FINAL BASIC ASSESSMENT REPORT

PROPOSED MULILO NEWCASTLE WIND POWER GRID CONNECTION AND ASSOCIATED INFRASTRUCTURE NEAR NEWCASTLE, KWAZULU NATAL.

DEDTEA REFERENCE NUMBER: DC25/0003/2023: KZN/EIA/0002110/2024

AUGUST 2024

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PREPARED FOR:

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AUGUST 2024

INFORMATON REQUIRED BY THE COMPETENT AUTHORITY

The Environmental Impact Assessment (EIA) Regulations, promulgated in terms of the National Environmental Management Act (NEMA) (Act no. 107 of 1998, as amended) dated 8th of December 2014, were amended in April 2017. In terms of Appendix 1 (3) of the EIA Regulations (2014, and subsequent 2017 amendments), a Basic Assessment Report (BAR) must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include –

SCOPE OF ASSESSMENT AND CONTENT OF BASIC ASSESSMENT REPORTS	
(a) Details of - (i) The EAP who prepared the report; and (ii) The expertise of the EAP, including a curriculum vitae.	**Chapter 1 and Appendix A**
(b) The location of the activity, including – (i) The 21-digit Surveyor General code of each cadastral land parcel; (ii) Where available, the physical address and farm name; and (iii) Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	**Chapter 2**
(c) A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale, or, if it is – (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	**Chapter 2**
(d) A description of the scope of the proposed activity, including – (i) All listed and specified activities triggered and being applied for; and (ii) A description of the activities to be undertaken, including associated structures and infrastructure.	**Chapter 2**
(e) A description of the policy and legislative context within which the development is proposed including (i) An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) How the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks and instruments.	**Chapter 4**
(f) A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.	**Chapter 3**
(g) A motivation for the preferred site, activity and technology alternative.	**Chapter 7**
(h) A full description of the process followed to reach the proposed preferred alternative within the site, including – (i) Details of all the alternatives considered; (ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) The impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts – aa. Can be reversed; bb. May cause irreplaceable loss of resources; and cc. Can be avoided, managed or mitigated; (vi) The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	**Chapter 5, Chapter 6, Chapter 7, Chapter 8, Chapter 9 and Chapter 10**

SCOPE OF ASSESSMENT AND CONTENT OF BASIC ASSESSMENT REPORTS	
(vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) The possible mitigation measures that could be applied and level of residual risk; (ix) The outcome of the site selection matrix; (x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and (xi) A concluding statement indicating the preferred alternatives, including the preferred location of the activity.	
(i) A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including – (i) A description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.	**Chapter 9**
(j) An assessment of each identified potentially significant impact and risk, including – (i) Cumulative impacts; (ii) The nature, significance and consequences of the impact and risk; (iii) The extent and duration of the impact and risk; (iv) The probability of the impact and risk occurring; (v) The degree to which the impact and risk can be reversed; (vi) The degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) The degree to which the impact and risk can be avoided, managed, or mitigated.	**Chapter 9 and Appendix G**
(k) Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report.	**Chapter 8 and Chapter 9**
(l) An environmental impact statement which contains – (i) A summary of the key findings of the environmental impact assessment; (ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	**Chapter 10 and Chapter 12**
(m) Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for inclusion in the EMPr.	**Chapter 12**
(n) Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of the authorisation.	***None to date***
(o) A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed.	**Chapter 12**
(p) A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	**Chapter 12**
(q) Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post-construction monitoring requirements finalised.	*Not Applicable*
(r) An undertaking under oath or affirmation by the EAP in relation to – (i) The correctness of the information provided in the reports; (ii) The inclusion of comments and inputs from stakeholders and I&APs; (iii) The inclusion of inputs and recommendations from the specialist reports where relevant; and	**Appendix B**

SCOPE OF ASSESSMENT AND CONTENT OF BASIC ASSESSMENT REPORTS	
(iv) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	
(s) Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post-decommissioning management of negative environmental impacts.	*None to date*
(t) Any specific information that may be required by the competent authority.	**Appendix I**
(u) Any other matters required in terms of section 24 (4)(a) and (b) of the Act.	*None to date*

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TABLE OF ACRONYMS AND ABBREVIATIONS

BA	Basic Assessment
BAR	Basic Assessment Report
CLO	Community Liaison Officer
CV	*Curriculum Vitae*
DFFE	Department of Forestry, Fisheries and the Environment
DEDTEA	Department of Economic Development, Tourism and Environmental Affairs
DM	District Municipality
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioner's Association of South Africa
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
ESA	Early Stone Age
FEPA	Freshwater Ecosystem Priority Area
GHG	Greenhouse Gas
HVAC	Heating, Ventilation and Air-Conditioning
IDP	Integrated Development Plan
IPP	Independent Power Producers
IRP	Integrated Resource Plan
ISCW	Institute for Soil, Climate & Water
kV	Kilovolt
LEDPF	Local Economic Development Procurement Framework
LILO	Line-In-Line-Out
LM	Local Municipality
LSA	Later Stone Age
MPRDA	Mineral and Petroleum Resources Development Act
MSA	Middle Stone Age
MV	Medium Voltage
MW	Megawatt
MWh	Megawatt hours
MWp	Megawatt peak
NDC	Nationally Determined Contribution
NEMA	National Environmental Management Act
NEM:BA	National Environmental Management: Biodiversity Act
NEM:AQA	National Environmental Management: Air Quality Act
NEM:WA	National Environmental Management: Waste Act

NERSA	National Energy Regulator of South Africa
NFEPA	National Freshwater Ecosystem Priority Areas
NGI	National Geospatial Information
NHA	National Heritage Act
NPAES	National Protected Areas Expansion Strategy
NSBA	National Spatial Biodiversity Assessment
NWA	National Water Act
OHL	Overhead Line
PPP	Public Participation Process
QDS	Quarter Degree Square
REIPP	Renewable Energy Independent Power Producers
SAHRA	South African Heritage Resource Agency
SANBI	South African National Biodiversity Institute
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SMME	Small, Medium and Micro Enterprises
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change
WEF	Wind Energy Facility
WMA	Water Management Area
WRB	World Reference Base

1. PROJECT TEAM

1.1. CES COMPANY PROFILE (OVERVIEW)

Coastal & Environmental Services (Pty) Ltd (CES) has its head office in Makhanda (Grahamstown), where it was founded in 1990, to service a then fledging market in the fields of Environmental Management and Impact Assessment. CES now has offices in Cape Town, Gqeberha/Port Elizabeth, East London, and Johannesburg as well as a wholly owned subsidiary in Maputo, Mozambique (Coastal & Environmental Services LDa., registered as an Environmental Practitioner with the Mozambican authorities).

The Company has grown apace with the increased market demand for environmental and social advisory services in Southern Africa and further afield. Our principal area of expertise lies in assessing the risks and impacts of the development process on the natural, social, and economic environments through, among other instruments, the environmental impact assessment (EIA) process. We believe that by offering these services, we contribute meaningfully towards sustainable development.

We adopt a scientific approach to our studies, underpinned by an informed and holistic view of the environment and a pragmatic approach to sustainable development. This results in deliverables that are robust, defensible, and credible. This is important for both the development and EIA processes, and as a result, the outputs of our studies demonstrate objectivity, sincerity, and professionalism. We believe that a balance between development and environmental protection can be achieved by skilful and careful planning and that our outputs reflect this. Our track record across twenty (20) African countries as well as in the Middle East and Asia is evidence of the value add we bring to the environmental and social advisory services we provide and has contributed to our deep understanding of the environmental and social challenges associated with establishing and operating facilities and infrastructure in emerging markets.

1.2. CES PROJECT TEAM

Please refer to Appendix A for full *Curriculum Vitae* of the project team.

DR ALAN CARTER

EAP, Project Leader & Author

Alan is an Executive and the East London Branch Manager at CES. He has extensive training and experience in both financial accounting and environmental science disciplines with CES for the past 20 years and with international accounting firms in South Africa and the USA for 10 years. He is a member of the American Institute of Certified Public Accountants (licensed in Texas) and holds a PhD in Plant Sciences. He is also certified ISO14001 EMS Auditor with the American National Standards Institute. Alan has been responsible for leading and managing numerous and varied consulting projects over the past 30 years. He is a registered professional with the South African Council for Natural Scientific Professionals (SACNASP) and through Environmental Assessment Practitioners Association of South Africa (EAPASA).

MS SINAZO NYUDWANA

Report Co-Author & PPP Consultant

Sinazo is an Environmental Consultant with experience in Basic Assessments, Water Use Licence Applications, Climate Change Risk Assessment and Public Participation. She has 2 years of experience in Renewable Energy Development where her role included actively seeking new wind and solar opportunities and project permitting. She is a registered Candidate Natural Scientists (Cand.Sci.Nat.) with SACNASP. She obtained her MSc in Environmental and Geographical Science at the University of Cape Town where her research investigated the impact of climate services among commercial and smallholder farmers to improve the uptake of climate services. Her other academic qualifications include a BSc and BSc Hons in Environmental and Water Science from the University of the Western Cape.

1.3. EXPERTISE OF THE PROJECT TEAM

Table 1. consists of the expertise of the project team.

Table 1.3-1: Expertise of the Project Team

NAME	POSITION IN COMPANY	HIGHEST QUALIFICATION	YEARS EXPERIENCE
DR ALAN CARTER	Executive	PhD in Plant Science (Rhodes University) EAPASA	30+
MS SINAZO NYUDWANA	Environmental Consultant	MSc in Environmental and Geographical Science (University of Cape Town)	3

2. PROJECT DESCRIPTION

2.1. PROJECT ACTIVITY

The proposed Mulilo Newcastle Wind Power (MNWP) Grid Connection project includes a 132 kV onsite switching station and a single or double circuit 132 kV overhead transmission line with a total length of up to **approximately** 21 km (for the preferred alternative) connecting to an existing Substation near Newcastle. The proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure is required to supplement the development of the authorised MNWP Wind Energy Facility (WEF) (DFFE Ref: 14/12/16/3/3/2/2457). Additionally, the project is regarded as a Strategic Integrated Project (SIP) No. 20c under the Embedded Generation National Program (EGNP), to be expedited in terms of Schedule 2 (Section 17(2)) of the Infrastructure Development Act (IDA) (Act No. 23 of 2014). Therefore, to reiterate, the project's need and desirability also relate to the need and desirability of renewable energy on a local, district, provincial, national and international level, as the Grid Connection works (although authorised separately), are integral to the realisation of the WEF.

Infrastructure Component Descriptions:

1. Overhead Powerline (OHPL):
   - 132 kV Overhead powerline to be constructed
   - 300 m wide corridor to be assessed
   - Single circuit or double circuit options should be catered for
   - OHL towers will be between 25-32 m in height.
   - Combination of monopole guyed and self-supporting structures to be used. If technically necessary, lattice structures may also be required to be used where applicable
   - Once constructed, the OHPL will be handed back to Eskom and Eskom standards to be followed
   - A servitude of 31 m wide would ultimately be registered including a 4-6 m wide "jeep track" access road for construction and maintenance
   - Generic EMP's to be used

2. On-Site Switching Station
   - To be handed over to Eskom after construction
   - Located adjacent to the wind farm on site IPP substation

The footprint of the facility is calculated as follows:

Table 2.1-1: Development Footprints during the Construction and Operational Phases.

INFRASTRUCTURE COMPONENT	CONSTRUCTION FOOTPRINT	FINAL FOOTPRINT AFTER REHABILITATION
Overhead Transmission Line	Up to 40 km length 40 000 m/250 m = Approximately 160 monopoles 160 x 0.0072 ha = Approximately 1.152 ha	Up to 40 km length 40 000 m/250 m = Approximately 160 monopoles 160 x 0.0072 ha = Approximately 1.152 ha
Total servitude	Up to 40 000 m x 31 m = 124 ha Which equates to **124 ha**	Up to 40 000 m x 31 m = 124 ha Which equates to **124 ha**
Maintenance tracks	Up to 40 km length 4 m width Which equates to **16 ha**	Up to 40 km length 4 m width Which equates to **16 ha**

On-site 132kV Switching Station	Less than 1 ha	Less than 1 ha
TOTAL FOOTPRINT:	**Up to approximately 142.152 ha** ***of clearing needed for the construction phase of the development of the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.***	**Up to approximately 142.152 ha** ***of clearing remaining during the post-construction operational phase (after rehabilitation) of the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.***

Table 2.1-2: Infrastructure Corridor Requirements (as per Eskom Requirements).

INFRASTRUCTURE COMPONENT	CORRIDOR REQUIREMENTS
Transmission Line	TOTAL SERVITUDE: Up to 40 000 m x 31 m = 1 240 000 m^2 which equates to **124 ha overhead line servitude area.**
	TOTAL MAINTENANCE TRACKS (within the transmission line servitude): 40 000 m x 4 m = 160 000 m^2 which equates to **16 ha maintenance tracks.**

Within the proposed MNWP Grid Connection and associated infrastructure development, 10 alternative route options are being considered for the connection of the 132 kV powerline including the Preferred Route.

Preferred Route is up to approximately **21 km** in length, runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Incandu Substation.

Alternative 1 follows along the Alternative 7 route for 5 km, before a portion deviates to the north of Alternative 7 for a length of approximately 10 km before re-joining Alternative 7 to the substation. It is a total of 23 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Substation.

Alternative 2 follows along Alternative 7 route for 9.5 km. Just after the R34, a small portion deviates to the north of the Alternative 7 for a length of approximately 4 km before re-joining Alternative 7 to the substation. It is a total of 23 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Substation.

Alternative 3 follows along Alternative 7 route for 9.5 km. Just after the R34, a small portion deviates to the north of Alternative 7 for a length of approximately 5 km before re-joining Alternative 7 to the substation. It is a total of 23 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Substation.

Alternative 4 follows along Alternative 7 for 14 km. In the northern outskirts of Newcastle, a small portion deviates to the north of Alternative 7 for a length of approximately 2 km before re-joining Alternative 7 to the substation. It is a total of 24 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Substation.

Alternative 5 follows along the Alternative 7 route for most of the alignment. However, just after crossing the N11, instead of joining to the Eskom Substation near Arcelor Mittal Newcastle Works, the line deviates south and connects to the Incandu substation. It is a total of 20 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Incandu Substation.

Alternative 6 follows the same alignment as Alternative 1. However, just after crossing the N11, instead of joining to the Eskom Substation near Arcelor Mittal Newcastle Works, the line deviates south and connects to the Incandu substation. It is a total of 21 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Incandu Substation.

Alternative 7 is 23 km length runs from the Mulilo Newcastle Wind Power- Northern WEF switching station to an Eskom Substation near Arcelor Mittal Newcastle Works. It traverses over the R34 regional road, skirts the suburbs of Newcastle and crosses over the R34 and N11 before connecting to the Substation.

Alternative 8 follows the same alignment as Alternative 3. However, just after crossing the N11, instead of joining to the Eskom Substation near Arcelor Mittal Newcastle Works, the line deviates south and connects to the Incandu substation. It is a total of 20 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Incandu Substation.

Alternative 9 follows the same alignment as Alternative 4. However, just after crossing the N11, instead of joining to the Eskom Substation near Arcelor Mittal Newcastle Works, the line deviates south and connects to the Incandu substation. It is a total of 21 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Incandu Substation.

The map below shows the layout of the MNWP Grid Connection and associated infrastructure.

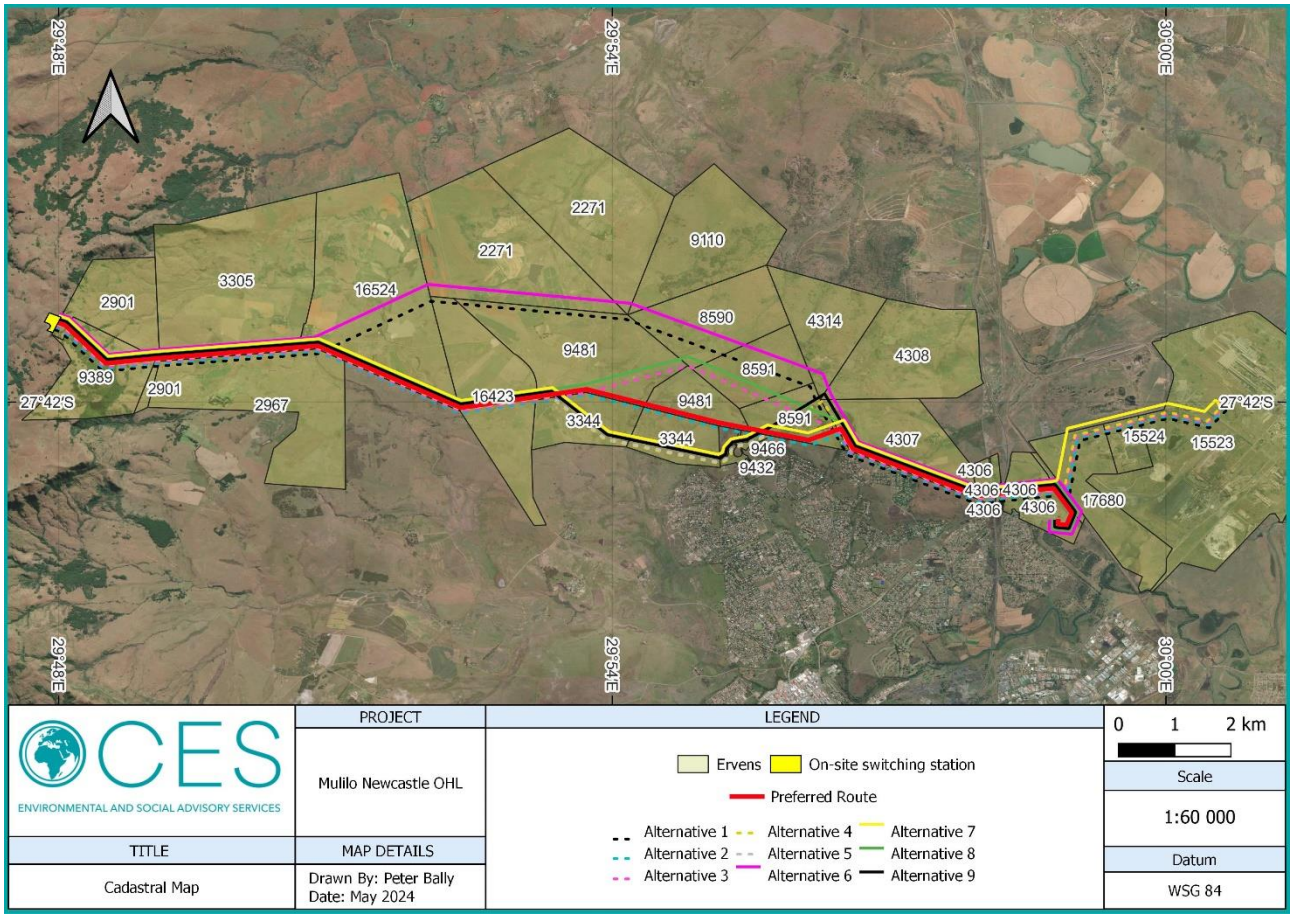


Figure 2.1.1: Layout Map of the Proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.

2.2. PROJECT LOCALITY

The proposed MNWP Grid Connection is located in the Newcastle Local Municipality, within the Amajuba District Municipality. Table indicates the town in the vicinity of the proposed site and Table consists of the affected properties for the proposed grid connection infrastructure.

Table 2.2-1: Nearest town in the vicinity of the MNWP Grid Connection and associated infrastructure project.

TOWN NAME	APPROXIMATE DISTANCE	DIRECTION
Newcastle	20 km	East

Table 2.2-2: 21-Digit Surveyor General (SG) Codes of the affected properties.

FARM NAME	SG DIGIT CODE	PORTION/FARM NUMBER
PROPOSED CONNECTION INFRASTRCUTURE (PREFERRED GRID ROUTE, ALTERNATIVES & SUBSTATION)		
BRACK HOEK	**N0HS00000000227100000**	RE/2271
BRACK HOEK	**N0HS00000000227100001**	1/2271
GLENDOWER	**N0HS00000000290100000**	RE/2901
GLENDOWER	**N0HS00000000290100001**	1/2901
ROSE BOOM	**N0HS00000000330500006**	6/3305
NORTHDOWN	**N0HS00000000430600001**	RE/1/4306
NORTHDOWN	**N0HS00000000430600001**	RE/1/4306
NORTHDOWN	**N0HS00000000430600001**	RE/1/4306
NORTHDOWN	**N0HS00000000430600006**	RE/6/4306

NORTHDOWN	**N0HS00000000430600013**	13/4306
NORTHDOWN	**N0HS00000000430600014**	14/4306
NORTHDOWN	**N0HS00000000430600027**	27/4306
NORTHDOWN	**N0HS00000000430600029**	29/4306
NORTHDOWN	**N0HS00000000430600039**	39/4306
NORTHDOWN	**N0HS00000000430600040**	40/4306
PARKSVILLE	**N0HS00000000430700000**	RE/4307
STONY KLOOF	**N0HS00000000431400000**	4314
INNISKILLING	**N0HS00000000859000000**	8590
STILFONTEIN 408 IP	**N0HS00000000859100000**	RE/8591
HIGHTON	**N0HS00000000859100001**	1/8591
ERIN	**N0HS00000000911000000**	RE/9110
LOT B PAARDEPLAAT	**N0HS00000000938900000**	9389
CLIFFDALE	**N0HS00000000943900000**	9439
FARM 2967	**N0HS00000000296700003**	3/2967
MATTANDU	**N0HS00000000298700000**	RE/2987
LENTVLEI	**N0HS00000001652400000**	16524
BUFFALO RIVER	**N0HS00000000430800035**	RE/35/4308
ISCOR	**N0HS00000001768000000**	RE/17680
ISCOR	**N0HS00000001768000000**	RE/17680
TWEEFONTEIN	**N0HS00000001642300000**	16423
GORDON	**N0HS00000000948100005**	5/9481
GORDON	**N0HS00000000948100003**	3/9431
TWEEFONTEIN	**N0HS00000000334400009**	9/3344
TWEEFONTEIN	**N0HS00000000334400010**	RE/10/3344
TWEEFONTEIN	**N0HS00000000334400011**	11/3344
TWEEFONTEIN	**N0HS00000000334400012**	12/3344
ERF 9432 NEWCASTLE EXTENSTION 37	**N0HS02210001552400000**	ERF NUMBER 9432
ERF 9466 NEWCASTLE EXTENSION 37	**N0HS02210001552300000**	ERF NUMBER 9466

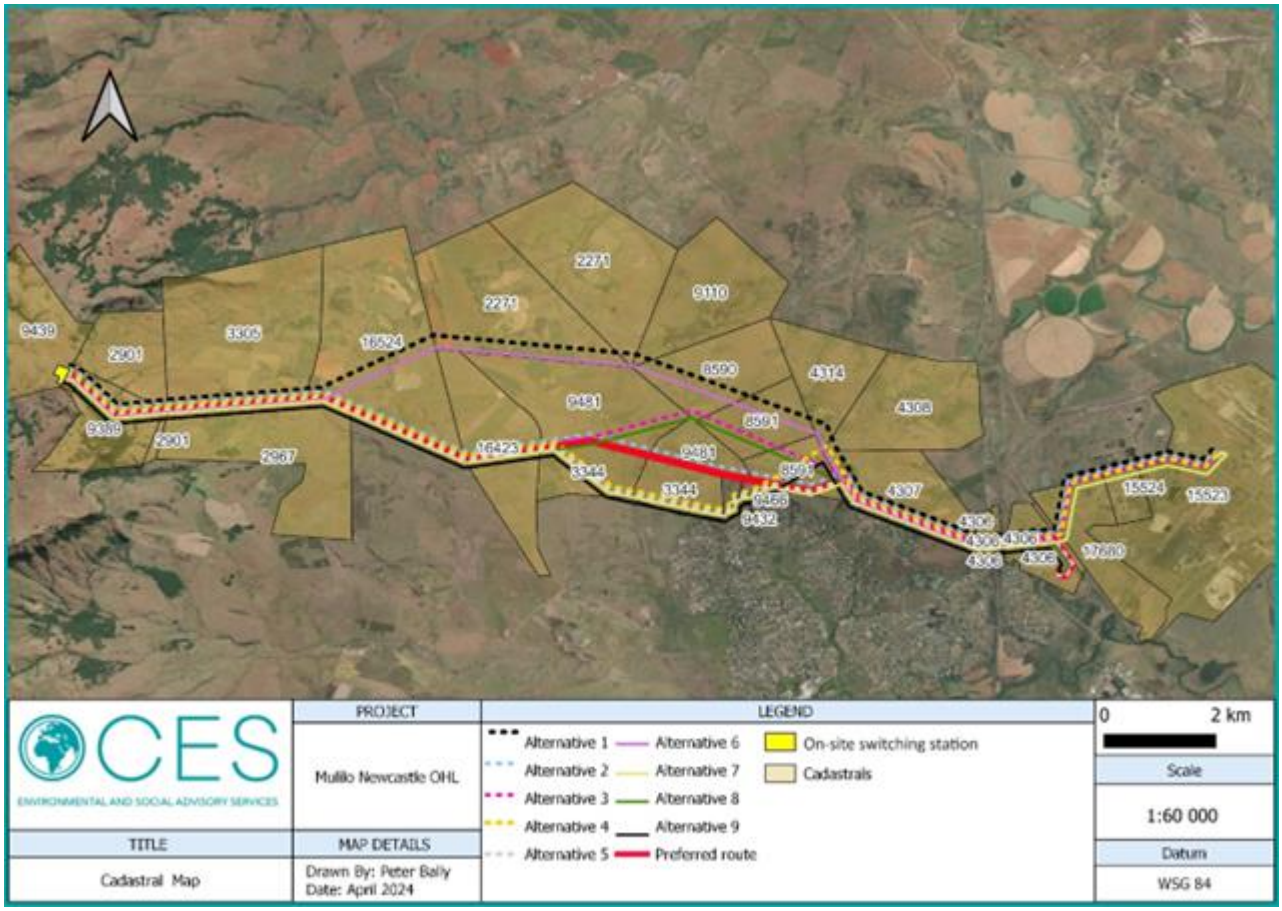


Figure 2.2.1: Cadastral Map of the Proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.

2.3. SITE PLAN

The MNWP Grid Connection Basic Assessment Report (BAR) assess the facility as a whole, but also motivates for certain alternatives. Coordinates of all the preferred alternatives, represented as coordinates at 200m intervals (as per NEMA) are listed below. Please kindly refer to Chapter 7 of this BAR for the full alternatives assessment.

Table 2.3-1: Coordinates of the on-site Switching Station and all preferred alternatives of the MNWP Grid Connection

