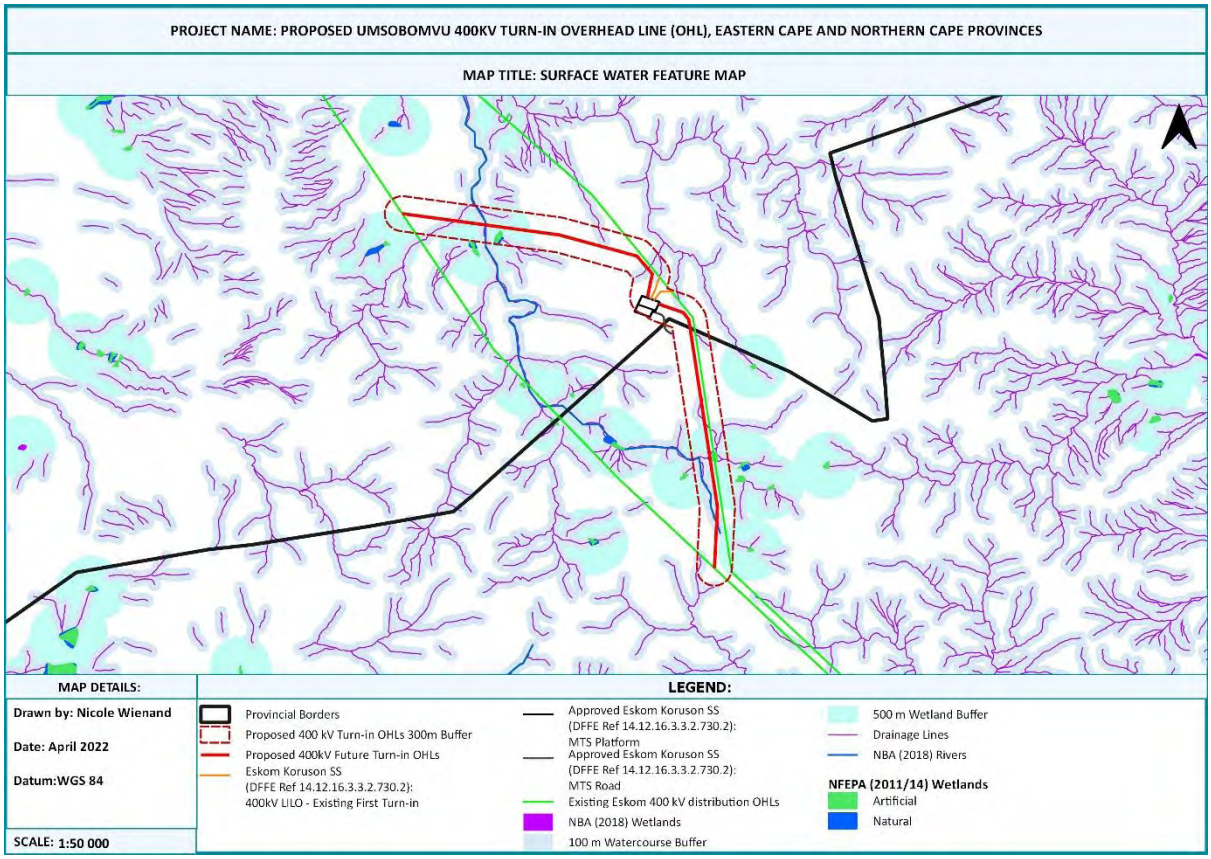

Figure 3.5: Surface water features affected by the proposed development.

Plate 3.1: The NBA (2018) river which traverses the proposed site.

3.2 LAND COVER

3.2.1 South African National Land-Cover Map (2020)

According to the South African National Land-Cover (2020) spatial dataset, the majority of the proposed Umsobomvu 400 kV LILO OHL falls within '*Natural Grassland'* which correlates with the Besemkaree Koppies Shrubland (Grassland Biome) of the project area. Small patches of '*Low Shrubland', 'Eroded Lands', 'Dense Forest & Woodland',* and a few '*Herbaceous Wetlands'* also occur within the development footprint. The *'Low Shrubland (Nama Karoo)'* component is more dominant within the north-western portion of the development footprint which correlates with the Eastern Upper Karoo (Nama-Karoo Biome) vegetation of the project area. The north-western portion of the proposed OHL also traverses '*Cultivated Commercial Annual Crops', 'Contiguous & Dense Planted Forest*', and '*Natural Grassland'* (Figure 3.6).

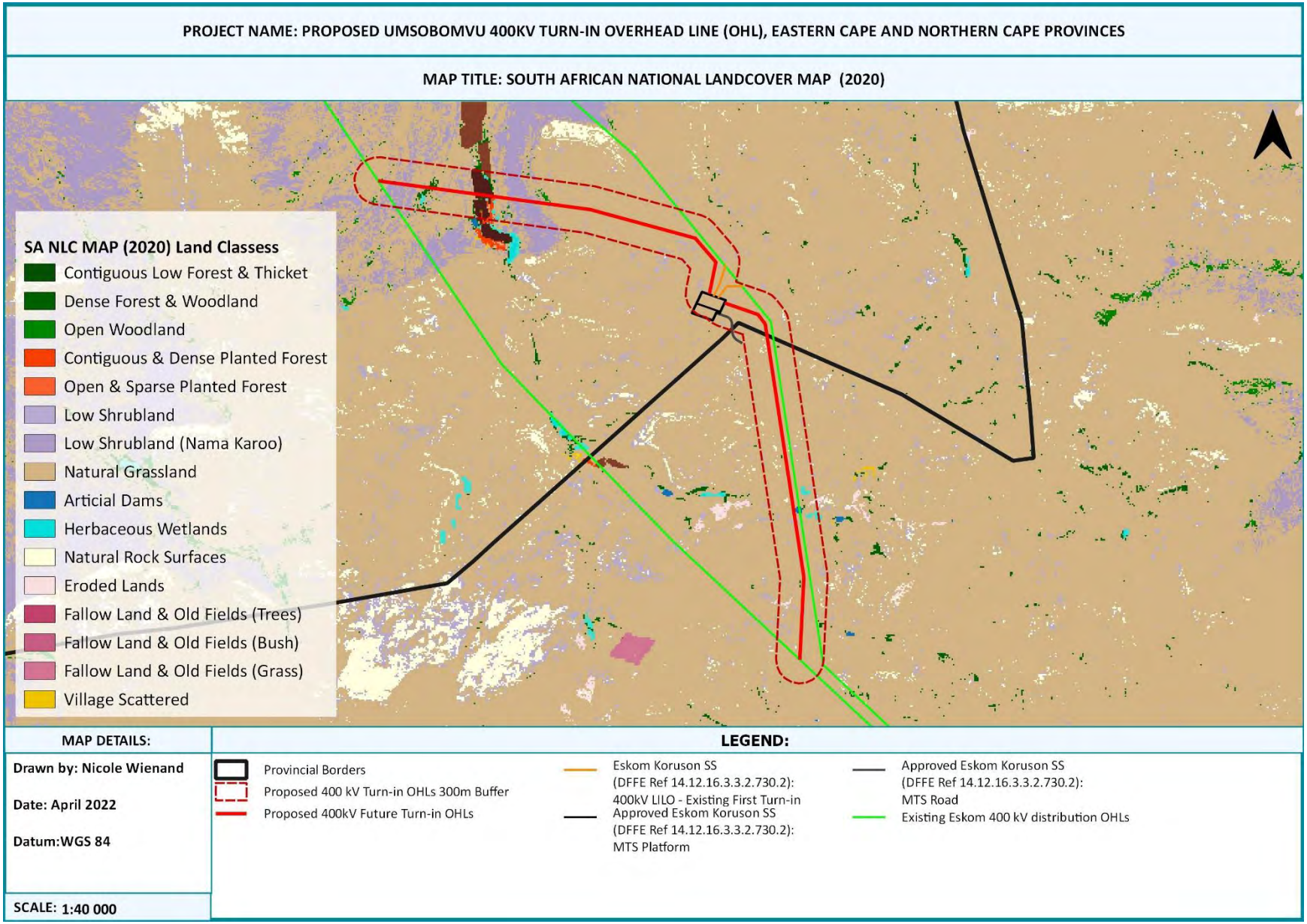

Figure 3.6: South African National Land-Cover (SANLC, 2020) Map of the project area.

3.3 THE CURRENT LAND USE

The properties on which the proposed development is located are currently utilised for agriculture practises (livestock farming and grazing, and crop production) and forms part of the approved site for the Umsobomvu WEF cluster. Adjacent land uses in the broader project area surrounding the Umsobomvu WEF cluster includes horse breeding and horse-riding shows, commercial farming and subsistence farming, cattle, sheep and goat grazing and breeding, production of livestock feeding crops such as lucerne, and fruit trees/orchards within the farmers gardens (CES, 2018).

3.4 DESCRIPTION OF THE VEGETATION AND FLORISTICS

The proposed development occurs within two (2) biomes, namely the Nama-Karoo Biome and the Grassland biome.

The north-western proportion of the proposed Umsobomvu 400 kV LILO OHL falls within the Nama-Karoo Biome. The Nama-Karoo Biome is the second largest biome in the region, covering the majority of the central plateau of the western half of South Africa with an estimated surface area of 248 284 km^2. The distribution of this biome is mainly determined by rainfall which generally occurs in summer (100-520mm per annum). The pre-dominant soil type underlying the majority of the biome consists of lime-rich, weakly developed, shallow soil over rock. The vegetation is described as grassy, dwarf shrubland, with the grassy component more common in depressions and sandy soils and less prominent on clay soils. According to Mucina *et al* (2006), very little of the Nama-Karoo has been transformed due to crops, grazing, dams, industry and/or other forms of land use. Major alien invaders which threaten the integrity of this biome include *Opuntia aurantiaca* (Jointed Prickly-pear) and *Prosopis glandulosa* (Mesquite) (Low and Rebelo, 1996; Mucina *et al*., 2006).

According to Mucina *et al* (2006), despite relatively low floristic diversity, the vegetation of the Nama-Karoo Biome boasts a relatively high diversity of plant life forms. Natural disturbance factors / ecological drivers that may influence vegetation structure and composition is mainly linked to human actions which interact with natural causes. Factors / ecological drivers include grazing by domestic livestock and wild herbivores, fire, rainfall and runoff which results in erosion, and other major events such as hailstorms.

The remainder and majority of the proposed Umsobomvu 400 kV LILO OHL falls within the Grassland Biome. Grasslands in South Africa boast remarkable biodiversity and cover approximately one third of South Africa's total land surface area, stretching over the majority of the Eastern Cape and KwaZulu-Natal Provinces. These ecosystems provide important habitat for a range of the country's rare, endangered and endemic animal and plant species, with plant diversity of the grassland biome only second to that of the fynbos biome. The incredible diversity and provision of ecosystem services has contributed to the classification of these ecosystems as an important biodiversity asset of global significance. Grasslands are considered important water production landscapes and provide various ecosystem services particularly for rural communities in South Africa (SANBI, 2013).

The two (2) key ecological drivers of grassland ecosystems include climate and fire which influences their character, community structure, composition and primary productivity. In

addition to climate and fire, other ecological drivers influencing these factors include grazing, soil types and nutrient status. Unfortunately, due to their high biodiversity and the suitability for human habitation, these ecosystems are impacted by various anthropogenic activities including grazing by livestock, over harvesting of natural resources, misappropriation of fire, mining, agriculture, urban and industrial expansion, amongst others (SANBI, 2013).

3.4.1 National Vegetation Map (SA VEGMAP2018): Expected Vegetation Types

The South African Vegetation Map (SA VEGMAP) of 2018 is an important resource for biodiversity monitoring and conservation management in South Africa. Under the custodianship of the South African National Biodiversity Institute (SANBI) the SA VEGMAP, (2018) was updated in order to '*provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before*'. The map provides a detailed description of each of South Africa's unique vegetation types along with a comprehensive list of the important species associated with each, including endemic and biologically important species.

According to SANBI's National Vegetation Map (2018), the proposed development occurs within two (2) vegetation types, namely Eastern Upper Karoo and Besemkaree Koppies Shrubland (**Error! Reference source not found.**).

Eastern Upper Karoo *(Nama-Karoo Biome)*

The north-western portion of the proposed Umsobomvu 400 kV LILO OHL falls within Eastern Upper Karoo vegetation. Eastern Upper Karoo vegetation occurs on flats and gently sloping plains in the Northern Cape, Eastern Cape and Western Cape Provinces. It is characterised by dwarf microphylllous shrubs and 'white' grasses of the genera *Aristida* and *Eragrosti*s (Mucina *et al*., 2006). According to the Red List of Terrestrial Ecosystems of South Africa (SANBI, 2021), Eastern Upper Karoo is classified as **Least Concern** with a conservation target of 21%. The historical extent of this vegetation type amounted to 49834.17 km^2 and 97% of this is still intact. Due to the low rates of natural habitat loss and biotic disruptions, this ecosystem is at a low risk of collapse (SANBI, 2021).

Besemkaree Koppies Shrubland (Grassland Biome)

The majority of the proposed Umsobomvu 400 kV LILO OHL falls within Besemkaree Koppies Shrubland. Besemkaree Koppies Shrubland vegetation occurs on the slopes of koppies, butts, and tafelbergs in the Northern Cape, Free State and Eastern Cape Provinces. The geology underlying this vegetation type typically includes dolerite koppies and sills embedded within Karoo Supergroup sediments. Besemkaree Koppies Shrubland is characterised by a two-layered karroid shrubland: the lower layer is characterised by a closed canopy dominated by dwarf small leaved shrubs and abundant grasses, while the upper canopy is characterised by a loose canopy of tall shrubs dominated by species such as *Searsia erosa*, S*. burchelii, S. cilliata, Euclea crispa*, *Diospyros austro-africana* and *Oleo europaea* (Mucina *et al*., 2006).

Besemkaree Koppies Shrubland is classified as **Least Concern** (SANBI, 2021), with a Conservation Target of 28%. The historical extent of this vegetation type amounted to 9677.82 km^2 and 95% of this is still intact. Although this vegetation type is poorly protected, this ecosystem is at low risk of collapse due to the low rates of natural habitat loss and biotic disruption (SANBI, 2021).

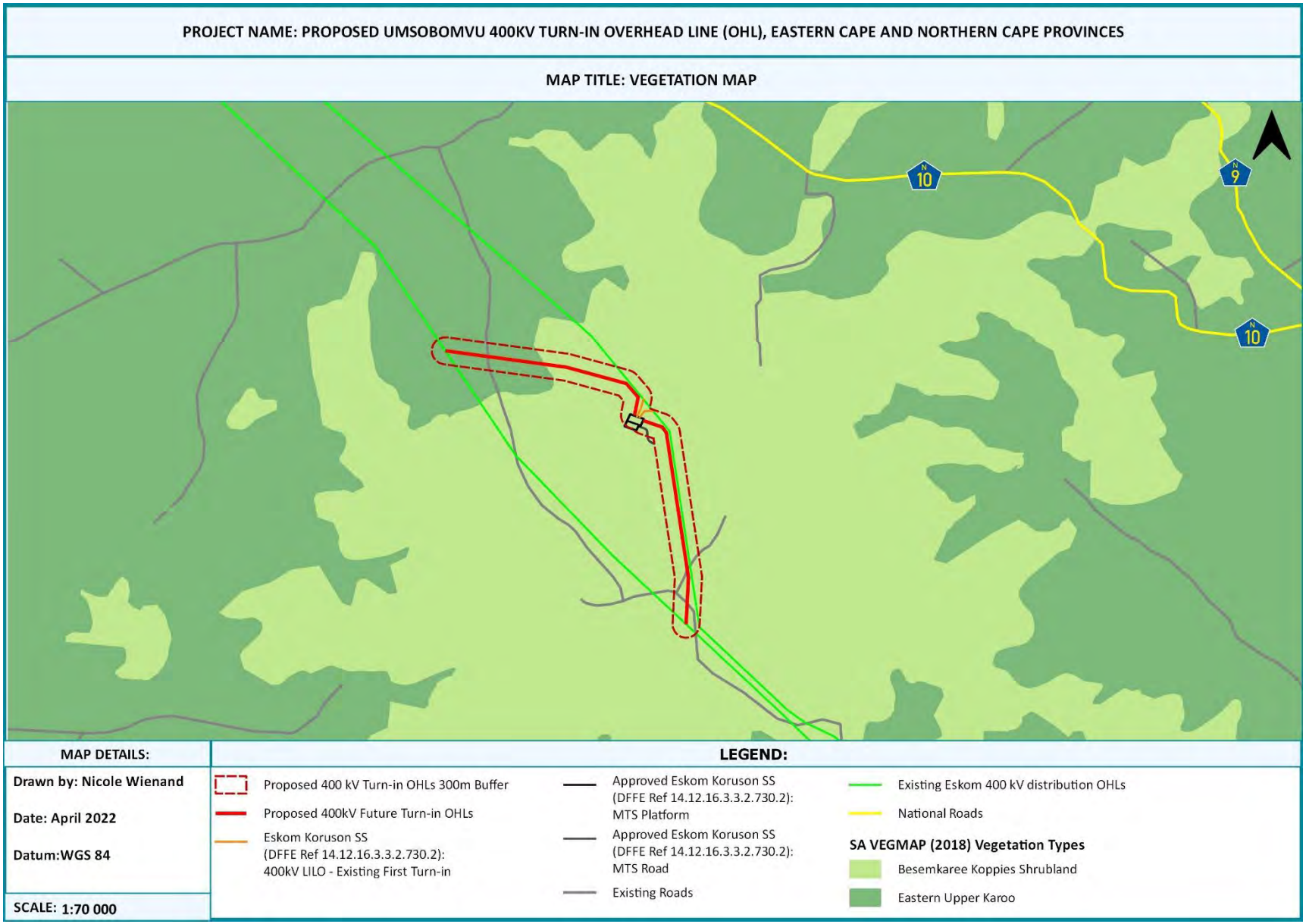

Figure 3.7: National vegetation map for the project site.

3.4.2 Vegetation types recorded on site

While National level vegetation maps have described broad vegetation types, local conditions and micro-habitats (rainfall, soil structure, rocky outcrops, etc.) can result in variations in plant composition. As such, site surveys are critical for the verification of desktop findings and establishing the baseline ecological conditions of a site.

A number of site visits have previously been conducted within the project area for the proposed Umsobomvu and Coleskop WEF as well as the infrastructure associated therewith. These site visits confirmed that the vegetation types within the project area include Besemkaree Koppies Shrubland and Eastern Upper Karoo. Eastern Upper Karoo is typically associated with flat, low-lying topography within the broader project area, while Besemkaree Koppies Shrubland is typically associated with high lying rocky outcrops, mountain plateaus, slopes and areas near drainage lines. Although data has previously been obtained for the broader project area, the site visit conducted for the proposed Umsobomvu 400 kV LILO OHL provided information on the current ecological state of the ecosystems occurring on site as well as the plant and animal species present.

The site visit conducted on the 2nd of March 2022 followed a period of significant rainfall in the region which has stimulated the emergence of a number of herbaceous plant species and grasses. The distinction between the two (2) vegetation types of the project area was not obvious as the plant species composition of both Besemkarrees Koppies Shrubland and Eastern Upper Karoo was similar. The only major distinction between the two vegetation types was the more prominent shrub component in Besemkaree Koppies Shrubland. Dominant grass species recorded in both vegetation types included *Aristida congesta, A. diffusa, Cenchrus ciliaris, Cynodon incompletes, Digitaria eriantha, Themeda triandra, Tragus koelerioides, Enneapogon scoparius,* and *Eragrostis obtusa*. *Cymbopogon caesius* was more dominant in Beskemkaree Koppies Shrubland whilst *Chloris virgata* and *Themeda triandra* was more dominant in Eastern Upper Karoo.

Small shrubs such as *Helichrysum sp., H. zeyheri, Ruschia intricata, Ruschia sp., Wahlenbergia nodosa, Dicerothamnus rhinocerotis, Selago saxatilis, Pentzia globose, Melolobium candicans, Felicia muricata, Eriocephalus ericoides* and *Asparagus suaveolens* and large shrubs such as *Diospyros austro-africana, D. lycioides, Searsia erosa, S. cilliata, S. pallens, S. pyroides,* and *Euclea crispa* were common in Besemkaree Koppies Shrubland. Scattered *D. lycioides* was also observed in the Eastern Upper Karoo vegetation of the project area. Rocky outcrops in Beskemkaree Koppies Shrubland provides micro-habitats for a range of plant species such as *Pelargonium sidoides, P. ranunculophyllum, P. abrotanifolium, P. minimum, Asplenium sp., Chilanthes sp., Heliophila sp.,* and *Chaenostoma halimifolium*.

Scattered alien invasive species such as *Agave americana, Argemone ochroleuca* and *Opuntia sp.* were observed within the broader project area and a large portion of the Eastern Upper Karoo vegetation of the project area has been transformed for crop cultivation. Evidence of erosion was also observed along watercourses.

Plate 3.2: Eastern Upper Karoo vegetation of the project area.

Plate 3.3: Besemkaree Koppies Shrubland of the project area.

Plate 3.4: Erosion along a drainage line within the project area.

3.4.3 Species of Conservation Concern

The below list of SCC (Table 3.3) likely to occur within the project area has been compiled using records from the Plants of Southern Africa (POSA) website, the National Screening Tool Report, the list of taxa common to Besemkaree Koppies Shrubland and Easter Upper Karoo, and the species previously recorded by CES (2018). No SCC were recorded in the National Screening Tool Report generated for the proposed site. However, based on the plant species lists obtained from the abovementioned data sources, nineteen (19) Species of Conservation Concern (SCC) were recorded for the site, seventeen (17) of which are classified as Least Concern (LC) and two (2) of which are classified as rare. Although classified as LC, these species are protected in terms of the Provincial Nature and Environmental Conservation Ordinance No. 19 Of 1974 and/or the Northern Cape Nature Conservation Act No. 9 of 2009.

Five (5) of the nineteen (19) SCC, including *Stomatium middelburgense, Gomphocarpus fruticosus, Crassula setulosa, Nemesia sp*., and *Jamesbrittenia filicaulis,* were recorded during the site visit conducted for this assessment, while eight (8) of the SCC have been recorded during previous assessments and micro-sitings undertaken by CES (2018 & 2021) within the broader project area, including *Aloe broomii, Morea huttonii, Harveya pumila, Stomatium middelburgense, Gomphocarpus fruticosus, Ruschia intricate, Anacampseros ustulate,* and *Haemanthus* cf *humilis.* It should be noted that the two (2) rare SCC recorded as 'likely to occur on site', including *Huernia piersii* and *Tridentea virescens*, have not been recorded during any of the previous assessment undertaken for the WEFs. The probability of occurrence on site based on habitat requirements for the remainder of the SCC is summarised in Table 3.3 below.

A full list of species found at the site has been included in Appendix 1.

Table 3.3: List of plant SCC likely to occur within the project area.

Family	Species	IUCN	SA Red List	PNCO	NCNCA	Protected Tree	NEM: BA	Habitat, distribution and population trend (SANBI Red List)	Probability of occurrence on site based on habitat requirements	Confirmed during this assessment (Yes/No)
Aizoaceae	*Delosperma lootsbergense*	LC	LC	-	Schedule 2	-	-	According to Clark and Raimondo(2019), this species is endemic to the high mountains of the Eastern Cape interior, including the Sneeuberg Range near Graaff-Reinet, the Stormberg near Molteno, and the Suurberg Range on the border of the Northern Cape south of Noupoort. Its habitat mainly includes rocky slopes and cliffs in high altitude montane grasslands and Nama-Karoo.	High	No
Aizoaceae	*Galenia subcarnosa*	LC	LC	-	Schedule 2	-	-	According to Kamundi and Victor (2006), this species is endemic to South Africa and mainly occurs in the Eastern Cape and Northern Cape Province.	High	No
Aizoaceae	*Stomatium middelburgense*	LC	LC	-	Schedule 2	-	-	This species is endemic to South Africa and mainly occurs in the Eastern Cape Province (Burgoyne, 2006).	Confirmed on site (CES, 2021)	Yes
Apocynaceae	*Xysmalobium gomphocarpoides*	LC	LC	Schedule 4	Schedule 2	-	-	This species is endemic to South Africa and occurs in the Eastern Cape, Free State, Northern Cape, North West, Western Cape Provinces. According to Foden and Potter (2005) this taxon was not selected in any one of their four screening processes for highlighting potential taxa of conservation concern for detailed assessment and was hence given an automated status of Least Concern. (	Possible	No
Apocynaceae	*Gomphocarpus fruticosus*	-	LC	Schedule 4	Schedule 2	-	-	This species is widespread, common and not in danger of extinction. It is not endemic to South Africa. It occurs on dry sandy soils in open disturbed places (often on riverbanks) in a variety of habitats including Albany Thicket, Desert, Fynbos, Grassland, Indian Ocean Coastal Belt, Nama Karoo, Savanna, and Succulent Karoo in the Eastern Cape, Free State,	Confirmed in broader project area by CES (2018)	Yes

Family	Species	IUCN	SA Red List	PNCO	NCNCA	Protected Tree	NEM: BA	Habitat, distribution and population trend (SANBI Red List)	Probability of occurrence on site based on habitat requirements	Confirmed during this assessment (Yes/No)
								Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape, North West, Western Cape Provinces (von Staden, 2012).		
Asphodelaceae	*Aloe broomii*	LC	LC	Schedule 4	Schedule 2	-	-	This species is widespread in the central interior of South Africa, from the eastern Karoo in the south-eastern parts of the Northern Cape and adjacent areas in the Western Cape eastwards through the southern Free State and the Eastern Cape interior. Major habitats includes Nama-Karoo and Grasslands (von Staden, 2018).	Confirmed on site (CES, 2021)	No
Crassulaceae	*Crassula umbellata*	LC	LC	-	Schedule 2	-	-	This species is endemic to South Africa and occurs on sandy or gravelly slopes of the Fynbos and Succulent Karoo Biome in the Eastern Cape, Northern Cape and Western Cape Provinces (Foden and Potter, 2009).	Possible	No
Crassulaceae	*Crassula setulosa*	NE	LC	-	Schedule 2	-	-	According to van der Colff (2015), this species is not endemic to South Africa and occurs in a wide variety of habitats in the Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape, and North West Provinces.	High	Yes
Iridaceae	*Morea huttonii*	-	LC	Schedule 4	Schedule 2	-	-	According to Cholo and Foden (2006), this species is not endemic to South Africa. There is a lack of information on the habitat requirements for this species, however it has been recorded in the Eastern Cape, Free State, KwaZulu-Natal, and Mpumalanga Provinces.	Confirmed in broader project area by CES (2018)	No
Orobanchaceae	*Harveya pumila*	-	LC	Schedule 4	-	-		According to Victor (2004), this species is not endemic to South Africa and occurs in the Eastern Cape, Free State, Gauteng, KwaZulu-Natal, and Mpumalanga Provinces.	Confirmed in broader project area by CES (2018 & 2021)	No
Scrophulariaceae	*Nemesia sp.*			-	Schedule 2	-	-	Unknown	Possible	Yes

Family	Species	IUCN	SA Red List	PNCO	NCNCA	Protected Tree	NEM: BA	Habitat, distribution and population trend (SANBI Red List)	Probability of occurrence on site based on habitat requirements	Confirmed during this assessment (Yes/No)
Scrophulariaceae	*Manulea plurirosulata*	LC	LC	-	Schedule 2	-	-	According to Foden and Potter (2005), this species is endemic to South Africa and occurs in the Eastern Cape and Free State Provinces. There is a lack of information on the habitat requirements for this species, however this taxon was not selected in any one of four screening processes for highlighting potential taxa of conservation concern for detailed assessment and was hence given an automated status of Least Concern.	Possible	No
Scrophulariaceae	*Jamesbrittenia filicaulis*	LC	LC	-	Schedule 2	-	-	According to Foden and Potter (2005), this species is not endemic to South Africa and occurs within the Eastern Cape, Free State and KwaZulu-Natal Provinces. There is a lack of information on the habitat requirements for this species, however this taxon was not selected in any one of four screening processes for highlighting potential taxa of conservation concern for detailed assessment and was hence given an automated status of Least Concern.	Possible	Yes
Aizoaceae	*Ruschia intricata*	-	LC	-	Schedule 2	-	-	According to Burgoyne (2006), this species has been classified as LC and its population trend has been classified as stable. It is endemic to South Africa and occurs in the Eastern Cape, Free State, Northern Cape, and Western Cape Provinces.	Confirmed in broader project area by CES (2018)	No
Aizoaceae	*Psilocaulon coriarium*	-	LC	-	Schedule 2	-	-	According to Burgoyne (2006), this species has been classified as LC and is not endemic to South Africa and occurs in the Eastern Cape, Free State, Northern Cape, and Western Cape Provinces. There is little information relating to this species habitat requirements.		No
Anacampserotaceae	*Anacampseros ustulata*	-	LC	-	Schedule 2	-	-	According to Williamson and Potter (2005), this species is endemic to South Africa and	Confirmed in broader	No

Family	Species	IUCN	SA Red List	PNCO	NCNCA	Protected Tree	NEM: BA	Habitat, distribution and population trend (SANBI Red List)	Probability of occurrence on site based on habitat requirements	Confirmed during this assessment (Yes/No)
								occurs in the Eastern Cape, Free State, and Western Cape Provinces. Its population trend is currently stable.	project area by CES (2021)	
Amaryllidaceae	*Haemanthus cf humilis*	-	LC	Schedule 4	Schedule 2	-	-	According to Snijman and Victor (2004), this species is not endemic to South Africa. It is widespread and occurs in all nine provinces of South Africa.	Confirmed in broader project area by CES (2021)	No
Apocynaceae	*Huernia piersii*	-	Rare	Schedule 4	Schedule 2	-	-	Victor and Dold (2009), this species is endemic to the Eastern Cape Province. It occurs at high altitudes on bare dolerite domes in the Grassland and Nama-Karoo Biome. It has been recorded in the Eastern Great Karoo between Graaff-Reinet, Sterkstroom and Steynsburg. Despite its rare status, its population trend is classified as stable	Possible	No
Apocynaceae	*Tridentea virescens*	-	Rare	Schedule 4	Schedule 2	-	-	According to Victor (2009), this species is not endemic to South Africa. It is widespread and occurs as sporadic small populations of up to six plants. No threats are known to impact this species and its population trend has been classified as stable. Its habitat includes stony or hard loam in flood plains.	Possible	No

3.4.4 Alien Invasive Species Present on site

An “invasive species” is any species whose establishment and spread outside of its natural distribution range (i) threatens ecosystems, habitats or other species or has a demonstrable potential to threaten ecosystems, habitats or other species; and (ii) may result in economic or environmental harm or harm to human health. Invasive alien plant species are globally considered as one of the greatest threats to the environment, biodiversity, ecosystem integrity and the economy.

According to the Conservation of Agricultural Resources Act (No. 43 of 1983 - Regulation 15, 30 March 2001) (CARA), for agricultural land, and the National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEMBA), for natural areas, invasive alien plant species should be controlled and eradicated with an emphasis on urgent action in biodiversity Ancillary areas. NEM:BA published a list of Alien and Invasive Species (No 599) in 2014 which regulates the management of alien and invasive plants in natural environments.

The following alien invasive species have been recorded in the broader project area:

Table 3.4: Alien Invasive species recorded within the project area.

FAMILY	SPECIES	COMMON NAME	CARA (Act No. 43 of 1983)	NEMBA NATIONAL LIST OF INVASIVE SPECIES IN TERMS SECTIONS 70(1), 71(3) and 71A
Asteraceae	*Tagetes cf minuta*	-	Not Listed.	Not Listed.
Poaceae	*Paspalum dilatatum*	Dallis Grass	Not Listed.	Not Listed.
Salicaceae	*Populus sp.*	-	Category 2	Category 2
Agavaceae	*Agave americana*	American agave	Not Listed.	Not Listed.
Papaveraceae	*Argemone ochroleuca*	Mexican Poppy	Category 1	Not Listed.

NEM:BA Category 1b: Invasive Species

Plants classified as Category 1b alien invasive species are prohibited from:

- Being imported into the Republic;
- Growing or in any other way propagating any specimen;
- Conveying, moving or otherwise translocating any specimen;
- Spreading or allowing the spread of any specimen; and
- Releasing any specimen.

NEM:BA Category 2: Invasive Species

Category 2 invasive species are regulated by area. A permit is required to import, posses, grow breed, move, sell, buy or accept as a gift any species listed under Category 2.

CARA Category 1: Declared weeds

Plants classified as Category 1 in CARA are Declared Weeds. These are prohibited plants, which must be controlled or eradicated where possible (except in biocontrol reserves, which are areas designated for the breeding of biocontrol agents).

CARA Category 2: Invader Plants

Plants classified as Category 2 are declared Invader Plants and may only be grown under controlled conditions if a permit is acquired. No trade in these plants is permitted.

* All alien and invasive plant species must be controlled during all phases of development according to the recommendations outlined in the Environmental Management Programme (EMPr).