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
On-site Switching Substation		
Corner A	27°41'7.92"S	29°47'50.64"E
Corner B	27°41’14.8”S	29°47’56.15”E
Corner C	27°41’4.86”S	29°48’1.51”E
Corner D	27°41’2.03’S	29°47’53.87”E
Powerline – Preferred Route		
	Latitude (South)	**Longitude (East)**
Preferred 1	27°41'8"S	29°48'0"E
Preferred 2	27°41'12"S	29°48'6"E
Preferred 3	27°41'16"S	29°48'11"E
Preferred 4	27°41'21"S	29°48'16"E
Preferred 5	27°41'26"S	29°48'21"E
Preferred 6	27°41'30"S	29°48'26"E
Preferred 7	27°41'35"S	29°48'31"E
Preferred 8	27°41'34"S	29°48'38"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Preferred 9	27°41'33"S	29°48'46"E
Preferred 10	27°41'33"S	29°48'53"E
Preferred 11	27°41'32"S	29°49'0"E
Preferred 12	27°41'31"S	29°49'7"E
Preferred 13	27°41'31"S	29°49'15"E
Preferred 14	27°41'30"S	29°49'22"E
Preferred 15	27°41'30"S	29°49'29"E
Preferred 16	27°41'29"S	29°49'36"E
Preferred 17	27°41'28"S	29°49'44"E
Preferred 18	27°41'28"S	29°49'51"E
Preferred 19	27°41'27"S	29°49'58"E
Preferred 20	27°41'27"S	29°50'5"E
Preferred 21	27°41'26"S	29°50'13"E
Preferred 22	27°41'26"S	29°50'20"E
Preferred 23	27°41'25"S	29°50'27"E
Preferred 24	27°41'25"S	29°50'34"E
Preferred 25	27°41'24"S	29°50'42"E
Preferred 26	27°41'24"S	29°50'49"E
Preferred 27	27°41'27"S	29°50'56"E
Preferred 28	27°41'29"S	29°51'2"E
Preferred 29	27°41'32"S	29°51'9"E
Preferred 30	27°41'35"S	29°51'15"E
Preferred 31	27°41'38"S	29°51'22"E
Preferred 32	27°41'41"S	29°51'28"E
Preferred 33	27°41'44"S	29°51'35"E
Preferred 34	27°41'46"S	29°51'41"E
Preferred 35	27°41'49"S	29°51'48"E
Preferred 36	27°41'52"S	29°51'55"E
Preferred 37	27°41'55"S	29°52'1"E
Preferred 38	27°41'58"S	29°52'8"E
Preferred 39	27°42'1"S	29°52'14"E
Preferred 40	27°42'3"S	29°52'21"E
Preferred 41	27°42'3"S	29°52'28"E
Preferred 42	27°42'2"S	29°52'35"E
Preferred 43	27°42'1"S	29°52'42"E
Preferred 44	27°42'0"S	29°52'50"E
Preferred 45	27°41'59"S	29°52'57"E
Preferred 46	27°41'57"S	29°53'4"E
Preferred 47	27°41'56"S	29°53'11"E
Preferred 48	27°41'55"S	29°53'18"E
Preferred 49	27°41'54"S	29°53'26"E
Preferred 50	27°41'53"S	29°53'33"E
Preferred 51	27°41'52"S	29°53'40"E
Preferred 52	27°41'53"S	29°53'47"E
Preferred 53	27°41'54"S	29°53'54"E
Preferred 54	27°41'56"S	29°54'1"E
Preferred 55	27°41'58"S	29°54'8"E
Preferred 56	27°42'0"S	29°54'15"E
Preferred 57	27°42'2"S	29°54'22"E
Preferred 58	27°42'3"S	29°54'29"E
Preferred 59	27°42'5"S	29°54'36"E
Preferred 60	27°42'7"S	29°54'43"E
Preferred 61	27°42'9"S	29°54'50"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Preferred 62	27°42'10"S	29°54'57"E
Preferred 63	27°42'12"S	29°55'4"E
Preferred 64	27°42'14"S	29°55'11"E
Preferred 65	27°42'15"S	29°55'18"E
Preferred 66	27°42'17"S	29°55'26"E
Preferred 67	27°42'18"S	29°55'33"E
Preferred 68	27°42'19"S	29°55'40"E
Preferred 69	27°42'21"S	29°55'47"E
Preferred 70	27°42'22"S	29°55'54"E
Preferred 71	27°42'23"S	29°56'1"E
Preferred 72	27°42'24"S	29°56'8"E
Preferred 73	27°42'22"S	29°56'15"E
Preferred 74	27°42'20"S	29°56'22"E
Preferred 75	27°42'17"S	29°56'29"E
Preferred 76	27°42'23"S	29°56'32"E
Preferred 77	27°42'29"S	29°56'35"E
Preferred 78	27°42'32"S	29°56'41"E
Preferred 79	27°42'35"S	29°56'48"E
Preferred 80	27°42'37"S	29°56'54"E
Preferred 81	27°42'40"S	29°57'1"E
Preferred 82	27°42'42"S	29°57'8"E
Preferred 83	27°42'45"S	29°57'15"E
Preferred 84	27°42'47"S	29°57'21"E
Preferred 85	27°42'50"S	29°57'28"E
Preferred 86	27°42'52"S	29°57'35"E
Preferred 87	27°42'55"S	29°57'42"E
Preferred 88	27°42'57"S	29°57'48"E
Preferred 89	27°43'0"S	29°57'55"E
Preferred 90	27°43'1"S	29°58'2"E
Preferred 91	27°43'0"S	29°58'9"E
Preferred 92	27°42'59"S	29°58'17"E
Preferred 93	27°42'58"S	29°58'24"E
Preferred 94	27°42'58"S	29°58'31"E
Preferred 95	27°42'57"S	29°58'38"E
Preferred 96	27°42'56"S	29°58'45"E
Preferred 97	27°43'0"S	29°58'50"E
Preferred 98	27°43'6"S	29°58'54"E
Preferred 99	27°43'11"S	29°58'58"E
Preferred 100	27°43'17"S	29°58'57"E
Preferred 101	27°43'19"S	29°58'51"E
Alternative 1		
	Latitude (South)	**Longitude (East)**
Alternative 1 - 1	27°41'8"S	29°48'0"E
Alternative 1 - 2	27°41'12"S	29°48'6"E
Alternative 1 - 3	27°41'16"S	29°48'11"E
Alternative 1 - 4	27°41'21"S	29°48'16"E
Alternative 1 - 5	27°41'26"S	29°48'21"E
Alternative 1 - 6	27°41'30"S	29°48'26"E
Alternative 1 - 7	27°41'35"S	29°48'31"E
Alternative 1 - 8	27°41'34"S	29°48'38"E
Alternative 1 - 9	27°41'33"S	29°48'46"E
Alternative 1 - 10	27°41'33"S	29°48'53"E
Alternative 1 - 11	27°41'32"S	29°49'0"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 1 - 12	27°41'31"S	29°49'7"E
Alternative 1 - 13	27°41'31"S	29°49'15"E
Alternative 1 - 14	27°41'30"S	29°49'22"E
Alternative 1 - 15	27°41'30"S	29°49'29"E
Alternative 1 - 16	27°41'29"S	29°49'36"E
Alternative 1 - 17	27°41'28"S	29°49'44"E
Alternative 1 - 18	27°41'28"S	29°49'51"E
Alternative 1 - 19	27°41'27"S	29°49'58"E
Alternative 1 - 20	27°41'27"S	29°50'5"E
Alternative 1 - 21	27°41'26"S	29°50'13"E
Alternative 1 - 22	27°41'26"S	29°50'20"E
Alternative 1 - 23	27°41'25"S	29°50'27"E
Alternative 1 - 24	27°41'25"S	29°50'34"E
Alternative 1 - 25	27°41'24"S	29°50'42"E
Alternative 1 - 26	27°41'23"S	29°50'49"E
Alternative 1 - 27	27°41'20"S	29°50'55"E
Alternative 1 - 28	27°41'17"S	29°51'2"E
Alternative 1 - 29	27°41'14"S	29°51'8"E
Alternative 1 - 30	27°41'11"S	29°51'15"E
Alternative 1 - 31	27°41'8"S	29°51'21"E
Alternative 1 - 32	27°41'5"S	29°51'28"E
Alternative 1 - 33	27°41'2"S	29°51'34"E
Alternative 1 - 34	27°40'59"S	29°51'41"E
Alternative 1 - 35	27°40'56"S	29°51'47"E
Alternative 1 - 36	27°40'53"S	29°51'54"E
Alternative 1 - 37	27°40'50"S	29°52'0"E
Alternative 1 - 38	27°40'50"S	29°52'7"E
Alternative 1 - 39	27°40'51"S	29°52'14"E
Alternative 1 - 40	27°40'51"S	29°52'22"E
Alternative 1 - 41	27°40'52"S	29°52'29"E
Alternative 1 - 42	27°40'53"S	29°52'36"E
Alternative 1 - 43	27°40'53"S	29°52'43"E
Alternative 1 - 44	27°40'54"S	29°52'51"E
Alternative 1 - 45	27°40'55"S	29°52'58"E
Alternative 1 - 46	27°40'55"S	29°53'5"E
Alternative 1 - 47	27°40'56"S	29°53'12"E
Alternative 1 - 48	27°40'57"S	29°53'20"E
Alternative 1 - 49	27°40'57"S	29°53'27"E
Alternative 1 - 50	27°40'58"S	29°53'34"E
Alternative 1 - 51	27°40'59"S	29°53'41"E
Alternative 1 - 52	27°40'59"S	29°53'49"E
Alternative 1 - 53	27°41'0"S	29°53'56"E
Alternative 1 - 54	27°41'1"S	29°54'3"E
Alternative 1 - 55	27°41'1"S	29°54'10"E
Alternative 1 - 56	27°41'4"S	29°54'17"E
Alternative 1 - 57	27°41'6"S	29°54'24"E
Alternative 1 - 58	27°41'9"S	29°54'31"E
Alternative 1 - 59	27°41'11"S	29°54'37"E
Alternative 1 - 60	27°41'14"S	29°54'44"E
Alternative 1 - 61	27°41'16"S	29°54'51"E
Alternative 1 - 62	27°41'19"S	29°54'58"E
Alternative 1 - 63	27°41'21"S	29°55'4"E
Alternative 1 - 64	27°41'24"S	29°55'11"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 1 - 65	27°41'26"S	29°55'18"E
Alternative 1 - 66	27°41'29"S	29°55'25"E
Alternative 1 - 67	27°41'31"S	29°55'31"E
Alternative 1 - 68	27°41'33"S	29°55'38"E
Alternative 1 - 69	27°41'36"S	29°55'45"E
Alternative 1 - 70	27°41'38"S	29°55'52"E
Alternative 1 - 71	27°41'41"S	29°55'58"E
Alternative 1 - 72	27°41'43"S	29°56'5"E
Alternative 1 - 73	27°41'46"S	29°56'12"E
Alternative 1 - 74	27°41'52"S	29°56'15"E
Alternative 1 - 75	27°41'58"S	29°56'17"E
Alternative 1 - 76	27°42'3"S	29°56'21"E
Alternative 1 - 77	27°42'9"S	29°56'24"E
Alternative 1 - 78	27°42'15"S	29°56'27"E
Alternative 1 - 79	27°42'21"S	29°56'31"E
Alternative 1 - 80	27°42'26"S	29°56'34"E
Alternative 1 - 81	27°42'31"S	29°56'39"E
Alternative 1 - 82	27°42'34"S	29°56'45"E
Alternative 1 - 83	27°42'36"S	29°56'52"E
Alternative 1 - 84	27°42'39"S	29°56'59"E
Alternative 1 - 85	27°42'41"S	29°57'5"E
Alternative 1 - 86	27°42'44"S	29°57'12"E
Alternative 1 - 87	27°42'46"S	29°57'19"E
Alternative 1 - 88	27°42'49"S	29°57'26"E
Alternative 1 - 89	27°42'51"S	29°57'32"E
Alternative 1 - 90	27°42'54"S	29°57'39"E
Alternative 1 - 91	27°42'56"S	29°57'46"E
Alternative 1 - 92	27°42'59"S	29°57'52"E
Alternative 1 - 93	27°43'1"S	29°57'59"E
Alternative 1 - 94	27°43'0"S	29°58'7"E
Alternative 1 - 95	27°42'59"S	29°58'14"E
Alternative 1 - 96	27°42'59"S	29°58'21"E
Alternative 1 - 97	27°42'58"S	29°58'28"E
Alternative 1 - 98	27°42'57"S	29°58'36"E
Alternative 1 - 99	27°42'56"S	29°58'43"E
Alternative 1 - 100	27°42'55"S	29°58'50"E
Alternative 1 – 101	27°42'51"S	29°58'54"E
Alternative 1 – 102	27°42'45"S	29°58'55"E
Alternative 1 - 103	27°42'38"S	29°58'56"E
Alternative 1 – 104	27°42'32"S	29°58'58"E
Alternative 1 – 105	27°42'26"S	29°58'59"E
Alternative 1 – 106	27°42'20"S	29°59'2"E
Alternative 1 – 107	27°42'19"S	29°59'9"E
Alternative 1 – 108	27°42'17"S	29°59'16"E
Alternative 1 – 109	27°42'15"S	29°59'23"E
Alternative 1 – 110	27°42'13"S	29°59'30"E
Alternative 1 – 111	27°42'12"S	29°59'37"E
Alternative 1 – 112	27°42'10"S	29°59'44"E
Alternative 1 – 113	27°42'8"S	29°59'51"E
Alternative 1 – 114	27°42'6"S	29°59'58"E
Alternative 1 – 115	27°42'6"S	30°0'5"E
Alternative 1 – 116	27°42'8"S	30°0'12"E
Alternative 1 – 117	27°42'9"S	30°0'19"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 1 – 118	27°42'11"S	30°0'26"E
Alternative 1 – 119	27°42'7"S	30°0'31"E
Alternative 2		
	Latitude (South)	**Longitude (East)**
Alternative 2 - 1	27°41'8"S	29°48'0"E
Alternative 2 - 2	27°41'12"S	29°48'6"E
Alternative 2 - 3	27°41'16"S	29°48'11"E
Alternative 2 - 4	27°41'21"S	29°48'16"E
Alternative 2 - 5	27°41'26"S	29°48'21"E
Alternative 2 - 6	27°41'30"S	29°48'26"E
Alternative 2 - 7	27°41'35"S	29°48'31"E
Alternative 2 - 8	27°41'34"S	29°48'38"E
Alternative 2 - 9	27°41'33"S	29°48'46"E
Alternative 2 - 10	27°41'33"S	29°48'53"E
Alternative 2 - 11	27°41'32"S	29°49'0"E
Alternative 2 - 12	27°41'31"S	29°49'7"E
Alternative 2 - 13	27°41'31"S	29°49'15"E
Alternative 2 - 14	27°41'30"S	29°49'22"E
Alternative 2 - 15	27°41'30"S	29°49'29"E
Alternative 2 - 16	27°41'29"S	29°49'36"E
Alternative 2 - 17	27°41'28"S	29°49'44"E
Alternative 2 - 18	27°41'28"S	29°49'51"E
Alternative 2 - 19	27°41'27"S	29°49'58"E
Alternative 2 - 20	27°41'27"S	29°50'5"E
Alternative 2 - 21	27°41'26"S	29°50'13"E
Alternative 2 - 22	27°41'26"S	29°50'20"E
Alternative 2 - 23	27°41'25"S	29°50'27"E
Alternative 2 - 24	27°41'25"S	29°50'34"E
Alternative 2 - 25	27°41'24"S	29°50'42"E
Alternative 2 - 26	27°41'24"S	29°50'49"E
Alternative 2 - 27	27°41'27"S	29°50'56"E
Alternative 2 - 28	27°41'29"S	29°51'2"E
Alternative 2 - 29	27°41'32"S	29°51'9"E
Alternative 2 - 30	27°41'35"S	29°51'15"E
Alternative 2 - 31	27°41'38"S	29°51'22"E
Alternative 2 - 32	27°41'41"S	29°51'28"E
Alternative 2 - 33	27°41'44"S	29°51'35"E
Alternative 2 - 34	27°41'46"S	29°51'41"E
Alternative 2 - 35	27°41'49"S	29°51'48"E
Alternative 2 - 36	27°41'52"S	29°51'55"E
Alternative 2 - 37	27°41'55"S	29°52'1"E
Alternative 2 - 38	27°41'58"S	29°52'8"E
Alternative 2 - 39	27°42'1"S	29°52'14"E
Alternative 2 - 40	27°42'3"S	29°52'21"E
Alternative 2 - 41	27°42'3"S	29°52'28"E
Alternative 2 - 42	27°42'2"S	29°52'35"E
Alternative 2 - 43	27°42'1"S	29°52'42"E
Alternative 2 - 44	27°42'0"S	29°52'50"E
Alternative 2 - 45	27°41'59"S	29°52'57"E
Alternative 2 - 46	27°41'57"S	29°53'4"E
Alternative 2 - 47	27°41'56"S	29°53'11"E
Alternative 2 - 48	27°41'55"S	29°53'18"E
Alternative 2 - 49	27°41'54"S	29°53'26"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 2 - 50	27°41'53"S	29°53'33"E
Alternative 2 - 51	27°41'52"S	29°53'40"E
Alternative 2 - 52	27°41'53"S	29°53'47"E
Alternative 2 - 53	27°41'54"S	29°53'54"E
Alternative 2 - 54	27°41'56"S	29°54'1"E
Alternative 2 - 55	27°41'58"S	29°54'8"E
Alternative 2 - 56	27°42'0"S	29°54'15"E
Alternative 2 - 57	27°42'2"S	29°54'22"E
Alternative 2 - 58	27°42'3"S	29°54'29"E
Alternative 2 - 59	27°42'5"S	29°54'36"E
Alternative 2 - 60	27°42'7"S	29°54'43"E
Alternative 2 - 61	27°42'9"S	29°54'50"E
Alternative 2 - 62	27°42'10"S	29°54'57"E
Alternative 2 - 63	27°42'12"S	29°55'4"E
Alternative 2 - 64	27°42'14"S	29°55'11"E
Alternative 2 - 65	27°42'15"S	29°55'18"E
Alternative 2 - 66	27°42'17"S	29°55'26"E
Alternative 2 - 67	27°42'18"S	29°55'33"E
Alternative 2 - 68	27°42'19"S	29°55'40"E
Alternative 2 - 69	27°42'21"S	29°55'47"E
Alternative 2 - 70	27°42'22"S	29°55'54"E
Alternative 2 - 71	27°42'23"S	29°56'1"E
Alternative 2 - 72	27°42'24"S	29°56'8"E
Alternative 2 - 73	27°42'22"S	29°56'15"E
Alternative 2 - 74	27°42'20"S	29°56'22"E
Alternative 2 - 75	27°42'17"S	29°56'29"E
Alternative 2 - 76	27°42'23"S	29°56'32"E
Alternative 2 - 77	27°42'29"S	29°56'35"E
Alternative 2 - 78	27°42'32"S	29°56'41"E
Alternative 2 - 79	27°42'35"S	29°56'48"E
Alternative 2 - 80	27°42'37"S	29°56'54"E
Alternative 2 - 81	27°42'40"S	29°57'1"E
Alternative 2 - 82	27°42'42"S	29°57'8"E
Alternative 2 - 83	27°42'45"S	29°57'15"E
Alternative 2 - 84	27°42'47"S	29°57'21"E
Alternative 2 - 85	27°42'50"S	29°57'28"E
Alternative 2 - 86	27°42'52"S	29°57'35"E
Alternative 2 - 87	27°42'55"S	29°57'42"E
Alternative 2 - 88	27°42'57"S	29°57'48"E
Alternative 2 - 89	27°43'0"S	29°57'55"E
Alternative 2 - 90	27°43'1"S	29°58'2"E
Alternative 2 - 91	27°43'0"S	29°58'9"E
Alternative 2 - 92	27°42'59"S	29°58'17"E
Alternative 2 - 93	27°42'58"S	29°58'24"E
Alternative 2 - 94	27°42'58"S	29°58'31"E
Alternative 2 - 95	27°42'57"S	29°58'38"E
Alternative 2 - 96	27°42'56"S	29°58'45"E
Alternative 2 - 97	27°42'55"S	29°58'53"E
Alternative 2 - 98	27°42'49"S	29°58'54"E
Alternative 2 - 99	27°42'42"S	29°58'56"E
Alternative 2 - 100	27°42'36"S	29°58'57"E
Alternative 2 - 101	27°42'29"S	29°58'58"E
Alternative 2 - 102	27°42'23"S	29°58'59"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 2 - 103	27°42'20"S	29°59'4"E
Alternative 2 – 104	27°42'18"S	29°59'11"E
Alternative 2 – 105	27°42'16"S	29°59'18"E
Alternative 2 – 106	27°42'14"S	29°59'25"E
Alternative 2 – 107	27°42'13"S	29°59'32"E
Alternative 2 – 108	27°42'11"S	29°59'39"E
Alternative 2 – 109	27°42'9"S	29°59'46"E
Alternative 2 – 110	27°42'7"S	29°59'53"E
Alternative 2 – 111	27°42'6"S	30°0'0"E
Alternative 2 – 112	27°42'7"S	30°0'8"E
Alternative 2 – 113	27°42'8"S	30°0'15"E
Alternative 2 – 114	27°42'10"S	30°0'22"E
Alternative 2 – 115	27°42'10"S	30°0'28"E
Alternative 2 – 116	27°42'5"S	30°0'33"E
Alternative 3		
	Latitude (South)	**Longitude (East)**
Alternative 3 - 1	27°41'8"S	29°48'0"E
Alternative 3 - 2	27°41'12"S	29°48'6"E
Alternative 3 - 3	27°41'16"S	29°48'11"E
Alternative 3 - 4	27°41'21"S	29°48'16"E
Alternative 3 - 5	27°41'26"S	29°48'21"E
Alternative 3 - 6	27°41'30"S	29°48'26"E
Alternative 3 - 7	27°41'35"S	29°48'31"E
Alternative 3 - 8	27°41'34"S	29°48'38"E
Alternative 3 - 9	27°41'33"S	29°48'46"E
Alternative 3 - 10	27°41'33"S	29°48'53"E
Alternative 3 - 11	27°41'32"S	29°49'0"E
Alternative 3 - 12	27°41'31"S	29°49'7"E
Alternative 3 - 13	27°41'31"S	29°49'15"E
Alternative 3 - 14	27°41'30"S	29°49'22"E
Alternative 3 - 15	27°41'30"S	29°49'29"E
Alternative 3 - 16	27°41'29"S	29°49'36"E
Alternative 3 - 17	27°41'28"S	29°49'44"E
Alternative 3 - 18	27°41'28"S	29°49'51"E
Alternative 3 - 19	27°41'27"S	29°49'58"E
Alternative 3 - 20	27°41'27"S	29°50'5"E
Alternative 3 - 21	27°41'26"S	29°50'13"E
Alternative 3 - 22	27°41'26"S	29°50'20"E
Alternative 3 - 23	27°41'25"S	29°50'27"E
Alternative 3 - 24	27°41'25"S	29°50'34"E
Alternative 3 - 25	27°41'24"S	29°50'42"E
Alternative 3 - 26	27°41'24"S	29°50'49"E
Alternative 3 - 27	27°41'27"S	29°50'56"E
Alternative 3 - 28	27°41'29"S	29°51'2"E
Alternative 3 - 29	27°41'32"S	29°51'9"E
Alternative 3 - 30	27°41'35"S	29°51'15"E
Alternative 3 - 31	27°41'38"S	29°51'22"E
Alternative 3 - 32	27°41'41"S	29°51'28"E
Alternative 3 - 33	27°41'44"S	29°51'35"E
Alternative 3 - 34	27°41'46"S	29°51'41"E
Alternative 3 - 35	27°41'49"S	29°51'48"E
Alternative 3 - 36	27°41'52"S	29°51'55"E
Alternative 3 - 37	27°41'55"S	29°52'1"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 3 - 38	27°41'58"S	29°52'8"E
Alternative 3 - 39	27°42'1"S	29°52'14"E
Alternative 3 - 40	27°42'3"S	29°52'21"E
Alternative 3 - 41	27°42'3"S	29°52'28"E
Alternative 3 - 42	27°42'2"S	29°52'35"E
Alternative 3 - 43	27°42'1"S	29°52'42"E
Alternative 3 - 44	27°42'0"S	29°52'50"E
Alternative 3 - 45	27°41'59"S	29°52'57"E
Alternative 3 - 46	27°41'58"S	29°53'4"E
Alternative 3 - 47	27°41'56"S	29°53'11"E
Alternative 3 - 48	27°41'55"S	29°53'18"E
Alternative 3 - 49	27°41'54"S	29°53'26"E
Alternative 3 - 50	27°41'53"S	29°53'33"E
Alternative 3 - 51	27°41'52"S	29°53'40"E
Alternative 3 - 52	27°41'51"S	29°53'47"E
Alternative 3 - 53	27°41'49"S	29°53'54"E
Alternative 3 - 54	27°41'47"S	29°54'1"E
Alternative 3 - 55	27°41'45"S	29°54'8"E
Alternative 3 - 56	27°41'43"S	29°54'15"E
Alternative 3 - 57	27°41'41"S	29°54'22"E
Alternative 3 - 58	27°41'40"S	29°54'29"E
Alternative 3 - 59	27°41'38"S	29°54'36"E
Alternative 3 - 60	27°41'36"S	29°54'43"E
Alternative 3 - 61	27°41'34"S	29°54'50"E
Alternative 3 - 62	27°41'37"S	29°54'56"E
Alternative 3 - 63	27°41'40"S	29°55'3"E
Alternative 3 - 64	27°41'43"S	29°55'10"E
Alternative 3 - 65	27°41'46"S	29°55'16"E
Alternative 3 - 66	27°41'48"S	29°55'23"E
Alternative 3 - 67	27°41'51"S	29°55'29"E
Alternative 3 - 68	27°41'54"S	29°55'36"E
Alternative 3 - 69	27°41'57"S	29°55'43"E
Alternative 3 - 70	27°42'0"S	29°55'49"E
Alternative 3 - 71	27°42'2"S	29°55'56"E
Alternative 3 - 72	27°42'5"S	29°56'2"E
Alternative 3 - 73	27°42'8"S	29°56'9"E
Alternative 3 - 74	27°42'11"S	29°56'15"E
Alternative 3 - 75	27°42'14"S	29°56'22"E
Alternative 3 - 76	27°42'17"S	29°56'28"E
Alternative 3 - 77	27°42'22"S	29°56'32"E
Alternative 3 - 78	27°42'28"S	29°56'35"E
Alternative 3 - 79	27°42'32"S	29°56'41"E
Alternative 3 - 80	27°42'34"S	29°56'47"E
Alternative 3 - 81	27°42'37"S	29°56'54"E
Alternative 3 - 82	27°42'40"S	29°57'1"E
Alternative 3 - 83	27°42'42"S	29°57'7"E
Alternative 3 - 84	27°42'45"S	29°57'14"E
Alternative 3 - 85	27°42'47"S	29°57'21"E
Alternative 3 - 86	27°42'50"S	29°57'28"E
Alternative 3 - 87	27°42'52"S	29°57'34"E
Alternative 3 - 88	27°42'55"S	29°57'41"E
Alternative 3 - 89	27°42'57"S	29°57'48"E
Alternative 3 - 90	27°43'0"S	29°57'55"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 3 - 91	27°43'1"S	29°58'2"E
Alternative 3 - 92	27°43'0"S	29°58'9"E
Alternative 3 - 93	27°42'59"S	29°58'16"E
Alternative 3 - 94	27°42'58"S	29°58'23"E
Alternative 3 - 95	27°42'58"S	29°58'31"E
Alternative 3 - 96	27°42'57"S	29°58'38"E
Alternative 3 - 97	27°42'56"S	29°58'45"E
Alternative 3 - 98	27°42'55"S	29°58'52"E
Alternative 3 - 99	27°42'49"S	29°58'54"E
Alternative 3 - 100	27°42'43"S	29°58'55"E
Alternative 3 - 101	27°42'36"S	29°58'57"E
Alternative 3 – 102	27°42'30"S	29°58'58"E
Alternative 3 – 103	27°42'24"S	29°58'59"E
Alternative 3 – 104	27°42'20"S	29°59'4"E
Alternative 3 – 105	27°42'18"S	29°59'11"E
Alternative 3 – 106	27°42'16"S	29°59'18"E
Alternative 3 – 107	27°42'15"S	29°59'25"E
Alternative 3 – 108	27°42'13"S	29°59'32"E
Alternative 3 – 109	27°42'11"S	29°59'39"E
Alternative 3 – 110	27°42'9"S	29°59'46"E
Alternative 3 – 111	27°42'8"S	29°59'53"E
Alternative 3 – 112	27°42'6"S	30°0'0"E
Alternative 3 – 113	27°42'7"S	30°0'7"E
Alternative 3 – 114	27°42'8"S	30°0'14"E
Alternative 3 – 115	27°42'10"S	30°0'21"E
Alternative 3 – 116	27°42'10"S	30°0'28"E
Alternative 3 - 117	27°42'5"S	30°0'32"E
Alternative 4		
	Latitude (South)	**Longitude (East)**
Alternative 4 - 1	27°41'8"S	29°48'0"E
Alternative 4 - 2	27°41'12"S	29°48'6"E
Alternative 4 - 3	27°41'16"S	29°48'11"E
Alternative 4 - 4	27°41'21"S	29°48'16"E
Alternative 4 - 5	27°41'26"S	29°48'21"E
Alternative 4 - 6	27°41'30"S	29°48'26"E
Alternative 4 - 7	27°41'35"S	29°48'31"E
Alternative 4 - 8	27°41'34"S	29°48'38"E
Alternative 4 - 9	27°41'33"S	29°48'46"E
Alternative 4 - 10	27°41'33"S	29°48'53"E
Alternative 4 - 11	27°41'32"S	29°49'0"E
Alternative 4 - 12	27°41'31"S	29°49'7"E
Alternative 4 - 13	27°41'31"S	29°49'15"E
Alternative 4 - 14	27°41'30"S	29°49'22"E
Alternative 4 - 15	27°41'30"S	29°49'29"E
Alternative 4 - 16	27°41'29"S	29°49'36"E
Alternative 4 - 17	27°41'28"S	29°49'44"E
Alternative 4 - 18	27°41'28"S	29°49'51"E
Alternative 4 - 19	27°41'27"S	29°49'58"E
Alternative 4 - 20	27°41'27"S	29°50'5"E
Alternative 4 - 21	27°41'26"S	29°50'13"E
Alternative 4 - 22	27°41'26"S	29°50'20"E
Alternative 4 - 23	27°41'25"S	29°50'27"E
Alternative 4 - 24	27°41'25"S	29°50'34"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 4 - 25	27°41'24"S	29°50'42"E
Alternative 4 - 26	27°41'24"S	29°50'49"E
Alternative 4 - 27	27°41'27"S	29°50'56"E
Alternative 4 - 28	27°41'29"S	29°51'2"E
Alternative 4 - 29	27°41'32"S	29°51'9"E
Alternative 4 - 30	27°41'35"S	29°51'15"E
Alternative 4 - 31	27°41'38"S	29°51'22"E
Alternative 4 - 32	27°41'41"S	29°51'28"E
Alternative 4 - 33	27°41'44"S	29°51'35"E
Alternative 4 - 34	27°41'46"S	29°51'41"E
Alternative 4 - 35	27°41'49"S	29°51'48"E
Alternative 4 - 36	27°41'52"S	29°51'55"E
Alternative 4 - 37	27°41'55"S	29°52'1"E
Alternative 4 - 38	27°41'58"S	29°52'8"E
Alternative 4 - 39	27°42'1"S	29°52'14"E
Alternative 4 - 40	27°42'3"S	29°52'21"E
Alternative 4 - 41	27°42'3"S	29°52'28"E
Alternative 4 - 42	27°42'2"S	29°52'35"E
Alternative 4 - 43	27°42'1"S	29°52'42"E
Alternative 4 - 44	27°42'0"S	29°52'50"E
Alternative 4 - 45	27°41'59"S	29°52'57"E
Alternative 4 - 46	27°41'58"S	29°53'4"E
Alternative 4 - 47	27°41'57"S	29°53'11"E
Alternative 4 - 48	27°41'56"S	29°53'18"E
Alternative 4 - 49	27°41'59"S	29°53'24"E
Alternative 4 - 50	27°42'3"S	29°53'30"E
Alternative 4 - 51	27°42'7"S	29°53'35"E
Alternative 4 - 52	27°42'12"S	29°53'41"E
Alternative 4 - 53	27°42'16"S	29°53'46"E
Alternative 4 - 54	27°42'20"S	29°53'52"E
Alternative 4 - 55	27°42'24"S	29°53'58"E
Alternative 4 - 56	27°42'25"S	29°54'5"E
Alternative 4 - 57	27°42'27"S	29°54'12"E
Alternative 4 - 58	27°42'28"S	29°54'19"E
Alternative 4 - 59	27°42'30"S	29°54'26"E
Alternative 4 - 60	27°42'31"S	29°54'33"E
Alternative 4 - 61	27°42'33"S	29°54'40"E
Alternative 4 - 62	27°42'34"S	29°54'47"E
Alternative 4 - 63	27°42'36"S	29°54'54"E
Alternative 4 - 64	27°42'37"S	29°55'1"E
Alternative 4 - 65	27°42'38"S	29°55'9"E
Alternative 4 - 66	27°42'36"S	29°55'15"E
Alternative 4 - 67	27°42'30"S	29°55'18"E
Alternative 4 - 68	27°42'27"S	29°55'24"E
Alternative 4 - 69	27°42'25"S	29°55'31"E
Alternative 4 - 70	27°42'22"S	29°55'37"E
Alternative 4 - 71	27°42'19"S	29°55'43"E
Alternative 4 - 72	27°42'15"S	29°55'49"E
Alternative 4 - 73	27°42'11"S	29°55'55"E
Alternative 4 - 74	27°42'8"S	29°56'1"E
Alternative 4 - 75	27°42'4"S	29°56'7"E
Alternative 4 - 76	27°42'0"S	29°56'13"E
Alternative 4 - 77	27°42'0"S	29°56'18"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 4 - 78	27°42'5"S	29°56'22"E
Alternative 4 - 79	27°42'11"S	29°56'25"E
Alternative 4 - 80	27°42'17"S	29°56'28"E
Alternative 4 - 81	27°42'23"S	29°56'32"E
Alternative 4 - 82	27°42'28"S	29°56'35"E
Alternative 4 - 83	27°42'32"S	29°56'41"E
Alternative 4 - 84	27°42'35"S	29°56'47"E
Alternative 4 - 85	27°42'37"S	29°56'54"E
Alternative 4 - 86	27°42'40"S	29°57'1"E
Alternative 4 - 87	27°42'42"S	29°57'8"E
Alternative 4 - 88	27°42'45"S	29°57'14"E
Alternative 4 - 89	27°42'47"S	29°57'21"E
Alternative 4 - 90	27°42'50"S	29°57'28"E
Alternative 4 - 91	27°42'52"S	29°57'35"E
Alternative 4 - 92	27°42'55"S	29°57'41"E
Alternative 4 - 93	27°42'57"S	29°57'48"E
Alternative 4 - 94	27°43'0"S	29°57'55"E
Alternative 4 - 95	27°43'1"S	29°58'2"E
Alternative 4 - 96	27°43'0"S	29°58'9"E
Alternative 4 - 97	27°42'59"S	29°58'16"E
Alternative 4 - 98	27°42'58"S	29°58'23"E
Alternative 4 - 99	27°42'58"S	29°58'31"E
Alternative 4 - 100	27°42'57"S	29°58'38"E
Alternative 4 – 101	27°42'56"S	29°58'45"E
Alternative 4 – 102	27°42'55"S	29°58'52"E
Alternative 4 – 103	27°42'49"S	29°58'54"E
Alternative 4 – 104	27°42'43"S	29°58'56"E
Alternative 4 - 105	27°42'36"S	29°58'57"E
Alternative 4 – 106	27°42'30"S	29°58'58"E
Alternative 4 – 107	27°42'23"S	29°58'59"E
Alternative 4 – 108	27°42'20"S	29°59'4"E
Alternative 4 – 109	27°42'18"S	29°59'11"E
Alternative 4 – 110	27°42'16"S	29°59'18"E
Alternative 4 – 111	27°42'14"S	29°59'25"E
Alternative 4 – 112	27°42'13"S	29°59'32"E
Alternative 4 – 113	27°42'11"S	29°59'39"E
Alternative 4 – 114	27°42'9"S	29°59'46"E
Alternative 4 – 115	27°42'7"S	29°59'53"E
Alternative 4 – 116	27°42'6"S	30°0'0"E
Alternative 4 – 116	27°42'7"S	30°0'7"E
Alternative 4 – 117	27°42'8"S	30°0'14"E
Alternative 4 – 118	27°42'10"S	30°0'21"E
Alternative 4 – 119	27°42'10"S	30°0'28"E
Alternative 4 – 120	27°42'5"S	30°0'33"E
Alternative 5		
	Latitude (South)	**Longitude (East)**
Alternative 5 - 1	27°41'8"S	29°48'0"E
Alternative 5 - 2	27°41'12"S	29°48'6"E
Alternative 5 - 3	27°41'16"S	29°48'11"E
Alternative 5 - 4	27°41'21"S	29°48'16"E
Alternative 5 - 5	27°41'26"S	29°48'21"E
Alternative 5 - 6	27°41'30"S	29°48'26"E
Alternative 5 - 7	27°41'35"S	29°48'31"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 5 - 8	27°41'34"S	29°48'38"E
Alternative 5 - 9	27°41'33"S	29°48'46"E
Alternative 5 - 10	27°41'33"S	29°48'53"E
Alternative 5 - 11	27°41'32"S	29°49'0"E
Alternative 5 - 12	27°41'31"S	29°49'7"E
Alternative 5 - 13	27°41'31"S	29°49'15"E
Alternative 5 - 14	27°41'30"S	29°49'22"E
Alternative 5 - 15	27°41'30"S	29°49'29"E
Alternative 5 - 16	27°41'29"S	29°49'36"E
Alternative 5 - 17	27°41'28"S	29°49'44"E
Alternative 5 - 18	27°41'28"S	29°49'51"E
Alternative 5 - 19	27°41'27"S	29°49'58"E
Alternative 5 - 20	27°41'27"S	29°50'5"E
Alternative 5 - 21	27°41'26"S	29°50'13"E
Alternative 5 - 22	27°41'26"S	29°50'20"E
Alternative 5 - 23	27°41'25"S	29°50'27"E
Alternative 5 - 24	27°41'25"S	29°50'34"E
Alternative 5 - 25	27°41'24"S	29°50'42"E
Alternative 5 - 26	27°41'24"S	29°50'49"E
Alternative 5 - 27	27°41'27"S	29°50'56"E
Alternative 5 - 28	27°41'29"S	29°51'2"E
Alternative 5 - 29	27°41'32"S	29°51'9"E
Alternative 5 - 30	27°41'35"S	29°51'15"E
Alternative 5 - 31	27°41'38"S	29°51'22"E
Alternative 5 - 32	27°41'41"S	29°51'28"E
Alternative 5 - 33	27°41'44"S	29°51'35"E
Alternative 5 - 34	27°41'46"S	29°51'41"E
Alternative 5 - 35	27°41'49"S	29°51'48"E
Alternative 5 - 36	27°41'52"S	29°51'55"E
Alternative 5 - 37	27°41'55"S	29°52'1"E
Alternative 5 - 38	27°41'58"S	29°52'8"E
Alternative 5 - 39	27°42'1"S	29°52'14"E
Alternative 5 - 40	27°42'3"S	29°52'21"E
Alternative 5 - 41	27°42'3"S	29°52'28"E
Alternative 5 - 42	27°42'2"S	29°52'35"E
Alternative 5 - 43	27°42'1"S	29°52'42"E
Alternative 5 - 44	27°42'0"S	29°52'50"E
Alternative 5 - 45	27°41'59"S	29°52'57"E
Alternative 5 - 46	27°41'58"S	29°53'4"E
Alternative 5 - 47	27°41'57"S	29°53'11"E
Alternative 5 - 48	27°41'56"S	29°53'18"E
Alternative 5 - 49	27°41'59"S	29°53'24"E
Alternative 5 - 50	27°42'3"S	29°53'30"E
Alternative 5 - 51	27°42'7"S	29°53'35"E
Alternative 5 - 52	27°42'12"S	29°53'41"E
Alternative 5 - 53	27°42'16"S	29°53'46"E
Alternative 5 - 54	27°42'20"S	29°53'52"E
Alternative 5 - 55	27°42'24"S	29°53'58"E
Alternative 5 - 56	27°42'25"S	29°54'5"E
Alternative 5 - 57	27°42'27"S	29°54'12"E
Alternative 5 - 58	27°42'28"S	29°54'19"E
Alternative 5 - 59	27°42'30"S	29°54'26"E
Alternative 5 - 60	27°42'31"S	29°54'33"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 5 - 61	27°42'33"S	29°54'40"E
Alternative 5 - 62	27°42'34"S	29°54'47"E
Alternative 5 - 63	27°42'36"S	29°54'54"E
Alternative 5 - 64	27°42'37"S	29°55'1"E
Alternative 5 - 65	27°42'38"S	29°55'9"E
Alternative 5 - 66	27°42'36"S	29°55'15"E
Alternative 5 - 67	27°42'30"S	29°55'18"E
Alternative 5 - 68	27°42'27"S	29°55'24"E
Alternative 5 - 69	27°42'25"S	29°55'31"E
Alternative 5 - 70	27°42'22"S	29°55'37"E
Alternative 5 - 71	27°42'20"S	29°55'43"E
Alternative 5 - 72	27°42'21"S	29°55'50"E
Alternative 5 - 73	27°42'23"S	29°55'58"E
Alternative 5 - 74	27°42'24"S	29°56'5"E
Alternative 5 - 75	27°42'23"S	29°56'12"E
Alternative 5 - 76	27°42'21"S	29°56'18"E
Alternative 5 - 77	27°42'18"S	29°56'25"E
Alternative 5 - 78	27°42'20"S	29°56'30"E
Alternative 5 - 79	27°42'26"S	29°56'34"E
Alternative 5 - 80	27°42'31"S	29°56'38"E
Alternative 5 - 81	27°42'33"S	29°56'44"E
Alternative 5 - 82	27°42'36"S	29°56'51"E
Alternative 5 - 83	27°42'38"S	29°56'58"E
Alternative 5 - 84	27°42'41"S	29°57'5"E
Alternative 5 - 85	27°42'43"S	29°57'11"E
Alternative 5 - 86	27°42'46"S	29°57'18"E
Alternative 5 - 87	27°42'49"S	29°57'25"E
Alternative 5 - 88	27°42'51"S	29°57'31"E
Alternative 5 - 89	27°42'54"S	29°57'38"E
Alternative 5 - 90	27°42'56"S	29°57'45"E
Alternative 5 - 91	27°42'59"S	29°57'52"E
Alternative 5 - 92	27°43'1"S	29°57'58"E
Alternative 5 - 93	27°43'0"S	29°58'6"E
Alternative 5 - 94	27°42'59"S	29°58'13"E
Alternative 5 - 95	27°42'59"S	29°58'20"E
Alternative 5 - 96	27°42'58"S	29°58'27"E
Alternative 5 - 97	27°42'57"S	29°58'35"E
Alternative 5 - 98	27°42'56"S	29°58'42"E
Alternative 5 - 99	27°42'58"S	29°58'48"E
Alternative 5 - 100	27°43'3"S	29°58'52"E
Alternative 5 – 101	27°43'8"S	29°58'56"E
Alternative 5 – 102	27°43'14"S	29°58'58"E
Alternative 5 – 103	27°43'20"S	29°58'55"E
Alternative 5 – 104	27°43'17"S	29°58'50"E
Alternative 6		
	Latitude (South)	**Longitude (East)**
Alternative 6 - 1	27°41'8"S	29°48'0"E
Alternative 6 - 2	27°41'12"S	29°48'6"E
Alternative 6 - 3	27°41'16"S	29°48'11"E
Alternative 6 - 4	27°41'21"S	29°48'16"E
Alternative 6 – 5	27°41'26"S	29°48'21"E
Alternative 6 - 6	27°41'30"S	29°48'26"E
Alternative 6 - 7	27°41'35"S	29°48'31"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 6 - 8	27°41'34"S	29°48'38"E
Alternative 6 - 9	27°41'33"S	29°48'46"E
Alternative 6 - 10	27°41'33"S	29°48'53"E
Alternative 6 - 11	27°41'32"S	29°49'0"E
Alternative 6 - 12	27°41'31"S	29°49'7"E
Alternative 6 - 13	27°41'31"S	29°49'15"E
Alternative 6 - 14	27°41'30"S	29°49'22"E
Alternative 6 - 15	27°41'30"S	29°49'29"E
Alternative 6 - 16	27°41'29"S	29°49'36"E
Alternative 6 - 17	27°41'28"S	29°49'44"E
Alternative 6 - 18	27°41'28"S	29°49'51"E
Alternative 6 - 19	27°41'27"S	29°49'58"E
Alternative 6 - 20	27°41'27"S	29°50'5"E
Alternative 6 - 21	27°41'26"S	29°50'13"E
Alternative 6 - 22	27°41'26"S	29°50'20"E
Alternative 6 - 23	27°41'25"S	29°50'27"E
Alternative 6 - 24	27°41'25"S	29°50'34"E
Alternative 6 - 25	27°41'24"S	29°50'42"E
Alternative 6 - 26	27°41'23"S	29°50'49"E
Alternative 6 - 27	27°41'20"S	29°50'55"E
Alternative 6 - 28	27°41'17"S	29°51'2"E
Alternative 6 - 29	27°41'14"S	29°51'8"E
Alternative 6 - 30	27°41'11"S	29°51'15"E
Alternative 6 - 31	27°41'8"S	29°51'21"E
Alternative 6 - 32	27°41'5"S	29°51'28"E
Alternative 6 - 33	27°41'2"S	29°51'34"E
Alternative 6 - 34	27°40'59"S	29°51'41"E
Alternative 6 - 35	27°40'56"S	29°51'47"E
Alternative 6 - 36	27°40'53"S	29°51'54"E
Alternative 6 - 37	27°40'50"S	29°52'0"E
Alternative 6 - 38	27°40'50"S	29°52'7"E
Alternative 6 - 39	27°40'51"S	29°52'14"E
Alternative 6 - 40	27°40'51"S	29°52'22"E
Alternative 6 - 41	27°40'52"S	29°52'29"E
Alternative 6 - 42	27°40'53"S	29°52'36"E
Alternative 6 - 43	27°40'53"S	29°52'43"E
Alternative 6 - 44	27°40'54"S	29°52'51"E
Alternative 6 - 45	27°40'55"S	29°52'58"E
Alternative 6 - 46	27°40'55"S	29°53'5"E
Alternative 6 - 47	27°40'56"S	29°53'12"E
Alternative 6 - 48	27°40'57"S	29°53'20"E
Alternative 6 - 49	27°40'57"S	29°53'27"E
Alternative 6 - 50	27°40'58"S	29°53'34"E
Alternative 6 - 51	27°40'59"S	29°53'41"E
Alternative 6 - 52	27°40'59"S	29°53'49"E
Alternative 6 - 53	27°41'0"S	29°53'56"E
Alternative 6 - 54	27°41'1"S	29°54'3"E
Alternative 6 - 55	27°41'1"S	29°54'10"E
Alternative 6 - 56	27°41'4"S	29°54'17"E
Alternative 6 - 57	27°41'6"S	29°54'24"E
Alternative 6 - 58	27°41'9"S	29°54'31"E
Alternative 6 - 59	27°41'11"S	29°54'37"E
Alternative 6 - 60	27°41'14"S	29°54'44"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 6 - 61	27°41'16"S	29°54'51"E
Alternative 6 - 62	27°41'19"S	29°54'58"E
Alternative 6 - 63	27°41'21"S	29°55'4"E
Alternative 6 - 64	27°41'24"S	29°55'11"E
Alternative 6 - 65	27°41'26"S	29°55'18"E
Alternative 6 - 66	27°41'29"S	29°55'25"E
Alternative 6 - 67	27°41'31"S	29°55'31"E
Alternative 6 - 68	27°41'33"S	29°55'38"E
Alternative 6 - 69	27°41'36"S	29°55'45"E
Alternative 6 - 70	27°41'38"S	29°55'52"E
Alternative 6 - 71	27°41'41"S	29°55'58"E
Alternative 6 - 72	27°41'43"S	29°56'5"E
Alternative 6 - 73	27°41'46"S	29°56'12"E
Alternative 6 - 74	27°41'52"S	29°56'15"E
Alternative 6 - 75	27°41'58"S	29°56'17"E
Alternative 6 - 76	27°42'3"S	29°56'21"E
Alternative 6 - 77	27°42'9"S	29°56'24"E
Alternative 6 - 78	27°42'15"S	29°56'27"E
Alternative 6 - 79	27°42'21"S	29°56'31"E
Alternative 6 - 80	27°42'26"S	29°56'34"E
Alternative 6 - 81	27°42'31"S	29°56'39"E
Alternative 6 - 82	27°42'34"S	29°56'45"E
Alternative 6 - 83	27°42'36"S	29°56'52"E
Alternative 6 - 84	27°42'39"S	29°56'59"E
Alternative 6 - 85	27°42'41"S	29°57'5"E
Alternative 6 - 86	27°42'44"S	29°57'12"E
Alternative 6 - 87	27°42'46"S	29°57'19"E
Alternative 6 - 88	27°42'49"S	29°57'26"E
Alternative 6 - 89	27°42'51"S	29°57'32"E
Alternative 6 - 90	27°42'54"S	29°57'39"E
Alternative 6 - 91	27°42'56"S	29°57'46"E
Alternative 6 - 92	27°42'59"S	29°57'52"E
Alternative 6 - 93	27°43'1"S	29°57'59"E
Alternative 6 - 94	27°43'0"S	29°58'7"E
Alternative 6 - 95	27°42'59"S	29°58'14"E
Alternative 6 - 96	27°42'59"S	29°58'21"E
Alternative 6 - 97	27°42'58"S	29°58'28"E
Alternative 6 - 98	27°42'57"S	29°58'36"E
Alternative 6 - 99	27°42'56"S	29°58'43"E
Alternative 6 - 100	27°42'58"S	29°58'49"E
Alternative 6 – 101	27°43'4"S	29°58'53"E
Alternative 6 – 102	27°43'9"S	29°58'57"E
Alternative 6 - 103	27°43'15"S	29°58'57"E
Alternative 6 - 104	27°43'20"S	29°58'54"E
Alternative 7		
	Latitude (South)	**Longitude (East)**
Alternative 7 - 1	27°41'9"S	29°47'59"E
Alternative 7 - 2	27°41'13"S	29°48'5"E
Alternative 7 - 3	27°41'17"S	29°48'10"E
Alternative 7 - 4	27°41'22"S	29°48'15"E
Alternative 7 - 5	27°41'27"S	29°48'20"E
Alternative 7 - 6	27°41'31"S	29°48'25"E
Alternative 7 - 7	27°41'36"S	29°48'30"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 7 - 8	27°41'35"S	29°48'38"E
Alternative 7 - 9	27°41'34"S	29°48'45"E
Alternative 7 - 10	27°41'34"S	29°48'52"E
Alternative 7 - 11	27°41'33"S	29°48'59"E
Alternative 7 - 12	27°41'32"S	29°49'7"E
Alternative 7 - 13	27°41'32"S	29°49'14"E
Alternative 7 - 14	27°41'31"S	29°49'21"E
Alternative 7 - 15	27°41'31"S	29°49'28"E
Alternative 7 - 16	27°41'30"S	29°49'36"E
Alternative 7 - 17	27°41'30"S	29°49'43"E
Alternative 7 - 18	27°41'29"S	29°49'50"E
Alternative 7 - 19	27°41'28"S	29°49'58"E
Alternative 7 - 20	27°41'28"S	29°50'5"E
Alternative 7 - 21	27°41'27"S	29°50'12"E
Alternative 7 - 22	27°41'27"S	29°50'19"E
Alternative 7 - 23	27°41'26"S	29°50'27"E
Alternative 7 - 24	27°41'26"S	29°50'34"E
Alternative 7 - 25	27°41'25"S	29°50'41"E
Alternative 7 - 26	27°41'25"S	29°50'48"E
Alternative 7 - 27	27°41'27"S	29°50'55"E
Alternative 7 - 28	27°41'30"S	29°51'2"E
Alternative 7 - 29	27°41'33"S	29°51'8"E
Alternative 7 - 30	27°41'36"S	29°51'15"E
Alternative 7 - 31	27°41'39"S	29°51'21"E
Alternative 7 - 32	27°41'42"S	29°51'28"E
Alternative 7 - 33	27°41'44"S	29°51'34"E
Alternative 7 - 34	27°41'47"S	29°51'41"E
Alternative 7 - 35	27°41'50"S	29°51'47"E
Alternative 7 - 36	27°41'53"S	29°51'54"E
Alternative 7 - 37	27°41'56"S	29°52'1"E
Alternative 7 - 38	27°41'59"S	29°52'7"E
Alternative 7 - 39	27°42'1"S	29°52'14"E
Alternative 7 - 40	27°42'4"S	29°52'20"E
Alternative 7 - 41	27°42'4"S	29°52'27"E
Alternative 7 - 42	27°42'3"S	29°52'35"E
Alternative 7 - 43	27°42'2"S	29°52'42"E
Alternative 7 - 44	27°42'1"S	29°52'49"E
Alternative 7 - 45	27°42'0"S	29°52'56"E
Alternative 7 - 46	27°41'59"S	29°53'3"E
Alternative 7 - 47	27°41'58"S	29°53'11"E
Alternative 7 - 48	27°41'57"S	29°53'18"E
Alternative 7 - 49	27°42'0"S	29°53'24"E
Alternative 7 - 50	27°42'4"S	29°53'29"E
Alternative 7 - 51	27°42'8"S	29°53'35"E
Alternative 7 - 52	27°42'13"S	29°53'40"E
Alternative 7 - 53	27°42'17"S	29°53'46"E
Alternative 7 - 54	27°42'21"S	29°53'51"E
Alternative 7 - 55	27°42'25"S	29°53'57"E
Alternative 7 - 56	27°42'26"S	29°54'4"E
Alternative 7 - 57	27°42'28"S	29°54'11"E
Alternative 7 - 58	27°42'29"S	29°54'19"E
Alternative 7 - 59	27°42'31"S	29°54'26"E
Alternative 7 - 60	27°42'32"S	29°54'33"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 7 - 61	27°42'34"S	29°54'40"E
Alternative 7 - 62	27°42'35"S	29°54'47"E
Alternative 7 - 63	27°42'37"S	29°54'54"E
Alternative 7 - 64	27°42'38"S	29°55'1"E
Alternative 7 - 65	27°42'40"S	29°55'8"E
Alternative 7 - 66	27°42'37"S	29°55'15"E
Alternative 7 - 67	27°42'32"S	29°55'18"E
Alternative 7 - 68	27°42'28"S	29°55'23"E
Alternative 7 - 69	27°42'27"S	29°55'30"E
Alternative 7 - 70	27°42'23"S	29°55'37"E
Alternative 7 - 71	27°42'21"S	29°55'43"E
Alternative 7 - 72	27°42'22"S	29°55'50"E
Alternative 7 - 73	27°42'24"S	29°55'57"E
Alternative 7 - 74	27°42'25"S	29°56'4"E
Alternative 7 - 75	27°42'24"S	29°56'11"E
Alternative 7 - 76	27°42'22"S	29°56'18"E
Alternative 7 - 77	27°42'20"S	29°56'25"E
Alternative 7 - 78	27°42'21"S	29°56'30"E
Alternative 7 - 79	27°42'27"S	29°56'33"E
Alternative 7 - 80	27°42'32"S	29°56'38"E
Alternative 7 - 81	27°42'34"S	29°56'44"E
Alternative 7 - 82	27°42'37"S	29°56'51"E
Alternative 7 - 83	27°42'39"S	29°56'58"E
Alternative 7 - 84	27°42'42"S	29°57'4"E
Alternative 7 - 85	27°42'45"S	29°57'11"E
Alternative 7 - 86	27°42'47"S	29°57'18"E
Alternative 7 - 87	27°42'50"S	29°57'25"E
Alternative 7 - 88	27°42'52"S	29°57'31"E
Alternative 7 - 89	27°42'55"S	29°57'38"E
Alternative 7 - 90	27°42'57"S	29°57'45"E
Alternative 7 - 91	27°43'0"S	29°57'52"E
Alternative 7 - 92	27°43'2"S	29°57'58"E
Alternative 7 - 93	27°43'1"S	29°58'6"E
Alternative 7 - 94	27°43'0"S	29°58'13"E
Alternative 7 - 95	27°43'0"S	29°58'20"E
Alternative 7 - 96	27°42'59"S	29°58'27"E
Alternative 7 - 97	27°42'58"S	29°58'35"E
Alternative 7 - 98	27°42'58"S	29°58'42"E
Alternative 7 - 99	27°42'59"S	29°58'48"E
Alternative 7 - 100	27°43'4"S	29°58'52"E
Alternative 7 - 101	27°43'10"S	29°58'56"E
Alternative 7 - 102	27°43'16"S	29°58'56"E
Alternative 7 - 103	27°43'18"S	29°58'51"E
Alternative 8		
	Latitude (South)	**Longitude (East)**
Alternative 8 - 1	27°41'8"S	29°48'0"E
Alternative 8 - 2	27°41'12"S	29°48'6"E
Alternative 8 - 3	27°41'16"S	29°48'11"E
Alternative 8 - 4	27°41'21"S	29°48'16"E
Alternative 8 - 5	27°41'26"S	29°48'21"E
Alternative 8 - 6	27°41'30"S	29°48'26"E
Alternative 8 - 7	27°41'35"S	29°48'31"E
Alternative 8 - 8	27°41'34"S	29°48'38"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 8 - 9	27°41'33"S	29°48'46"E
Alternative 8 - 10	27°41'33"S	29°48'53"E
Alternative 8 - 11	27°41'32"S	29°49'0"E
Alternative 8 - 12	27°41'31"S	29°49'7"E
Alternative 8 - 13	27°41'31"S	29°49'15"E
Alternative 8 - 14	27°41'30"S	29°49'22"E
Alternative 8 - 15	27°41'30"S	29°49'29"E
Alternative 8 - 16	27°41'29"S	29°49'36"E
Alternative 8 - 17	27°41'28"S	29°49'44"E
Alternative 8 - 18	27°41'28"S	29°49'51"E
Alternative 8 - 19	27°41'27"S	29°49'58"E
Alternative 8 - 20	27°41'27"S	29°50'5"E
Alternative 8 - 21	27°41'26"S	29°50'13"E
Alternative 8 - 22	27°41'26"S	29°50'20"E
Alternative 8 - 23	27°41'25"S	29°50'27"E
Alternative 8 - 24	27°41'25"S	29°50'34"E
Alternative 8 - 25	27°41'24"S	29°50'42"E
Alternative 8 - 26	27°41'24"S	29°50'49"E
Alternative 8 - 27	27°41'27"S	29°50'56"E
Alternative 8 - 28	27°41'29"S	29°51'2"E
Alternative 8 - 29	27°41'32"S	29°51'9"E
Alternative 8 - 30	27°41'35"S	29°51'15"E
Alternative 8 - 31	27°41'38"S	29°51'22"E
Alternative 8 - 32	27°41'41"S	29°51'28"E
Alternative 8 - 33	27°41'44"S	29°51'35"E
Alternative 8 - 34	27°41'46"S	29°51'41"E
Alternative 8 - 35	27°41'49"S	29°51'48"E
Alternative 8 - 36	27°41'52"S	29°51'55"E
Alternative 8 - 37	27°41'55"S	29°52'1"E
Alternative 8 - 38	27°41'58"S	29°52'8"E
Alternative 8 - 39	27°42'1"S	29°52'14"E
Alternative 8 - 40	27°42'3"S	29°52'21"E
Alternative 8 - 41	27°42'3"S	29°52'28"E
Alternative 8 - 42	27°42'2"S	29°52'35"E
Alternative 8 - 43	27°42'1"S	29°52'42"E
Alternative 8 - 44	27°42'0"S	29°52'50"E
Alternative 8 - 45	27°41'59"S	29°52'57"E
Alternative 8 - 46	27°41'58"S	29°53'4"E
Alternative 8 - 47	27°41'56"S	29°53'11"E
Alternative 8 - 48	27°41'55"S	29°53'18"E
Alternative 8 - 49	27°41'54"S	29°53'26"E
Alternative 8 - 50	27°41'53"S	29°53'33"E
Alternative 8 - 51	27°41'52"S	29°53'40"E
Alternative 8 - 52	27°41'51"S	29°53'47"E
Alternative 8 - 53	27°41'49"S	29°53'54"E
Alternative 8 - 54	27°41'47"S	29°54'1"E
Alternative 8 - 55	27°41'45"S	29°54'8"E
Alternative 8 - 56	27°41'43"S	29°54'15"E
Alternative 8 - 57	27°41'41"S	29°54'22"E
Alternative 8 - 58	27°41'40"S	29°54'29"E
Alternative 8 - 59	27°41'38"S	29°54'36"E
Alternative 8 - 60	27°41'36"S	29°54'43"E
Alternative 8 - 61	27°41'34"S	29°54'50"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 8 - 62	27°41'37"S	29°54'56"E
Alternative 8 - 63	27°41'40"S	29°55'3"E
Alternative 8 - 64	27°41'43"S	29°55'10"E
Alternative 8 - 65	27°41'46"S	29°55'16"E
Alternative 8 - 66	27°41'48"S	29°55'23"E
Alternative 8 - 67	27°41'51"S	29°55'29"E
Alternative 8 - 68	27°41'54"S	29°55'36"E
Alternative 8 - 69	27°41'57"S	29°55'43"E
Alternative 8 - 70	27°42'0"S	29°55'49"E
Alternative 8 - 71	27°42'2"S	29°55'56"E
Alternative 8 - 72	27°42'5"S	29°56'2"E
Alternative 8 - 73	27°42'8"S	29°56'9"E
Alternative 8 - 74	27°42'11"S	29°56'15"E
Alternative 8 - 75	27°42'14"S	29°56'22"E
Alternative 8 - 76	27°42'17"S	29°56'28"E
Alternative 8 - 77	27°42'22"S	29°56'32"E
Alternative 8 - 78	27°42'28"S	29°56'35"E
Alternative 8 - 79	27°42'32"S	29°56'41"E
Alternative 8 - 80	27°42'34"S	29°56'47"E
Alternative 8 - 81	27°42'37"S	29°56'54"E
Alternative 8 - 82	27°42'40"S	29°57'1"E
Alternative 8 - 83	27°42'42"S	29°57'7"E
Alternative 8 - 84	27°42'45"S	29°57'14"E
Alternative 8 - 85	27°42'47"S	29°57'21"E
Alternative 8 - 86	27°42'50"S	29°57'28"E
Alternative 8 - 87	27°42'52"S	29°57'34"E
Alternative 8 - 88	27°42'55"S	29°57'41"E
Alternative 8 - 89	27°42'57"S	29°57'48"E
Alternative 8 - 90	27°43'0"S	29°57'55"E
Alternative 8 - 91	27°43'1"S	29°58'2"E
Alternative 8 - 92	27°43'0"S	29°58'9"E
Alternative 8 - 93	27°42'59"S	29°58'16"E
Alternative 8 - 94	27°42'58"S	29°58'23"E
Alternative 8 - 95	27°42'58"S	29°58'31"E
Alternative 8 - 96	27°42'57"S	29°58'38"E
Alternative 8 - 97	27°42'56"S	29°58'45"E
Alternative 8 - 98	27°43'0"S	29°58'50"E
Alternative 8 - 99	27°43'5"S	29°58'54"E
Alternative 8 - 100	27°43'11"S	29°58'58"E
Alternative 8 - 101	27°43'17"S	29°58'57"E
Alternative 8 - 102	27°43'20"S	29°58'52"E
Alternative 9		
	Latitude (South)	**Longitude (East)**
Alternative 9 - 1	27°41'8"S	29°48'0"E
Alternative 9 - 2	27°41'12"S	29°48'6"E
Alternative 9 - 3	27°41'16"S	29°48'11"E
Alternative 9 - 4	27°41'21"S	29°48'16"E
Alternative 9 - 5	27°41'26"S	29°48'21"E
Alternative 9 - 6	27°41'30"S	29°48'26"E
Alternative 9 - 7	27°41'35"S	29°48'31"E
Alternative 9 - 8	27°41'34"S	29°48'38"E
Alternative 9 - 9	27°41'33"S	29°48'46"E
Alternative 9 - 10	27°41'33"S	29°48'53"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 9 - 11	27°41'32"S	29°49'0"E
Alternative 9 - 12	27°41'31"S	29°49'7"E
Alternative 9 - 13	27°41'31"S	29°49'15"E
Alternative 9 - 14	27°41'30"S	29°49'22"E
Alternative 9 - 15	27°41'30"S	29°49'29"E
Alternative 9 - 16	27°41'29"S	29°49'36"E
Alternative 9 - 17	27°41'28"S	29°49'44"E
Alternative 9 - 18	27°41'28"S	29°49'51"E
Alternative 9 - 19	27°41'27"S	29°49'58"E
Alternative 9 - 20	27°41'27"S	29°50'5"E
Alternative 9 - 21	27°41'26"S	29°50'13"E
Alternative 9 - 22	27°41'26"S	29°50'20"E
Alternative 9 - 23	27°41'25"S	29°50'27"E
Alternative 9 - 24	27°41'25"S	29°50'34"E
Alternative 9 - 25	27°41'24"S	29°50'42"E
Alternative 9 - 26	27°41'24"S	29°50'49"E
Alternative 9 - 27	27°41'27"S	29°50'56"E
Alternative 9 - 28	27°41'29"S	29°51'2"E
Alternative 9 - 29	27°41'32"S	29°51'9"E
Alternative 9 - 30	27°41'35"S	29°51'15"E
Alternative 9 - 31	27°41'38"S	29°51'22"E
Alternative 9 - 32	27°41'41"S	29°51'28"E
Alternative 9 - 33	27°41'44"S	29°51'35"E
Alternative 9 - 34	27°41'46"S	29°51'41"E
Alternative 9 - 35	27°41'49"S	29°51'48"E
Alternative 9 - 36	27°41'52"S	29°51'55"E
Alternative 9 - 37	27°41'55"S	29°52'1"E
Alternative 9 - 38	27°41'58"S	29°52'8"E
Alternative 9 - 39	27°42'1"S	29°52'14"E
Alternative 9 - 40	27°42'3"S	29°52'21"E
Alternative 9 - 41	27°42'3"S	29°52'28"E
Alternative 9 - 42	27°42'2"S	29°52'35"E
Alternative 9 - 43	27°42'1"S	29°52'42"E
Alternative 9 - 44	27°42'0"S	29°52'50"E
Alternative 9 - 45	27°41'59"S	29°52'57"E
Alternative 9 - 46	27°41'58"S	29°53'4"E
Alternative 9 - 47	27°41'57"S	29°53'11"E
Alternative 9 - 48	27°41'56"S	29°53'18"E
Alternative 9 - 49	27°41'59"S	29°53'24"E
Alternative 9 - 50	27°42'3"S	29°53'30"E
Alternative 9 - 51	27°42'7"S	29°53'35"E
Alternative 9 - 52	27°42'12"S	29°53'41"E
Alternative 9 - 53	27°42'16"S	29°53'46"E
Alternative 9 - 54	27°42'20"S	29°53'52"E
Alternative 9 - 55	27°42'24"S	29°53'58"E
Alternative 9 - 56	27°42'25"S	29°54'5"E
Alternative 9 - 57	27°42'27"S	29°54'12"E
Alternative 9 - 58	27°42'28"S	29°54'19"E
Alternative 9 - 59	27°42'30"S	29°54'26"E
Alternative 9 - 60	27°42'31"S	29°54'33"E
Alternative 9 - 61	27°42'33"S	29°54'40"E
Alternative 9 - 62	27°42'34"S	29°54'47"E
Alternative 9 - 63	27°42'36"S	29°54'54"E