3.5 Description of Fauna

According to the Screening Report generated for the site, the Animal Species Theme is classified as HIGH sensitivity due to the presence of two (2) bird species, including *Neotis ludwigii* and *Aquila verreauxii*. However, birds were not assessed in this report as a separate Avifaunal Assessment has been conducted for the proposed development.

The environment of the broader project area is characterised by the Upper Karoo and Dry Highveld Grassland Bioregions and hosts a wide variety of faunal species. This section provides a brief description of the herpetofauna and mammals which occur, or which are likely to occur, within the proposed project area.

3.5.1 Herpetofauna

The Northern Cape Province, in which the proposed development occurs, is home to approximately seventy-four (74) herpetofauna species, which includes twenty-nine (29) amphibian species and forty-five (45) reptile species. Additionally, the Eastern Cape Province is home to approximately one-hundred-and-seventy-seven (177) herpetofauna species, which includes fifty-seven (57) amphibian species and one-hundred-and-twenty (120) reptile species (iNaturalist, 2021).

The IUCN (2021) database indicates that twelve (12) amphibian species and twenty (20) reptile species could occur within the proposed project area. None of these species are threatened in terms of the Regional Red Data List for frogs (2004) and reptiles (2014). However, one (1) amphibian species (*Pyxicephalus adspersus)* and one (1) reptile species (*Psammobates tentorius*) is listed as Near Threatened. Moreover, all chameleons and girdled lizards, as well as Giant Bullfrog, are listed as Schedule I species on the Northern Cape Nature Conservation Act (Act No. 9 of 2009) and all tortoises, lizards, and other frogs are listed as Schedule II. Schedule I and II species are protected in the Northern Cape Province. Additionally, thirty (30) species are protected in terms of the Eastern Cape PNCO (Act No. 19of 1974), including all tortoises, lizards, frogs and toads. Table 3.5 lists the herpetofauna SCC which are likely to occur within the proposed project area.

Table 3.5: Herpetofauna SCC within the proposed project area (IUCN).

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS (IUCN 2021, MEASEY 2011, SANBI 2004 & 2014)	HABITAT	PROBABILITY OF OCCURRENCE (High, Medium, Low, Confirmed)
Amphibians				
Giant Bullfrog	*Pyxicephalus adspersus*	NT	Inhabits various vegetation types of grassland, savanna, karroid and thicket habitats, generally	Low

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS (IUCN 2021, MEASEY 2011, SANBI 2004 & 2014)	HABITAT	PROBABILITY OF OCCURRENCE (High, Medium, Low, Confirmed)
			breeding in seasonal, shallow, grassy pans in flat, open areas (SANBI 2004)	
Southern Pygmy Toad	*Poyntonophrynus vertebralis*	LC	Inhabits primarily karroid habitat but is also found in savannah and grassland sections, occurring on a variety of substrates, from brackish soils to gravels, in open sandy and grassy areas and in karoo scrub, breeding in temporary Waterbodies (SANBI 2004).	Medium
Karoo Toad	*Vandijkophrynus gariepensis*	LC	Found in many habitats, including open, sandy areas in the semi-arid karoo, and grassland in the eastern parts of its range, breeding in various permanent and temporary waterbodies (SANBI 2004).	Medium
Bubbling Kassina	*Kassina senegalensis*	LC	Inhabits various vegetation types in savanna and grassland habitats, breeding in both temporary and permanent waterbodies (SANBI 2004).	Medium
Common Platanna	*Xenopus laevis*	LC	Occurs all over (SANBI 2004).	High
Cape River Frog	*Amietia fuscigula*	LC	Inhabits mainly grassland and fynbos habitats but occurs in parts of the karoo and is associated with permanent waterbodies and well-vegetated waterways (SANBI 2004).	Low
Delalande's River Frog	*Amietia delalandii*	LC	Found along large and small rivers, and in dams and	Low

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS (IUCN 2021, MEASEY 2011, SANBI 2004 & 2014)	HABITAT	PROBABILITY OF OCCURRENCE (High, Medium, Low, Confirmed)
			ornamental ponds (IUCN 2017).	
Poynton's River Frog	*Amietia poyntoni*	LC	Occurs in grassland, forest, savanna and agricultural habitats, preferring shallow water such as wetlands, ponds, dams, streams and rivers, and requires permanent waterbodies to breed in (IUCN 2017).	Low
Common Caco	*Cacosternum boettgeri*	LC	Favours open areas with short vegetation and is abundant in grassy areas within the karroid, savanna, grassland, fynbos and thicket habtiats (SANBI 2004).	Medium
Tandy's Sand Frog	*Tomopterna tandyi*	LC	Inhabits loose, sandy soils and occurs along small streams, pans and temporary rain pools or farm dams within karroid, grassland and savanna habitats (SANBI 2004).	Medium
Gray's Stream Frog	*Strongylopus grayii*	LC	Inhabits entire fynbos habitat as well as parts of the karoo, savanna, grassland, thicket and forest, breeding in small dams, ponds, pools, ditches and shallow seeps (SANBI 2004).	Low
Tortoises				
Greater Padloper	*Homopus femoralis*	LC	High presence in sweet veld areas, such as the Dry Highveld Grassland and the eastern Nama Karoo. Lower presence in Savanna and Fynbos vegetation and rocky areas (Hofmeyr *et al*. 2018).	Confirmed
Tent Tortoise	*Psammobates tentorius*	NT	Occurs in dwarf shrubland with succulents, annuals,	High

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS (IUCN 2021, MEASEY 2011, SANBI 2004 & 2014)	HABITAT	PROBABILITY OF OCCURRENCE (High, Medium, Low, Confirmed)
			grasses and geophytes (Hofmeyr *et al*. 2018).	
Lizards				
Burchell's Sand Lizard	*Pedioplanis burchelli*	LC	Often associated with large mountains and found in rocky areas, especially those with exposed bedrock and sparse vegetation (SANBI, 2014).	High
Karoo Girdled Lizard	*Karusaurus polyzonus*	LC	Inhabits rocky outcrops in lowland areas and on lower mountain slopes (SANBI, 2014).	High
Cape Crag Lizard	*Pseudocordylus microlepidotus*	LC	Found in montane regions on rock outcrops and cliffs, usually in fynbos or on grassy slopes, sheltering in crevices or under rocks (SANBI, 2014).	Low
Chameleons				
Eastern Cape Dwarf Chameleon	*Bradypodion ventrale*	LC	Found across several biomes and considered a habitat generalist (SANBI, 2014).	Low
Snakes				
Rhombic Egg-eater	*Dasypeltis scabra*	LC	Occurs in a wide variety of habitats where it is often found in deserted termitaria, under rocks, in crevices, under the bark of trees and rotting logs (SANBI, 2014).	Medium
Aurora House Snake	*Lamprophis aurora*	LC	Occurs in grassland, fynbos and moist savanna habitats where it is often found near streams and under rocks, occasionally in old termitaria (SANBI, 2014).	Low
Spotted Rock Snake	*Lamprophis guttatus*	LC	Found in rocky habitats throughout its range (SANBI, 2014).	High

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS (IUCN 2021, MEASEY 2011, SANBI 2004 & 2014)	HABITAT	PROBABILITY OF OCCURRENCE (High, Medium, Low, Confirmed)
Sundevall's Shovel-snout	*Prosymna sundevallii*	LC	Outside the Western Cape, occurs in moist and dry savanna and karroid areas where it is often found in old termitaria and under rocks (SANBI, 2014).	High

One (1) of the thirty-one (31) herpetofauna species, *Homo femoralis*, likely to occur within the project area was recorded during a site survey conducted by CES in 2021 (Plate 3.5**Error! Reference source not found.**). Additionally, *Sclerophrys capensi* (Raucous toad - LC) and *Stigmochelys pardali* (Leopard tortoise – LC) was recorded during the site survey undertaken for this study (Plate 3.6).

Plate 3.5: Greater Padloper (Homo femoralis) recorded within the project area.

Plate 3.6: Raucous toad (LC) and Leopard tortoise (LC) recorded during the site survey.

3.5.2 Mammals

The IUCN (2021) database suggests that the distributions of fifty-four (54) mammal species (excluding bats, as a sperate specialist assessment has been conducted) intersect with the proposed project area. These species have been assessed against the Regional Red List (2016) and it has been determined whether they are endemic, near endemic or not endemic, as well as their status in the Northern Cape Nature Conservation Act (Act No. 9 of 2009) and the Eastern Cape Provincial Nature Conservation Ordinance (No. 19 OF 1974) (Appendix 3). Of the fifty-four (54) mammal species, fifty (50) are protected in terms of the Northern Cape Nature Conservation Act (Act No. 9 of 2009) and twenty-three (23) are protected in terms of the Eastern Cape Provincial Nature Conservation Ordinance (No. 19 OF 1974). Table 2 lists threatened mammal SCC; a comprehensive mammal list for the proposed project area can be found in Appendix 3.

Eight (8) mammal species are endemic and two (2) are near endemic. Endemic mammal species include the Karoo Four-striped Grass Mouse, Karoo Bush Rat, Slogget's Vlei Rat, Grant's Rock Mouse, Spectacled Dormouse, White-tailed Rat, Common Mole-rat and the Cape Rock Sengi. Near-endemic mammal species include the Cape Grey Mongoose and Southern White Rhino. According to the Regional Red List Status (2016), two (2) species are threatened, namely the Black-footed Cat and White-tailed Rat (both Vulnerable), and five (5) are Near Threatened, namely the Brown Hyaena, African Striped Weasel, Cape Clawless Otter, Southern White Rhino and the Spectacled Dormouse. All mammal species listed in the report belonging to the taxonomic order *Carnivora* (except caracal and black-backed jackal), including *Perissodactyla, Artiodactyla, Tubulidentata, Hyracoidea, Rodentia, Lagomorpha and Insectivora* are listed as either a Schedule I or II species on in the Northern Cape Nature Conservation Act (Act No. 9 of 2009).

Table 3.6: Mammal SCC within the proposed project area (IUCN).

Name	Conservation Status (EWT 2016)	Conservation Actions	Habitat	Probability of occurrence (High, Medium, Low, Confirmed)
Cape Clawless Otter (*Aonyx capensis*)	NT	Present in several protected areas and included in CITES Appendix II (Jacques *et al*. 2015).	Occurs in forest, grassland, wetland (inland), and marine coastal areas (Jacques *et al*. 2015). This species is predominantly aquatic and seldom found far from water. They are also found in many seasonal or episodic rivers in the Karoo (South Africa) (Okes *et al*., 2016). Based on the proximity of the nearest watercourse, it is unlikely that this species will occur onsite.	Low
Southern White Rhino (*Ceratotherium simum*)	NT	Concentrated in fenced sanctuaries, conservancies, rhino conservation areas and intensive protection zones where law enforcement effort can be concentrated at effective levels. Rhinos are listed on CITES Appendix I (Emslie 2020).	Naturally occurs in savanna, shrubland, and desert areas (Emslie 2020). However, due to rampant poaching this species no longer occurs naturally outside of protected areas and its likelihood of occurrence on site is therefore highly unlikely.	Highly unlikely

Name	Conservation Status (EWT 2016)	Conservation Actions	Habitat	Probability of occurrence (High, Medium, Low, Confirmed)
Brown Hyaena (*Parahyaena brunnea*)	NT	Occurs in several protected areas, but can be found in non-protected areas, where they exhibit some tolerance to land-use changes (Wiesel 2015)	Favours rocky, mountainous areas with bush cover (Wiesel 2015). It shows an ability to survive close to urban areas. Is independent of drinking water but requires some type of cover in which to lie during the day. Occurs in several protected areas, but can be found in non-protected areas, where they exhibit some tolerance to land-use changes (Wiesel 2015). Populations of Brown Hyaenas in non-protected areas comprise a significant proportion of the global population, suggesting that such areas are likely to be important for their sustained conservation. Based on the above, it is possible that this species could occur within the project area.	Medium
Black-footed Cat (*Felis nigripes*)	VU	Human activities that lead to habitat degradation and the loss of prey species need to be addressed, particularly in the Karoo region which is likely to be the remaining stronghold region for the species (Silwa *et al*. 2015)	Inhabits dry, open savannah, grasslands and Karoo semi-desert with sparse shrub and tree cover (Silwa *et al*. 2015). Predominantly ground dwellers and during the day use dens in termite mounds or made by other animals. As the proposed site contains this species preferred habitat, it is possible that this species could occur within the project area.	Medium

Name	Conservation Status (EWT 2016)	Conservation Actions	Habitat	Probability of occurrence (High, Medium, Low, Confirmed)
Spectacled Dormouse (*Graphiurus ocularis*)	NT	Present in several protected areas (Cassola 2016).	Occurs in shrubland and rocky areas, such as inland cliffs and mountain peaks (Cassola 2016). Nocturnal and hides during the day mainly in rock crevices and feeds mainly on invertebrates but also seeds and other plant material.	Medium
White-tailed Rat (*Mystromys albicaudatus*)	VU	Conservation of grasslands through protected area expansion and biodiversity stewardship schemes is suspected to be the most important intervention for this species (Avenant *et al*. 2016).	Habitat requirements need further investigation but often associated with calcrete soils within shrubland and grasslands (Avenant *et al*. 2016). They are never found on soft, sandy substrate, rocks, wetlands or riverbanks. In the Maclear district of the Eastern Cape Province, it was found in habitats with crests and ridges and trapped on bare patches with sparse vegetation (Avenant, et. al., 2019). The proposed site is not underlain by calcrete soils but rather mudstone and arenite with isolated rocky platforms. Based on the above, it is unlikely that this species would occur within the project area.	Low

Name	Conservation Status (EWT 2016)	Conservation Actions	Habitat	Probability of occurrence (High, Medium, Low, Confirmed)
African Striped Weasel (*Poecilogale albinucha*)	NT	Present in several protected areas across its range. Outside protected areas, land-use planning should continue to conserve grassland habitats through protected area expansion, conservancy formation or stewardship schemes (Child *et al*. 2016).	Mainly found in savannah and grassland habitats, although it probably has a wide habitat tolerance and has been recorded from lowland rainforest, semidesert grassland, fynbos (with dense grass) and pine plantations (Child *et al*. 2016). As the proposed site contains this species known habitat type, it is possible that this species could occur within the project area.	High

During the field survey evidence of burrowing activity was observed, most likely from the Common Mole-rat, Cape Ground Squirrel, Aardvark, as well as from unidentified animals. Droppings from Rock Hyrax and a Cape Porcupine quill were also found on site. Other mammal species such as Bat-eared Fox, Yellow and Grey mongooses, Cape Ground Squirrel, Suricate, Steenbok, Springbok, Duiker, Red Rock Rabbit, Secretary Bird and two unidentified rodents were observed in the broader project area during previous site surveys.

4 SITE SENSITIVITY

4.1 CRITICAL BIODIVERSITY AREAS

The proposed development is located on the boarder of the Northern Cape and Eastern Cape Province. As such, both the Eastern Cape Biodiversity Conservation Plan (ECBCP, 2019) and the Northern Cape Critical Biodiversity Areas (2016) were consulted for this section.

The ECBCP (2019) replaces the ECBCP (2007) in its entirety and provides a map of important biodiversity areas, outside of the Protected Areas network, which must be used to inform land use and resource-use planning and decision making. The objectives of the ECBCP (2019) are to:

1) Identify the minimum spatial requirements needed to maintain a living landscape that continues to support all aspects of biodiversity and retain/maintain essential ecological infrastructure. This is achieved through the selection of areas, based on achieving targets, which represent important biodiversity pattern AND ecological processes;
2) Serve as the primary source of biodiversity information for land use planning and decision-making; and
3) Inform conservation and restoration action in important biodiversity areas.

The aim of the ECBCP (2019) was to map biodiversity priority areas through a systematic conservation planning process. The main outputs of the ECBCP include Protected Areas (PA), Critical Biodiversity Areas (CBA), Ecological Support Areas (ESA), Other Natural Areas (ONA) and No Natural Habitat Remaining (NNR) for both terrestrial and aquatic ecosystems.

The Northern Cape Critical Biodiversity Area (NC CBA, 2016) Map provides an updated and revised systematic biodiversity plan for the Northern Cape Province. It identifies and maps biodiversity priority areas, including CBAs, Ecological Support Areas (ESAs), Protected Areas (Pas), and Other Natural Areas (ONAs), through a Systematic Conservation Planning Approach. The plan provides important information on the minimum spatial requirements for the persistence of a viable representative sample of all ecosystem types and species required in order to ensure the maintenance of ecological functioning and landscapes as a whole.