COMPONENT/INFRASTRUCTURE	LATITUDE	LONGITUDE
Alternative 9 - 64	27°42'37"S	29°55'1"E
Alternative 9 - 65	27°42'38"S	29°55'9"E
Alternative 9 - 66	27°42'36"S	29°55'15"E
Alternative 9 - 67	27°42'30"S	29°55'18"E
Alternative 9 - 68	27°42'27"S	29°55'24"E
Alternative 9 - 69	27°42'25"S	29°55'31"E
Alternative 9 - 70	27°42'22"S	29°55'37"E
Alternative 9 - 71	27°42'19"S	29°55'43"E
Alternative 9 - 72	27°42'15"S	29°55'49"E
Alternative 9 - 73	27°42'11"S	29°55'55"E
Alternative 9 - 74	27°42'8"S	29°56'1"E
Alternative 9 - 75	27°42'4"S	29°56'7"E
Alternative 9 - 76	27°42'0"S	29°56'13"E
Alternative 9 - 77	27°42'0"S	29°56'18"E
Alternative 9 - 78	27°42'5"S	29°56'22"E
Alternative 9 - 79	27°42'11"S	29°56'25"E
Alternative 9 - 80	27°42'17"S	29°56'28"E
Alternative 9 - 81	27°42'23"S	29°56'32"E
Alternative 9 - 82	27°42'28"S	29°56'35"E
Alternative 9 - 83	27°42'32"S	29°56'41"E
Alternative 9 - 84	27°42'35"S	29°56'47"E
Alternative 9 - 85	27°42'37"S	29°56'54"E
Alternative 9 - 86	27°42'40"S	29°57'1"E
Alternative 9 - 87	27°42'42"S	29°57'8"E
Alternative 9 - 88	27°42'45"S	29°57'14"E
Alternative 9 - 89	27°42'47"S	29°57'21"E
Alternative 9 - 90	27°42'50"S	29°57'28"E
Alternative 9 - 91	27°42'52"S	29°57'35"E
Alternative 9 - 92	27°42'55"S	29°57'41"E
Alternative 9 - 93	27°42'57"S	29°57'48"E
Alternative 9 - 94	27°43'0"S	29°57'55"E
Alternative 9 - 95	27°43'1"S	29°58'2"E
Alternative 9 - 96	27°43'0"S	29°58'9"E
Alternative 9 - 97	27°42'59"S	29°58'16"E
Alternative 9 - 98	27°42'58"S	29°58'23"E
Alternative 9 - 99	27°42'58"S	29°58'31"E
Alternative 9 - 100	27°42'57"S	29°58'38"E
Alternative 9 - 101	27°42'56"S	29°58'45"E
Alternative 9 - 102	27°43'0"S	29°58'50"E
Alternative 9 – 103	27°43'6"S	29°58'54"E
Alternative 9 – 104	27°43'11"S	29°58'58"E
Alternative 9 – 105	27°43'17"S	29°58'57"E
Alternative 9 - 106	27°43'19"S	29°58'52"E

2.4. ENVIRONMENTAL AUTHORISATIONS IN SOUTH AFRICA

The regulation and protection of the environment within South Africa, occurs mainly through the application of various items of legislation, within the regulatory framework of the Constitution (Act No. 108 of 1996).