Terrestrial CBAs

According to the ECBCP (2019), the proposed Umsobomvu 400 kV LILO OHL occurs within a terrestrial CBA 1 and CBA 2 (Figure 4.1). According to the NC CBA (2016), only a small portion of the 300 m buffer falls within a CBA 1 while the remainder of the footprint falls within a CBA 2 (Figure 4.3).

Aquatic CBAs

According to the ECBCP (2019), the proposed Umsobomvu kV LILO OHL traverses an area classified as an ESA 1 (Figure 4.2). The Northern Cape CBA Map (2016) does not include spatial data relating to aquatic CBAs.

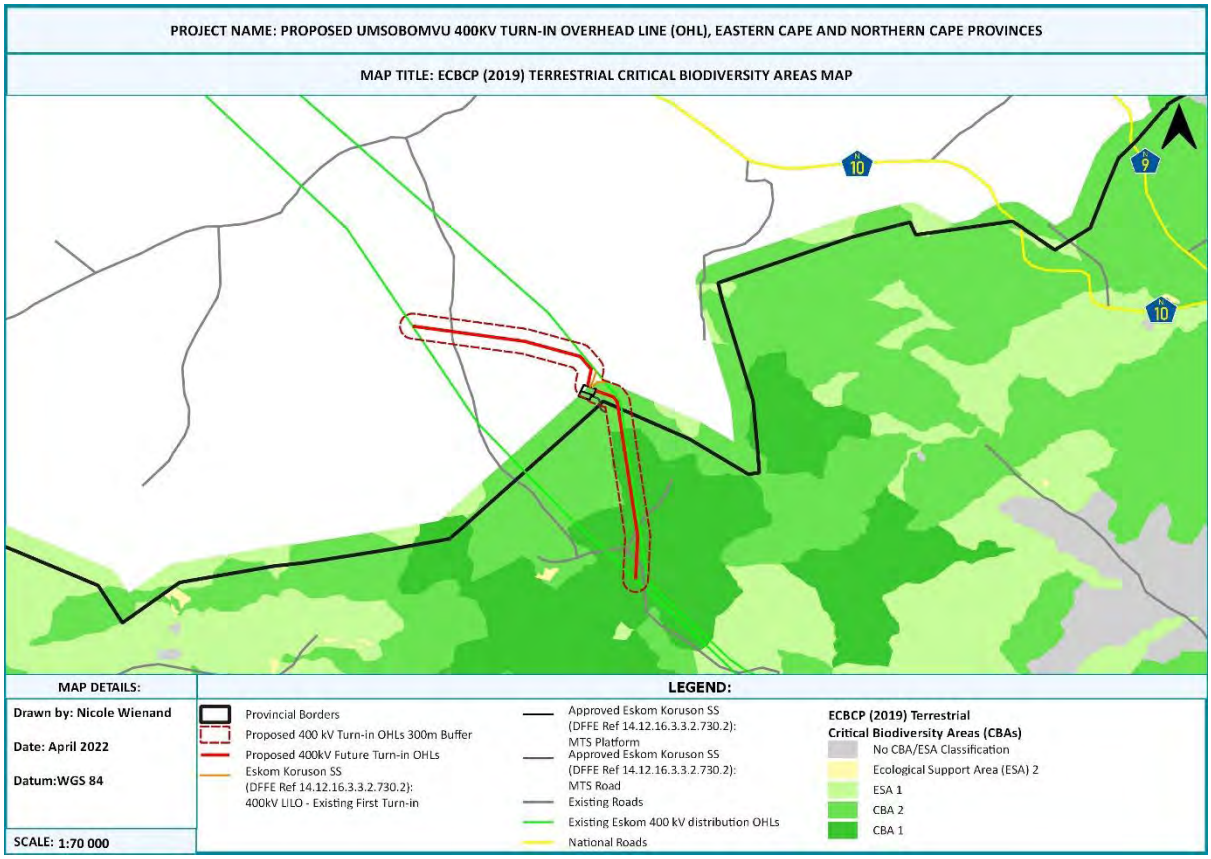

Figure 4.1: ECBCP (2019) Terrestrial CBAs located within the project area.

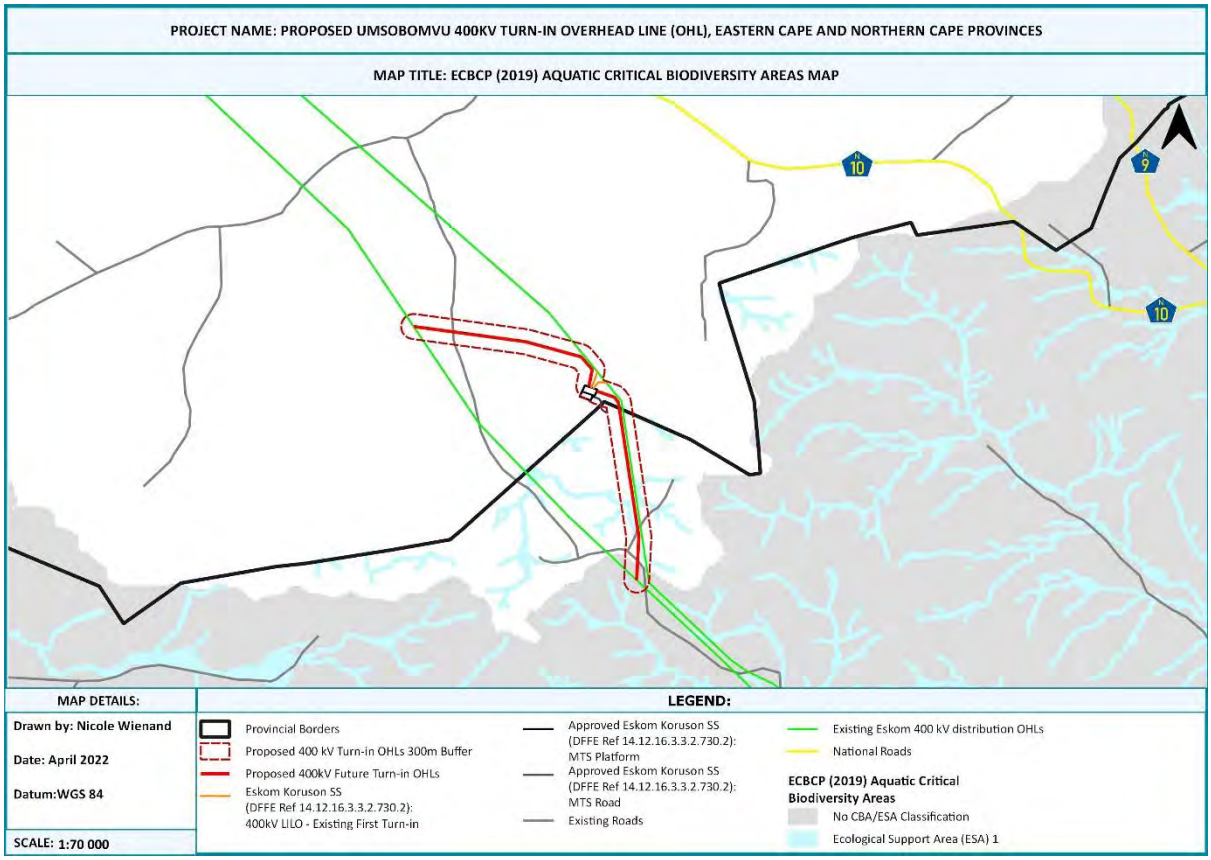

Figure 4.2: ECBCP (2019) Aquatic CBAs located within the project area.

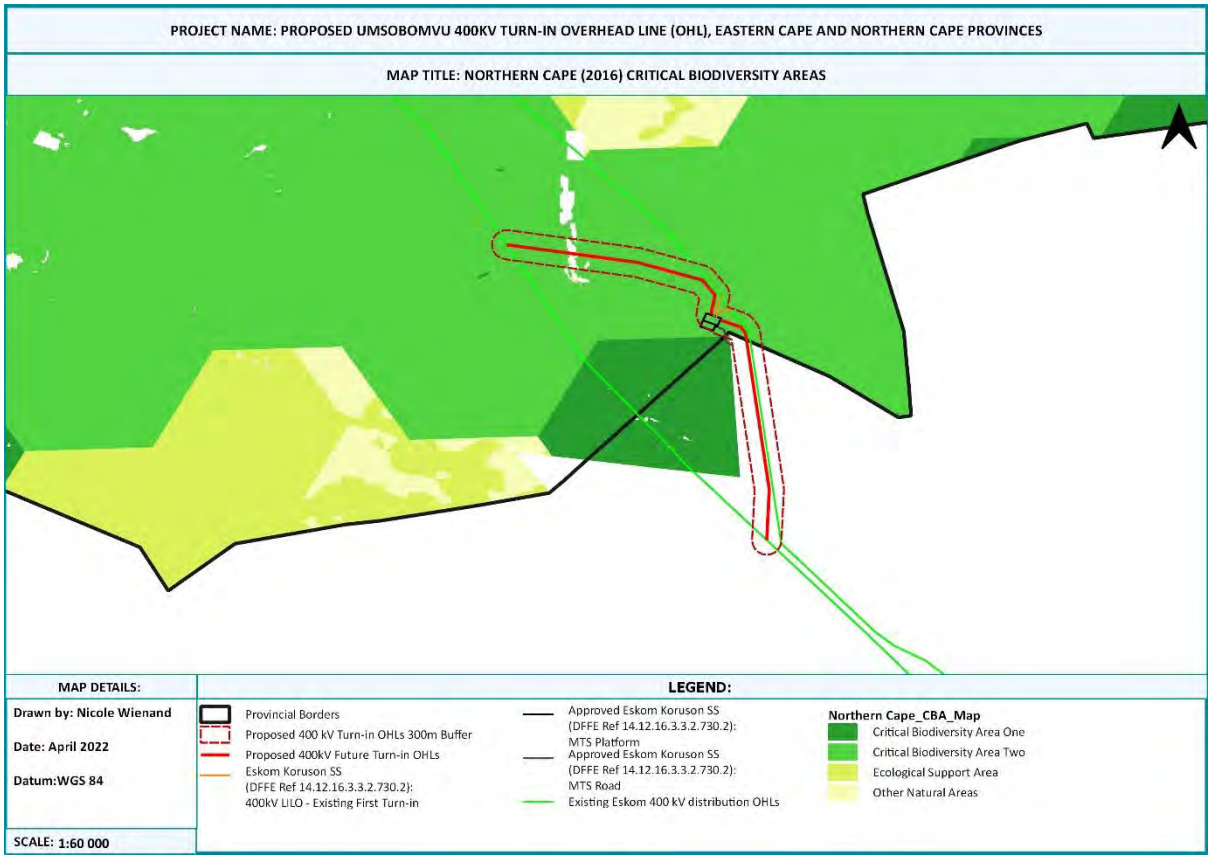

Figure 4.3: Northern Cape CBAs (2016) located within the project area.

Table 4.1: Biodiversity Priority areas affected by the proposed development.

Category	Sensitivity Features	Desired Management Objective	Recommendation
ECBCP (2019) Terrestrial CBAs			

CBA 1	• CBAs are selected to meet biodiversity targets for species, ecosystems and ecological processes. These include:
	  • Critically Endangered and Endangered Ecosystem.
	  • Critical linkage points (bottlenecks or pinch-points) in the corridor network.
	  • All areas required to meet biodiversity targets and to ensure future
		Maintain in a natural state (or near-natural state if this is the current condition of the site) that secures the retention of biodiversity pattern and ecological processes:
		For areas classified as CBA1, the following objectives must apply:
		• Ecosystem and species must remain intact and undisturbed;
		• Since these areas demonstrate high irreplaceability, if disturbed or lost, biodiversity targets will not be met;
		• Important: these biodiversity features are at, or beyond, their limits of acceptable change.
		
		If land use activities are unavoidable in these areas, and depending on
			Based on the desired management objective for areas classified as CBA 1, the study area should be maintained in a natural state. However, it is worth noting that the study site forms part of the approved Umsobomvu and Coleskop WEFs. As development within the CBA 1 is not avoidable due to the location of existing OHLs, all mitigations and recommendations as specified in this report must be implemented and adhered to. Additionally, the

Category	Sensitivity Features	Desired Management Objective	Recommendation
	persistence of species, ecosystems, and habitats. • CBAs are areas of high biodiversity value and should therefore be maintained in a natural state with no further loss of habitat.	expert opinion of the condition of the site, a Biodiversity Offset must be designed and implemented.	clearance of vegetation must be limited to that which is strictly necessary for the construction of the pylons. Existing roads must be utilised where feasible. A set-aside area / biodiversity offset is not deemed necessary due to the small footprint of the proposed development, the availability of the remaining intact ecosystem surrounding the proposed site, and the fact that the site has been previously impacted to some extent due to grazing. In the medium to long term, the development of the Umsobomvu and Coleskop WEF will result in a higher level of protection for these vegetation types and associated floral species, as access to the site will be restricted, and farming activities substantially reduced within the boundaries of the project area.
CBA 2	• These areas are considered as natural or near-natural landscapes and biodiversity must be managed for minimal loss of ecosystem integrity. No transformation of natural habitat should be permitted.	Maintain in natural (or near-natural state if this is the current condition of the site) that secures the retention of biodiversity pattern and ecological processes: For areas classified as CBA2, the following objectives apply: • Ecosystems and species must remain intact and undisturbed;	The management objectives state that set-aside areas must be designed in the layout and implemented where land use activities are unavoidable in areas classified as CBA 2, depending on the condition of the site. As development within the CBA 2 is not avoidable, all mitigations and recommendations as specified in this

Category	Sensitivity Features	Desired Management Objective	Recommendation
		• There is some flexibility in the landscape to achieve biodiversity targets in these areas. It must be noted that the loss of a CBA2 area may elevate other CBA 2 areas to a CBA 1 category. • These biodiversity features are at risk of reaching their limits of acceptable change. If land use activities are unavoidable in these areas, and depending on the condition of the site, set-aside areas must be designed in the layout and implemented. If site specific data confirms that biodiversity is significant, unique and/or highly threatened or that a Critically Endangered or Endangered species is present, Biodiversity Offsets must be implemented.	report must be implemented and adhered to. The development footprint must be limited to that which is strictly necessary for the construction of the pylons. Existing roads must be utilised where feasible. A set-aside area is not deemed necessary due to the small footprint of the proposed development, the availability of the remaining intact ecosystem surrounding the proposed site, and the fact that the site has been previously impacted to some extent due to grazing. In the medium to long term, the development of the Umsobomvu and Coleskop WEF will result in a higher level of protection for these vegetation types and associated floral species, as access to the site will be restricted, and farming activities substantially reduced within the boundaries of the project area.
Northern Cape CBAs (2016)			
CBA 1	The Critical Biodiversity Areas of the North Cape: Technical Report (Holness and Oosthuysen, 2016) does not provide information on the defining/sensitivity features or the management objectives for biodiversity priority areas.		
CBA 2			

4.2 Ecosystem Threat Status

The National Environmental Management: Biodiversity Act, (Act No. 10 OF 2004) (NEM:BA) provides a National List of Ecosystems that are threatened and in need of protection – GN 1002 of 2011. However, since the promulgation of this list, the NBA (2018) Terrestrial Ecosystem Threat Status Assessment (Skowno *et al.*, 2019) and the Red List of Terrestrial Ecosystems of South Africa (SANBI, 2021) was undertaken. According to both assessments,

the vegetation types affected by the proposed development, including Besemkaree Koppies Shrubland and Eastern Upper Karoo, are classified as Least Concern (Figure 4.4Figure 4.4).

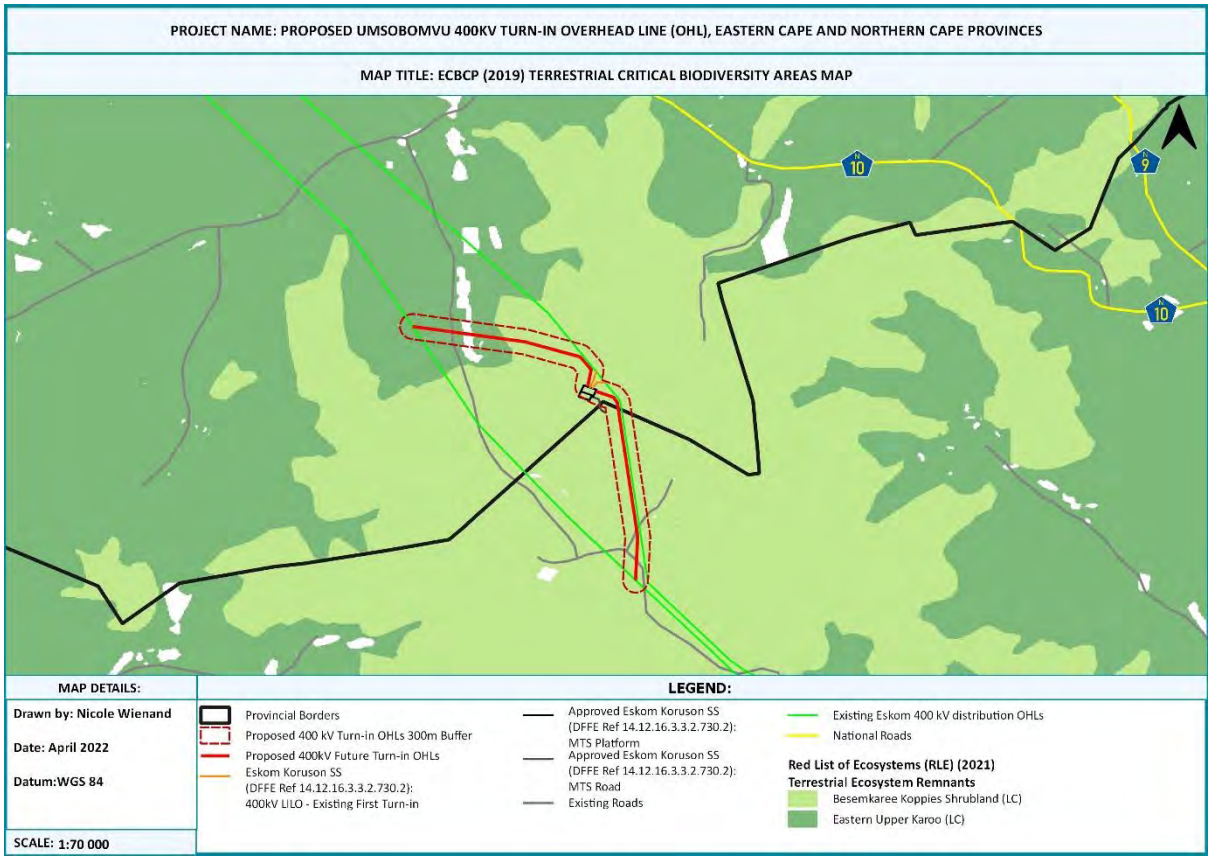

Figure 4.4: Threatened Ecosystem Map of the Project Area.

4.3 PROTECTED AREAS

The National Protected Areas Expansion Strategy (NPAES, 2011) was developed to "*achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change*." The NPAES originated as Government recognised the importance of protected areas in maintaining biodiversity and critical ecological processes. The NPAES sets targets for expanding South Africa's protected area network, placing emphasis on those ecosystems that are least protected.

The proposed Umsobomvu 400 kV LILO OHL occurs within the Karoo Escarpment Grassland NPAES Focus Area (Figure 4.5). The site does not occur within a protected area identified by the South African Protected Areas Database (SAPAD, 2021, Q3), a conservation area identified by the South African Conservation Areas Database (SACAD, 2021,Q3), or an Important Bird Area (IBA) (Bird Life, 2015).

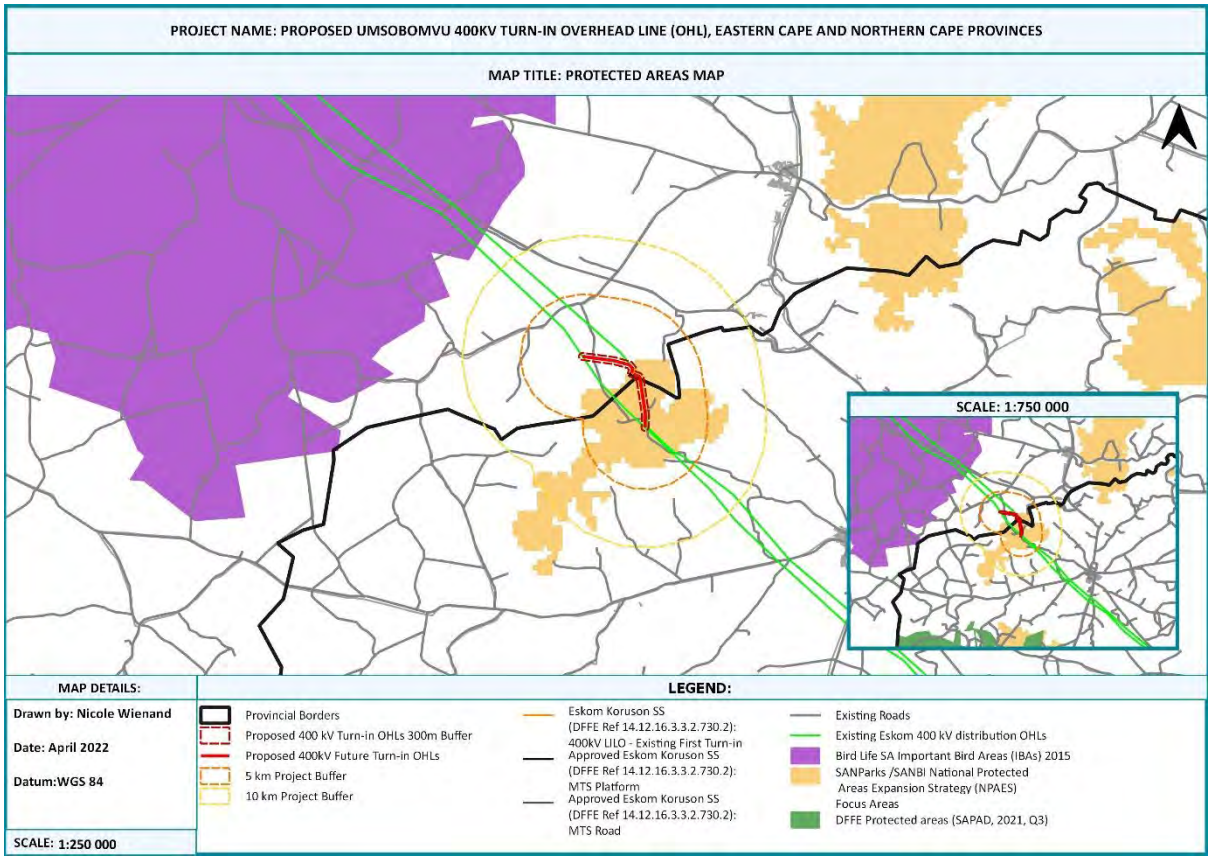

Figure 4.5: NPAES Focus Areas and Protected Areas surrounding the Project Area.

4.4 SITE SENSITIVITY

The Species Environmental Assessment guideline (SANBI, 2020) was applied to assess the Site Ecological Importance (SEI) of the project area. The habitats and the SCC in the project area were assessed based on their conservation importance, functional integrity and receptor resilience (Table 4.2). The combination of these resulted in a rating of SEI and interpretation of mitigation requirements based on the ratings.

The sensitivity map was developed using available spatial planning tools as well as by applying the SEI sensitivity based on the field survey.

Table 4.2: Criteria for establishing Site Ecological importance and description of criteria.

Criteria	Description
Conservation Importance (CI)	*The importance of a site for supporting biodiversity features of conservation concern present e.g. populations of IUCN Threatened and Near-Threatened species (CR, EN, VU & NT), Rare, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes.*
Functional Integrity (FI)	*A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.*
Biodiversity Importance (BI) is a function of Conservation Importance (CI) and the Functional Integrity (FI) of a receptor.	
Receptor Resilience (RR)	*The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.*
Site Ecological Importance (SEI) is a function of Biodiversity Importance (BI) and Receptor Resilience (RR)	

Areas of medium sensitivity include the Eastern Upper Karoo vegetation and the Besemkaree Koppies Shrubland.

Table 4.3 provides a summary of how each vegetation type was assessed.

Areas of medium sensitivity include the Eastern Upper Karoo vegetation and the Besemkaree Koppies Shrubland.

Table 4.3: Evaluation of Site Ecological Importance (SEI) of habitat and SCC.

Habitat / Species	Conservation Importance (CI)	Functional Integrity (FI)	BI	Receptor Resilience	SEI
Eastern Upper Karoo	**Low**	**Very High**	**Medium**	**Medium**	**Medium**
	No confirmed or highly likely populations of threatened SCC or range restricted species.	Very large (>100 ha) intact area for any conservation status of ecosystem type. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches. Current negative ecological impacts include grazing and transformation of indigenous vegetation for agriculture.		• Vegetation responses to disturbance may depend on several factors including stress resistance (e.g., Chambers *et al*. 2014), vegetative reproduction (e.g., Yang & Kim 2016) and seed dispersal (e.g., Neushulz *et al*. 2016). • Annual and biannual grass and herbs are more stress-resistant than the seedlings of perennial grasses and shrubs (Gonzalez & Ghermandi, 2019). Seedlings of the latter also recruit in gaps but do not usually survive in water deficient situations such as prolonged drought. • Annual species typically recover more quickly from a disturbance than perennial species as they put more energy into reproduction from seed than perennial species do. Therefore, the dominant plant species (whether annuals or perennials) as well as the availability of water will greatly influence the resilience of plant communities. The proposed development will impact plant communities though soil disturbance, vegetation loss and habitat fragmentation, which can decrease receptor resilience (Ott *et al*. 2020). However, the potential for alien invasion is minor and 98 % of this vegetation is still relatively intact, apart from minimal grazing and the existing agricultural development in the northern half of the proposed development. It should be noted that vegetation clearance will be limited to that which is strictly necessary for the construction of pylons, therefore seed dispersal and faunal migrations will still be possible. In addition, despite the fact that the majority of species on site are perennials, the Nama-Karoo biome is adapted to disturbance factors such as fire and grazing by livestock and herbivory, which	

Habitat / Species	Conservation Importance (CI)	Functional Integrity (FI)	BI	Receptor Resilience	SEI
				has been found to increase species richness. This suggests that the vegetation of the Nama-Karoo Biome is resilient to disturbance.	
Besemkaree Koppies Shrubland	**Low** No confirmed or highly likely populations of threatened SCC or range restricted species.	**Very High** Very large (>100 ha) intact area for any conservation status of ecosystem type. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches. Minimal current negative ecological impacts (grazing).	**Medium**	**Medium** • Vegetation responses to disturbance may depend on several factors including stress resistance (e.g., Chambers *et al*. 2014), vegetative reproduction (e.g., Yang & Kim 2016) and seed dispersal (e.g., Neushulz *et al*. 2016). • Annual and biannual grass and herbs are more stress-resistant than the seedlings of perennial grasses and shrubs (Gonzalez & Ghermandi, 2019). Seedlings of the latter also recruit in gaps but do not usually survive in water deficient situations such as prolonged drought. • Annual species typically recover more quickly from a disturbance than perennial species as they put more energy into reproduction from seed than perennial species do. The resilience of plant communities here will therefore largely depend on whether the community is dominated by perennials or annuals and availability of water. • The existence of plant communities within this vegetation type is also linked to specific habitat conditions involving shallow soils and rocky outcrops (Mucina & Rutherford, 2006). • Grassland plant communities generally are highly vulnerable to anthropogenic disturbances that alter soils (Buisson et al. 2019), therefore these plants, especially shrubs, may be more vulnerable to soil erosion, reducing receptor resilience. • Most grassland species, however, can withstand some grazing pressure and may even play a critical role in maintaining the structure of grasslands (SANBI, 2013).	**Medium**

Habitat / Species	Conservation Importance (CI)	Functional Integrity (FI)	BI	Receptor Resilience	SEI
				• This vegetation remains largely intact as it is generally excluded from intensive agricultural activities (Mucina & Rutherford, 2006). The proposed development will impact plant communities though soil disturbance and vegetation loss which can decrease receptor resilience (Ott *et al*. 2020). However, the potential for alien invasion is minor and 98 % of this vegetation is still relatively intact, apart from minor impacts due to grazing. It should be noted that vegetation clearance will be limited to that which is strictly necessary for the construction of pylons, therefore seed dispersal and faunal migrations will still be possible. The Grassland Biome is adapted to disturbance factors such as fire, climate, and to a degree, grazing by livestock and herbivory. This suggests that the vegetation of the grassland biome is resilient to disturbance.	

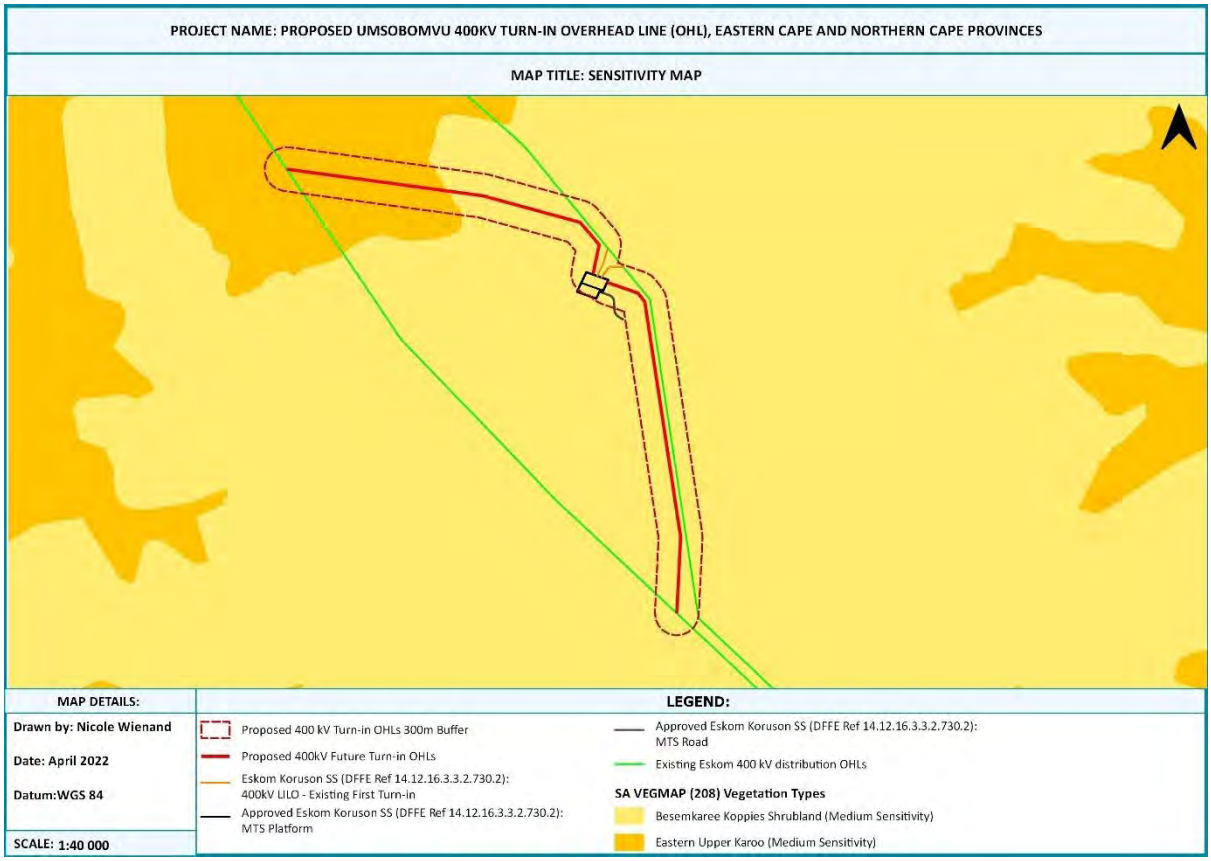

Figure 4.6: Sensitivity map of the proposed Umsobomvu 400 kV LILO OHL.

It should be noted that at the time of the site sensitivity assessment undertaken as part of the Ecological Impact Assessment conducted by CES in 2018 for the Umsobomvu I WEF, there was no legally recognised guideline for assessing sensitivity and the specialist therefore used the system developed by CES. Under this system, areas of high sensitivity were areas that needed to be avoided while development was permitted in areas of moderate sensitivity, provided mitigation measures were implemented to avoid and minimise the impacts where feasible. Table 4.4 below summarises the site sensitivity and reasons therefore utilised in the original Umsobomvu I WEF Ecological Impact Assessment (CES, 2018).

Table 4.4: Site sensitivity and features as identified by CES (2018) for the Umsobomvu I WEF.