The primary legislation regulating EIAs within South Africa is the NEMA (Act No. 107 of 1998, and subsequent amendments). The NEMA makes provision for the Minister of Environmental Affairs to identify activities which may not commence prior to authorisation from either the Minister or the provincial Member of the

Executive Council ("the MEC"). In addition to this, the NEMA also provides for the formulation of regulations in respect of such authorisations.

Table 2.4-1: Relevant Legislation, Policies and Guidelines

TITLE OF LEGISLATION, POLICY OR GUIDELINE	RELEVANCE TO THE PROJECT
Constitution Act (Act No. 108 of 1996)	The Developer is obligated to ensure that the development of the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure will not result in pollution and ecological degradation. In addition, the Developer is obligated to ensure that the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure is ecologically sustainable and that it demonstrates economic and social development.
National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) Environmental Impact Assessment Regulations (2014, as amended)	The construction of the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure triggers listed activities in terms of Listing Notice 1 and Listing Notice 3 of the NEMA EIA Regulations (2014, as amended). A Basic Assessment (BA) Process is being undertaken and an Environmental Authorisation (EA) is required from the provincial KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (KZN DEDTEA) prior to the commencement of construction.
National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 of 2004) National Forestry Act (NFA) (Act No. 84 of 1998) Nature Conservation Act (Act 9 of 1997)	The proposed development of the Mulilo Newcastle Wind Power Grid Connection and associated infrastructure will require the clearance of sections of vegetation, specifically Low Escarpment Moist Grassland and Northern KwaZulu Moist Grassland (SANBI National Vegetation Map, 2018), which will impact on the biodiversity of the area. In addition, small patches of Southern Mistbelt Forest (SANBI National Vegetation Map, 2018) occur within the Connection Corridor; however, this vegetation type will be avoided.
National Water Act (NWA) (Act No. 36 of 1998, as amended)	Should the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure development trigger water use activities in terms of Section 21 of the NWA, authorisation will be required from the Department of Water and Sanitation (DWS) prior to the commencement of the construction phase. Regardless of whether Section 21 water uses are triggered, the DWS remains a stakeholder which will be notified of the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.
Mineral and Petroleum Resources Development Act (MPRDA) (Act No. 28 of 2002)	The Department of Mineral Resources and Energy (DMRE) should be made aware of the proposed development and any necessary approvals must be obtained from the DMRE prior to the commencement of these activities.
National Heritage Resources Act (NHRA) (Act No. 25 of 1999)	The proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure development could impact sensitive heritage resources. The KwaZulu Natal Amafa and Research Institute (PHRA) will be informed of the proposed development and any relevant authorisation and/or permits must be obtained prior to the commencement of the construction phase.
National Environmental Management: Waste Act (NEM:WA) (Act No. 59 of 2008)	The Developer must ensure that all activities associated with the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure address waste-related matters in compliance with the requirements of the NEM:WA. The Developer should communicate with the affected municipalities to ensure that waste is disposed of at a suitably registered landfill site.
Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1983)	The Department of Agriculture, Forestry and Fisheries (DAFF) should be informed of the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure. An invasive species monitoring, control, and eradication plan for land/activities under their control should be developed as part of the environmental plans in accordance with CARA.
Electricity Regulation Act (Act No. 4 of 2006)	The proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure must be in line with the Electricity Regulation Act.
Occupational Health and Safety Act (OHSA, Act No. 85 of 1993)	The Developer and the appointed Contractor must be mindful of the principles and broad liability and implications associated with the OHSA and mitigate any potential impacts which are identified prior to the construction phase.

TITLE OF LEGISLATION, POLICY OR GUIDELINE	RELEVANCE TO THE PROJECT
National Environmental Management: Air Quality Act (NEM:AQA) (Act No. 39 of 2004)	No major air quality issues are expected due to the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure; however, the Developer and the appointed Contractor should be mindful of the potential impact associated with dust generation as a result of vegetation clearance during the construction phase.
National Road Traffic Act (NRTA) (Act No. 93 of 1996)	The Developer and the appointed Contractor must comply with all the requirements in terms of the NRTA during the various phases of the Mulilo Newcastle Wind Power Grid Connection and associated infrastructure development.
National Veld and Forest Fire Act (NVFFA) (Act No. 101 of 1998)	The Developer and the appointed Contractor must ensure that appropriate firefighting equipment, protective clothing, and trained personnel (for extinguishing fires) are present onsite during the construction of the Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.
Newcastle Local Municipality	The proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure must comply with/be in line with all relevant municipal by-laws, the Spatial Development Framework (SDF) and the Integrated Development Plan (IDP). Representatives from the affected municipalities must be informed of the proposed development.
Amajuba District Municipality	

Table provides the relevant listed activities, in terms of the NEMA EIA Regulations (2014, as amended), which are likely to be triggered by the activities associated with the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.

The NEMA EIA Regulations (2014, as amended) allow for a BA Process for activities with limited environmental impact (GN R. 327 and 324, 2017) and a more rigorous two (2) tiered approach to activities with potentially greater environmental impact (GN R. 325, 2014). The proposed development of the Mulilo Newcastle Wind Power Grid Connection and associated infrastructure triggers the **BA Process**, due to the Listing Notice 1 and Listing Notice 3 activities, which will require an EA from the provincial KwaZulu Natal Department of Economic Development, Tourism and Environmental Affairs (KZN EDTEA).

Table 2.4-2: Listed Activities triggered by the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.

ACTIVITY NO(S):	PROVIDE THE RELEVANT **BASIC ASSESSMENT ACTIVITY(IES)** AS SET OUT IN **LISTING NOTICE 1** (GN R. 327)	DESCRIBE THE PORTION OF THE PROPOSED PROJECT TO WHICH THE APPLICABLE LISTED ACTIVITY RELATES.
GNR. 327 (Listing Notice 1) Activity 11(i):	***The development of facilities or infrastructure for the transmission and distribution of electricity – (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.***	The development entails the construction of an on-site 132kV Switching Substation and a 132kV single circuit or double circuit overhead powerline (OHPL) from the proposed Mulilo Newcastle Wind Power WEF in the west to the substation outside of Newcastle in the east. The OHPL is located outside of urban areas.
GNR. 327 (Listing Notice 1) Activity 12 (ii)(a) and (c):	***The development of (ii) infrastructure or structures with a physical footprint of 100 square metres or more. Where such development occurs (a) within a watercourse and (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.***	The combined construction footprint of the proposed Mulilo Newcastle Wind Power Grid Connection OHPL and on-site Switching Substation will exceed 100m^2. This relates to the proposed pylon structures which may be constructed within 32m of watercourse. The final siting of this infrastructure will be refined throughout the process. It is anticipated that all watercourses will be

		avoided as the pylons can be between 100-300m apart.
GNR. 327 (Listing Notice 1) Activity 19:	***The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.***	Internal access roads will require excavation of material well in excess of 10m^3 within the regulatory buffer of a wetland and water courses.
GNR. 327 (Listing Notice 1) Activity 28(ii):	***Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:*** ***(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.***	The proposed development will entail the rezoning of the land from agriculture to special industrial for the placement of the Mulilo Newcastle Wind Power Grid Connection OHPL pylons. The total footprint of the proposed OHPL and on-site Switching Substation will exceed 1ha in extent.
ACTIVITY NO(S):	PROVIDE THE RELEVANT **BASIC ASSESSMENT ACTIVITY(IES)** AS SET OUT IN **LISTING NOTICE 3** (GN R. 324)	DESCRIBE THE PORTION OF THE PROPOSED PROJECT TO WHICH THE APPLICABLE LISTED ACTIVITY RELATES.
GNR. 324 (Listing Notice 3) Activity 4(viii) and (xii):	***The development of a road wider than 4 metres with a reserve less than 13,5 metres.*** ***d. KwaZulu-Natal*** ***viii. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*** ***xii. Outside urban areas:*** ***(aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve.***	Site access to the Mulilo Newcastle Wind Power Grid Connection OHPL and on-site Switching Substation will, where possible, make use of existing farm roads. However, new roads may need to be constructed (where there are no existing roads) in order to allow for maintenance access. The OHPL and on-site Switching Substation will be located within the KwaZulu-Natal Province, outside the urban edge. Mulilo Newcastle Wind Power Grid Connection OHPL will be situated within a Critical Biodiversity Area (CBA) as identified in the Ezemvelo KZN Critical Biodiversity Map (2016). In addition, a short section of the on-site Switching Substation and a short section of the OHPL on the western side is located within 10 km of the Sneeuberg Protected Environment.
GNR. 324 (Listing Notice 3) Activity 12(d)(v):	***The clearance of an area of 300 square metres or more of indigenous vegetation*** ***(d) KwaZulu-Natal*** ***v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans***	The total construction footprint of the Mulilo Newcastle Wind Power Grid Connection OHPL and on-site Switching Substation is expected to exceed 300 m^2. Indigenous vegetation exceeding this area will need to be cleared in order to establish the pylon footprints and access roads. The OHPL and on-site Switching Substation overlaps partly with areas designated as Critical Biodiversity Areas 1 & 2 (CBA) as identified in the Ezemvelo KZN Critical Biodiversity Map (2016).

14(ii)(a) and (c); (d)(vii):	***The development of –*** ***(ii) infrastructure or structures with a physical footprint of 10 square metres or more.*** ***Where such development occurs –*** ***(a) within a watercourse, and*** ***(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse.*** ***(d) KwaZulu-Natal*** ***(vii) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans***	The total construction footprint of the Mulilo Newcastle Grid Connection OHPL is expected to exceed 300 m^2. Indigenous vegetation exceeding this area will need to be cleared in order to establish the pylon footprints and access roads. The OHPL and on-site Switching Substation overlaps partly with areas designated as Critical Biodiversity Areas 1 & 2 (CBA) as identified in the Ezemvelo KZN Critical Biodiversity Map (2016).
GNR. 324 Activity 18(d)(viii)	***The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.*** ***(d) KwaZulu-Natal*** ***viii. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.***	Site access to the Mulilo Newcastle Wind Power Grid Connection OHPL will where possible make use of existing farm roads. However, new roads may need to be constructed (where there are no existing roads) in order to allow for maintenance access. The OHPL will be located within the KwaZulu-Natal Province, outside the urban edge. OHPL will be situated within a Critical Biodiversity Area (CBA) as identified in the Ezemvelo KZN Critical Biodiversity Map (2016). In addition, the OHPL in a short section in the west is located within 10 km of the Sneeuberg Protected Environment.
Not Applicable. No Listing Notice 2 (GN R. 325) activities have been identified for the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.		

The Competent Authority that must consider and decide on the application for EA in respect of the activities, listed in Table above.

In addition to the requirements for an EA in terms of the NEMA, there may be additional legislative requirements that need to be considered prior to commencing with the activity, these include but are not limited to:

- National Heritage Resources Act (Act No. 25 of 1999);
- National Water Act (Act No. 36 of 1998) as amended;
- Civil Aviation Act (Act No. 74 of 1962) as amended;
- National Environmental Management Biodiversity Act (Act No. 10 of 2004);
- National Forests Act (Act No. 84 of 1998); and the

These are discussed in detail in Chapter **Error! Reference source not found.** of this report.

3. NEED AND DESIRABILITY

3.1. BACKGROUND

The current section has taken note of the revised Guideline on Need and Desirability in terms of the *Environmental Impact Assessment (EIA) Regulations, 2014, DFFE Integrated Environmental Management Guidelines Series 9. 2017*.

When considering an application for EA, the competent authority must comply with section 24O of the NEMA (Act No. 107 of 1998) and must have regard for any guideline published in terms of section 24J of the Act and any minimum information requirements for the application. This includes this need and desirability guideline.

Additionally, the EIA Regulations require EAPs who undertake environmental assessments, to have knowledge and take into account relevant guidelines. A person applying for an EA must abide by the regulations, which are binding on the applicant.

The Guideline contains information on best practice and how to meet the peremptory requirements prescribed by the legislation and sets out both the strategic and statutory context for the consideration of the need and desirability of a development involving any one of the NEMA listed activities. Need and desirability is based on the principle of sustainability, set out in the Constitution and in NEMA, and provided for in various policies and plans, including the National Development Plan 2030 (NDP). Addressing the need and desirability of a development is a way of ensuring sustainable development – in other words, that a development is ecologically sustainable and socially and economically justifiable – and ensuring the simultaneous achievement of the triple bottom-line.

The Guideline sets out a list of questions which should be addressed when considering need and desirability of a proposed development. These are divided into questions that relate to ecological sustainability and justifiable economic and social development. The questions that relate to ecological sustainability include how the development may impact ecosystems and biological diversity; pollution; and renewable and non-renewable resources. When considering how the development may affect or promote justifiable economic and social development, the relevant spatial plans must be considered, including Municipal IDPs, SDFs and Environmental Management Frameworks (EMFs). The assessment reports will need to provide information as to how the development will address the socio-economic impacts of the development, and whether any socio-economic impact resulting from the development impact on people's environmental rights. Considering the need and desirability of a development entails the balancing of these factors.

Sustainable development refers to the integrated relationship between social, economic and environmental factors in planning, implementation and decision-making so as to ensure that development serves present and future generations (National Sustainable Development Framework). Sustainable development is a programme to change the process of economic development so that it ensures a basic quality of life for all people and protects the ecosystems and community systems that make life possible and worthwhile.

3.2. CURRENT CONTEXT

Increasing pressure is being placed on countries internationally to reduce their reliance on fossil fuels, such as oil and coal, which contribute towards Greenhouse Gases (GHG) being emitted into the atmosphere and therefore contribute to climate change. Renewable energy resources, such as wind and solar facilities, are being implemented as alternative sources of energy at both a global and national scale.

South Africa has recognised the need to expand electricity generation capacity within the country. This is based on national policy and informed by ongoing planning undertaken by the Department of Mineral Resources and Energy (DMRE), previously the Department of Energy (DoE), and the National Energy Regulator of South Africa (NERSA).

The draft of the South African Integrated Resource Plan (IRP 2018) was released for public comment in August 2018, setting out a new direction in energy sector planning. The plan included a shift away from coal, increased adoption of renewables and gas, and an end to the expansion of nuclear power. The revised plan marks a major shift in energy policy. The draft policy aimed to decommission a total of 35 GW (of 42 GW currently operating) of coal generation capacity from Eskom by 2050, starting with 12 GW by 2030, 16 GW by 2040 and a further 7 GW by 2050.

The IRP 2019 was Gazetted in October 2019 and makes provision for the procurement of 1.6 GW of wind energy per annum from 2020 to 2030. However, the REIPPPP: Round 5 selected 1.6 GW (wind) by 2021, of this, only 1.1 GW has reached financial close / is under construction. Due to severe grid constraints the 3.2 GW of wind, which was anticipated in Round 6, was cancelled, resulting in a grim picture in terms of solving the current energy crisis. Solar is therefore critical component in the solution to the South African energy crisis.

The implementation of the IRP constitutes significant progress in the transformation of the South African energy sector. To be in line with the Paris Agreement goals for mitigation, South Africa would still need to adopt more ambitious actions by 2050 such as expanding renewable energy capacity beyond 2030, fully phasing out coal by mid-century, and substantially limiting unabated natural gas use.

Emergency regulations in terms of the Disaster Management Act

In addition to the above, South Africa has currently been experiencing severe electricity shortages causing frequent and prolonged loadshedding. Consequently, on the 27th of February 2023, Government gazetted the Disaster Management Act (57/2002): Regulations issued in terms of Section 27 (2) of the Act.

The objective of these Regulations is to assist, protect and provide relief to the public; to protect property; to prevent and combat disruption; and to deal with the destructive nature and other effects of the disaster by:

- Minimising the impact of load shedding on livelihoods, the economy, policing functions, National security, security services, education services, health services, water services, food security, communications and municipal services, amongst others;
- Reducing and managing the impact of load shedding on service delivery to support lifesaving and specified essential infrastructure;
- Providing measures to enable the connection of new generation of electricity; and
- Providing measures to improve Eskom's plant performance.

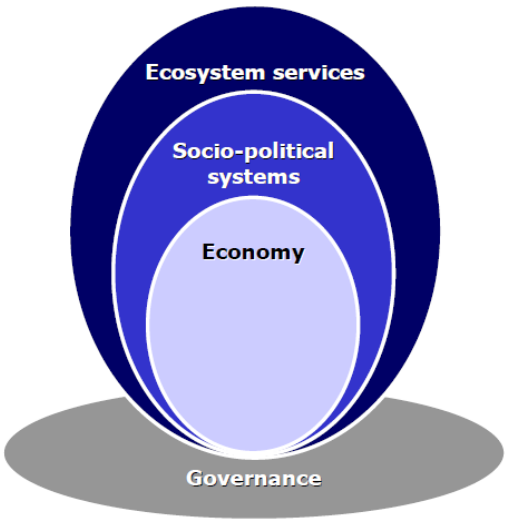
3.3. NATIONAL FRAMEWORK FOR SUSTAINABLE DEVELOPMENT (NFSD)

The National Framework for Sustainable Development (NFSD) (2008) is a key National policy that should be considered in the ECPC diagnostic report, as it provides an overarching national strategy for sustainable development in South Africa. The NFSD is particularly relevant to the NDP and the KwaZulu Natal Provincial Growth and Development Plan 2012-2030 as it confirms that sustainable development in the South African context is about enhancing human well-being and quality of life for all time, in particular those most affected by poverty and inequality. Resource use efficiency and intergenerational equity are also the core principles.

Fundamental to understanding sustainable development is recognising the interdependence of our economic, social and environmental systems. In its draft policy on a framework for considering market-based instruments to support environmental fiscal reform in South Africa, the National Treasury notes that:

> "As the South African economy continues to develop, it is increasingly important to ensure that it does so in a sustainable way and that, at the same time, issues of poverty and inequality are effectively addressed. It is, therefore, important to appreciate that it's not just the quantity of growth that matters, but also its quality."

The current understanding of sustainable development is illustrated by the diagram below:



The diagram represents a systems approach to sustainability where the economic system, socio-political system and ecosystem are seen as embedded within each other, and then integrated via the governance system that holds all the other systems together within a legitimate regulatory framework. Sustainability implies the continuous and mutually compatible integration of these systems over time; sustainable development means making sure that these systems remain mutually compatible as the key development challenges are met via specific actions and interventions to eradicate poverty and severe inequalities. This is preferable to the more commonly used image of the three separate intersecting circles which depict sustainable development as limited to a fragile space where all three circles intersect.

The NFSD provides the following definitions for sustainable development relevant to KwaZulu Natal Provincial Growth and Development Plan 2012-2030:

Sustainable shared and accelerated growth

Sustainable development that is appropriate and specific to the South African context will entail shared and accelerated growth, targeted interventions and community mobilisation to eradicate poverty, and ensure the ecologically sustainable use of our natural resources and eco-system services.

Sustainable development in terms of NEMA

"Sustainable development means the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations."

The NFSD notes that the achievement of sustainable development is not a once-off occurrence, and its objectives cannot be achieved by a single action or decision. It is an ongoing process that requires a particular set of values and attitudes in which economic, social and environmental assets that society has at its disposal, are managed in a manner that sustains human well-being without compromising the ability of future generations to meet their own needs.

3.4. ELECTRICITY SUPPLY IN SOUTH AFRICA

South Africa's current electricity generation and supply system is unreliable and in crisis. Currently, Eskom has a net output of 47,201 MW, and it produces 85% of South Africa's electricity, which is an equivalent of 40% of Africa's electricity. Renewable energy accounts for 5% of South Africa's electricity. This is mainly due to the targets set in the IRP2010-2030 that aimed to change the electricity landscape from high coal (91.7%) to medium coal (48%) using electricity produced by the Independent Power Producers (IPP's), with the utility company, Eskom, as the single buyer of the electricity. Data from RMB Morgan Stanley shows that the private sector, through renewables, will generate more electricity than Eskom by 2025. This is based on the assumption that Eskom will maintain an Electricity Availability Factor (EAF) of 53%, which is unlikely as the EAF has deteriorated markedly in the last 12 months. In 2025, RMB estimates that Eskom will generate around 25 200 MW of electricity, just over 47% of its nominal capacity. Alternative energy sources will produce 26 600 MW in 2025 – up from 13 300 MW at the end of March 2023 (Source: https://dailyinvestor.com/south-africa/16448/eskom-getting-replaced/, 9 May 2023).

South Africa has a high level of renewable energy potential and presently has in place a target of 17,800 MW of renewable energy. The Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) has been designed to contribute towards the national target and towards socio-economic and environmentally sustainable growth, and to start and stimulate the renewable industry in South Africa.

In terms of the REIPPPP, bidders will be required to bid on tariff and the identified socio-economic development objectives of the DoE. The tariff will be payable by the Buyer (currently ESKOM) pursuant to the Power Purchase Agreement (PPA) to be entered into between the Buyer and the Project Company of a Preferred Bidder.

The Sixth (6th) Bid Window under the REIPPPP was concluded in December 2022. Of the 56 bid submissions received by the Department in October 2022, only five (5) Solar PV projects were awarded Preferred Bidder status, at a total of 860 MW out of a target of 4,200 MW (expanded from an original 2,600 MW). Eskom listed grid constraints as a limiting factor to certain areas within South Africa and consequently, no wind energy projects were awarded preferred bidder status during Round 6.

3.5. PRIVATE OFFTAKE

In 2022, in response to the emerging energy crisis, the President issued instructions where Independent Power Producers (IPPs) no longer require a NERSA generation licence. Thus, in addition to participating in the REIPPP, energy developers are more readily able to enter into offtake agreements with private companies in order to enhance energy security and to contribute to decarbonisation of private intensive electricity users such as mines, chemical industries, smelters etc.

The MNWP Grid Connection intends to promote local economic growth and development through direct and indirect employment, as well as the identification and implementation of social development schemes during the project's operational phase. A local community trust will be established in order to ensure that funds are channelled to these social development schemes.

3.6. SOCIAL AND ECONOMIC DEVELOPMENT

The need and desirability of the proposed MNWP Grid Connection and associated infrastructure project can be demonstrated in the following main areas:

- Move to green energy due to growing concerns associated with climate change and the on-going exploitation of non-renewable resources;
- Security of electricity supply, where over the last few years, South Africa has been adversely impacted by interruptions in the supply of electricity; and
- Stimulation of the green economy where there is a high potential for new business opportunities and job creation.

The proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure is required to supplement the development of the authorised Mulilo Newcastle Wind Power Energy Facility (WEF) (DFFE Ref: 14/12/16/3/3/2/2457). Additionally, the project is regarded as a Strategic Integrated Project (SIP) No. 20c under the Embedded Generation National Program (EGNP), to be expedited in terms of Schedule 2 (Section 17(2)) of the Infrastructure Development Act (IDA) (Act No. 23 of 2014). Therefore, to reiterate, the project need and desirability also relate to the need and desirability of renewable energy on a local, district, provincial, national and international level.

The above main drivers, for renewable energy projects, are supported by the following International, National and Provincial (KwaZulu-Natal Province) policy documents.

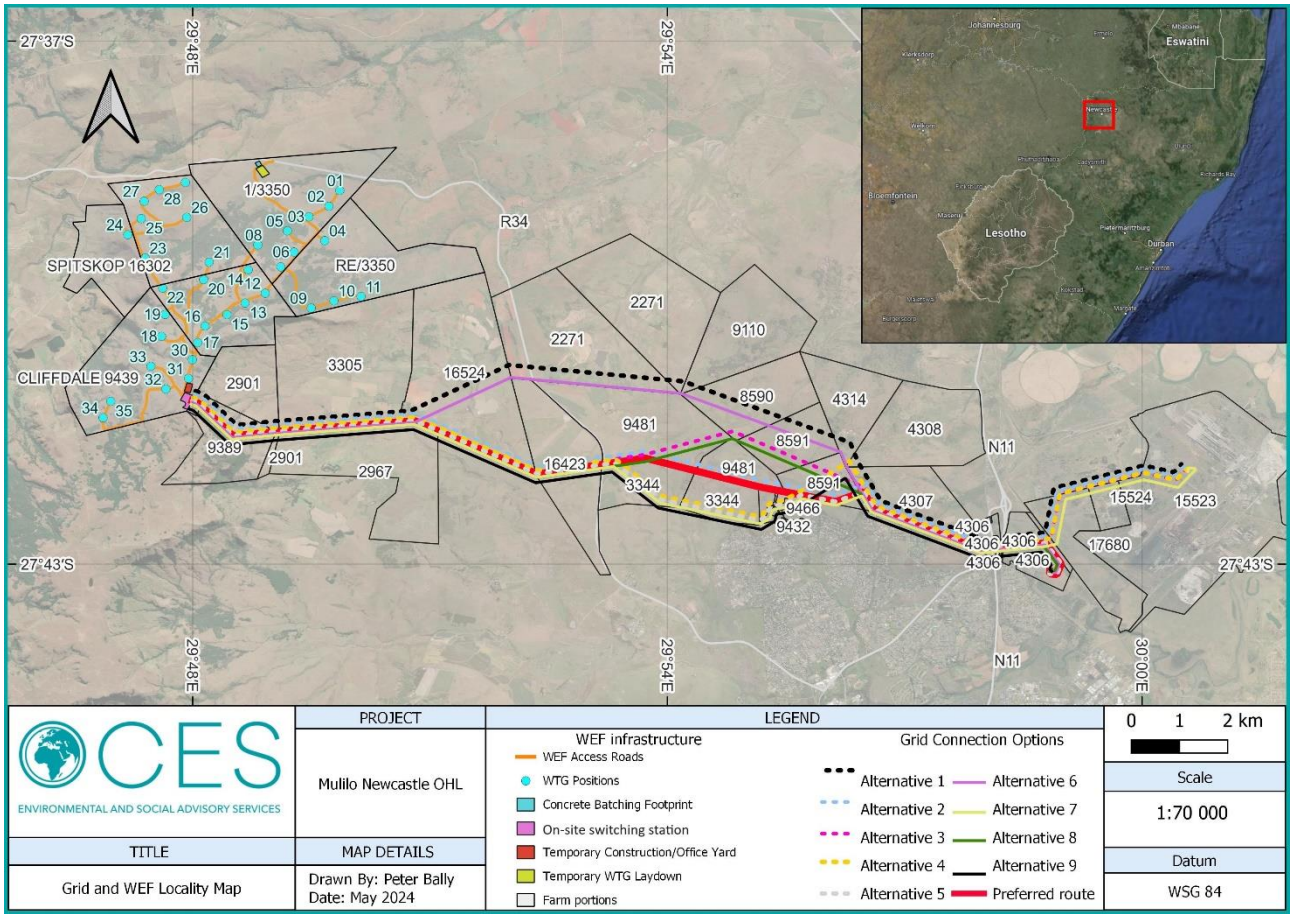


Figure 3.6.1: Combined Locality Map of the Proposed Mulilo Newcastle Wind Power Energy Facility and the Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.

3.7. INTERNATIONAL

3.7.1. THE 1992 UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

The UNFCCC is a framework convention which was adopted at the 1992 Rio Earth Summit. South Africa signed the UNFCCC in 1993 and ratified it in August 1997. The stated purpose of the UNFCCC is to, "achieve… stabilisation of greenhouse gas concentrations in the atmosphere at concentrations at a level that would prevent dangerous anthropogenic interference with the climate system", and to thereby prevent human-induced climate change by reducing the production of greenhouse gases defined as, "those gaseous constituents of the atmosphere both natural and anthropogenic, that absorb and re-emit infrared radiation".

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The UNFCCC is relevant in that the proposed MNWP Grid Connection project will contribute to a reduction in the production of greenhouse gases by providing an alternative to fossil fuel-derived electricity. South Africa has committed to reducing emissions to demonstrate its commitment to meeting international obligations.

3.7.2. KYOTO PROTOCOL (2002)

The Kyoto Protocol is a protocol to the UNFCCC which was initially adopted for use on the 11th of December 1997 in Kyoto, Japan, and which entered into force on the 16th of February 2005 (UNFCCC, 2009). The Kyoto Protocol is the chief instrument for tackling climate change. The major feature of the Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas (GHG) emissions. This amounts to an average of 5% against 1990 levels over the five-year period 2008-2011. The major distinction between the Protocol and the Convention is that "while the Convention encouraged

industrialised countries to stabilize GHG emissions, the Protocol commits them to do so".

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION
The Kyoto Protocol is relevant in that the proposed MNWP Grid Connection project will contribute to a reduction in the production of greenhouse gases by providing an alternative to fossil fuel-derived electricity and will assist South Africa to begin demonstrating its commitment to meeting international obligations in terms of reducing its emissions.