Sensitivity Rating	High	Moderate	Low
Reason	• Process areas such as rivers, tributaries and wetlands which are important for ecosystem functioning; • 20 m buffers on all rivers and tributaries for the protection of riparian vegetation and ecosystem functioning; • 50 m buffers on all NFEPA wetlands for the protection of riparian vegetation and ecosystem functioning; and	• 100 m regulatory (DWS) buffers on all rivers and tributaries; • 500 m regulatory (DWS) buffers on all wetlands; and • Areas classified as CBA 2 (NC CBA, 2016 and ECBCP, 2019) which might contain SCC.	• Transformed areas such as roads and urban areas; and • Highly degraded areas which are unlikely to support SCC.

Sensitivity Rating	High	Moderate	Low
	• Areas classified as CBA 1 (NC CBA, 2016 and ECBCP, 2019) which are likely to contain SCC.		

Since the ecological assessment for the proposed Umsobomvu 400 kV LILO OHL (this report) took place after the release of the new Species Environmental Guideline (2020) document, the methodology to determine sensitivity (SEI) was used so that the report met the legislated requirements as per the Procedures for the Assessment and Minimum Criteria for Reporting on Identified environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when Applying for Environmental Authorisation (2020). Using these guidelines, the overall SEI for the Eastern Upper Karoo and Besemkaree Koppies Shrubland was determined to be of moderate sensitivity and as such the following guidelines must be applied:

"Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities".

These findings are in line with those of the Umsobomvu I WEF Ecological Impact Assessment (CES, 2018).

5 IMPACT IDENTIFICATION AND ASSESSMENT

The study that has been undertaken provides the necessary information in order to assess the impacts of the proposed Umsobomvu 400 kV LILO OHL on the ecology of the area at the appropriate spatial and temporal scales. The impacts identified and described in Section 5.1 below have been assessed in terms of the criteria described in Appendix 4 of this report.

5.1 IMPACT ASSESSMENT

Table 5.1: Assessment of impacts associated with the proposed Umsobomvu 400 kV LILO OHL.

CONSTRUCTION PHASE
IMPACT 1: LOSS OF NATURAL VEGETATION DUE TO VEGETATION CLEARING
Cause and Comment ***Direct Impact (Preferred Alternative)*** The clearing of land for the construction of the proposed Umsobomvu 400 kV LILO OHL will result in the direct loss of approximately 10-15m^2 per pylon within the Eastern Upper Karoo vegetation and 10-15m^2 per pylon within the Besemkaree Koppies Shrubland. Given the small footprint of the proposed development which has been placed within the authorised footprint of the Umsobomvu and Coleskop Wind Energy Facilities (WEFs), as well as the extent of remaining intact Eastern Upper Karoo vegetation and Besemkaree Koppies Shrubland outside of and surrounding the project area, it is unlikely that the loss of vegetation associated with the proposed development will impact on the extent and long-term conservation of these vegetation types, which is classified as Least Threatened. The overall significance of the loss of natural vegetation due to vegetation clearing for the construction of the pylons, provided the recommended mitigation measures are implemented, is classified as low negative. ***Cumulative Impact*** Minor portions of these vegetation types have already been lost mainly due to agriculture, grazing by livestock, and the construction of roads. However, the footprint of the proposed development is relatively small compared to the approved authorised WEFs. The additional (cumulative) loss of vegetation as a consequence of the construction of the proposed Umsobomvu 400 kV LILO OHL is therefore classified as low negative. ***No-Go Alternative*** The site forms part of the authorised Umsobomvu and Coleskop WEFs. If the proposed development is not approved, vegetation will still be lost due to the construction of the approved WEFs and the current land use impacts such as grazing will continue. The No-go Alternative is therefore classified as low negative.
Mitigation Measures: → The clearance of vegetation at any given time should be kept to a minimum and vegetation clearance must be strictly limited to the development footprint (pylons). → Employees must be prohibited from making fires and harvesting plants. → As far as practically possible, existing access roads should be utilised. → The development footprint/construction area must be demarcated to prevent encroachment of construction activities into surrounding areas. → Ensure that roads on slopes incorporate storm water diversion. → Where possible, reserve and store natural vegetation for re-vegetation post-construction. → Only indigenous plant species must be used for rehabilitation purposes.

→ Topsoil must be carefully removed and used to rehabilitate the site.

Significance Assessment:

Impact	Nature	Duration	Extent	Severity	Likelihood	Significance Before Mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Significance After Mitigation
Preferred	Direct	Permanent	Localised	Slight	Definite	**Low (-)**	Reversible	Resource will be partly lost	Achievable	**Low (-)**
Cumulative	Cumulative	Long-Term	Study-Area	Slight	Definite	**Low (-)**	It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area. However, it is imperative that the applicant implement the mitigation measures listed above.			**N/A**
No-Go	Direct	Long-Term	Study Area	Slight	Definite	**Low (-)**	**N/A**			

IMPACT 2: LOSS OF PLANT SPECIES OF CONSERVATION CONCERN

Cause and Comment

Direct Impact (Preferred Alternative)

The clearance of vegetation for the construction of the proposed development could result in the loss of plant Species of Conservation Concern (SCC). However, it should be noted that no threatened SCC have been recorded or are likely to occur within the project area (refer to Section 3.4.3.). Additionally, the development footprint of the proposed development is relatively small and vegetation clearance will be limited to that which is necessary for the construction of the pylons.

Cumulative Impact

SCC have likely already been lost as a result of the existing developments within and surrounding the broader area. As such, the loss of SCC associated with the proposed development will likely contribute to the cumulative loss of non-threatened SCC within the region. However, it should be noted that the development footprint of the proposed development is relatively small. As such, the significance of the cumulative loss of SCC is classified as low negative.

No-Go Alternative

The No-go alternative will not require the clearance of vegetation and will therefore not result in the additional loss of plant SCC. However, it should be noted that the site forms part of the authorised Umsobomvu and Coleskop WEFs. If the proposed development is not approved, SCC could be lost due to the construction of the WEFS and the current land use impacts such as grazing will continue. The No-go Alternative is therefore classified as low negative

Mitigation Measures:

- → A Search and Rescue Operation should be undertaken for protected plant species. In the unlikely event that a population of endangered SCC are found, infrastructure should be shifted to avoid these. Where this is not possible, SCC that are known to survive translocation, must be translocated to the nearest available habitat on the same property.
- → If the translocation or removal of SCC is required, a permit must be obtained from the relevant issuing authority.

Significance Assessment:

Impact	Nature	Duration	Extent	Severity	Likelihood	Significance Before Mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Significance After Mitigation
Preferred	Direct	Permanent	Localised	Slight	May Occur	**Low (-)**	Irreversible	Resource will be partly lost	Achievable	**Low (-)**
Cumulative	Cumulative	Permanent	Study-Area	Slight	May Occur	**Low (-)**	It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area. However, it is imperative that the applicant implement the mitigation measures listed above.			**N/A**
No-Go	Direct	Long-Term	Study Area	Slight	Definite	**Low (-)**	**N/A**			

IMPACT 3: DISTURBANCE OF FAUNAL SPECIES AND LOSS OF FAUNAL HABITAT
Cause and Comment ***Direct Impact (Preferred Alternative)*** During the construction phase, vegetation clearance and associated construction activities (including noise and vehicular movement) could result in the mortality or disturbance of faunal species and the subsequent movement of species out of the area. Additionally, the loss of vegetation coincides with the loss of faunal habitat, which could impact on the feeding, breeding and rearing locales of faunal species within the project area during construction. Other mammal SCC are likely to move away from the areas during construction. ***Cumulative Impact*** The addition of the proposed development will exacerbate the impact on faunal species caused by existing developments and activities (including the traffic, farming, amongst others). However, it should be noted that the footprint of the proposed development is relatively small. Therefore, the cumulative impact is classified as moderate negative. ***No-Go Alternative*** The No-go alternative will not require the clearance of vegetation and will therefore not result in the additional disturbance of faunal species and habitat. However, it should be noted that the site forms part of the authorised Umsobomvu and Coleskop WEFs. If the proposed development is not approved, faunal species are still likely to be disturbed due to the construction of the WEFs. As such, the no-go alternative is classified as moderate negative.
Mitigation Measures: → A Faunal Search and Rescue must be undertaken directly prior to vegetation clearance. → The appointed ECO must be trained in snake removal techniques → ECO to walk ahead of clearing construction machinery and move slow moving species e.g. tortoises and cryptic species out of harm's way and into suitable neighbouring habitat. → Any faunal species that may die as a result of construction must be recorded (photographed, GPS coordinates) and if somewhat intact, preserved and donated to SANBI. → Any faunal species observed onsite must be recorded (photographed, GPS coordinates) and loaded onto iNaturalist. → Staff and contractors are not permitted to capture, collect or eat any faunal species onsite. → It is illegal to remove or kill all frogs, toads, tortoises, lizards, chameleons and snakes within the proposed project area that are listed as ether Schedule I or II on the NCNCA List unless the relevant permit is acquired. It is recommended that construction staff are educated with regards to herpetofauna conservation and that all staff employed by the developer ensure that any herpetofauna encountered are not harmed or killed. → Amphibians and/or reptiles encountered must be allowed to move away from the construction area and a permit is required to remove or relocate these species. Amphibians must be released in the same catchment areas while reptiles must be relocated to directly adjacent areas of the proposed development. → Speed restrictions (40 km per hour is recommended) must be implemented to reduce the chance of road kills, as well as to reduce the amount of dust caused by vehicle movement along the roads. → All reasonable and feasible measures should be implemented to reduce noise in ecologically sensitive areas.
Significance Assessment:

Impact	Nature	Duration	Extent	Severity	Likelihood	Significance Before Mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Significance After Mitigation
Both Layout Alternatives	Direct	Short-term	Study-Area	Moderate	Probable	**MODERATE (-)**	Reversible	Resource will be partly lost	Achievable	**MODERATE (-)**
Cumulative	Cumulative	Short-term	Study-Area	Moderate	Probable	**MODERATE (-)**	It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area. However, it is imperative that the applicant implement the mitigation measures listed above.			**N/A**
No-Go	Direct	Long-Term	Study Area	Moderate	Definite	**MODERATE (-)**	**N/A**			

IMPACT 4: WILDLIFE POACHING

Cause and Comment

Direct Impact (Preferred Alternative)

During the construction phase, the increase in individuals accessing the project area for the proposed development could result in an increase in wildlife poaching (particularly of reptile species).

Cumulative Impact

Wildlife poaching, particularly of reptile species, is a serious problem in the Northern Cape Province. Should the increase in individuals associated with the construction of the proposed development lead to the increase in wildlife poaching, this will exacerbate the loss of faunal species within the broader project area.

No-Go Alternative

The no-go alternative has been classified as Low Negative as wildlife poaching has been identified as an existing impact in the project area.

Mitigation Measures:

- → All individuals should sign a register prior to accessing the construction site, including construction workers.
- → Construction workers must not be housed onsite.
- → No animal shall be killed or injured as a result of the construction of the proposed development and presence of construction staff.

→ The appointed ECO should inquire and undertake an overview inspection of the site for the evidence of snares during the construction phase.
→ No hunting, baiting or trapping shall be allowed within the affected properties or surrounding properties by construction staff.

Significance Assessment:

Impact	Nature	Duration	Extent	Severity	Likelihood	Significance Before Mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Significance After Mitigation
Preferred	Direct/ Indirect	Short-term	Study Area	Moderate	May Occur	**MODERATE (-)**	Reversible	Resource will be partly lost	Achievable	**LOW (-)**
Cumulative	Cumulative	Short-term	Study Area	Moderate	May Occur	**MODERATE (-)**	It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area. However, it is imperative that the applicant implement the mitigation measures listed above.			**N/A**
No-Go	Direct	Long-term	Study area	Moderate	Definite	**LOW (-)**	**N/A**			

IMPACT 5: DISTURBANCE OF SENSITIVE AREAS

Cause and Comment

Direct Impact (Preferred Alternative)

During the construction phase, negligent construction activities within the 100 m regulatory buffer of a drainage line (non-perennial river) could cause the erosion, sedimentation, or subsequent degradation of nearby water courses and the associated riparian vegetation.

Cumulative Impact

Disturbance of sensitive areas such as water courses has already occurred within the broader project area due to the construction of roads, agricultural practises which have caused erosion and degradation of water courses (including drainage lines) and riparian vegetation, amongst other. Therefore, should the proposed development lead to the further disturbance of sensitive areas such as water courses, this could impact the characteristics of the greater catchment area. As such, the cumulative impact associated therewith has been classified as moderate.

No-Go Alternative

Disturbance of sensitive areas such as water courses has already occurred within the broader project area due to the construction of roads, agricultural practises which have caused erosion and degradation of water courses (including drainage lines) and riparian vegetation, amongst other. Therefore, the no-go alternative has been classified as moderate.

Mitigation Measures:

- → It is recommended that the construction area is demarcated and fenced off to prevent the encroach of construction activities into nearby sensitive areas.
- → Stormwater must be managed in accordance with the recommendations outlined in the EMPr to ensure that runoff does not enter nearby surrounding water courses or drainage lines.
- → All erosion control mechanisms should be regularly maintained. The appointed ECO must conduct regular checks for signs of erosion.
- → Re-vegetation of disturbed surfaces must occur immediately after the construction activities have been completed.
- → The necessary Water Use Authorisations must be obtained prior to the commencement of construction.

Significance Assessment:

Impact	Nature	Duration	Extent	Severity	Likelihood	Significance Before Mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Significance After Mitigation
Preferred	Direct/ Indirect	Long-term	Localised	Moderate	May Occur	**MODERATE (-)**	Reversible	Resource will be partially lost	Achievable	**LOW (-)**
Cumulative	Cumulative	Long-term	Localised	Moderate	May Occur	**MODERATE (-)**	It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area. However, it is imperative that the applicant implement the mitigation measures listed above.			**N/A**
No-Go	Existing	Long-term	Localised	Moderate	Definite	**MODERATE (-)**	**N/A**			

IMPACT 6: ESTABLISHMENT OF ALIEN PLANT SPECIES

Cause and Comment

Direct Impact (Preferred Alternative)

The removal of existing natural vegetation creates 'open' habitats which favours the establishment of undesirable vegetation in areas that are typically very difficult to eradicate which could pose a threat to surrounding ecosystems. Failure to successfully rehabilitate land to its natural state will exacerbate this impact.

Cumulative Impact

Scattered alien invasive species have already established in the broader area surrounding the proposed development footprint. Therefore, should the proposed development lead to the further establishment of alien invasive species in the project area, the invasion by alien species could be exacerbated. Considering the relatively small footprint of the proposed development, the cumulative impact associated therewith has been classified as low.

No-Go Alternative

There is already evidence of scattered alien invasive species in the broader area surrounding the proposed development footprint. Under the no-go alternative these species are likely to continue multiplying if left unchecked. The current no-go alternative is thus low negative.

Mitigation Measures:

- → The site must be checked regularly for the presence of alien invasive species.
- → The alien Invasive Management Plan compiled for the authorised Umsobomvu and Coleskop WEFs must be implemented and adhered to.
- → The ECO must create a list with accompanying photographs of possible alien invasive species that could occur on site prior to construction. This photo guide must be used to determine if any alien invasive species are present.
- → Any alien seedlings which establish within the construction area must be removed and disposed of as per the Working for Water Guidelines relating to the management of invasive alien plants.

Significance Assessment:

Impact	Nature	Duration	Extent	Severity	Likelihood	Significance Before Mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Significance After Mitigation
Preferred	Direct/ Indirect	Long-Term	Study Area	Moderate	May Occur	**MODERATE (-)**	Reversible	Resource will be partly lost	Achievable	**LOW (-)**
Cumulative	Cumulative	Long-Term	Study Area	Slight	May Occur	**LOW (-)**	It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area.			**N/A**

							However, it is imperative that the applicant implement the mitigation measures listed above.	
No-Go	Existing	Long-Term	Study Area	Slight	Probable	**Low (-)**	**N/A**	

OPERATIONAL PHASE

IMPACT 7: ESTABLISHMENT OF ALIEN PLANT SPECIES

Cause and Comment

Direct Impact (Preferred Alternative)

During the operational phase, failure to remove and manage alien vegetation during construction could result in the permanent establishment of alien vegetation in the study area. Failure to successfully rehabilitate land to its natural state will exacerbate this impact and lead to the permanent degradation of ecosystems as well as allow invasion by alien plant species.

Cumulative Impact

Scattered alien invasive species have already established in the broader area surrounding the proposed development footprint. Therefore, should the proposed development lead to the further establishment of alien invasive species in the project area, the invasion of alien species could be exacerbated. Considering the relatively small footprint of the proposed development, the cumulative impact associated therewith has been classified as low.

No-Go Alternative

There is already evidence of scattered alien invasive species surrounding the proposed development footprint. Under the no-go alternative these species are likely to continue multiplying if left unchecked. The current no-go alternative is thus low negative.

Mitigation Measures:

- → The site must be checked regularly for the presence of alien invasive species. Any alien seedlings which establish within the site must be removed and disposed of as per the Working for Water Guidelines relating to the management of invasive alien plants
- → The alien Invasive Management Plan compiled for the authorised Umsobomvu and Coleskop WEFs must be implemented and adhered to during the operational phase.
- → Monitoring of the establishment of alien seedlings within the boundaries of the proposed development should continue throughout the operational phase. Any alien seedlings should be removed and disposed of as per the Working for Water Guidelines relating to the management of invasive alien plants.
- → The Rehabilitation Management Plan compiled for the authorised Umsobomvu and Coleskop WEFs must be implemented and adhered to during the Operational Phase.

Significance Assessment:

Impact	Nature	Duration	Extent	Severity	Likelihood	Significance Before Mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Significance After Mitigation
Preferred	Direct/ Indirect	Long-term	Study Area	Moderate	May Occur	**MODERATE (-)**	Reversible	Resource will be lost	Achievable	**LOW (-)**
Cumulative	Cumulative	Long-Term	Study Area	Slight	May Occur	**LOW (-)**	It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area. However, it is imperative that the applicant implement the mitigation measures listed above.			**N/A**
No-Go	Existing	Long-Term	Study Area	Slight	Probable	**LOW (-)**	**N/A**			

IMPACT 8: IMPACTS OF NOISE AND LIGHTING ON FAUNAL POPULATIONS

Cause and Comment

Direct Impact (Preferred Alternative)

During the operational phase, noise and lighting associated with the proposed development (including maintenance activities) could cause a disturbance to surrounding faunal populations within the project area.

Cumulative Impact

The addition of the noise and lighting associated with the proposed development will exacerbate the impact on faunal species caused by existing developments and activities (including the traffic).

No-Go Alternative

The nearby roads, and the noise and lighting associated with the passing traffic, already impacts surrounding faunal population. As such, the no-go alternative is low negative.

Mitigation Measures:

- → Regular maintenance and checks of the infrastructure must be undertaken.
- → The mitigation measures specified in the Noise Impact Assessment conducted for the Coleskop and Umsobomvu WEFs must be implemented and adhered to during the operational phase of the proposed development.
- → External lighting should be avoided where possible. However, if required, lighting should be down lighting and low wattage
- → Minimise access to the site.

Significance Assessment:										
Impact	**Nature**	**Duration**	**Extent**	**Severity**	**Likelihood**	**Significance Before Mitigation**	**Reversibility**	**Irreplaceable Loss**	**Mitigation Potential**	**Significance After Mitigation**
Preferred	Direct	Long-term	Localised	Slight	Definite	**Low (-)**	Reversible	Resource will not lost	Achievable	**Low (-)**
Cumulative	Cumulative	Long-Term	Localised	Slight	May Occur	**Low (-)**	It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area. However, it is imperative that the applicant implement the mitigation measures listed above.			**N/A**
No-Go	Existing	Long-Term	Study Area	Slight	Definite	**Low (-)**	**N/A**			

DECOMMISSIONING PHASE

It is highly unlikely that the proposed Umsobomvu 400 kV LILO OHL will be decommissioned in the near future. However, should the infrastructure be decommissioned in the long-term, the impacts associated with the decommissioning phase are likely to be similar to those identified for the construction phase. The mitigation measures and recommendations specified for the construction phase must therefore be implemented during the decommissioning of the proposed Umsobomvu 400 kV LILO OHL should this occur and rehabilitation of the site must be undertaken.

6 IMPACT STATEMENT, CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

The proposed Umsobomvu 400 kV LILO OHL will result in the loss of approximately 10-15m^2 per pylon within the within the Eastern Upper Karoo vegetation and 10-15m^2 per pylon within the Besemkaree Koppies Shrubland. Pylons are to be between 200m and 250m apart.

Eight (8) impacts were identified for the proposed development; five (5) impacts were classified as moderate and three (3) impacts were classified as low prior to mitigation. If mitigation measures are implemented, these impacts will be reduced to one (1) moderate impact and seven (7) low impacts. No high or very high impacts were identified for the proposed development.

6.2 CONDITIONS OF EMPR, EA AND MONITORING

All management / mitigation measures identified for the impacts associated with the proposed development must be incorporated into the EMPr and implemented during the relevant phases of the proposed Umsobomvu 400 kV LILO OHL (please refer to Section 5.1 above for the recommended mitigation measures associated with each impact identified). Specific mitigation measures and recommendations that should be incorporated into the EA (if granted) include:

- All necessary permitting and authorisations must be obtained prior to the commencement of any construction activities.
- A suitably qualified ECO must be appointed prior to the commencement of the construction phase.
- A Search and Rescue Operation should be undertaken for protected plant species. In the unlikely event that a population of endangered SCC are found, infrastructure should be shifted to avoid these. Where this is not possible, SCC that are known to survive translocation, must be translocated to the nearest available habitat on the same property.
- If the translocation or removal of SCC is required, a permit must be obtained from the relevant issuing authority.
- A Faunal Search and Rescue must be undertaken directly prior to vegetation clearance.
- ECO to walk ahead of clearing construction machinery and move slow moving species e.g. tortoises and cryptic species out of harm's way and into suitable neighbouring habitat.
- An Erosion Management Plan/Method Statement must be developed prior to the commencement of construction activities in order to mitigate the unnecessary loss of topsoil and runoff.

- The Alien Invasive Vegetation Management compiled for the Umsobomvu WEF must be implemented and adhered to during all phases of the proposed development.
- The Rehabilitation Plan compiled for the Umsobomvu WEF must be implemented. Only indigenous plant species typical of the local vegetation should be used for rehabilitation purposes.

6.3 Ecological Statement and Opinion of the Specialist

The proposed development is deemed environmentally acceptable, provided the mitigation measures and recommendations specified in this report are implemented and adhered to. Specific mitigation measures, as specified above, should be incorporated into the EA, if granted, for implementation during the relevant phases of the development.

Furthermore, the development footprint of the proposed Umsobomvu 400 kV LILO OHL must be demarcated to prevent any encroachment of construction or operational activities into surrounding natural areas. Minor location deviations from the proposed works is deemed acceptable but the footprint may not be made larger.

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APPENDIX 1: LIST OF PLANT SPECIES OCCURRING WITHIN THE PROJECT AREA.

Table A.1 Plant species occurring within the project area.

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
INDIGENOUS PLANT SPECIES								
	Aizoaceae	*Ruschia sp.*	LC	Schedule 4	Schedule 2	-	-	All sample sites
	Aizoaceae	*Chasmatophyllum musculinum*	LC	Schedule 4	Schedule 2	-	-	S2, S3, S4

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Aizoaceae	*Stomatium middelburgense*	LC	Schedule 4	Schedule 2	-	-	S2
	Aizoaceae	*Trichodiadema pomeridianum*	LC	Schedule 4	Schedule 2	-	-	S1
	Amaryllidaceae	*Brunsvigia radulosa*	LC	Schedule 4	Schedule 2	-	-	S2; S3

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Anacardiaceae	*Searsia ciliata*	LC	-	-	-	-	S3; S4
	Anacardiaceae	*Searsia erosa*	LC	-	-	-	-	All sample sites
	Anacardiaceae	*Searsia pallens*	LC	-	-	-	-	S1; S2; S4

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Anacardiaceae	*Searsia pyroides*	LC	-	-	-	-	S1; S3
	Apocynaceae	*Asclepias crispa*	LC	Schedule 4	Schedule 2	-	-	S2

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Apocynaceae	*Gomphocarpus fruticosus*	LC	Schedule 4	Schedule 2	-	-	All sample sites
	Asparagaceae	*Asparagus suaveolens*	LC	-	-	-	-	S3; S4

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Asphodelaceae	*Kniphofia stricta*	LC	Schedule 4	Schedule 2	-	-	S3
	Aspleniaceae	*Asplenium sp.*	LC	-	-	-	-	S3
	Asteraceae	*Chrysocoma ciliata*	LC	-	-	-	-	All sample sites

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Asteraceae	*Eriocephalus ericoides*	LC	-	-	-		S1; S2
	Asteraceae	*Pentzia globosa*	LC	-	-	-	-	All sample sites
	Asteraceae	*Arctotheca prostrata*	LC	-	-	-	-	S1

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Asteraceae	*Senecio burchellii*	LC	-	-	-	-	All sample sites
	Asteraceae	*Felicia muricata*	LC	-	-	-	-	All sample sites
	Asteraceae	*Helichrysum sp.*	LC	-	-	-	-	All sample sites

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Asteraceae	*Helichrysum zeyheri*	LC	-	-	-	-	All sample sites
	Asteraceae	*Berkheya sp.*	LC	-	-	-	-	S1
	Asteraceae	*Gerbera sp.*	LC	-	-	-	-	S2; S3; S4

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Asteraceae	*Gazania sp.*	LC	-	-	-	-	S1
	Asteraceae	*Elytropappus rhinocerotis*	LC	-	-	-	-	All sample sites

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Boraginaceae	*Anchusa capensis*	LC	-	-	-	-	S1
	Brassicaceae	*Heliophila sp.*	LC	-	-	-	-	S3

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Brassicaceae	*Heliophila suavissima*	LC	-	-	-	-	S3
	Caryophyllaceae	*Silene undulat*	LC	-	-	-	-	S3
	Campanulaceae	*Wahlenbergia nodosa*	LC	-	-	-	-	S3

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Campanulaceae	*Wahlenbergia albens*	LC	-	-	-	-	S4
	Commelinaceae	*Commelina africana*	LC	-	-	-	-	All Sample Sites
	Convolvulaceae	*Convolvulus sagittatus*	LC	-	-	-	-	S3
	Crassulaceae	*Crassula tetragona*	LC	-	Schedule 2	-	-	S2

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Crassulaceae	*Crassula setulosa*	LC	-	Schedule 2	-	-	S3
	Crassulaceae	*Cotyledon orbiculata*	LC	-	Schedule 2	-	-	S3
	Cyperaceae	*Cyperus congestus*	LC	-	-	-	-	All sample sites

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Cyperaceae	*Cyperus usitatus*	LC	-	-	-	-	S1
	Cyperaceae	*Cyperus marginatus*	LC	-	-	-	-	S1; S3
	Ebenaceae	*Euclea crispa*	LC	-	-	-	-	S2; S3; S4

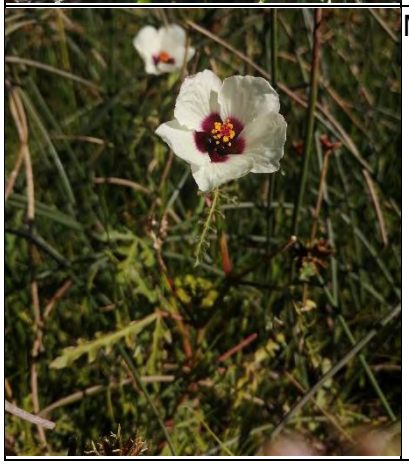
PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Ebenaceae	*Diospyros austro-africana*	LC	-	-	-	-	All sample sites
	Ebenaceae	*Diospyros lycioides*	LC	-	-	-	-	All sample sites

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Euphorbiaceae	*Euphorbia mauritanica*	LC	-	Schedule 2	-	-	S1
	Fabaceae	*Indigofera alternans*	LC	-	-	-	-	S3
	Fabaceae	*Melolobium candicans*	LC	-	-	-	-	S2; S3; S4

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Geraniaceae	*Pelargonium minimum*	LC	-	Schedule 1	-	-	S3
	Geraniaceae	*Pelargonium abrotanifolium*	LC	-	Schedule 1	-	-	S3
	Geraniaceae	*Pelargonium ranunculophyllum*	LC	-	Schedule 1	-	-	S3

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Geraniaceae	*Pelargonium sidoides*		-	Schedule 1	-	-	S3; S4
	Hyacinthaceae	*Massonia sp.*	LC	-	-	-	-	S1
	Iridaceae	*Moraea polystachya*	LC	Schedule 4	Schedule 2	-	-	S1

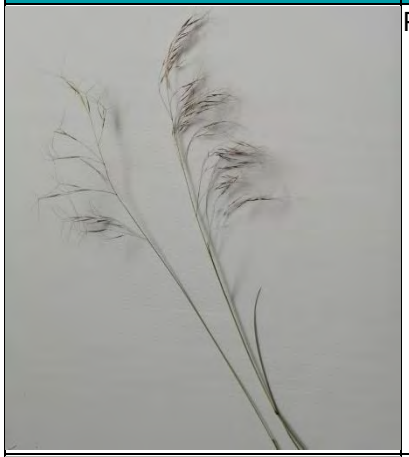
PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Juncaceae	*Juncus rigidus*	LC	-	-	-	-	S3
	Lamiaceae	*Mentha longifolia*	LC	-	-	-	-	S4

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Lamiaceae	*Stachys linearis*	LC	-	-	-	-	S1; S4
	Malvaceae	*Hibiscus trionum*	Not evaluated	-	-	-	-	S1; S4

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Malvaceae	*Hermannia multiflora*	LC	-	-	-	-	All sample sites
	Melianthaceae	*Melianthus comosus*	LC	-	-	-	-	S1

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Molluginaceae	*Limeum aethiopicum*	LC	-	-	-	-	S3
	Oxalidaceae	*Oxalis sp.*	LC	-	Schedule 2	-	-	All sample sites
	Poaceae	*Eragrostis obtusa*	LC	-	-	-	-	All sample sites

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Poaceae	*Themeda triandra*	LC	-	-	-	-	All sample sites
	Poaceae	*Tragus koelerioides*	LC					S1

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Poaceae	*Aristida diffusa*	LC	-	-	-	-	All sample sites
	Poaceae	*Aristida congesta*	LC	-	-	-	-	All sample sites

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Poaceae	*Cenchrus ciliaris*	LC	-	-	-	-	S1
	Poaceae	*Cymbopogon caesius*	LC	-	-	-	-	S2; S3; S4
	Poaceae	*Cynodon incompletus*	LC	-	-	-	-	All sample sites

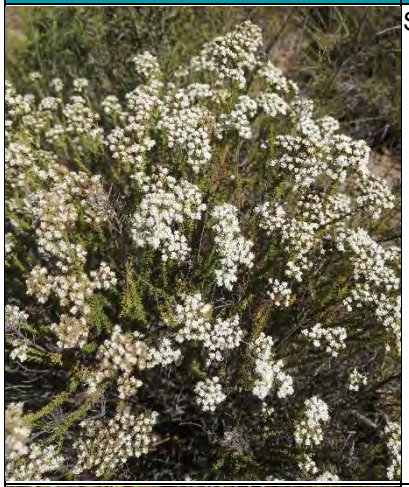
PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Poaceae	*Eragrostis curvula*	LC	-	-	-	-	All sample sites
	Poaceae	*Eragrostis sp.*	LC	-	-	-	-	All sample sites

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Poaceae	*Digitaria eriantha*	LC	-	-	-	-	All sample sites
	Poaceae	*Enneapogon scoparius*	LC	-	-	-	-	All sample sites

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Poaceae	*Chloris virgata*	LC	-	-	-	-	S1
	Pteridaceae	*Cheilanthes sp.*	LC	-	-	-	-	S3

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Rhamnaceae	*Rhamnus prinoides*	LC	-	-	-	-	S1
	Rosaceae	*Rubus ludwigii*	LC	-	-	-	-	S3

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Scrophulariaceae	*Diascia* cf *capsularis*	LC	Schedule 4	Schedule 2	-	-	S3
	Scrophulariaceae	*Chaenostoma halimifolium*	LC	-	-	-	-	S3

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Scrophulariaceae	*Selago saxatilis*	LC	-	-	-	-	All sample sites
	Scrophulariaceae	*Jamesbrittenia filicaulis*	LC	-	Schedule 2	-	-	S2; S3; S4

PHOTOGRAPH	FAMILY	SPECIES	SA RED DATA LIST	PNCO	NC NCA	PROTECTED TREES	NEMBA	SAMPLING SITE
	Solanaceae Solanaceae	*Lycium sp.*	LC	-	-	-	-	S1

PHOTOGRAPH	FAMILY	SPECIES	CARA	NEM:BA
ALIEN SPECIES				
	Agavaceae	*Agave americana*	Not Listed	Not Listed

PHOTOGRAPH	FAMILY	SPECIES	CARA	NEM:BA
ALIEN SPECIES				
	Asteraceae	*Tagetes* cf *minuta*	Not Listed	Not Listed
	Papaveraceae	*Argemone ochroleuca*	Category 1	Not Listed

PHOTOGRAPH	FAMILY	SPECIES	CARA	NEM:BA
ALIEN SPECIES				
	Poaceae	*Paspalum dilatatum*	Not Listed	Not Listed
	Salicaceae	*Populus sp,*	Category 2	Not Listed

APPENDIX 2: LIST OF HERPETOFAUNA SPECIES.