3.8. NATIONAL

3.8.1. NATIONAL DEVELOPMENT PLAN (2011)

The National Development Plan (NDP) (also referred to as Vision 2030) is a detailed plan produced by the National Planning Commission in 2011 that is aimed at reducing and eliminating poverty in South Africa by 2030. The NDP represents a new approach by Government to promote sustainable and inclusive development in South Africa, promoting a decent standard of living for all, and includes twelve (12) key focus areas, those relevant to the current proposed MNWP Grid Connection being:

- An economy that will create more jobs;
- Improving infrastructure; and
- Transition to a low carbon economy.

SECTOR	TARGET
Transition to a low carbon economy	• Achieve the peak, plateau and decline greenhouse gas emissions trajectory by 2025. • About 20,000 MW of renewable energy capacity should be constructed by 2030.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION
The proposed MNWP Grid Connection will contribute towards additional energy capacity in South Africa and will contribute towards a reduction in greenhouse gas emissions.

3.8.2. NATIONAL CLIMATE CHANGE RESPONSE WHITE PAPER (2012)

The White Paper indicates that Government regards climate change as one of the greatest threats to sustainable development in South Africa and commits the country to making a fair contribution to the global effort to achieve the stabilisation of greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with the climate system.

The White Paper also identifies various strategies in order to achieve its climate change response objectives, including:

- The prioritisation of mitigation interventions that significantly contribute to an eventual decline emission trajectory from 2036 onwards, in particular, interventions within the energy, transport and industrial sectors; and
- The prioritisation of mitigation interventions that have potential positive job creation, poverty alleviation and/or general economic impacts. In particular, interventions that stimulate new industrial activities and those that improve the efficiency and competitive advantage of existing business and industry.

The White Paper provides numerous specific actions for various Key Mitigation Sectors including renewable energy. The following selected strategies (amongst others) must be implemented by South Africa in order to achieve its climate change response objectives:

- The prioritisation of mitigation interventions that significantly contribute to a peak, plateau and decline emission trajectory where greenhouse gas emissions peak in 2020 to 2025 at 34% and 42% respectively

below a business as usual baseline, plateau to 2035 and begin declining in absolute terms from 2036 onwards, in particular, interventions within the energy, transport and industrial sectors; and

- The prioritisation of mitigation interventions that have potential positive job creation, poverty alleviation and/or general economic impacts. In particular, interventions that stimulate new industrial activities and those that improve the efficiency and competitive advantage of existing business and industry.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed MNWP Grid Connection will enable the WEF project to provide an alternative to fossil fuel-derived electricity and will contribute to climate change mitigation.

3.8.3. White Paper on Renewable Energy Policy (2003)

The White Paper on the Renewable Energy Policy (2003) commits the South African Government support for the development, demonstration and implementation of renewable energy sources for both small and large scale applications. It sets out the policy principles, goals and objectives to achieve, "An energy economy in which modern renewable energy increases its share of energy consumed and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation".

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed MNWP Grid is consistent with the White Paper and the objectives therein to develop an economy in which renewable energy has a significant market share and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation.

3.8.4. Integrated Resource Plan for Electricity 2010 – 20330 (Revision 3, 2019)

The Integrated Resource Plan (IRP, 2019) for South Africa was initiated by the DoE and lays the foundation for the country's energy mix up to 2030, and seeks to find an appropriate balance between the expectations of different stakeholders considering a number of key constraints and risks, including:

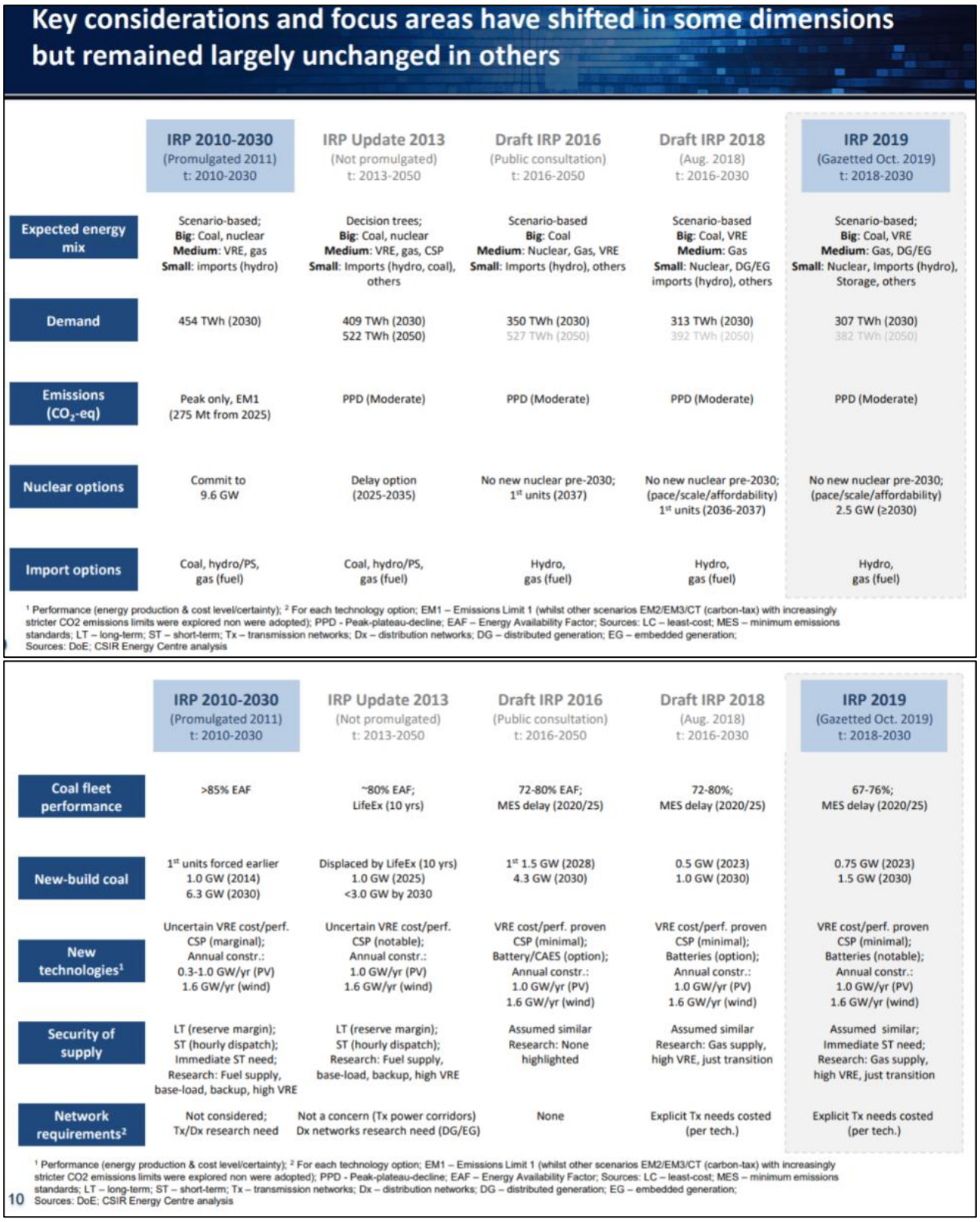
- Reducing carbon emissions;
- New technology uncertainties such as costs, operability and lead time to build;
- Water usage;
- Localisation and job creation;
- Southern African regional development and integration; and
- Security of supply.

The IRP is an electricity infrastructure development plan based on the least-cost electricity supply and demand balance, taking into account security of supply and the environment through the minimisation of negative emission and water use. It is important because it is South Africa's plan for the procurement of generation capacity up to 2030. The last such plan was the Integrated Resource Plan 2010 (IRP 2010) promulgated in March 2011, and such plans are intended to be updated every two years.

Since the promulgation of IRP 2010, a total of 18 000 MW of new generation capacity has been committed comprising 9,564 MW of coal power at Medupi and Kusile, 1,332 MW of water pumped storage at Ingula, 6,422 MW of renewable energy by independent power producers (IPPs), and 1,005 MW of Open Cycle Gas Turbine (OCGT) peaking plants currently using diesel at Avon and Dedisa.

6,000 MW of new solar PV capacity and 14,400 MW of new wind power capacity will be commissioned by 2030 under IRP 2019. The current annual build limits on solar PV and wind have been retained pending a report on the just transition strategy. There will be no new concentrated solar power commissioned under IRP 2019 up to 2030 beyond the 300 MW already committed to being commissioned in 2019.

The following image outlines the steps taken between the last IRP Revision (2011) and the latest IRP Revision (2019). As per the CSIR summary (Online: https://researchspace.csir.co.za/).



Key considerations and focus areas have shifted in some dimensions but remained largely unchanged in others

	IRP 2010-2030 (Promulgated 2011) t: 2010-2030	IRP Update 2013 (Not promulgated) t: 2013-2050	Draft IRP 2016 (Public consultation) t: 2016-2050	Draft IRP 2018 (Aug. 2018) t: 2016-2030	IRP 2019 (Gazetted Oct. 2019) t: 2018-2030
Expected energy mix	Scenario-based; **Big**: Coal, nuclear **Medium**: VRE, gas **Small**: imports (hydro)	Decision trees; **Big**: Coal, nuclear **Medium**: VRE, gas, CSP **Small**: Imports (hydro, coal), others	Scenario-based **Big**: Coal **Medium**: Nuclear, Gas, VRE **Small**: Imports (hydro), others	Scenario-based **Big**: Coal, VRE **Medium**: Gas **Small**: Nuclear, DG/EG imports (hydro), others	Scenario-based; **Big**: Coal, VRE **Medium**: Gas, DG/EG **Small**: Nuclear, Imports (hydro), Storage, others
Demand	454 TWh (2030)	409 TWh (2030) 522 TWh (2050)	350 TWh (2030) 527 TWh (2050)	313 TWh (2030) 392 TWh (2050)	307 TWh (2030) 382 TWh (2050)
Emissions (CO_2-eq)	Peak only, EM1 (275 Mt from 2025)	PPD (Moderate)	PPD (Moderate)	PPD (Moderate)	PPD (Moderate)
Nuclear options	Commit to 9.6 GW	Delay option (2025-2035)	No new nuclear pre-2030; 1st units (2037)	No new nuclear pre-2030; (pace/scale/affordability) 1st units (2036-2037)	No new nuclear pre-2030; (pace/scale/affordability) 2.5 GW (≥2030)
Import options	Coal, hydro/PS, gas (fuel)	Coal, hydro/PS, gas (fuel)	Hydro, gas (fuel)	Hydro, gas (fuel)	Hydro, gas (fuel)

[1] Performance (energy production & cost level/certainty); [2] For each technology option; EM1 – Emissions Limit 1 (whilst other scenarios EM2/EM3/CT (carbon-tax) with increasingly stricter CO2 emissions limits were explored non were adopted); PPD - Peak-plateau-decline; EAF – Energy Availability Factor; Sources: LC – least-cost; MES – minimum emissions standards; LT – long-term; ST – short-term; Tx – transmission networks; Dx – distribution networks; DG – distributed generation; EG – embedded generation; Sources: DoE; CSIR Energy Centre analysis

	IRP 2010-2030 (Promulgated 2011) t: 2010-2030	IRP Update 2013 (Not promulgated) t: 2013-2050	Draft IRP 2016 (Public consultation) t: 2016-2050	Draft IRP 2018 (Aug. 2018) t: 2016-2030	IRP 2019 (Gazetted Oct. 2019) t: 2018-2030
Coal fleet performance	>85% EAF	~80% EAF; LifeEx (10 yrs)	72-80% EAF; MES delay (2020/25)	72-80%; MES delay (2020/25)	67-76%; MES delay (2020/25)
New-build coal	1st units forced earlier 1.0 GW (2014) 6.3 GW (2030)	Displaced by LifeEx (10 yrs) 1.0 GW (2025) <3.0 GW by 2030	1st 1.5 GW (2028) 4.3 GW (2030)	0.5 GW (2023) 1.0 GW (2030)	0.75 GW (2023) 1.5 GW (2030)
New technologies[1]	Uncertain VRE cost/perf. CSP (marginal); Annual constr.: 0.3-1.0 GW/yr (PV) 1.6 GW/yr (wind)	Uncertain VRE cost/perf. CSP (notable); Annual constr.: 1.0 GW/yr (PV) 1.6 GW/yr (wind)	VRE cost/perf. proven CSP (minimal); Battery/CAES (option); Annual constr.: 1.0 GW/yr (PV) 1.6 GW/yr (wind)	VRE cost/perf. proven CSP (minimal); Batteries (option); Annual constr.: 1.0 GW/yr (PV) 1.6 GW/yr (wind)	VRE cost/perf. proven CSP (minimal); Batteries (notable); Annual constr.: 1.0 GW/yr (PV) 1.6 GW/yr (wind)
Security of supply	LT (reserve margin); ST (hourly dispatch); Immediate ST need; Research: Fuel supply, base-load, backup, high VRE	LT (reserve margin); ST (hourly dispatch); Research: Fuel supply, base-load, backup, high VRE	Assumed similar Research: None highlighted	Assumed similar Research: Gas supply, high VRE, just transition	Assumed similar; Immediate ST need; Research: Gas supply, high VRE, just transition
Network requirements[2]	Not considered; Tx/Dx research need	Not a concern (Tx power corridors) Dx networks research need (DG/EG)	None	Explicit Tx needs costed (per tech.)	Explicit Tx needs costed (per tech.)

[1] Performance (energy production & cost level/certainty); [2] For each technology option; EM1 – Emissions Limit 1 (whilst other scenarios EM2/EM3/CT (carbon-tax) with increasingly stricter CO2 emissions limits were explored non were adopted); PPD - Peak-plateau-decline; EAF – Energy Availability Factor; Sources: LC – least-cost; MES – minimum emissions standards; LT – long-term; ST – short-term; Tx – transmission networks; Dx – distribution networks; DG – distributed generation; EG – embedded generation; Sources: DoE; CSIR Energy Centre analysis

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RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed MNWP Grid is in line with the IRP 2019 with respect to the energy mix and movement to a low carbon economy up to 2030 and beyond.

3.8.5. Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)

South Africa has a high level of renewable energy potential and presently has in place a target of 17 800 MW of renewable energy. The REIPPP Programme has been designed so as to contribute towards the national target and towards socio-economic and environmentally sustainable growth, and to start and stimulate the renewable industry in South Africa.

In terms of the REIPPPP, bidders will be required to bid on tariff and the identified socio-economic development objectives of the DoE. The tariff will be payable by the Buyer (currently ESKOM) pursuant to the Power Purchase Agreement (PPA) to be entered into between the Buyer and the Project Company of a Preferred Bidder.

The following table summarises the REIPPPP bidding windows which have already been completed.

Bidding Window 1	Bidding Window 2	Bidding Window 3	Bidding Window 3.5	Bidding Window 4	Bidding Window 5	Bidding Window 6	Bidding Window 7
Submission Date: 04/11/2011 28 Pref Bidders 1,425 MW of contracted capacity	Submission Date: 05/03/2012 19 Pref Bidders 1,040 MW of contracted capacity	Submission Date: 19/08/2013 17 Pref Bidders 1,457 MW of contracted capacity	Submission Date: 31/04/2014 2 Pref Bidders 200 MW of contracted capacity	Submission Date: 18/08/2014 Pref Bidders 2,205 MW of Contracted capacity	Submission Date: 28/10/2021 25 Pref Bidders 2,205 MW of contracted capacity	Submission Date: 06/10/2022 5 Pref Bidders 860 MW of Contracted capacity	Submission Date: 15/08/2024 TBA Pref Bidders TBA MW of Contracted capacity ***Mulilo Newcastle WEF was bid in BW7**

The Sixth (6th) Bid Window under the REIPPPP was concluded in December 2022. Of the 56 bid submissions received by the Department in October 2022, only five (5) Solar PV projects were awarded Preferred Bidder status, at a total of 860 MW out of a target of 4,200 MW (expanded from an original 2,600 MW). Eskom listed grid constraints as a limiting factor to certain areas within South Africa and consequently, no wind energy projects were awarded preferred bidder status during Round 6.

Given the energy challenges the country is facing the qualification criteria have been developed to promote the participation of projects that are fully developed and will be able to be constructed and connected to the national grid as soon as possible, but not later than 24 months post Commercial Close.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

In terms of REIPPPP, bids would be awarded for renewable energy supply to Eskom through up to 7 bidding phases. The 1st, 2nd, 3rd, 4th, 5th and 6th round bidding processes have been completed where projects are currently reaching financial close in order to implement the projects, while the 7th bidding round is in process with bids submitted on 15 August 2024. The MNWP WEF was bid into BW7 and requires the MNWP Grid Connection project to connect to the grid.

3.8.6. Long Term Mitigation Scenarios (2007)

The aim of the Long-Term Mitigation Scenarios (LTMS) was to set the pathway for South Africa's long-term climate policy and will eventually inform a legislative, regulatory and fiscal package that will give effect to the

policy package at a mandatory level. The overall goal is to "develop a plan of action which is economically risk-averse and internationally aligned to the world effort on climate change."

The strategy assesses various response scenarios but concludes that the only sustainable option ("the preferred option") for South Africa is the "Required by Science" scenario where the emissions reduction targets should target a band of between -30% to -40% emission reductions from 2003 levels by 2050 which includes increasing renewable energy in the energy mix by 50% by 2050.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed MNWP Grid Connection will contribute towards an overall reduction in emissions and aligns with the world stance on efforts towards the mitigation of climate change.

3.8.7. Industrial Policy Action Plan 2011/2 – 2013/14

The South African Industrial Policy Action Plan (IPAP 2) 2011/12 – 2013/14 represents a further step in the evolution of this work and serves as an integral component of government's New Growth Path and notes that there are significant opportunities to develop new 'green' and energy-efficient industries and related services; and indicates that in 2007/2008, the global market value of the 'Low-Carbon Green Sector' was estimated at £3 trillion (or nearly US$5 trillion), a figure that is expected to rise significantly in the light of climate-change imperatives, energy and water security imperatives.

Based on economic, social and ecological criteria, IPAP identified a number of sub-sectors and an initial round of concrete measures were proposed for development of the renewable energy sector with the following key action programmes:

- Solar and Wind Energy - Stimulate demand to create significant investment in renewable energy supply and the manufacturing of local content for this supply.
- Green Industries special focus: The South African Renewables Initiative (SARi), an intra-governmental initiative set to catalyse industrial and economic benefits from an ambitious program of renewables development; including financing and associated institutional arrangements that would not impose an unacceptable burden on South Africa's economy, public finances or citizens.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed MNWP Grid Connection will contribute towards an overall reduction in emissions and aligns with the world stance on efforts towards the mitigation of climate change.

3.8.8. Strategic Infrastructure Projects (2012)

The National Infrastructure Plan that was adopted in 2012 together with the New Growth Path, which sets a goal of five million new jobs by 2020, identifies structural problems in the economy and points to opportunities in specific sectors and markets or "jobs drivers" resulted in the establishment of the Presidential Infrastructure Coordinating Committee (PICC) which in turn resulted in the development of 18 Strategic Infrastructure Projects (SIPS).

SIPS relevant to renewable energy include:

SIP 8: Green energy in support of the South African economy

- Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP2010).

SIP 9: Electricity generation to support socio-economic development

- Accelerate the construction of new electricity generation capacity in accordance with the IRP2010 to meet the needs of the economy and address historical imbalances.

SIP 20: Energy

- Embedded Generation Investment Programme (EGIP) – 400MW: National

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed MNWP Grid Connection will contribute to SIP project rule out and MNWP has been registered as a SIP project.

SIP NUMBER	SIP NAME
STRATEGIC INTEGRATED PROJECT (SIP) 20c	EMBEDDED GENERATION NATINAL PROGRAM (EGNP)

3.9. PROVINCIAL

3.9.1. KWAZULU-NATAL PROVINCIAL GROWTH AND DEVELOPMENT PLAN 2012 – 2030 (2013)

The KZN Provincial Growth and Development Strategy (PGDS) 2012 – 2030, was adopted as a strategic guide for growth and development in KZN. The PGDS presents a long-term vision and outlines a strategic growth and development agenda for the Province. It identifies seven strategic goals and 34 strategic objectives aimed at 'growing the economy for the development and the improvement of the quality of life of all people living in the province of KwaZulu-Natal'.

Figure 3.9.1: Strategic goals and objectives for KZN until the Year 2030.The following PGDS goals and objectives are relevant to the development of renewable energy projects in KZN.

3.9.2. STRATEGIC GOAL 4: STRATEGIC INFRASTRUCTURE

Objective 6: Improve energy production and supply so that sufficient electricity is available for the growth and development needs of KZN including:

- Develop and implement the Provincial Energy Strategy;
- Investigate renewable energy sources;
- Provide base load alternative energy supply; and
- Programme and fund operations and maintenance.

3.9.3. STRATEGIC GOAL 5: ENVIRONMENTAL SUSTAINABILITY

Objective 4. Adapt to climate change so that KZN is able to effectively anticipate, mitigate and respond to the effects of climate change, including:

- Research and monitor climate change continuously to inform adaptation, response and mitigation;

- Formulate a climate change disaster response; and
- Strengthen district disaster management and mitigation capacity.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed MNWP Grid Connection will contribute towards the strategic goals and objectives of the KZN PGDS with respect to including renewable energy in the energy mix and climate change mitigation.

3.9.4. KwaZulu-Natal Province Green Economy Strategy (2012)

The KwaZulu-Natal Department of Economic Development and Tourism (KZN EDTEA) identified the need to transform the Province's economy to a green economy, in line with national policy. DEDT therefore initiated a project in the second half of 2010 to better understand and promote the green economy in KwaZulu-Natal (KZN). The principal aim of this Green Economy Strategy is to support and direct the re-orientation and growth of the KwaZulu-Natal economy to become increasingly competitive and resilient, by:

- Increasing resource use efficiency in business and government infrastructure and development;
- Increasing the supply of renewable energy;
- Securing the supply of ecosystem services from the province's natural assets; and
- Reducing environmental and climate related risks;
- Create sustainable jobs for local people;
- Reduce poverty; and
- Address social equity throughout all regions of the province.

The KZN Green Economic Strategy centres on three main goals as reflected below.

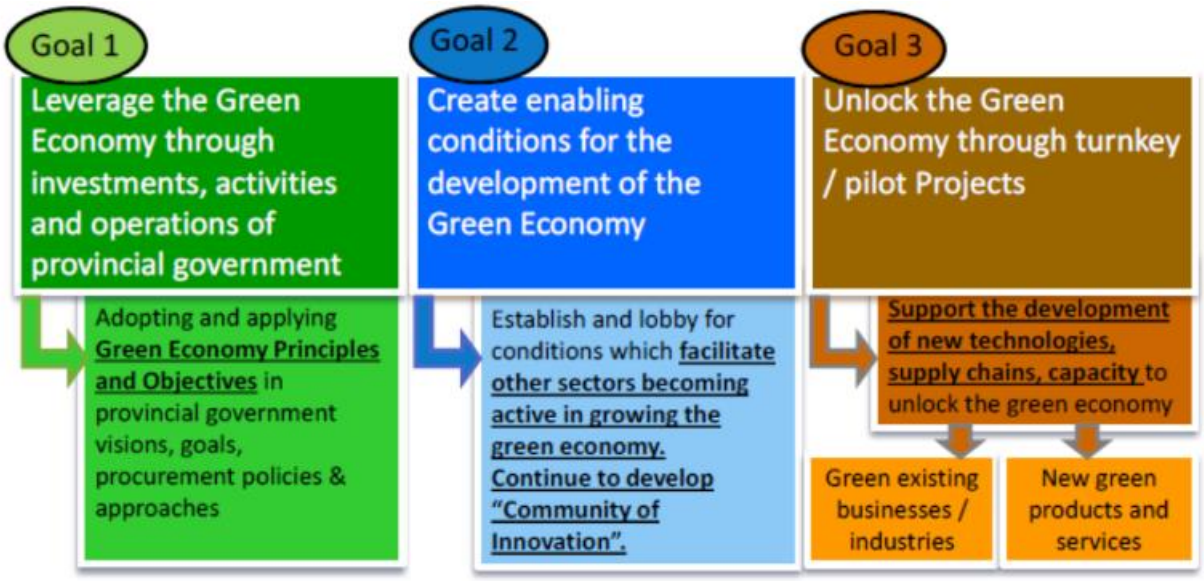

Figure 3.9.2: KZN Green Economic Strategy

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed MNWP Grid Connection will contribute towards the goals of KZN Green Economic Strategy particularly with respect to increasing the supply of renewable energy.

3.9.5. Trade and Invest KwaZulu-Natal (2022)

Trade & Investment KwaZulu-Natal (TIKZN) was established by the Department of Trade & Investment to promote the province of KwaZulu-Natal as an investment destination and to facilitate trade by assisting local companies' access international markets.

TIKZN has called for a shift to renewable energy as part of a bigger plan to transition to a low carbon economy. It also aligns with undertakings given by South Africa's Government as a signatory to the Paris Agreement

that would allow for a reduction of greenhouse gas emissions. Nationally, there is a commitment of systematic reduction towards 17,800 MW renewable energy generated by 2030, and a further reduction to 13,225 MW renewable energy generated by 2025. Importantly, it is reported that for each kilowatt hour of renewable energy that displaces fossil fuels in the national grid, 1.2 litres of water will be saved, allowing the Province to achieve both greenhouse gas emission and water demand reduction targets.

Globally, the case for the Green, renewable or Clean Economy has been made abundantly clear. Renewable energy is the only electricity generation technology whose price has decreased dramatically, with solar PV module prices falling by 80% during the past five years, while wind turbines have become 30% less expensive. South Africa's wind resources are regarded as amongst the top five in the world and could sustain 25% of our grid's capacity. Furthermore, it is estimated that by 2020 the price of wind and solar PV will be at least R0-50/kwh, unlike Eskom's Medupi power station, which - once completed - will charge close to R1-10/kwh.

KwaZulu-Natal is an energy-hungry province and consumes in excess of 6 700 MW of electricity and to maintain predicted economic growth rates of between 6% and 7%, the province requires between 400MW and 470MW more electricity every year. As part of the transition towards a low carbon economy, there is a need to consider alternative energy options at the district, provincial and industrial level. The province's renewable energy sector incorporates a host of sustainable solutions and includes the installation and supply of solar water heaters and heat pumps, solar energy, biomass, biogas, biofuels, wind, hydro, waste to energy, industrial symbiosis and also the circular economy and energy efficiency measures.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed MNWP Grid Connection will contribute towards the goals of TIKZN particularly the shift to renewable energy and a low carbon economy.

3.10. Local and District Level

The proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure, as well as the proposed Mulilo Newcastle Wind Power Energy Facility (WEF), aim to promote local economic growth and development through the creation of direct and indirect employment opportunities as well as to supply the national grid with electricity.

3.10.1. Newcastle Local Municipality Integrated Development Plan (IDP) 2022-2023

According to Statistics South Africa's Quarterly Labour Force Survey (Q1 of 2023), the working-age population increased by 141 000 (0,3%) in the first quarter of 2023 compared to the fourth quarter of 2022. Compared to Q1 of 2022, the working-age population increased by 571 000 (1,4%). The number of employed persons increased by 258 000 to 16,2 million in Q1 of 2023, and the number of unemployed persons increased by 179 000 to 7,9 million compared to Q4 of 2022, resulting in an increase of 437 000 (up by 1,8%) in the number of people in the labour force. The number of discouraged work-seekers decreased by 87 000 (down by 2,6%) and the number of people who were not economically active for reasons other than discouragement also decreased by 209 000 (down by 1,6%) between the two quarters, resulting in a net decrease of 296 000 in the not economically active population.

The unemployed people within Newcastle Local Municipality were ranging from the seasonal workers who were presently unemployed, and individuals who could not find work. Regarding the unemployment rate within Newcastle Local Municipality for the year 2011, the economically active population constituted 27.71% (100 654) of the total population. From the total number of economically active people, only 62.56% (62 968) were employed and the rest of the 37.44% (37 686) were unemployed. The average rate of unemployment in Newcastle Local Municipality is low compared to the Amajuba District Municipality, but higher than the provincial average of 21.7% and 22.4% among the females and males respectively.

The Newcastle LM development strategy is based on a long-term vision but acknowledges the significance of issues that need to be addressed in the short-to-medium term. As such, the municipality has formulated development goals that seek to address the challenges facing the institution currently and reposition the area in a developmental path as follows:

- To develop Newcastle as a service and industrial hub.
- To eradicate all forms of poverty and destitution/indigence.
- To be an example of service and governance excellence.
- To improve the quality of life.
- To achieve environmental sustainability.
- To promote gender equality and empowerment.

The Newcastle LM intends to initiate projects towards the attainment of these goals. It will accelerate delivery of services and gradually consolidate outcomes so as to attain the desired future situation. Particular focus will be paid to the following key areas of strategic intervention:

- Spatial integration and environmental sustainability;
- Local economic development;
- Service delivery and infrastructure development;
- Municipal transformation and organisational development;
- Financial viability and management; and
- Good governance and public participation.

There are various references in the Newcastle LM IDP to potential interventions to both mitigate against climate change through reduced greenhouse gas emissions and promoting energy security by way of promoting renewable energy, energy efficiency etc. In addition, the IDP indicates that the Municipal Systems Act empowers municipalities to pass by-laws for energy efficiency and renewable energy. However, the preferred approach by municipalities has been to develop policies, plans and strategies and to not implement projects. In this regard, the LM is about to initiate an Energy Services Development Plan (ESDP) to unpack in part the renewable energy opportunities in the LM, and also indicates that the proposed Wind Energy Plant in Newcastle Local Municipality, will increase opportunities for the diversification of energy sources, hence environmental sustainability.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed MNWP Grid Connection will contribute towards the Newcastle LM IDP goals, such as follows:

- *Spatial integration and environmental sustainability – climate change mitigation;*
- *Local economic development – local business stimulation and job creation; and*
- *Service delivery and infrastructure development – contribution to energy security both locally and nationally.*

3.10.2. Amajuba District Municipality Integrated Development Plan (IDP), 2023 – 24/2026 - 27

The proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure is in line with the Amajuba District Municipality IDP as it will contribute to the creation of employment opportunities, which is a key issue in the district due to high unemployment rates, 27,7% of the population. The section below consists of some of the relevant paragraphs which have been extracted from the Amajuba District Municipality IDP.

> *"The municipality has a responsibility in terms of the legislation to pursue both renewable energy and energy efficiency projects within its jurisdiction. It is recognised that there are many cross-cutting roles and responsibilities regarding the green economy, therefore decentralisation of this function is best suited. It needs to include the private sector, civil society and all levels of government. Given the current challenges with ESKOM as an energy service provider, it is imperative that the municipality starts to look at alternative energy sources. This is particularly important for an area that has a large manufacturing and mining base, which requires a constant supply of energy.*

Programme 1: Formulation of Green Economy Plan
The Amajuba District needs to appoint a consultant to prepare a holistic green economy plan, which must be streamlined with the Integrated Development Plan, to explore all the options of greening the municipality.

Programme 2: Promotion of Solar and Wind Energy
This option must be considered when projects are being proposed in the area. This could be understood to be solar energy generation plants and looking to the manufacture of the components for solar energy thereby creating new and numerous green employment opportunities in the area.

Programme 3: Promotion of Recycling
Further education and facilities for recycling needs to be provided particularly around plastic and electronic waste.

Programme 4: Explore possible greening options
There are several additional options that need to be considered and explored. Those that are considered most suitable for the local context should be further investigated. These include Waste to Energy (W2E), Embedded Generation, Industrial Symbiosis and Bioenergy. These should be further investigated and unpacked in the Green Economy Plan."

3.11. CONCLUDING REMARKS

Based on the above assessment, the proposed MNWP Grid Connection is consistent with various National, Provincial and local policies and programmes relating to economic and socio-economic development, infrastructure development (renewable energy) and climate change mitigation.

The construction and operation of the MNWP Grid Connection will contribute to local developmental objectives of poverty eradication and other social and socio-economic benefits that are integral to the REIPPPP process. The development of wind farms attracts significant direct foreign financial investment into South Africa and local communities. REIPPP local content requirements can lead to the creation of local industry and both skilled and un-skilled jobs in the RE industrial sector. Further positive social and socio-economic benefits will be realised by the landowners which will host turbines, in the form of rental income which in turn will have multiplier effects on the local economy due to local spend. In addition, farming activities can continue alongside the wind turbines, while rental income may also be used to enhance farming activities.

The MNWP Grid Connection project developer has also indicated that local socio-economic benefits will be realised with the development of the powerline, specifically in line with the socio-economic development goals under the REIPPPP, which will include:

- The realisation of the local needs and requirements within the area;
- Job creation within an area;
- The creation of a second income for the affected landowners;
- An increase in the standard of living; and
- An overall economic and social upliftment within the area.

4. RELEVANT LEGISLATION

The development of the proposed MNWP Grid Connection will be subject to the requirements of various items of South African legislation. These are described below.

4.1. THE CONSTITUTION ACT (ACT NO. 108 OF 1996)

This is the supreme law of the land. As a result, all laws, including those pertaining to the proposed development, must conform to the Constitution. The Bill of Rights - Chapter 2 of the Constitution, includes an environmental right (Section 24) according to which, everyone has the right:
(a) To an environment that is not harmful to their health or well-being.
(b) To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that:

i. Prevent pollution and ecological degradation.
ii. Promote conservation.
iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

- *The MNWP Grid Connection Developer is obligated to ensure that the development of the MNWP Grid Connection and associated infrastructure will not result in pollution and ecological degradation.*
- *In addition, the Developer is obligated to ensure that the activity is ecologically sustainable and that it demonstrates economic and social development.*

4.2. NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 107 OF 1998 AND SUBSEQUENT AMENDMENTS)

The National Environmental Management Act (NEMA, Act No. 107 of 1998) provides for basis for environmental governance in South Africa by establishing principles and institutions for decision-making on matters affecting the environment.

A key aspect of the NEMA is that it provides a set of environmental management principles that apply throughout the Republic to the actions of all organs of state that may significantly affect the environment. Section 2 of NEMA contains principles (see Table below) relevant to the proposed MNWP Grid Connection project, and likely to be utilised in the process of decision making by KZN EDTEA.

(2)	Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
(3)	Development must be socially, environmentally and economically sustainable.
(4)(a)	Sustainable development requires the consideration of all relevant factors including the following: i. That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; ii. That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; iii. That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.
(4)(e)	Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
(4)(i)	The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
(4)(j)	The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.

(4)(p)	The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.
(4)(r)	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

As these principles are utilised as a guideline by the competent authority in ensuring the protection of the environment, the proposed development should, where possible, be in accordance with these principles. Where this is not possible, deviation from these principles would have to be very strongly motivated.

NEMA introduces the duty of care concept, which is based on the policy of strict liability. This duty of care extends to the prevention, control and rehabilitation of significant pollution and environmental degradation. It also dictates a duty of care to address emergency incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution and may lead to the prosecution of managers or directors of companies for the conduct of the legal persons.

Employees who refuse to perform environmentally hazardous work, or whistle blowers, are protected in terms of NEMA.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

- *The MNWP Grid Connection developer must be mindful of the principles, broad liability and implications associated with NEMA and must eliminate or mitigate any potential impacts.*
- *The MNWP Grid Connection developer must be mindful of the principles, broad liability and implications of causing damage to the environment.*

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

The National Environmental Management: Protected Areas Act (NEMPAA, Act No. 57 of 2003) mainly provides for the following:

- Declaration of nature reserves and determination of the type of reserve declared.
- Cooperative governance in the declaration and management of nature reserves.
- A system of protected areas in order to manage and conserve biodiversity.
- Utilization and participation of local communities in the management of protected areas

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

- *The western extent of the proposed alignments intersect marginally within the Moist Escarpment Grasslands NPAES (2018) Priority Focus Area. The project area also occurs within 10 km of the Sneeuwberg Protected Environment.*

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

The National Environment Management: Biodiversity Act (NEM:BA, Act No. 10 of 2004) provides for the management and conservation of South Africa's biodiversity and the protection of species and ecosystems that warrant national protection.

The objectives of this Act are to:

- Provide, within the framework of the National Environmental Management Act.
- Manage and conserve of biological diversity within the Republic.
- Promote the use of indigenous biological resources in a sustainable manner.

The Act provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act 107 of 1998. In terms of the Biodiversity Act, the developer has a responsibility for:

1. The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (including The Endangered and Threatened Ecosystem Regulations, Government Notice R. 1002 dated 9th December 2011).
2. Application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity.
3. Limit further loss of biodiversity and conserve endangered ecosystems.

The Act's permit system is further regulated in the Act's Threatened or Protected Species Regulations Government Notice R. 152, dated the 23rd of February 2007.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed development of the MNWP Grid Connection will require the clearance of sections of vegetation, specifically Low Escarpment Moist Grassland and Northern KwaZulu Moist Grassland (SANBI National Vegetation Map, 2018), which will impact on the biodiversity of the area. In addition, small patches of Southern Mistbelt Forest (SANBI National Vegetation Map, 2018) occur within the Connection Corridor; however, this vegetation type will be avoided.

- *However, the MNWP Grid Connection developer will ensure not to cause a threat to any endangered ecosystems and must protect and promote biodiversity;*
- *The MNWP Grid Connection developer must assess the impacts of the proposed development on endangered ecosystems;*
- *The MNWP Grid Connection developer may not remove or damage any protected species without a permit; and*
- *The MNWP Grid Connection developer must ensure that the site is cleared of alien vegetation using appropriate means (AIS Regulations, Government Notice R. 598 of the 1st of April 2014 are applicable).*

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

The National Environmental Management: Air Quality Act (NEM:AQA, Act No. 39 of 2004) is the principal legislation regulating air quality in South Africa. The objects of the Act are to:

- Give effect to Section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people, and
- Protect the environment by providing reasonable measures for:
  - Protection and enhancement of the quality of air in the Republic.
  - Prevention of air pollution and ecological degradation.
- Securing ecologically sustainable development while promoting justifiable economic and social development.

The Air Quality Act empowers the Minister to establish a national framework for achieving the objects of this Act. The said national framework will bind all organs of state. The said national framework will inter alia have to establish national standards for municipalities to monitor ambient air quality and point, non-point and mobile emissions.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

Although no major air quality issues are expected, the MNWP Grid Connection developer needs to be mindful of the Act as it also relates is potential dust generation during construction, etc.

4.6. NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE MANAGEMENT ACT (NO. 59 OF 2008)

The National Environmental Management: Waste Management Act (NEM:WA, Act No. 59 of 2008) gives legal effect to the Government's policies and principles relating to waste management in South Africa, as reflected in the National Waste Management Strategy (NWMS).

The objects of the Act are (amongst others) to protect health, well-being and the environment by providing reasonable measures for:

- Minimising the consumption of natural resources;
- Avoiding and minimising the generation of waste;
- Reducing, re-using, recycling and recovering waste;
- Treating and safely disposing of waste as a last resort;
- Preventing pollution and ecological degradation; and
- Securing ecologically sustainable development while promoting justifiable economic and social development.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

- *The MNWP Grid Connection developer must ensure that all activities associated with the project address waste related matters in compliance with the requirements of the Act.*
- *The MNWP Grid Connection developer must consult with the local municipalities to ensure that waste is disposed of at a registered landfill site.*

4.7. NATIONAL FOREST ACT (NO. 84 OF 1998)

The objective of this Act is to monitor and manage the sustainable use of forests. In terms of Section 12 (1) (d) of this Act and GN No. 1012 (promulgated under the National Forests Act), no person may, except under licence:

- Cut, disturb, damage or destroy a protected tree.
- Possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed development of the MNWP Grid Connection will require the clearance of sections of vegetation, specifically Low Escarpment Moist Grassland and Northern KwaZulu Moist Grassland (SANBI National Vegetation Map, 2018), which will impact on the biodiversity of the area. In addition, small patches of Southern Mistbelt Forest (SANBI National Vegetation Map, 2018) occur within the Connection Corridor; however, this vegetation type will be avoided for the placement of pylons.

4.8. NATIONAL HERITAGE RESOURCES ACT (NO. 25 OF 1999)

The protection of archaeological and paleontological resources is the responsibility of a provincial heritage resources authority, and all archaeological objects, paleontological material and meteorites are the property of the State. "Any person who discovers archaeological or paleontological objects or material or a meteorite in the course of development must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority".

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

- *SAHRA and KZN Amafa and Research Institute must be informed of the project and BA process.*
- *A Heritage Impact Assessment (HIA) must be undertaken by a suitably qualified specialist.*

- *No person may alter or demolish any structure or part of a structure, which is older than 60 years or disturb any archaeological or paleontological site or grave older than 60 years without a permit issued by the relevant provincial heritage resources authority.*
- *No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter or deface archaeological or historically significant sites.*

4.9. ELECTRICITY REGULATION ACT (NO. 4 OF 2006)

The Electricity Regulation Act (Act No. 4 of 2006) came into effect on the 1st of August 2006 and the objectives of this Act are to:

- Facilitate universal access to electricity.
- Promote the use of diverse energy sources and energy efficiencies.
- Promote competitiveness and customer and end user choice.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed MNWP Grid Connection is in line with the call of the Electricity Regulation Act as it has the potential to improve energy security of supply through diversification.

4.10. OCCUPATIONAL HEALTH AND SAFETY ACT (NO. 85 OF 1993)

The objective of this Act is to provide for the health and safety of persons at work. In addition, the Act requires that, "as far as reasonably practicable, employers must ensure that their activities do not expose non-employees to health hazards". The importance of the Act lies in its numerous regulations, many of which will be relevant to the proposed MNWP WEF. These cover, among other issues, noise and lighting.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed MNWP Grid Connection developer must be mindful of the principles and broad liability and implications contained in the OHSA and mitigate any potential impacts

4.11. NATIONAL WATER ACT (NO. 36 OF 1998)

The National Water Act (NWA, Act No. 36 of 1998) provides for fundamental reform of the law relating to water resources in South Africa.

The purpose of the Act amongst other things is to:

- Ensure that the national water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors:
  - Promoting equitable access to water.
  - Promoting the efficient, sustainable and beneficial use of water in the public interest.
  - Facilitating social and economic development.
  - Protecting aquatic and associated ecosystems and their biological diversity.
  - Reducing and preventing pollution and degradation of water resources.

The NWA is concerned with the overall management, equitable allocation and conservation of water resources in South Africa. To this end, it requires registration of water users and licenses to be obtained for water use except for certain limited instances set out in the Act. These instances include domestic use, certain recreational use, where the use occurs in terms of an existing lawful use or where the Department of Water Affairs (DWA) has issued a general authorisation that obviates the need for a permit.

Water use for which a permit is required

For the purposes of this Act, water uses for which a permit is required (amongst other), are defined in Section 21 as follows:

- Taking water from a water resource (a).

- Storing water (b).
- Impeding or diverting the flow of water in a watercourse (c).
- Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit (f).
- Disposing of waste in a manner which may detrimentally impact on a water resource (g).
- Altering the bed, banks, course or characteristics of a watercourse (i).

PLEASE NOTE THAT GENERAL AUTHORISATIONS (GAS) AND WULAS ARE ONLY CONSIDERED AND PROCESSED BY DWS ONCE A WIND ENERGY FACILITY HAS BEEN GRANTED PREFERRED BIDDER STATUS. THE REQUIRED WUL APPLICATIONS FOR THE MNWP WEF AND GRID CONNECTION PROJECTS HAVES BEEN SUBMITTED, AND APPLICATION REFERNCE NUMBERS OBTAINED. SHOULD MNWP WEF BE GRANTED PREFERRED BIDDER STATUS THEN THE WULAs WILL BE PROGRESSED FOR CONSIDERATION BY THE DWS.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

Should the proposed MNWP Grid Connection project trigger water use activities in terms of Section 21 of the NWA, authorisation will be required from the Department of Water and Sanitation (DWS) prior to the commencement of the construction phase. Regardless of whether Section 21 water uses are triggered, the DWS remains a stakeholder which will be notified of the proposed MNWP Grid Connection.

4.12. CONSERVATION OF AGRICULTURAL RESOURCES ACT (NO. 43 OF 1983)

The Conservation of Agricultural Resources Act (CARA, Act No. 43 of 1983) is the main statute that deals with agricultural resource conservation.

The objects of the Act are to provide for the conservation of the natural agricultural resources of South Africa by the maintenance of the production potential of land. In order to maintain production potential of land, CARA provides for the following mechanisms; namely:

- Combating and prevention of erosion and weakening and destruction of water sources.
- Protection of vegetation.
- Combating of weeds and invader plants.

In order to give meaning to mechanisms aimed maintaining production potential of land provided for in CARA, Minister of Agriculture published regulations under CARA (CARA Regulations) which prescribes control measures which all land users have to comply, in respect of a number of matters, including the:

- Cultivation of virgin soil.
- Protection of cultivated land.
- Utilisation and protection of the veld.
- Control of weed and invader plants.
- Prevention and control of veld fires and the restoration and reclamation of eroded land.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION

The proposed MNWP Grid Connection site is not deemed to be situated on high agricultural land with high potential. Preventative measures must be considered as part of the EMPr to ensure that farmers are able to continue using their land as livestock grazing as far as possible

4.13. SUBDIVISION OF AGRICULTURAL LAND ACT (NO. 70 OF 1970)

The Subdivision of Agricultural Land Act (Act No. 70 of 1970) controls the subdivision of all agricultural land in South Africa and prohibits certain actions relating to agricultural land. In terms of the Act, the owner of agricultural land is required to obtain consent from the Minister of Agriculture in order to subdivide agricultural land.

The purpose of the Act is to prevent uneconomic farming units from being created and degradation of prime agricultural land. The Act also regulates leasing and selling of agricultural land as well as registration of servitudes.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION
Approval will be required from the Department of Agriculture, Land Reform and Rural Development (DALRRD) for any activities on the land zoned for agriculture and any proposed rezoning or sub-divisions of agricultural land.

4.14. Mineral and Petroleum Resources Development Act (No. 28 of 2002)

Mineral and Petroleum Resources Development Act (MPRDA, Act No. 28 of 2002) makes provision for equitable access to and sustainable development of the South Africa's mineral and petroleum resources and to provide for matters connected therewith.

The objects of this Act are (amongst others) to:

- Give effect to the principle of the State's custodianship of the nation's mineral and petroleum resources.
- Promote equitable access to the nation's mineral and petroleum resources to all the people of South Africa.
- Give effect to Section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development.

Application for a mining right

As per Section 27 (1) of the Act, the Department of Minerals Resources (DMR) must grant permission for all mining operations. Both the removal of sand and/or stone from a borrow pit or quarry requires an application for a mining permit or a mining right.

There are two (2) categories of permission relevant to borrow pits and hard rock quarries, namely, "Mining Permits" and secondly "Mining Rights." As is reflected in the table below, these categories are linked to the size of the proposed operation and the proposed operational period.

Category	Size	Period of Operation	DMRE Requirement
Mining Permit	< 1.5 ha	< 2 years	EIA: Basic Assessment Environmental Management Programme (EMPr)
Mining Right (Licence)	> 1.5 ha	< 30 years	EIA: Scoping and EIA Environmental Management Programme (EMPr)

In addition, Section 53 of the Act requires that Ministerial approval is attained for "any person who intends to use the surface of any land in any way which may be contrary to any object of this Act or is likely to impede any such object".

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION
- *Any activities associated with the MNWP Grid Connection requiring extraction of sand or hard rock for construction purposes will require the submission of an application to DMRE for either a mining permit or mining licence.*

4.15. National Road Traffic Act (No. 93 of 1996)

The National Road Traffic Act (NRTA, Act No. 93 of 1996) provides for all road traffic matters and is applied uniformly throughout South Africa. The Act enforces the necessity of registering and licensing motor vehicles.

It also stipulates requirements regarding fitness of drivers and vehicles as well as making provision for the transportation of dangerous goods.

RELEVANCE TO THE PROPOSED MNWP GRID CONNECTION
All the requirements stipulated in the NRTA will need to be complied with during the construction and operational phases of the proposed MNWP Grid Connection project.

4.16. National Veld and Forest Fire Act (No. 101 of 1998)

The aim of the Act is to "prevent and combat veld, forest and mountain fires" in South Africa. Of particular relevance to the proposed MNWP Grid Connection development the following requirements of the Act need to be considered:

Relevant Section of the Act	Relevance to the Project
Section 3: Fire Protection Associations	The proposed MNWP Grid Connection must register as a member of the fire protection association in the area.
Chapter 4 Section 12-14: Veld fire prevention: duty to prepare and maintain firebreaks	The proposed MNWP Grid Connection will be required to take all practicable measures to ensure that fire breaks are prepared and maintained according to the specifications contained in Section 12 – 14
Section 17: Firefighting readiness	The proposed MNWP Grid Connection must have the appropriate equipment, protective clothing and trained personnel for extinguishing fires.

4.17. Other Relevant National Legislation

Other legislation that may be relevant to the proposed MNWP WEF includes:

- The Environment Conservation Act No 73 of 1989 (ECA) Noise Control Regulations, which specifically provide for regulations to be made with regard to the control of noise, vibration and shock, including prevention, acceptable levels, powers of local authorities and related matters.
- The Telecommunication Act (1966) which has certain requirements with regard to potential impacts on signal reception.
- Spatial Planning and Land Use Management Act (SPLUMA) (Act 16 of 2013 – came into force on 1 July 2015) aims to provide inclusive, developmental, equitable and efficient spatial planning at the different spheres of the government. This act repeals national laws on the Removal of Restrictions Act, Physical Planning Act, Less Formal Township Planning Act and Development Facilitation Act.
- KwaZulu-Natal Nature Conservation Management Act 9 of 1997 where the main objectives are to: To provide institutional structures for nature conservation in Kwazulu-Natal; to establish control and monitoring bodies and mechanisms, and to provide for matters incidental thereto.
- KwaZulu-Natal Planning and Development Act No. 6 of 2008. The objects of this Act are to, amongst others, to provide for the adoption, replacement and amendment of schemes; provide for the subdivision and consolidation of land; and provide for provincial planning and development norms and standards.

In addition to the above, aside from the environmental authorisation, there are other permits, contracts and licenses that will need to be obtained by the project proponent for the proposed project some of which fall outside the scope of the BA Process. However, for the purposes of completeness, these include:

- National Energy Regulator of South Africa (NERSA): Generation License.
- Eskom: Connection agreement and Power Purchase Agreement (PPA).
- Newcastle Local Municipality Spatial Development Framework (SDF), Integrated Development Plan (IDP) and municipal by-laws.
- Amajuba District Municipality SDF and IDP.

5. DESCRIPTION OF THE ENVIRONMENT

This chapter provides background information on the biological, physical (biophysical) and social environment of the proposed project site and surrounds. The section draws on existing available information within the immediate area as well as municipal and local planning tools and any additional published and unpublished material. The biophysical baseline section will look at aspects relating to climate, topography, geology, soils, flora, fauna and surface and groundwater resources, while the social baseline section will address the administrative and institutional structures, demographic profile, economy, land use, cultural heritage, infrastructure and services as well as noise and visual aspects of the area.

IMPORTANT NOTE:
The baseline information has been provided for the study area as a whole and has been sourced mainly by the EAP (CES) and the initial screening exercises conducted by the various appointed specialists (including both desktop and initial site assessments), including:

- Climate;
- Geology and soils;
- Agricultural potential and land use;
- Surface water features;
- Ecological sensitivity (flora and fauna);
- Avifaunal and bat sensitivity;
- Conservation planning tools;
- Socio-economic impacts and benefits.
- Visual impacts;
- Noise impacts;
- Heritage sites and resources; and
- Paleontological sites in terms of potential fossil deposits;

5.1. CLIMATE

Newcastle's climate is classified as warm and temperate. The summers are much rainier than the winters. The months of summer are December, January, February, March and the average annual temperature in is 16.0 °C. The annual rainfall is 895 mm with the least amount of rainfall occurring in June. The average rainfall in this month is 11 mm. The greatest amount of precipitation occurs in December, with an average of 163 mm. Table below indicates the average temperatures and rainfall data per month for Newcastle.

Table 5.1-1: Average Temperatures and Rainfall Data for Newcastle (Source: en.climate-data.org).

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Avg. Temp. (°C)	19.9	19.8	18.6	15.9	13.1	10.3	10.1	13	16	17.5	18.6	19.7
Min. Temp. (°C)	14.9	14.9	13.4	10.4	6.7	3.7	3.1	5.6	8.6	11	12.6	14.3
Max. Temp. (°C)	25.5	25.5	24.4	22	20.2	17.9	17.9	21	24	24.8	25.2	25.8
Rainfall (mm)	146	105	104	44	19	11	14	25	42	99	123	163

5.2. TOPOGRAPHY

The topography of Newcastle is relatively flat. However, the terrain becomes more undulating and steeper towards the WEF Complex. MNWP Grid Connection is located on a plateau approximately 1800 m above sea level (m.a.s.l). The landscape is incised by numerous drainage lines (Figure 5.2.1).

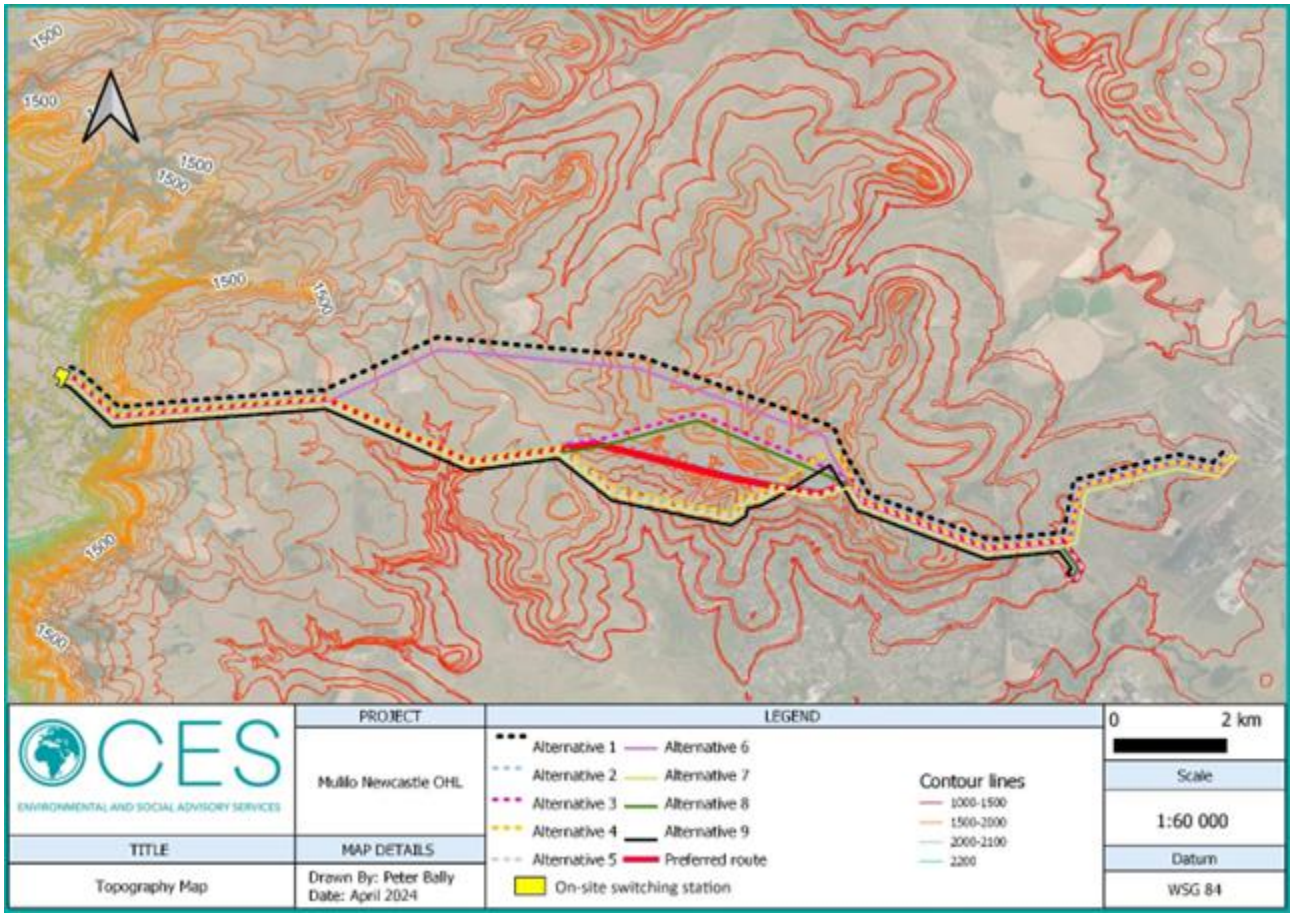

Figure 5.2.1: Contour Map of MNWP Grid Connection.

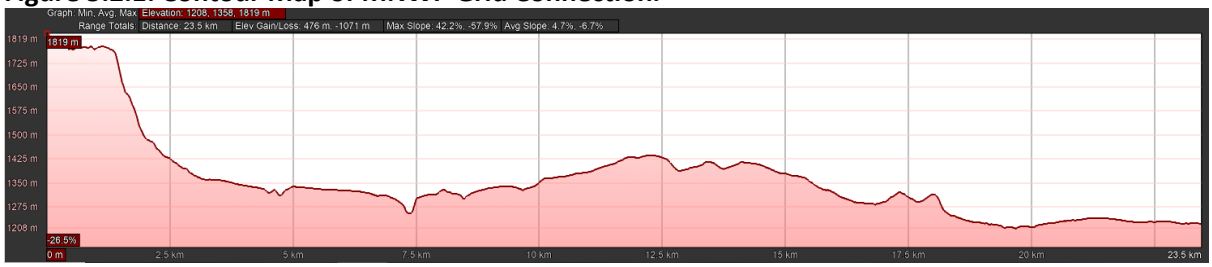

Figure 5.2.2: Elevation profile of MNWP Grid Connection from west-east for the preferred OHPL alternative.

5.3. GEOLOGY

The underlying geology of MNWP Grid Connection comprises of sedimentary deposits from predominantly the Karoo Dolerite Suite, followed by the Vryheid Formation, with a bit of overlap from the Beaufort Group (Figure 5.3.1).

Karoo Dolerite Suite represents a network of igneous dykes and sills that intruded rocks of the Beaufort Group in the Karoo Basin about 180 million years ago (Neumann *et al*. 2011).

Vryheid Formation is rich in fossils (majority Middle Permian flora) and dominated by light grey mostly fine-grained sandstone and siltstone. It is characterised by deltaic mudrocks and sandstones, fluvial deposits, with occasional coal seams. The presence of coal is detectable by dark coloured siltstone (SAHRIS, 2013).

Beaufort Group covers a surface area of approximately 200 000 km^2 and is made up of fluvial rocks deposited about 250 million years ago within the Main Karoo Basin of South Africa. The strata in the Beaufort Group consist predominantly of mudstones and sandstones deposited by a variety of fluvial systems (Catuneanu *et al*. 2005).

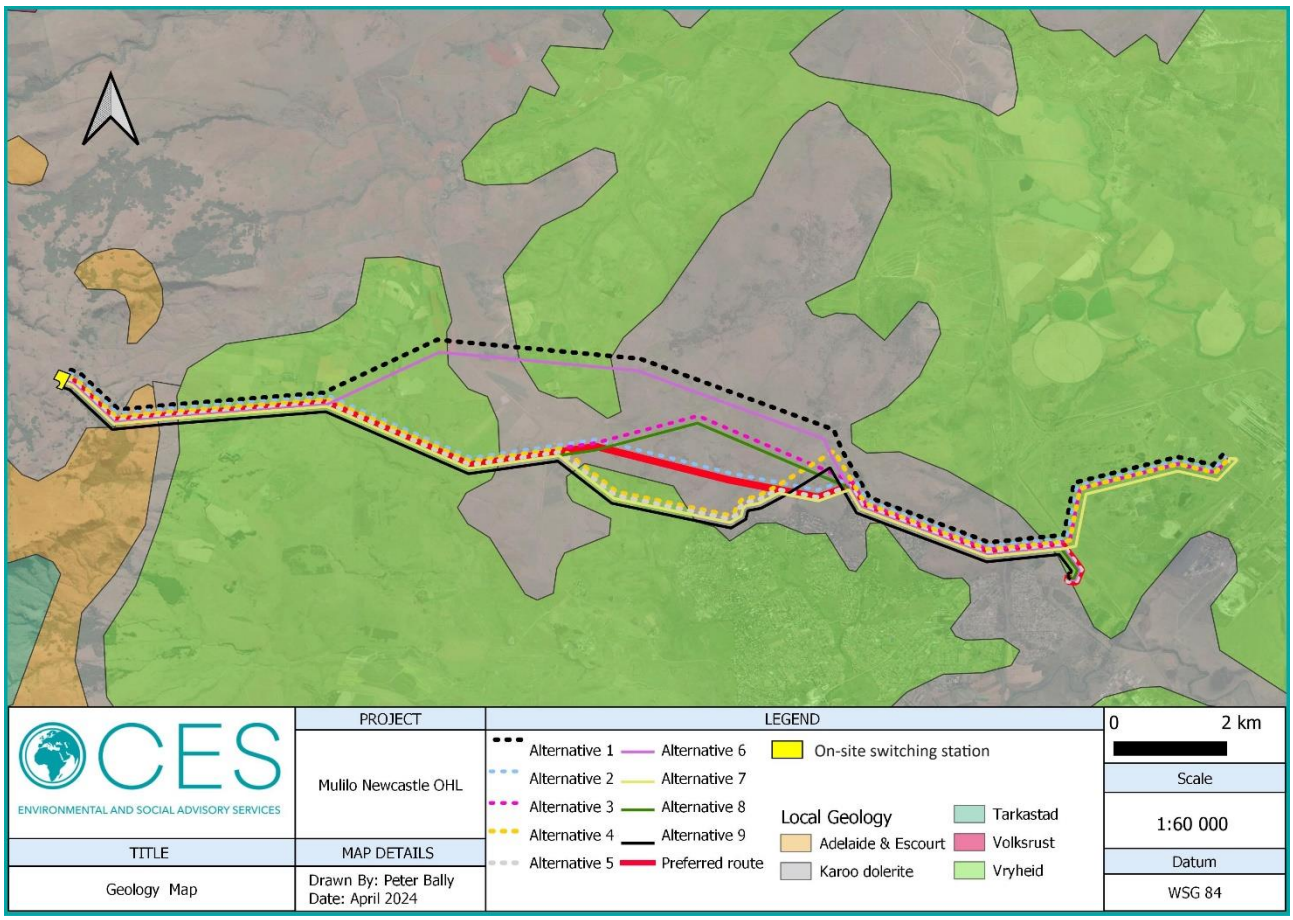

Figure 5.3.1: South African Geology Map of the Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.

5.4. SOILS

According to SOTER (1995), the soils within the project area are classified as *Epipetric Plinthosols*, *Lithic Leptosols*, *Paraplinthic Acrisols*, *Rhodic Nitisols*, and *Rhodic Ferrasols* (Figure 5.4.1).