Table A2: List of Herpetofauna species which are likely to occur within the proposed project area (IUCN).

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS (IUCN 2021, MEASEY 2011, SANBI 2014)	CITES	NCNCA	PNCO	RECORDED ON SITE (YES/NO)
Amphibians						
Southern Pygmy Toad	*Poyntonophrynus vertebralis*	LC	-	Schedule II	Schedule 2	-
Karoo Toad	*Vandijkophrynus gariepensis*	LC	-	Schedule II	Schedule 2	-
Bubbling Kassina	*Kassina senegalensis*	LC	-	Schedule II	Schedule 2	-
Common Platanna	*Xenopus laevis*	LC	-	Schedule II	Schedule 2	-
Cape River Frog	*Amietia fuscigula*	LC	-	Schedule II	Schedule 2	-
Delalande's River Frog	*Amietia delalandii*	LC	-	Schedule II	Schedule 2	-
Poynton's River Frog	*Amietia poyntoni*	LC	-	Schedule II	Schedule 2	-
Common Caco	*Cacosternum boettgeri*	LC	-	Schedule II	Schedule 2	-
Tandy's Sand Frog	*Tomopterna tandyi*	LC	-	Schedule II	Schedule 2	-

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS (IUCN 2021, MEASEY 2011, SANBI 2014)	CITES	NCNCA	PNCO	RECORDED ON SITE (YES/NO)
Giant Bullfrog	*Pyxicephalus adspersus*	NT	-	Schedule I	Schedule 2	-
Gray's Stream Frog	*Strongylopus grayii*	LC	-	Schedule II	Schedule 2	-
Terrapins & Tortoises						
Marsh Terrapin	*Pelomedusa galeata*	LC	-	-	-	-
Greater Padloper	*Homopus femoralis*	LC	Appendix II	Schedule II	Schedule 2	Yes
Tent Tortoise	*Psammobates tentorius*	NT	Appendix II	Schedule II	Schedule 2	-
Geckos						
Marico Gecko	*Pachydactylus mariquensis*	LC	-	-	Schedule 2	-
Spotted Gecko	*Pachydactylus maculatus*	LC	-	-	Schedule 2	-
Golden Spotted Gecko	*Pachydactylus oculatus*	LC	-	-	Schedule 2	-
Karoo Flat Gecko	*Afroedura karroica*	LC	-	-	Schedule 2	-
Agamas						

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS (IUCN 2021, MEASEY 2011, SANBI 2014)	CITES	NCNCA	PNCO	RECORDED ON SITE (YES/NO)
Southern Rock Agama	*Agama atra*	LC	-	-	Schedule 2	-
Skinks						
Short-headed Legless Skink	*Acontias breviceps*	LC	-	-	Schedule 2	-
Red-sided Skink	*Trachylepis homalocephala*	LC	-	-	Schedule 2	-
Speckled Rock Skink	*Trachylepis punctatissima*	LC	-	-	Schedule 2	-
Lizards						
Burchell's Sand Lizard	*Pedioplanis burchelli*	LC	-	Schedule II	Schedule 2	-
Karoo Girdled Lizard	*Karusaurus polyzonus*	LC	Appendix II	Schedule I	Schedule 2	-
Cape Crag Lizard	*Pseudocordylus microlepidotus*	LC	Appendix II	Schedule II	Schedule 2	-
Chameleons						
Eastern Cape Dwarf Chameleon	*Bradypodion ventrale*	LC	Appendix II	Schedule I	Schedule 2	-
Snakes						

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS (IUCN 2021, MEASEY 2011, SANBI 2014)	CITES	NCNCA	PNCO	RECORDED ON SITE (YES/NO)
Rhombic Egg-eater	*Dasypeltis scabra*	LC	-	Schedule II	Schedule 2	-
Aurora House Snake	*Lamprophis aurora*	LC	-	Schedule II	Schedule 2	-
Spotted Rock Snake	*Lamprophis guttatus*	LC	-	Schedule II	Schedule 2	-
Sundevall's Shovel-snout	*Prosymna sundevallii*	LC	-	Schedule II	Schedule 2	-
Montane Grass Snake	*Psammophis crucifer*	LC	-	Schedule III	Schedule 2	-

APPENDIX 3: LIST OF MAMMAL SPECIES.

Table A3: List of mammal species which are likely to occur within the proposed project area (IUCN).

COMMON NAME	SCIENTIFIC NAME	REGIONAL RED LIST STATUS (2016)	ENDEMIC	TOPS LISITNG (2007)	NCNCA	PNCO
Carnivora						
Caracal	*Caracal caracal*	LC	No	-	Schedule IV	-
African Wildcat	*Felis silvestris*	LC	No	-	Schedule I	-
Black-footed Cat	*Felis nigripes*	VU	No	Protected	Schedule I	Schedule 2
Bat-eared Fox	*Otocyon megalotis*	LC	No	-	Schedule I	Schedule 2
Cape Fox	*Vulpes chama*	LC	No	Protected	Schedule I	Schedule 2
Black-backed Jackal	*Canis mesomelas*	LC	No	-	Schedule IV	-
Aardwolf	*Proteles cristata*	LC	No	-	Schedule I	Schedule 2
Brown Hyaena	*Parahyaena brunnea*	NT	No	Protected	Schedule I	Schedule 2
Small-spotted Genet	*Genetta genetta*	LC	No	-	Schedule II	-
Striped Polecat	*Ictonyx striatus*	LC	No	-	Schedule I	-

COMMON NAME	SCIENTIFIC NAME	REGIONAL RED LIST STATUS (2016)	ENDEMIC	TOPS LISITNG (2007)	NCNCA	PNCO
African Striped Weasel	*Poecilogale albinucha*	NT	No	-	Schedule I	Schedule 2
Cape Clawless Otter	*Aonyx capensis*	NT	No	Protected	Schedule II	-
Honey Badger	*Mellivora capensis*	LC	No	Protected	Schedule I	Schedule 2
Yellow Mongoose	*Cynictis penicillate*	LC	No	-	Schedule II	-
Cape Grey Mongoose	*Herpestes pulverulentus*	LC	**Near**	-	Schedule II	-
Suricate	*Surcatta suricatta*	LC	No	-	Schedule II	-
Perissodactyla						
Southern White Rhino	*Ceratotherium simum*	NT	**Near**	Protected	Schedule I	Schedule 1
Artiodactyla						
Springbok	*Antidorcas marsupialis*	LC	No	-	Schedule II	Schedule 2
Steenbok	*Raphicerus campestris*	LC	No	-	Schedule II	Schedule 2
Blesbok	*Damaliscus pygargus*	LC	No	-	Schedule II	Schedule 2
Red Hartebeest	*Alcelaphus buselaphus caama*	LC	No	-	Schedule II	Schedule 2

COMMON NAME	SCIENTIFIC NAME	REGIONAL RED LIST STATUS (2016)	ENDEMIC	TOPS LISITNG (2007)	NCNCA	PNCO
African Buffalo	*Syncerus caffer*	LC	No	-	Schedule II	Schedule 2
Black Wildebeest	*Connochaetus gnou*	LC	No	Protected	Schedule II	Schedule 2
Common Eland	*Tragelaphus oryx*	LC	No	-	Schedule II	Schedule 2
Common Duiker	*Sylvicapra grimmia*	LC	No	-	Schedule II	Schedule 2
Primates						
Vervet Monkey	*Chlorocebus pygerythrus*	LC	No	-	Schedule IV	-
Chacma Baboon	*Papio ursinus*	LC	No	-	Schedule IV	-
Tubulidentata						
Aardvark	*Orycteropus afer*	LC	No	-	Schedule I	Schedule 2
Hyracoidea						
Rock Hyrax	*Procavia capensis*	LC	No	-	Schedule II	-
Rodentia						
Karoo Four-striped Grass Mouse	*Rhabdomys intermedius*	LC	**Yes**	-	Schedule II	-

COMMON NAME	SCIENTIFIC NAME	REGIONAL RED LIST STATUS (2016)	ENDEMIC	TOPS LISITNG (2007)	NCNCA	PNCO
Karoo Bush Rat	*Otomys unisulcatus*	LC	**Yes**	-	Schedule II	-
Slogget's Vlei Rat	*Otomys sloggetti*	LC	**Yes**	-	Schedule II	-
Grant's Rock Mouse	*Micaelamys granti*	LC	**Yes**	-	Schedule II	-
Namaqua Rock Mouse	*Micaelamys namaquensis*	LC	No	-	Schedule II	-
Cape Short-eared Gerbil	*Desmodillus auricularis*	LC	No	-	Schedule II	-
Highveld Gerbil	*Gerbilliscus brantsii*	LC	No	-	Schedule II	-
Hairy-footed Gerbil	*Gerbillurus paeba*	LC	No	-	Schedule II	-
Brant's Whistling Rat	*Parotomys brantsii*	LC	No	-	Schedule II	-
Multimammate Mouse	*Mastomys coucha*	LC	No	-	Schedule II	-
Spectacled Dormouse	*Graphiurus ocularis*	NT	**Yes**	-	Schedule II	-
White-tailed Rat	*Mystromys albicaudatus*	VU	**Yes**	-	Schedule II	-
Large-eared Mouse	*Malacothrix typica*	LC	No	-	Schedule II	-
Common Mole-rat	*Cryptomys hottentotus*	LC	**Yes**	-	Schedule II	-

COMMON NAME	SCIENTIFIC NAME	REGIONAL RED LIST STATUS (2016)	ENDEMIC	TOPS LISITNG (2007)	NCNCA	PNCO
Cape Porcupine	*Hystrix africaeaustralis*	LC	No	-	Schedule II	-
Cape Ground Squirrel	*Xerus inauris*	LC	No	-	Schedule II	-
Springhare	*Pedetes capensis*	LC	No	-	Schedule II	-
Lagomorpha						
Cape Hare	*Lepus capensis*	LC	No	-	Schedule II	-
Hewitt's Red Rock Rabbit	*Pronolagus saundersiae*	LC	No	-	Schedule II	-
Insectivora						
Reddish-grey Musk Shrew	*Crocidura cyanea*	LC	No	-	Schedule II	Schedule 2
Lesser Dwarf Shrew	*Suncus varilla*	LC	No	-	Schedule II	Schedule 2
Karoo Round-eared Sengi	*Macroscelides proboscideus*	LC	No	-	Schedule II	Schedule 2
Cape Rock Sengi	*Elephantulus edwardii*	LC	**Yes**	-	Schedule II	Schedule 2
Eastern Rock Sengi	*Elephantulus myurus*	LC	No	-	Schedule II	Schedule 2
Western Rock Sengi	*Elephantulus rupestris*	LC	No	-	Schedule II	Schedule 2

APPENDIX 4: IMPACT RATING SCALE

Pre-Mitigation Evaluation Criteria

This rating scale adopts four (4) key factors to determine the overall significance of the impact prior to mitigation:

1. **Temporal Scale**: This scale defines the duration of any given impact over time. This may extend from the short-term (less than 5 years, equivalent to the construction phase) to permanent. Generally, the longer the impact occurs the greater the significance of any given impact.
2. **Spatial Scale:** This scale defines the spatial extent of any given impact. This may extend from the local area to an impact that crosses international boundaries. The wider the impact extends, the more significant it is likely to be.
3. **Severity/Benefits Scale:** This scale defines how severe negative impacts would be, or how beneficial positive impacts would be. This negative/positive scale is critical in determining the overall significance of any impacts.
4. **Likelihood Scale:** This scale defines the risk or chance of any given impact occurring. While many impacts generally do occur, there is considerable uncertainty in terms of others. The scale varies from unlikely to definite, with the overall impact significance increasing as the likelihood increases.

Table A5: Pre-Mitigation Evaluation Criteria.

TEMPORAL SCALE		
Short term	Less than 5 years	
Medium term	Between 5-20 years	
Long term	Between 20 and 40 years (a generation) and from a human perspective also permanent	
Permanent	Over 40 years and resulting in a permanent and lasting change that will always be there	
SPATIAL SCALE		
Localised	At localised scale and a few hectares in extent	
Study Area	The proposed site and its immediate environs	
Regional	District and Provincial level	
National	Country	
International	Internationally	
SEVERITY SCALE	SEVERITY	BENEFIT
Slight	Slight impacts on the affected system(s) or party(ies)	Slightly beneficial to the affected system(s) and party(ies)
Moderate	Moderate impacts on the affected system(s) or party(ies)	Moderately beneficial to the affected system(s) and party(ies)
Severe/ Beneficial	Severe impacts on the affected system(s) or party(ies)	A substantial benefit to the affected system(s) and party(ies)

Very Severe/ Beneficial	Very severe change to the affected system(s) or party(ies)	A very substantial benefit to the affected system(s) and party(ies)
LIKELIHOOD SCALE		
Unlikely	The likelihood of these impacts occurring is slight	
May Occur	The likelihood of these impacts occurring is possible	
Probable	The likelihood of these impacts occurring is probable	
Definite	The likelihood is that this impact will definitely occur	

Table A6: Significance Descriptions.

SIGNIFICANCE RATE		DESCRIPTION
LOW NEGATIVE	LOW POSITIVE	*Impacts of low significance are typically acceptable impacts for which mitigation is desirable but not essential. The impact by itself is insufficient, even in combination with other low impacts, to prevent the development being approved. These impacts will result in negative medium to short term effects on the natural environment or on social systems.*
MODERATE NEGATIVE	MODERATE POSITIVE	*Impacts of moderate significance are impacts that require mitigation. The impact is insufficient by itself to prevent the implementation of the project but in conjunction with other impacts may prevent its implementation. These impacts will usually result in a negative medium to long-term effect on the natural environment or on social systems.*
HIGH NEGATIVE	HIGH POSITIVE	*Impacts that are rated as being high are serious impacts and may prevent the implementation of the project if no mitigation measures are implemented, or the impact is very difficult to mitigate. These impacts would be considered by society as constituting a major and usually long-term change to the environment or social systems and result in severe effects.*
VERY HIGH NEGATIVE	VERY HIGH POSITIVE	*Impacts that are rated as very high are very serious impact which may be sufficient by itself to prevent the implementation of the project. The impact may result in permanent change. Very often these impacts are unmitigable and usually result in very severe effects or very beneficial effects.*

Post-Mitigation Criteria

Once mitigation measures are proposed, the following three (3) factors are then considered to determine the overall significance of the impact after mitigation.

1. **Reversibility Scale**: This scale defines the degree to which an environment can be returned to its original/partially original state.
2. **Irreplaceable loss Scale:** This scale defines the degree of loss which an impact may cause.
3. **Mitigation potential Scale:** This scale defines the degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

Table 8.3: Post-Mitigation Criteria.

REVERSIBILITY	
Reversible	*The activity will lead to an impact that can be reversed provided appropriate mitigation measures are implemented.*
Irreversible	*The activity will lead to an impact that is permanent regardless of the implementation of mitigation measures.*
IRREPLACEABLE LOSS	
Resource will not be lost	*The resource will not be lost/destroyed provided mitigation measures are implemented.*
Resource will be partly lost	*The resource will be partially destroyed even though mitigation measures are implemented.*
Resource will be lost	*The resource will be lost despite the implementation of mitigation measures.*
MITIGATION POTENTIAL	
Easily achievable	*The impact can be easily, effectively and cost effectively mitigated/reversed.*
Achievable	*The impact can be effectively mitigated/reversed without much difficulty or cost.*
Difficult	*The impact could be mitigated/reversed but there will be some difficultly in ensuring effectiveness and/or implementation, and significant costs.*
Very Difficult	*The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly.*

The following assumptions and limitations are inherent in the rating methodology:

- **Value Judgements**: Although this scale attempts to provide a balance and rigor to assessing the significance of impacts, the evaluation relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society.
- **Cumulative Impacts**: These affect the significance rating of an impact because it considers the impact in terms of both on-site and off-site sources. This is particularly problematic in terms of impacts beyond the scope of the proposed development and the BA. For this reason, it is important to consider impacts in terms of their cumulative nature.
- **Seasonality**: Certain impacts will vary in significance based on seasonal change. Thus, it is difficult to provide a static assessment. Seasonality will need to be implicit in the temporal scale and, with management measures being imposed accordingly (e.g. dust suppression measures being implemented during the dry season).

APPENDIX 5: CURRICULUM VITAE OF PROJECT TEAM

APPENDIX 6: SPECIALIST DECLARATIONS