Plinthosols are iron-rich soils with petroplinthic or plinthic horizons. These soils occur mainly in low-lying areas where iron from the soil and adjacent uplands is accumulating (ISRIC, 2023).

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).

Acrisols are strongly weathered acid soils with low base saturation and are not very productive in terms of arable land use. They generally underlie old land surfaces with hilly or undulating topography, in wet, tropical, subtropical, or warm regions (ISRIC, 2023).

Nitisols are deep, well-drained, red, clayey soils that are generally found in hilly landscapes under tropical forests or grasslands. These soils are strongly weathered and considered to be fertile, making them relatively good for farming and plantations (ISRIC, 2023).

Ferralsols are deeply weathered, red or yellow, clayey soils found in humid tropical zones. These soils are typically found in low undulating areas and are low in fertility (ISRIC, 2023).

The Amajuba BSP (Ezemvelo KZN Wildlife, 2014), describes three types of soils that occur within the wider project area, including transported soils, colluvial and residuals of the Pleistocene and recent origin. These soils are subject to erosion by wind and water and the clay content of the soil leads to swelling and shrinking depending on the relative water content of the soil.

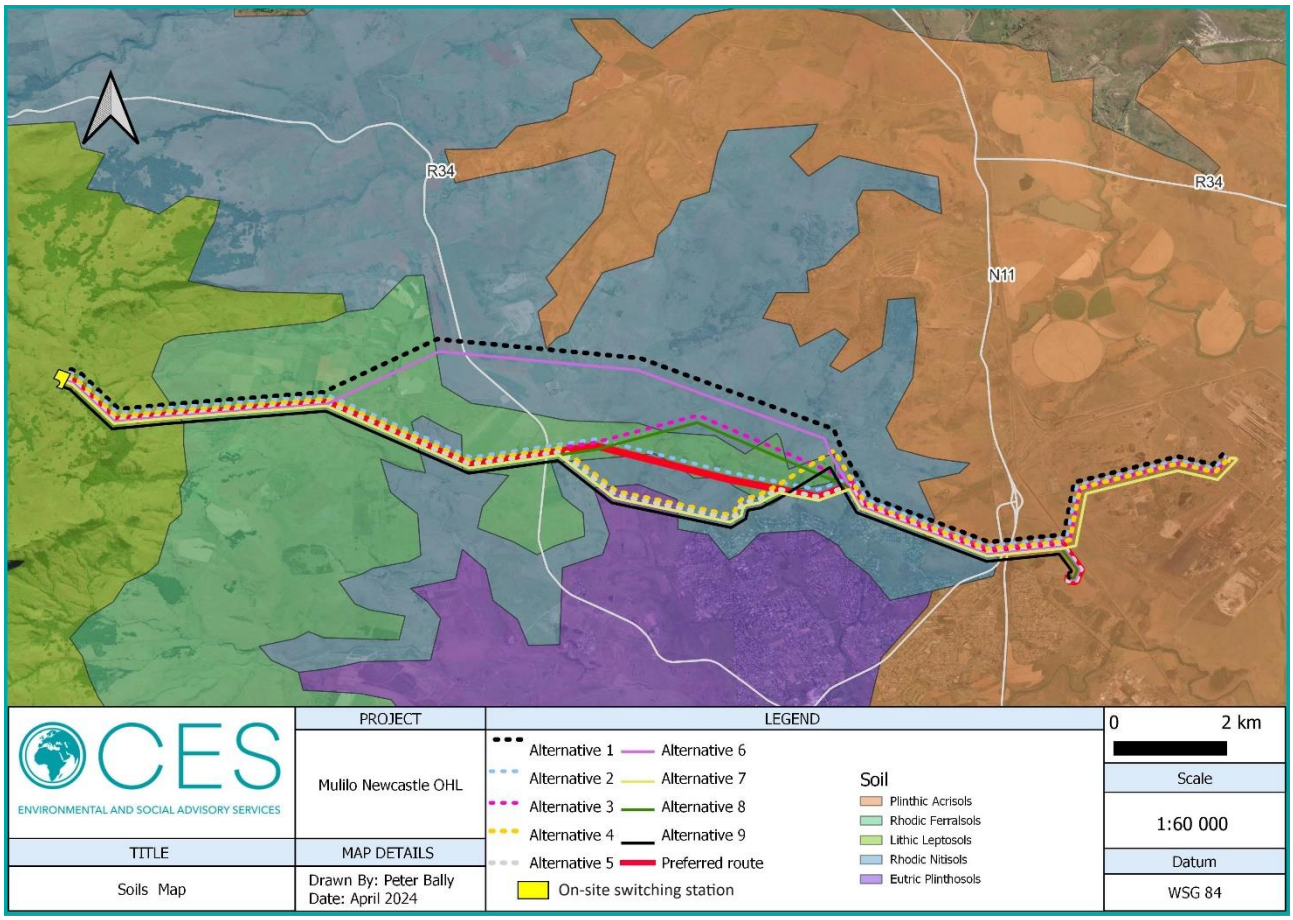

Figure 5.4.1: SOTER SAF Soil Map of MNWP Grid Connection.

5.5. AGRICULTURE

The properties affected by the grid connection are all zoned as Agriculture and mostly used for stock grazing. Woodlands or Afromontane forests occur in the ravines. No cultivated land could be identified on Google or Bing satellite images on any of the farms. There are a few cultivated dry lands along the southern alignment. Although not directly on the route, some houses of farmers or their labour were identified within the 100 metre buffer reserved for construction.

The proposed Mulilo Newcastle Wind Power Grid Connection development does not require the disturbance of the soil-surface within the whole Connection Corridor as the primary activity requiring the disturbance of the soil surface will be for the placement of the pylons (OHL) or along a linear route (underground).

An Agricultural Potential Assessment (Index, October 2023) has been undertaken by Dr Andries Gouws and included in Appendix C of this report.

5.6. SURFACE WATER

The proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure is situated within the regulatory 500 m buffer of a few NFEPA (2011/14) and NBA (2018) wetlands as well as within the regulatory 100 m buffer of watercourses. Water Use Authorisation, from the Department of Water and

Sanitation (DWS) in accordance with Section 21(i) and/or (c) of the National Water Act (NWA) (Act No. 36 of 1998, as amended) is required for development within these regulatory buffers (see Figure 5.6.1).

The proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure site traverses four (4) Quaternary Catchments (DWS, 2011), namely V31C, V31D, V31J and V31K. A majority of the site is drained by a series of non-perennial and perennial drainage lines, streams and rivers that drain in northerly and easterly directions into the Ngongo, Mbizana and Ngudumeni Rivers.

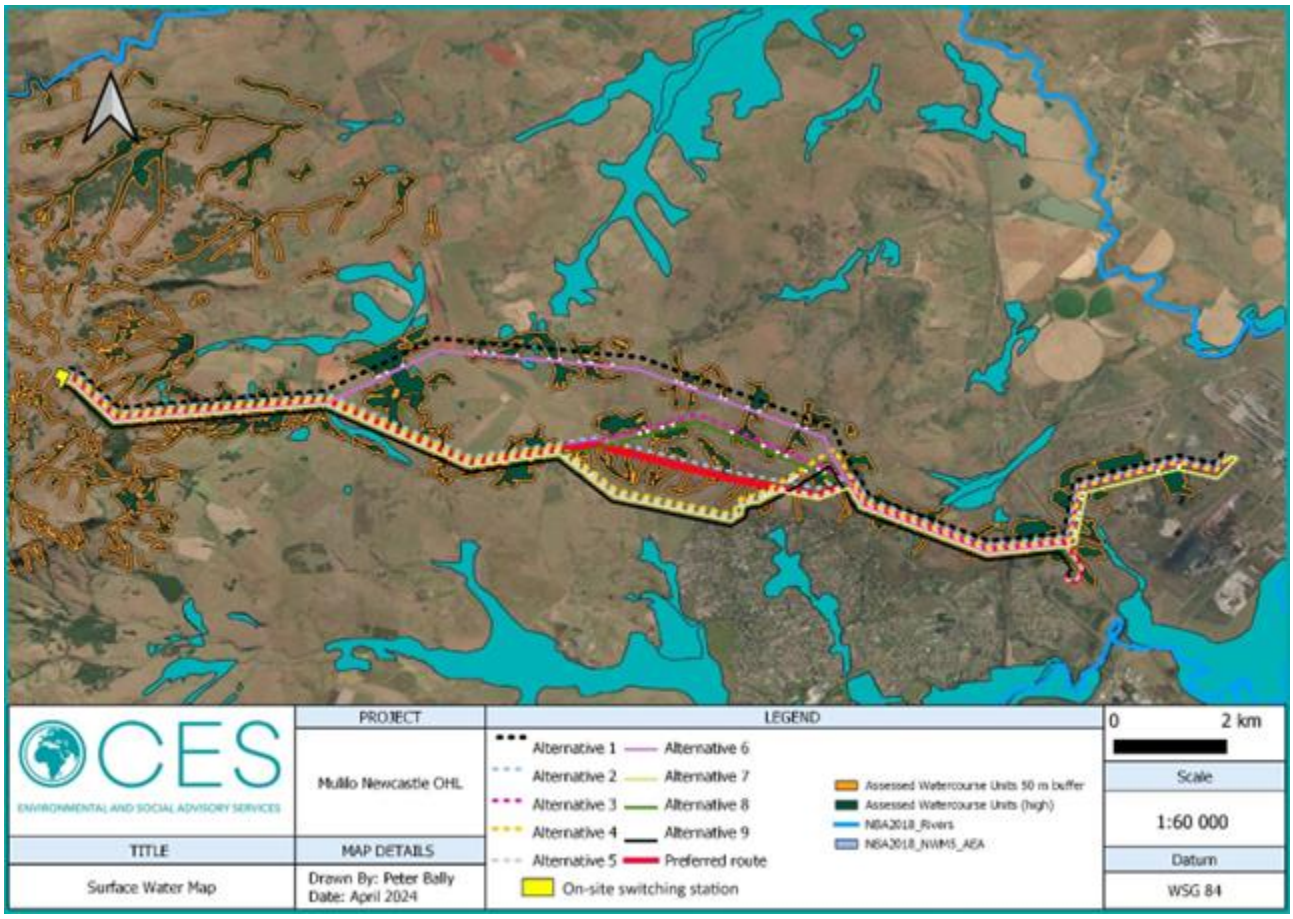

Figure 5.6.1: Surface Water Map of the Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.

Where possible, the Mulilo Newcastle Wind Power Grid Connection, will avoid being placed within watercourses and wetlands. However, the connection will likely be situated within the 100 m (watercourse) and 500 m (wetlands) regulatory buffers and will require Water Use Authorisation from the DWS prior to the commencement of construction.

Verdant Environmental undertook an Aquatic and Wetland Ecosystem Impact Assessment to determine the impact of the proposed grid connection. Please see Appendix C of this report.

5.7. LAND-COVER

According to the South African National Land-Cover (2020) spatial dataset, the major land class that covers the project area is 'natural grassland'. This is followed by fallow land (pink); cultivated land (brown); plantation (orange); and wetlands (blue). Minor land classes in the project area include forest, bare ground, rocky areas, as well as residential, commercial, and industrial land uses, amongst others (Figure 5.7.1).

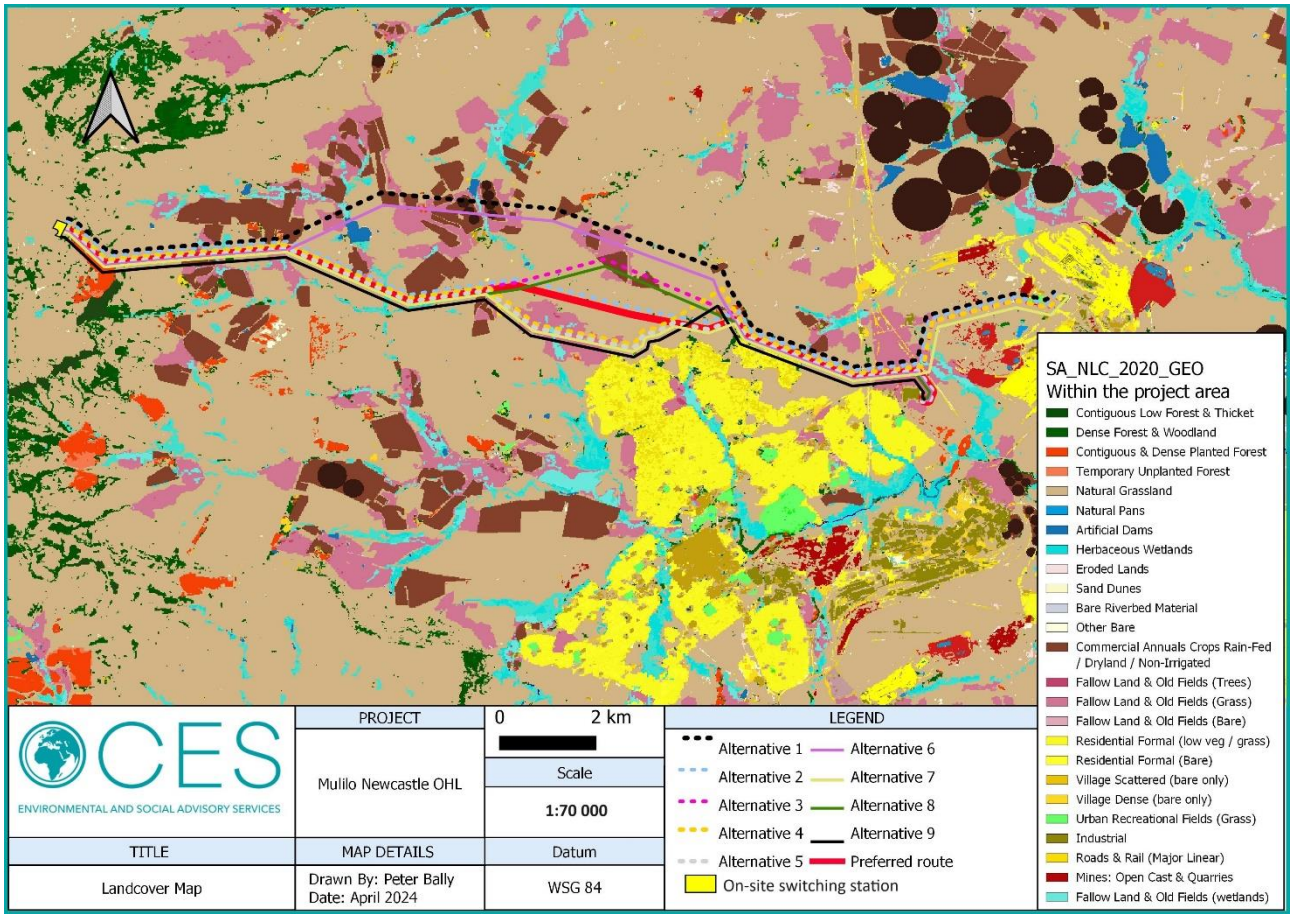

Figure 5.7.1: National Land-Cover Map of the Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.

5.8. VEGETATION

The project area falls within the Grassland and Forest Biomes (Mucina et al., 2006-2018).

5.8.1. GRASSLAND

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 second only in the country to that of the Fynbos Biome. The exceptional diversity and provision of ecosystem services have contributed to the classification of this ecosystem 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).

Approximately 40% of the Grassland Biome in South Africa has been transformed, while almost 60% of the remaining grassland areas are classified as threatened due to the loss of vital aspects of their composition, structure, and function. Only 3% of this valuable ecosystem is formally conserved. The fragmentation and degradation of grassland ecosystems severely affects their ability to provide valuable ecosystem services such as soil formation, freshwater, climate regulation and erosion prevention. As such, development within the remaining natural grassland areas should be well-informed and, where information is lacking, the Precautionary Principle should be applied (SANBI, 2013).

The two (2) key ecological drivers of grassland ecosystems are climate and fire, which influences the character, community structure, composition, and primary productivity of these systems. In addition to climate and fire, other ecological drivers influencing these features include grazing, soil types, and nutrient

status. Due to their high biodiversity and their suitability for human habitation, these ecosystems are often negatively 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).

5.8.2. FOREST

Indigenous forests in South Africa cover less than 0.1% of the land surface area and are defined as, "a generally multi-layered vegetation unit dominated by trees (largely evergreen or semi-deciduous), whose combined strata have overlapping crowns (i.e., crown cover is 75% or more), and where graminoids in the herbaceous stratum (if present) are generally rare" (Bailey et al., 1999 and Shackleton et al., 1999: in Rutherford et al., 2006). In South Africa, forests typically occur in small, scattered patches of less than 10 ha, forming islands within large scale patches of temperate biomes such as Grassland, Savanna, Fynbos, and Albany Thicket, along the eastern and southern margins (Great Escarpment, mountain ranges and coastal lowlands) (Rutherford et al., 2006).

The major factors determining the distribution of forest patches within South Africa include environmental factors such as rainfall and substrate, and fire pattern which in turn is determined by the interaction between the topography and the prevailing wind direction during dry periods. Forests tend to persist in topographic or wind shadow areas (also called fire refugia) (Rutherford et al., 2006).

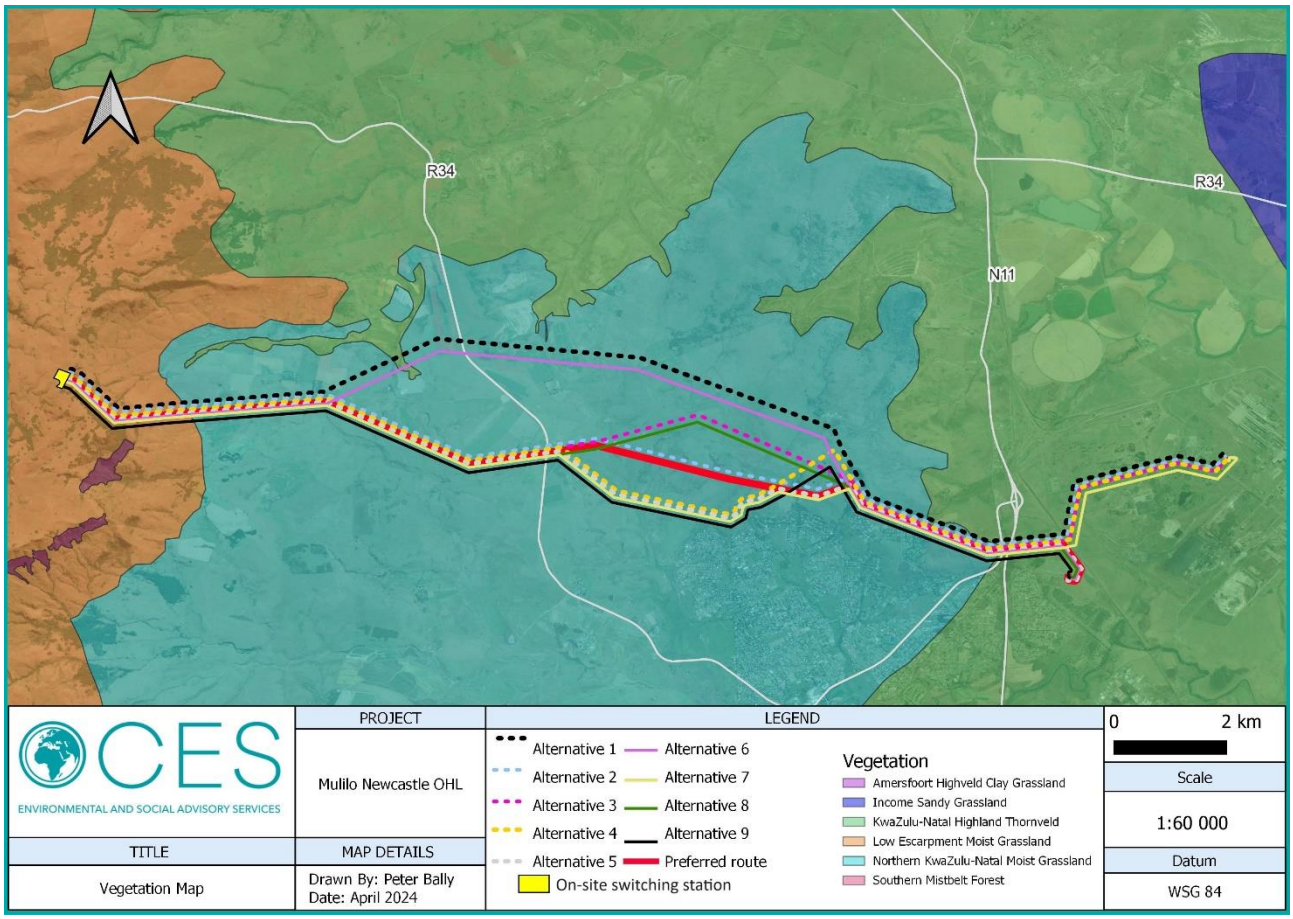

Figure 5.8.1: National Vegetation Map of the Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.

National Vegetation Map (SA VEGMAP, 2018)

The South African Vegetation Map (SA VEGMAP) of 2018 is an important resource for biodiversity and environmental management in South Africa. Under the custodianship of the South African National Biodiversity Institute (SANBI) the SA VEGMAP, (2018) was updated 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), a majority of the proposed project occurs within the *Northern KwaZulu-Natal Moist Grassland*. This is followed by *KwaZulu-Natal Highveld Thornveld* and *Low Escarpment Moist Grassland* (Figure 5.8.1). These vegetation types, including *Southern Mistbelt Forest*, which occurs just outside the project area, are described in detail below.

Northern KwaZulu-Natal Moist Grassland occurs on hilly and rolling landscapes in the northern and north-western regions of the KwaZulu-Natal Province where it forms a discontinuous rim around the upper Thukela Basin. It is typically underlain by mudstones, sandstones and shales of the Beaufort and Ecca Groups (Karoo Supergroup) which is intruded by dolerites. This vegetation type falls within the summer rainfall region (MAP: ±840 mm) and is characterised by tall tussock grassland, dominated by *Themeda triandra* and *Hyparrhenia hirta*. Disturbed sites and valleys surrounding this vegetation type are usually encroached upon by open *Vachellia sieberiana* savannoid woodlands (SANBI, 2006 in SANBI, 2021).

KwaZulu-Natal Highland Thornveld occurs in a series of patches in the central-northern regions of KwaZulu-Natal in dry valleys and moist uplands at an altitude of approximately 920-1440 m. This vegetation type falls within the summer rainfall region (MAP: ±750 mm) and is characterised by tall tussock grassland dominated by *Hyparrhenia hirta*, with occasional savannoid woodlands with scattered *Vachellia sieberiana*. *V. karroo* and *V. nilotica* which usually occur in small pockets. It is typically underlain by a variety of Karoo Supergroup rocks (SANBI, 2006 in SANBI, 2021).

Low Escarpment Moist Grassland occurs on complex mountain topography such as steep (generally east- and south-facing) slopes at a range of altitudes within the KwaZulu-Natal, Free State and Mpumalanga Provinces. It is characterised by tall, closed grassland dominated by *Hyparrhenia hirta* and *Themeda triandra* with patches of *Protea caffra* and *Leucosidea* scrub communities appearing at higher altitudes. This vegetation type falls within the summer rainfall region and is typically underlain by mudstone and shales of the Ecca and Beaufort Groups (Karoo Supergroups). Patches of Northern KwaZulu-Natal Mistbelt Forest occur within the sub-escarpment regions and deep-kloof positions (SANBI, 2006 in SANBI, 2021).

Southern Mistbelt Forest occurs as patches that develop in fire-shadow habitats on south- and southeast-facing slopes of the Main Escarpment which encompasses large areas spanning the surroundings of Sommerset East, Amatole Mountains, scarps of Transkei and KwaZulu-Natal Midlands, as far east as Ulundi, at altitudes of between 850-1600 m. In KwaZulu-Natal these forests are tall (15-20 m) and multilayered, characterized by two layers of trees, a dense shrubby understory, and a very well-developed herb layer. They occur as a wide band between the Drakensberg Montane Forests, the Northern KwaZulu-Natal Mistbelt Forests at higher altitudes and Eastern Scarp Forests at lower altitudes. *Podocarpus henkelii* is prominent in the canopy layer and deciduous trees play an important structural role. The soils underlying these forests are well developed, deep and loamy with a high nutrient status, derived from the weathering of dolerite intrusions or mudstones, shales, and sandstones. The most important climatic characteristic of these forests is the incidence of heavy summer mist (CSIR, 2003).

Amajuba District Municipality: BSP (2014) Vegetation Types

With reference to the study area, the Amajuba District Municipality: BSP (2014) recognises three vegetation types recorded in the SA VEGMAP (2018), namely *Northern KwaZulu-Natal Moist Grassland*, *KwaZulu-Natal Highland Thornveld*, and *Low Escarpment Moist Grassland*. The Amajuba District Municipality: BSP (2014) refers to Southern Mistbelt Forest as *Eastern Mistbelt Forest*.

The Amajuba District Municipality: BSP (2014) recognises an additional two (2) ecosystem types within the wider project area, namely *Alluvial Wetlands: Temperate Alluvial Vegetation* and *Freshwater Wetlands: Eastern Temperate Wetlands*.

Eastern Mistbelt Forest is a moist, tall (15-30 m) and multilayered forest, occurring in patches from approximately 1-1500 ha. Forest patches occur in extensive bands at altitudes ranging from 850-1600 m often on steep eastern to western slopes of mountains or escarpments from the Kokstad/ Mount Ayliff /Bizana area in the Eastern Cape to the KwaZulu-Natal Midlands. They are underlain by nutrient rich and loamy soils derived from the mudstones, sandstones, and shales of the Ecca and Beaufort Group. Most species are evergreen and single stemmed, however the presence of several deciduous trees gives the impression of an open forest canopy during the drier winter months. The forests are dominated by a range of species that vary in importance in different parts of the habitat units: *Xymalos monospora*, *Podocarpus henkelii*, *Podocarpus falcatus*, *Podocarpus latifolius*, *Ocotea bullata*, *Celtis africana*, *Calodendrum capense*, *Apodytes dimidiata*, *Curtisia dentata*, *Cussonia spicata* complex, *Kiggelaria africana*, *Prunus africana* (nowhere common), *Ptaeroxylon obliquum*, *Rapanea melanophloeos*, *Rhus chirindensis*, *Vepris lanceolata* and *Zanthoxylum davyi*. The strangler fig, *Ficus craterostoma*, occurs in many of the forests. Important sub-canopy trees and shrubs include *Allophylus dregeanus*, *Calpurnia aurea*, *Clausena anisata*, *Cryptocarya woodii*, *Diospyros whyteana*, *Eugenia zuluensis*, *Halleria lucida*, *Maytenus mossambicensis*, *Pterocelastrus rostratus*, *Rothmannia capensis*, *Trichocladus ellipticus* and *Trimeria grandifolia*. In some parts of the forest, the fern layer can be well developed and comprise of a variety of species. The estimated extent of this forest type is approximately 33 000 to 37 000 ha (CSIR, 2003).

Eastern Mistbelt Forests have a high socio-economic and biodiversity value. The high biodiversity value is attributed to the high species richness and the extent of this forest type while the high socio-economic value is attributed to the utilization of these forests for their timber and medicinal plant species. These forests are also valued for their cultural importance and their contribution to the sustainability of water supply. The main threats to this forest type include over exploitation of non-timber forest products, bark harvesting, as well as the mismanagement of fire and burning regimes in surrounding grasslands (CSIR, 2003).

An Ecological Impact Assessment (CES, October 2023), which includes floral and faunal assessments, has been undertaken and included in Appendix C of this report.

5.9. FAUNA

5.9.1. AVIFAUNAL

ERM were appointed as the avifaunal specialists to undertake an Avifaunal Impact Assessment. The Avifaunal Impact Assessment assessed the potential impacts of both the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.

The following information has been extracted from the Avifaunal Impact Assessment Report (ERM, July 2023):

- Based on the desktop study, 51 Priority Species were identified as potentially being present in the area. This included 34 Species of Conservation Concern (SCC).
- A total of 11 avifaunal SCCs were recorded during the pre-application avifaunal monitoring programme associated with the WEFs (including incidental sightings in the broader area and control sites); namely, Denham's Bustard, Blue Crane, Grey Crowned Crane, Wattled Crane, Crowned Eagle, Martial Eagle, Verreaux's Eagle, Black Harrier, Southern Bald Ibis, Secretary bird and Cape Vulture.

- Relatively low levels of flight activity were recorded along the steep topographic contours in the west of the assessment corridors and no nests of avifaunal SCCs were located within several kilometres of the proposed development.
- The Avifaunal Specialists have identified that the preferred route has more areas of avifaunal sensitivity than alternative 2. Note that the preferred alternative is still acceptable from an avifaunal perspective. Alternative 1 is considered unacceptable from an avifaunal perspective due to its close proximity to a large farm dam and wetland environments with High Site Ecological Importance (SEIs), increasing the risk of impact to avifaunal SCCs attracted to these features such as Blue Crane, Grey Crowned Crane, Wattled Crane, flamingos and other waterbirds.

As mentioned above, an Avifaunal Impact Assessment (ERM, July 2023) has been undertaken and included in Appendix C of this report.

5.9.2. FAUNA

No herpetofauna SCC were observed during site investigations. The only frog observed was *Amietia delalandi*a (Common River Frog). In addition, four snake species, namely Peter's Thread Snake (*Leptotyphlops scutifrons*), Puff Adder (*Bitis arietans*), Dusky-bellied Water Snake (*Lycodonomorphus laevissimus*), and Bibron's Blind Snake (*Afrotyphlops bibronii*) were observed (Plate 3.4). Two mammal SCC occur within the wider project area, namely *Redunca fulvorufula fulvorufula* (Mountain Reedbuck) and *Ourebia ourebi* (Oribi), which are both listed as Endangered. Other species observed within the project area include Common Duiker, Steenbok, Meerkat, Slender Mongoose, Black-backed Jackal, Chacma Baboon, Vervet Monkey, Kudu, and Eland. Based on spoor and other signs, Aardvark, Cape Porcupine, Rabbits, and African Savannah Hare, are also known to occur here.

An Ecological Impact Assessment (CES, October 2023), which includes floral and faunal assessments, has been undertaken and included in Appendix C of this report.

5.9.3. BIODIVERSITY INDICATORS

The Conservation Terms for the EKZNW Spatial Planning Products Document (2016) provides a map of important biodiversity areas within the KwaZulu-Natal Province, to guide sustainable development as well as focus conservation efforts within the province.

The aim of the Document is to provide stakeholders with a simplified guide to Systematic Conservation Assessment (SCA) and the development of the KwaZulu-Natal Biodiversity Sector Plan (KZN BSP). The KZN BSP consists of two primary spatial layers, namely Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), but also includes the legislated Protected Areas, modified areas, and Natural Biodiversity Areas.

Critical Biodiversity Areas (CBAs) are defined as natural or near-natural features, habitats or landscapes that include terrestrial, aquatic, and marine areas that are considered critical for the following reasons:

(i) Meeting national and provincial biodiversity targets and thresholds.
(ii) Safeguarding areas required to ensure the persistence and functioning of species and ecosystems, including the delivery of ecosystem services.
(iii) Conserving important locations for biodiversity features or rare species. Conservation of these areas is crucial, in that if these areas are not maintained in a natural or near-natural state, biodiversity conservation targets cannot be met.

The KZN BSP CBAs are divided into two subcategories, namely Irreplaceable and Optimal CBAs. Irreplaceable CBAs are areas considered critical for meeting biodiversity targets and thresholds, and which are required to

ensure the persistence of viable populations of species and the functionality of ecosystems. Optimal CBAs are areas that represent an optimised solution to meet the set biodiversity conservation targets while avoiding areas of conflict where the risk of biodiversity loss is high. This category is driven primarily by process but is also informed by expert input.

Unlike CBAs, ESAs may not be entirely natural but are still required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within and between CBAs. As illustrated in, Table the preferred and alternative alignments intersect with areas identified as CBA irreplaceable, CBA optimal and ESA. The desired management objectives for CBA and ESA are presented in Table .

Table 5.9.3-1: Management objectives for CBA and ESA.

Category	Sensitivity Features	Desired Management Objective
CBA: Irreplaceable	Areas which are required to meet biodiversity conservation targets, and where there are no alternative sites available.	Maintain in a natural state with limited to no biodiversity loss.
CBA: Optimal	Areas that are the most optimal solution to meet the required biodiversity conservation targets while avoiding high-cost areas as much as possible.	Maintain in a natural state with limited to no biodiversity loss.
Ecological Support Areas (ESAs)	Functional but not necessarily entirely natural terrestrial land that is largely required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within the Critical Biodiversity Areas. The area also contributes significantly to the maintenance of Ecological Infrastructure (EI).	Maintain ecosystem functionality and connectivity allowing for some loss of biodiversity.

Please refer to the Ecological Impact Assessment (CES, October 2023), which has been included in Appendix C of this report, for further details relating to the CBA classifications.

5.10. THREATENED ECOSYSTEMS

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 2747 in Government Gazette No. 47526, 2022). According to this list, MNWP Grid Connection traverses a threatened ecosystem, namely *Northern KwaZulu-Natal Moist Grassland*.

SANBI (2021) recently updated the Red List of South Africa's Terrestrial Threatened Ecosystems (RLEs), and *Northern KwaZulu-Natal Moist Grassland* is classified as Vulnerable, while *Low Escarpment Moist Grassland* and *Southern Mistbelt Forest* are classified as Least Concern. *Northern KwaZulu-Natal Moist Grassland* is classified as **Vulnerable (B1(i))** due to its restricted narrow distribution and high rate of habitat loss (SANBI, 2021). The historical extent of this vegetation type amounted to 7440.21 km^2, however only 57% of its natural extent remains. This vegetation type has a conservation target of 24%, while only 2% of it is protected and approximately 43% is modified. Major threats which lead to the loss of this ecosystem include cultivation, plantations, urban sprawl, and the building of dams. Bush encroachment and invasion by *Acacia dealbata*, *Rubus sp., Eucalyptus sp*., and *Populus sp.* is common (Mucina *et al.,* 2006).

Southern Mistbelt Forest, which is classified as *Eastern Mistbelt Forest* in the KZN Province, is considered Endangered in terms of the Amajuba District Municipality: BSP (2014). This vegetation type has a conservation target of 66.5%, but it is only moderately protected (16%) and 32% has been modified.

Two (2) additional ecosystem types delineated by the Amajuba District Municipality: BSP (2014), that are not listed in the SA Veg Map (SANBI 2018), are also classified as Vulnerable, namely *Freshwater Wetlands: Eastern Temperate Wetlands* and *Alluvial Wetlands: Temperate Alluvial Vegetation* (Ezemvelo KZN Wildlife, 2014). Both ecosystem types have a conservation target of 24% but are hardly conserved or protected – 0.4% and 3.4% respectively, and a large percentage has been anthropogenically altered – 41.2% and 56.5%, respectively (Ezemvelo KZN Wildlife, 2011).

Assessing MNWP Grid Connection against South Africa's Terrestrial Red List of Ecosystems (RLE) and the KZN Veg Map, Northern KwaZulu-Natal Moist Grassland (VU), Low Escarpment Moist Grassland (LC), Freshwater Wetlands: Eastern Temperate Wetlands (VU) and Alluvial Wetlands: Temperate Alluvial Vegetation (VU) are expected to occur within the 300 m buffer zone of MNWP Grid Connection.

5.11. PROTECTED AREAS

The National Protected Areas Expansion Strategy (NPAES, 2018) 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 ecosystem functions. The NPAES sets targets for expanding South Africa's protected area network, placing emphasis on those ecosystems that are least protected.

The western extent of the proposed alignments intersect marginally within the Moist Escarpment Grasslands NPAES (2018) Priority Focus Area. The project area also occurs within 10 km of the Sneeuwberg Protected Environment (SAPAD 2023, Q1).

Please refer to the Ecological Impact Assessment (CES, October 2023) in Appendix C for further information regarding the protected areas.

5.12. SOCIAL SETTING

Index undertook a Socio-Economic Impact Assessment (Index, June 2023) to assess the potential adverse impacts and the benefits of the proposed development of the Mulilo Newcastle WEF situated 15 km north-west of Newcastle in the Newcastle Local Municipality of the Amajuba District Municipality in the KwaZulu-Natal Province. The section below consists of extracts from the Socio-Economic Impact Assessment (Index, January 2023).

According to the Socio-Economic Impact Assessment (Index, June 2023), the Newcastle Local Municipality is categorised as a secondary city, with a population of 389 117. The Amajuba District Municipality has a total of 117 256 households with 90 347 of them in Newcastle Local Municipality, that accounts for 77.05% of the District's population (StatsSA, Community Survey 2016). The current annual population growth of 1,4%, translates to 5 176 people per year, and also includes a significant increase in the youth proportion of the population. Should this trend continue, Newcastle has a vision of becoming a city by the year 2035. The projected population for the year 2038 will be 502 988 (Newcastle LM IDP, 2021-22).

There has been a decrease in unemployment (official) from 60.48% to 37.44% (2001 to 2011) in the Newcastle Local Municipality. However, from 2013 to 2017, the unemployment increased from 29,5% to 31,8% (Newcastle LM IDP, 2021-22). When the discouraged work-seekers and the 'not economically active' portion of the population are also taken into consideration, then only 17% of the Newcastle Local Municipality economically active population (15 – 64 years old) is employed. The size of the economically active population in Newcastle has increased from 27,8% in 2013 to 30,1% in 2017 (Newcastle LM IDP, 2021-22). This is usually a positive trend for a region as it will transpire into lower levels of dependence. The dependency ratio11 in Newcastle has declined from 60.7% in 2001 down to 58% in 2011 (Census 2011) but increased again to 60.1% in 2016 (CS 2016).

Please refer to the Socio-Economic Impact Assessment (Index, June 2023) in Appendix C for further information regarding the social and socio-economic setting.

5.13. ARCHAEOLOGICAL AND CULTURAL HERITAGE

Umlando: Archaeological Surveys and Heritage (Umlando, August 2023) was appointed to assess the archaeological and cultural heritage of the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure. The section below consists of extracts from the Archaeological Impact Assessment (Umlando, August 2023).

The desktop study found 68 sites within the 300m corridor, however 24 of these are located within 50m of the proposed transmission line. One contemporary house occurs in the direct line of the transmission line and will require realignment. The sites found in the area can be categorised as farmhouses, features, general buildings, graves, houses, kraals and stone walling.

The field survey conducted in January 2023 found various sites within the preferred route which can be categorised as built features, kraals, farmhouses, graves, a British encampment, cemetery within a farmhouse and stone walling. The graves, cemetery and the British encampment were considered to have medium to high significance while the other sites had low significance. All the sites found in the alternative routes are considered to have low significance.

An Archaeological Impact Assessment (Umlando, February 2023) has been undertaken and included in Appendix C of this report.

5.14. PALAEONTOLOGY

Umlando: Archaeological Surveys and Heritage (Umlando, August 2023) was appointed to assess the palaeontological sensitivity of the proposed Mulilo Newcastle Wind Power Grid Connection and associated infrastructure. The section below consists of extracts from the Palaeontological Impact Assessment (Umlando, August 2023).

6. SITE SENSITIVITY VERIFICATION REPORT: NATIONAL SCREENING TOOL

The Site Sensitivity Verification Report (SSVR) (this chapter) has been prepared to comply with the requirements as stipulated in GNR 648 (2019), which outlines the procedures to be followed for the assessment and minimum criteria for reporting of identified environmental themes in terms of section 24(5)(a) and (h) of NEMA when applying for environmental authorisation. The initial site sensitivity verification must be undertaken by an EAP or registered specialist with expertise in the relevant environmental theme being considered.

Site sensitivity was verified via a desktop analysis, including the use of satellite imagery, as well as an on-site inspection. The objective of the on-site inspection was to ascertain whether the land use and environmental status quo versus the environmental sensitivity, as identified on the national web based environmental screening tool, are aligned or not. The current section is presented in line with the requirements of the Site Sensitivity Verification Requirements (GN 320, March 2020)

Please kindly refer to Appendix F2 for the full SSVR.

6.1. CONSOLIDATED SSVR TABLE

According to the National Screening Tool Report (see Appendix F1), the specialist studies listed in the table below are required for the BA Process for the proposed MNWP Grid Connection. The classification theme is as follows:

MNWP Grid Connection: Sensitivity Verification | Screening Tool Report (STR) vs Specialist SSVR			
Specialist Assessments	**Assessment Protocol Applied**	**DFFE STR Sensitivity Rating**	**Specialist Site Sensitivity Verification Rating**
AGRICULTURAL IMPACT ASSESSMENT	Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more.	**VERY HIGH**	**LOW**
LANDSCAPE/VISUAL IMPACT ASSESSMENT	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed. Appendix 6 of NEMA EIA Regulations, 2014 as amended, applied.	**VERY HIGH**	**MEDIUM**
ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed. Appendix 6 of NEMA EIA Regulations, 2014 as amended, applied.	**LOW**	**LOW**
PALAEONTOLOGY IMPACT ASSESSMENT	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed. Appendix 6 of NEMA EIA Regulations, 2014 as amended, applied.	**VERY HIGH**	**LOW**
TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity.	**VERY HIGH**	**HIGH**

MNWP Grid Connection: Sensitivity Verification | Screening Tool Report (STR) vs Specialist SSVR			
Specialist Assessments	**Assessment Protocol Applied**	**DFFE STR Sensitivity Rating**	**Specialist Site Sensitivity Verification Rating**
	Appendix 6 of NEMA EIA Regulations, 2014 as amended, applied.		
AQUATIC BIODIVERSITY IMPACT ASSESSMENT	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Aquatic Biodiversity. Appendix 6 of NEMA EIA Regulations, 2014 as amended, applied.	**VERY HIGH**	**MEDIUM**
CIVIL AVIATION ASSESSMENT	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Civil Aviation Installations.	**HIGH**	**NO CIVIL AVIATION ASSESSMENT CONDUCTED**
DEFENCE ASSESSMENT	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Defence Aviation Installations.	**LOW**	**NO DEFENCE ASSESSMENT CONDUCTED**
RFI ASSESSMENT	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed.	**LOW**	**NO RFI ASSESSMENT CONDUCTED**
GEOTECHNICAL ASSESSMENT	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed.	**NO SENSITIVITY IDENTIFIED BY THE SCREENING TOOL**	**NO SENSITIVITY IDENTIFIED BY THE SCREENING TOOL**
PLANT SPECIES ASSESSMENT	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Plant Species. Appendix 6 of NEMA EIA Regulations, 2014 as amended, applied.	**MEDIUM**	**HIGH**
ANIMAL SPECIES ASSESSMENT	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Animal Species. Appendix 6 of NEMA EIA Regulations, 2014 as amended, applied.	**HIGH**	**HIGH**
SOCIO-ECONOMIC IMPACT ASSESSMENT (ADDITIONAL)	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed. Appendix 6 of NEMA EIA Regulations, 2014 as amended, applied.	**NO SENSITIVITY IDENTIFIED BY THE SCREENING TOOL**	**NO SENSITIVITY IDENTIFIED BY THE SCREENING TOOL**

6.2. SITE VERIFICATION CONCLUSION

Please kindly see Appendix F2 for the full SSVR.

The EAP hereby confirms the following environmental themes' sensitivities were confirmed to coincide with the DFFE Screening Tool Rating:

- Archaeological and Cultural Heritage Theme
- Animal Species Theme

The following environmental themes' sensitivities were disputed against the DFFE Screening Tool Rating, and found to differ to the rating identified by the DFFE Screening Tool:

- Agricultural Theme
- Landscape/Visual Theme
- Aquatic Biodiversity Theme

- Civil Aviation Theme
- Defence Theme
- RFI Theme
- Avifauna Theme
- Palaeontology Theme
- Terrestrial Biodiversity Theme
- Plant Species Theme

6.3. SITE VERIFICATION CONCLUSION

The below specialist studies were undertaken.

- Agricultural Impact Assessment – Dr Andries Gouws
- Aquatic & Wetland Impact Assessment – Mr Ryan Edwards
- Avifaunal Impact Assessment – Dr Owen Davies
- Ecological Impact Assessment – Mr Brian Reeves
- Heritage Impact Assessment – Mr Gavin Anderson
- Socio-economic Impact Assessment – Mrs Marchelle Terblanche
- Visual Impact Assessment – Ms Bryony van Niekerk

7. ALTERNATIVES

7.1. REASONABLE AND FEASIBLE ALTERNATIVES

One (1) of the requirements of a BA Process is to investigate alternatives associated with a proposed project. Alternatives should include consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. In all cases, the no-go alternative must be included in the assessment process as the baseline against which the impacts of the other alternatives are assessed. The determination of whether the site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.

"Alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- The property on which or location where it is proposed to undertake the activity;
- The type of activity to be undertaken;
- The design or layout of the activity;
- The technology to be used in the activity;
- The operational aspects of the activity; and/or
- The option of not implementing the activity (no-go alternative).

7.2. FUNDAMENTAL, INCREMENTAL AND NO-GO ALTERNATIVES

7.2.1. FUNDAMENTAL ALTERNATIVES

Fundamental alternatives are developments which are completely different to the proposed project description and usually include the following:

- Alternative property or location where it is proposed to undertake the activity;
- Alternative type of activity to be undertaken; and
- Alternative technology to be used in the activity.

7.2.2. INCREMENTAL ALTERNATIVES

Incremental alternatives relate to modifications or variations to the design of a project that provide different options to reduce or minimise environmental impacts. Incremental alternatives which can be considered, include:

- Alternative design or layout of the activity; and
- Alternative operational aspects of the activity.

7.2.3. NO-GO ALTERNATIVE

It is mandatory to consider the "no-go" option during the BA Process. The "no-go" alternative refers to the current status quo and the risks and impacts associated with it. Some existing activities may carry risks and may be undesirable (e.g. an existing contaminated site earmarked for a development). The no-go is the continuation of the existing land use, i.e. to maintain the status quo. The no-go alternative has been assessed as part of the Albany Connection and Associated Grid Infrastructure BA Process.

7.3. ALTERNATIVES ASSESSED

Within the proposed MNWP Grid Connection and associated infrastructure development, 10 alternative route options are being considered for the connection of the 132 kV powerline including the Preferred Route.

Preferred Route is 20km in length, runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Incandu Substation.

Alternative 1 follows along the Alternative 7 route for 5 km, before a portion deviates to the north of Alternative 7 for a length of approximately 10 km before re-joining Alternative 7 to the substation. It is a total of 23 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Substation.

Alternative 2 follows along Alternative 7 route for 9.5 km. Just after the R34, a small portion deviates to the north of the Alternative 7 for a length of approximately 4 km before re-joining Alternative 7 to the substation. It is a total of 23 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Substation.

Alternative 3 follows along Alternative 7 route for 9.5 km. Just after the R34, a small portion deviates to the north of Alternative 7 for a length of approximately 5 km before re-joining Alternative 7 to the substation. It is a total of 23 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Substation.

Alternative 4 follows along Alternative 7 for 14 km. in the northern outskirts of Newcastle, a small portion deviates to the north of Alternative 7 for a length of approximately 2 km before re-joining Alternative 7 to the substation. It is a total of 23 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Substation.

Alternative 5 follows along the Alternative 7 route for most of the alignment. However, just after crossing the N11, instead of joining to the Eskom Substation near Arcelor Mittal Newcastle Works, the line deviates south and connects to the Incandu substation. It is a total of 20 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Incandu Substation.

Alternative 6 follows the same alignment as Alternative 1. However, just after crossing the N11, instead of joining to the Eskom Substation near Arcelor Mittal Newcastle Works, the line deviates south and connects to the Incandu substation. It is a total of 21 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Incandu Substation.

Alternative 7 is 23 km length runs from the Mulilo Newcastle Wind Power- Northern WEF switching station to an Eskom Substation near Arcelor Mittal Newcastle Works. It traverses over the R34 regional road, skirts the suburbs of Newcastle and crosses over the R34 and N11 before connecting to the Substation.

Alternative 8 follows the same alignment as Alternative 3. However, just after crossing the N11, instead of joining to the Eskom Substation near Arcelor Mittal Newcastle Works, the line deviates south and connects to the Incandu substation. It is a total of 20 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Incandu Substation.

Alternative 9 follows the same alignment as Alternative 4. However, just after crossing the N11, instead of joining to the Eskom Substation near Arcelor Mittal Newcastle Works, the line deviates south and connects to the Incandu substation. It is a total of 21 km in length. This alternative runs from the Mulilo Newcastle Wind Power- Northern WEF switching station, crosses over the R34 regional road and N11 before connecting to the Incandu Substation.

7.4. ANALYSIS OF ALTERNATIVES

Table includes the assessment of the alternatives which have been considered, including the advantages and disadvantages and provides further comments on the selected alternatives.

Table 7.4-1: Alternatives which were Considered during the Mulilo Newcastle Wind Power Grid Connection and associated infrastructure Planning Stages.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	FURTHER CONSIDERATION/ ASSESSMENT?	COMMENT
PROPERTY OR LOCATION This refers to the fundamental location options, and the environmental risks and impacts associated with such options.	**Preferred Alternative location:** Preferred alternative	→ The preferred alternative is the most suitably located alternative to supplement the development of the Mulilo Newcastle WEF and associated infrastructure. → Low impact significance on avifauna → Shortest length and preferred from an ecological perspective. → Lower significance for visual intrusion because the line runs along an existing powerline and therefore visual intrusion already exists.	→ The National Screening Tool Report identifies the following environmental sensitivities: → Very High Sensitivity – Agricultural Theme, Aquatic Biodiversity Theme, Palaeontology Theme, and Terrestrial Biodiversity Theme. → High Sensitivity – Animal Species Theme and Civil Aviation Theme. → Medium Sensitivity – Plant Species Theme.	**YES**	All alternatives, in addition to the preferred alternative, have been assessed in this BAR and by the specialists.
	Alternative location 1: Alternative 1	→ Alternative 1 is suitably located to supplement the development of the Mulilo Newcastle WEF and associated infrastructure. →	→ Potential land use, intrusion and sense of place impacts due to the line traversing cultivated areas and its proximity to homesteads. → From an avifaunal perspective, Alternative 1 is considered unacceptable due to risks to avifauna.	**YES**	All alternatives, in addition to the preferred alternative, have been assessed in this BAR and by the specialists.
	Alternative location 2: Alternative 2	→ Alternative 2 is suitably located to supplement the development of the Mulilo Newcastle WEF and associated infrastructure. → Low impact significance on avifauna.	→ The National Screening Tool Report (May 2024) identifies the following environmental sensitivities within Location Alternative 2: → Very High Sensitivity – Agricultural Theme, Aquatic Biodiversity Theme, Palaeontology Theme, and Terrestrial Biodiversity Theme.	**YES**	All alternatives, in addition to the preferred alternative, have been assessed in this BAR and by the specialists.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	FURTHER CONSIDERATION/ ASSESSMENT?	COMMENT
			→ High Sensitivity – Animal Species Theme and Civil Aviation Theme. → Medium Sensitivity – Plant Species Theme.		
	Alternative location 3: Alternative 3	→ Alternative 3 is suitably located to supplement the development of the Mulilo Newcastle WEF and associated infrastructure. → Low impact significance on avifauna.	→ The National Screening Tool Report (May 2024) identifies the following environmental sensitivities within Location Alternative 3: → Very High Sensitivity – Agricultural Theme, Aquatic Biodiversity Theme, Palaeontology Theme, and Terrestrial Biodiversity Theme. → High Sensitivity – Animal Species Theme and Civil Aviation Theme. → Medium Sensitivity – Plant Species Theme.	**YES**	All alternatives, in addition to the preferred alternative, have been assessed in this BAR and by the specialists.
	Alternative location 4: Alternative 4	→ Low impact significance on avifauna.	→ Intrusion, sense of place impacts and possible impacts on tourism/ guest houses due to the close proximity to the built-up northern suburbs of Newcastle.	**YES**	All alternatives, in addition to the preferred alternative, have been assessed in this BAR and by the specialists.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	FURTHER CONSIDERATION/ ASSESSMENT?	COMMENT
		→ The National Screening Tool Report (May 2024) identified a number of very high and high sensitivities within the location of Alternative 4, however the large area covered by the OHL corridor has been assessed (by the EAP and required specialists) to determine the most suitable route for the OHL (linear development) which will only require vegetation clearance for the placement of pylons and vegetation "trimming" for the maintenance tracks along the linear routing.			
	Alternative location 5: Alternative 5	→ From an avifaunal perspective, alternative 5 is more desirable because it has a minimised impact of preferred habitat loss for avifaunal Species of Conservation Concern (SCC). → Lower significance for visual intrusion because the line runs along an existing powerline and therefore visual intrusion already exists.	→ The National Screening Tool Report (May 2024) identifies the following environmental sensitivities within Location Alternative 5: → Very High Sensitivity – Agricultural Theme, Aquatic Biodiversity Theme, Palaeontology Theme, and Terrestrial Biodiversity Theme. → High Sensitivity – Animal Species Theme and Civil Aviation Theme. → Medium Sensitivity – Plant Species Theme.	**YES**	All alternatives, in addition to the preferred alternative, have been assessed in this BAR and by the specialists.

Alternative Level	Alternatives	Advantages	Disadvantages	Further Consideration/ Assessment?	Comment
	Alternative location 6: Alternative 6	→ Alternative 6 is suitably located to supplement the development of the Mulilo Newcastle WEF and associated infrastructure. → Lower significance for visual intrusion because the line runs along an existing powerline and therefore visual intrusion already exists.	→ Potential land use, intrusion and sense of place impacts due to the line traversing cultivated areas and its proximity to homesteads. → From an avifaunal perspective, Alternative 1 is considered unacceptable due to risks to avifauna. → Slightly higher significance for visual intrusion because of the line's close proximity to the town of Newcastle.	**YES**	All alternatives, in addition to the preferred alternative, have been assessed in this BAR and by the specialists.
	Alternative location 7: Alternative 7	→ Alternative 7 is suitably located to supplement the development of the Mulilo Newcastle WEF and associated infrastructure. →	→ Intrusion, sense of place impacts and possible impacts on tourism/ guest houses due to the close proximity to the built-up northern suburbs of Newcastle. → Slightly higher significance for visual intrusion because of the line's close proximity to the town of Newcastle.	**YES**	All alternatives, in addition to the preferred alternative, have been assessed in this BAR and by the specialists.
	Alternative location 8: Alternative 8	→ Alternative 8 is suitably located to supplement the development of the Mulilo Newcastle WEF and associated infrastructure.	→ The National Screening Tool Report (May 2024) identifies the following environmental sensitivities within Location Alternative 8: → Very High Sensitivity – Agricultural Theme, Aquatic Biodiversity Theme, Palaeontology Theme, and Terrestrial Biodiversity Theme. → High Sensitivity – Animal Species Theme and Civil Aviation Theme.	**YES**	All alternatives, in addition to the preferred alternative, have been assessed in this BAR and by the specialists.

Alternative Level	Alternatives	Advantages	Disadvantages	Further Consideration/ Assessment?	Comment
			→ Medium Sensitivity – Plant Species Theme.		
	Alternative location 9: Alternative 9	→ Alternative 9 is suitably located to supplement the development of the Mulilo Newcastle WEF and associated infrastructure. → The National Screening Tool Report (May 2024) identified a number of very high and high sensitivities within the location of Alternative 9, however the large area covered by the OHL corridor has been assessed (by the EAP and required specialists) to determine the most suitable route for the OHL (linear development) which will only require vegetation clearance for the placement of pylons and vegetation "trimming" for the maintenance tracks along the linear routing.	→ Intrusion, sense of place impacts and possible impacts on tourism/ guest houses due to the close proximity to the built-up northern suburbs of Newcastle. → Slightly higher significance for visual intrusion because of the line's close proximity to the town of Newcastle.	**YES**	All alternatives, in addition to the preferred alternative, have been assessed in this BAR and by the specialists.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	FURTHER CONSIDERATION/ ASSESSMENT?	COMMENT
	132 kV On-Site Switching Station Alternative 1 (Preferred Alternative)	→ The 132 kV Switching Station is proposed to be located within the already authorised MNWP WEF. The proposed location of the 132kV Switching Station will allow for the evacuation of electricity generated from the WEF via the proposed 132kV OHPL. → Avoids environmentally sensitive areas. → Footprint is approximately 1 ha.	→ No apparent disadvantages		The location of Alternative 1 Switching Station is favoured as it is located within the already authorised MNWP WEF. The proposed location allows for the evacuation of electricity generated from the WEF via the proposed 132 kV OHPL.
	132 kV On-Site Switching Station Alternative 2 No additional Switching Station locations were considered as the preferred location (alternative 1) is situated within already authorised land.			**NO**	Due to technical requirements, and the fact that the switching station needs to be adjacent to the already approved wind farm substation location, alternative locations for the Switching Station were not considered.
TYPE OF TECHNOLOGY This refers to the fundamental technology options and the environmental risks and impacts associated with such options.	**Preferred Powerline Technology** – Overhead (Preferred alternative).	→ The construction of the 132 kV OHL is sufficient to evacuate the planned energy output of the site.	→ See disadvantages in terms of the environmental and social setting in the alternative location section.	**YES**	No technology alternatives exist to date for the transmission of electricity from renewable energy sources to grid networks. Thus, no technology alternatives will be considered or assessed in this BAR. A single or double circuit 132 kV OHPL is suitable to evacuate the planned energy output of the Mulilo Newcastle Wind Power WEF. A combination of

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	FURTHER CONSIDERATION/ ASSESSMENT?	COMMENT
					monopole guyed and self-supporting structures is to be used. If technically necessary, lattice structures may be used.
	Alternative Powerline Alternative Technology 1 – Underground.	→ Safer alternative for avifauna, specifically with regards to collision risk.	→ Impacts on wetlands and other watercourses. → More intensive vegetation clearance required. → High impact during operational phase due to disturbance of top soil for maintenance purposes.	**NO**	This activity is not technically feasible for this particular development due to the length of the proposed powerline. The proposed powerline must connect at suitable substations to fulfil their energy transfer. This technology alternative has therefore not been considered as a feasible alternative.
<u>Layout and design</u> This relates mostly to alternative ways in which the proposed development or activity can be physically laid out on the ground to minimise or reduce environmental risks or impacts. It would also relate to the design of the proposed infrastructure (e.g. size).	**Alternative layout 1: Single or double circuit 132 kV OHPL and on-site switching station(preferred alternative)**	→	→		

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	FURTHER CONSIDERATION/ ASSESSMENT?	COMMENT
OPERATIONAL ASPECTS This relates mostly to alternative ways in which the development or activity can operate in order to reduce environmental risks or impacts	**Alternative operational activities:** Careful implementation of the EMPr (with updates to the working document) to inform the operational aspects of the Mulilo Newcastle Wind Power Grid Connection.	→ The operational aspects of the Mulilo Newcastle Wind Power Grid Connection will be informed by the EMPr, which will be updated to include the recommendations, mitigation measures and conditions of the BA Process (including Stakeholder and I&AP input), the specialists' impact assessments, the Environmental Authorisation, and any micro-siting recommendations. → The implementation of- and the success of the implementation of these measures should be monitored by the appointed Environmental Control Officer (ECO).	→ Unanticipated environmental and/or social impacts could still occur during the operation of the Mulilo Newcastle Wind Power Grid Connection which will require the EMPr to be updated with additional recommendations and mitigation measures, as frequently as required, during both the construction and the operation of the Mulilo Newcastle Wind Power Grid Connection.	**YES**	The EMPr will inform the operational activities of the Mulilo Newcastle Wind Power Grid Connection and should be updated with additional recommendations and/or mitigation measures when required. The implementation of the recommendations and mitigation measures in the EMPr will significantly reduce the environmental and social risks associated with the Mulilo Newcastle Wind Power Grid Connection. The appointed ECO should monitor the Contractor's compliance with the recommendations as set out in the EMPr.
TYPE OF ACTIVITY This refers to the fundamental activity options within the proposed location.	**Preferred alternative activity:** Preferred alternative The development of the proposed Mulilo Newcastle Wind Power Grid Connection, including the OHL preferred alternative, within the proposed location.	→ The preferred activity alternative, within the preferred location alternative, is suitably located to supplement the development of the Mulilo Newcastle WEF. → The energy produced at the MNWP WEF needs to be connected to the Eskom grid.	→ Potential environmental and social impacts due to the construction and operation of the Mulilo Newcastle Wind Power Grid Connection such as the influx of workers	**YES**	Both the preferred activity, the construction of the Mulilo Newcastle Wind Power Grid Connection (preferred alternative), and the No-Go Option (Alternative 1) have been assessed during this BA Process.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	FURTHER CONSIDERATION/ ASSESSMENT?	COMMENT
		→ The construction of the MNWP Grid Connection will create employment opportunities which will have a positive effect on the local, regional and national economy. → Positive impact on local procurements since DMRE's Preferential Procurement Policy is based on local content.			
	Alternative activity 1: Alternative 1 The "no-go" option, which entails no development within the proposed location.	→ The site will remain largely undeveloped/in a natural state. → Most of the potential adverse environmental and social impacts associated with the proposed Mulilo Newcastle Wind Power Grid Connection are unlikely to occur in the absence of the development.	→ The benefits associated with the proposed Mulilo Newcastle Wind Power Grid Connection, such as connecting the Mulilo Newcastle WEF to the national grid, will be lost. → The benefits associated with the proposed Mulilo Newcastle Wind Power Grid Connection, such as the creation of employment opportunities during the construction and operational phases, will be lost.	**YES**	

7.5. PREFERRED ALTERNATIVE

Based on the assessment of alternatives, the FINAL preferred alternative for the MNWP Grid Connection consists of:

7.5.1. LOCATION ALTERNATIVES

The selection of the Preferred Route is based on the following factors:

Availability of land: In order to develop the grid connection infrastructure associated with the already authorised MNWP WEF, sufficient space and access to land is required. As the Preferred Route is located adjacent to the MNWP WEF, the availability of land is seen as feasible.

Location within close proximity to the National Grid: The proposed MNWP Grid Connection requires connection to the national grid. The electricity generated by the MNWP Grid Connection will be fed into the Eskom Incandu Substation which is situated ~20km west of the facility, which means that the length of powerline required is relatively short.

Site Sensitivity: The site is not considered sensitive, and all no-go and areas of high sensitivities have been avoided.

The Preferred Route site is considered suitable for the reasons provided above. As this powerline alternative will only traverse a distance of 20 km and serves as the shortest and most direct route to the authorised grid infrastructure, it is favoured as the preferred alternative from an environmental and engineering perspective.

7.5.2. TECHNOLOGY ALTERNATIVES

Alternative energy technology 1: The Overhead Powerline (OHPL) as the preferred alternative is suitable to evacuate the planned energy output of the Mulilo Newcastle Wind Power WEF. A combination of monopole guyed, and self-supporting structures is to be used. If technically necessary, lattice structures may be used.

7.5.3. LAYOUT ALTERNATIVES

Preferred Route: Current proposed layout of 132 kV single or double circuit OHPL and switching stations.

Figure 7.5.1 below provides a map of the FINAL preferred alternative layout for the MNWP WEF which is based on the following inputs:

- Alternatives analysis (current Section 6)
- Sensitivity analysis (Section 10)
- Specialist input (Section 7)

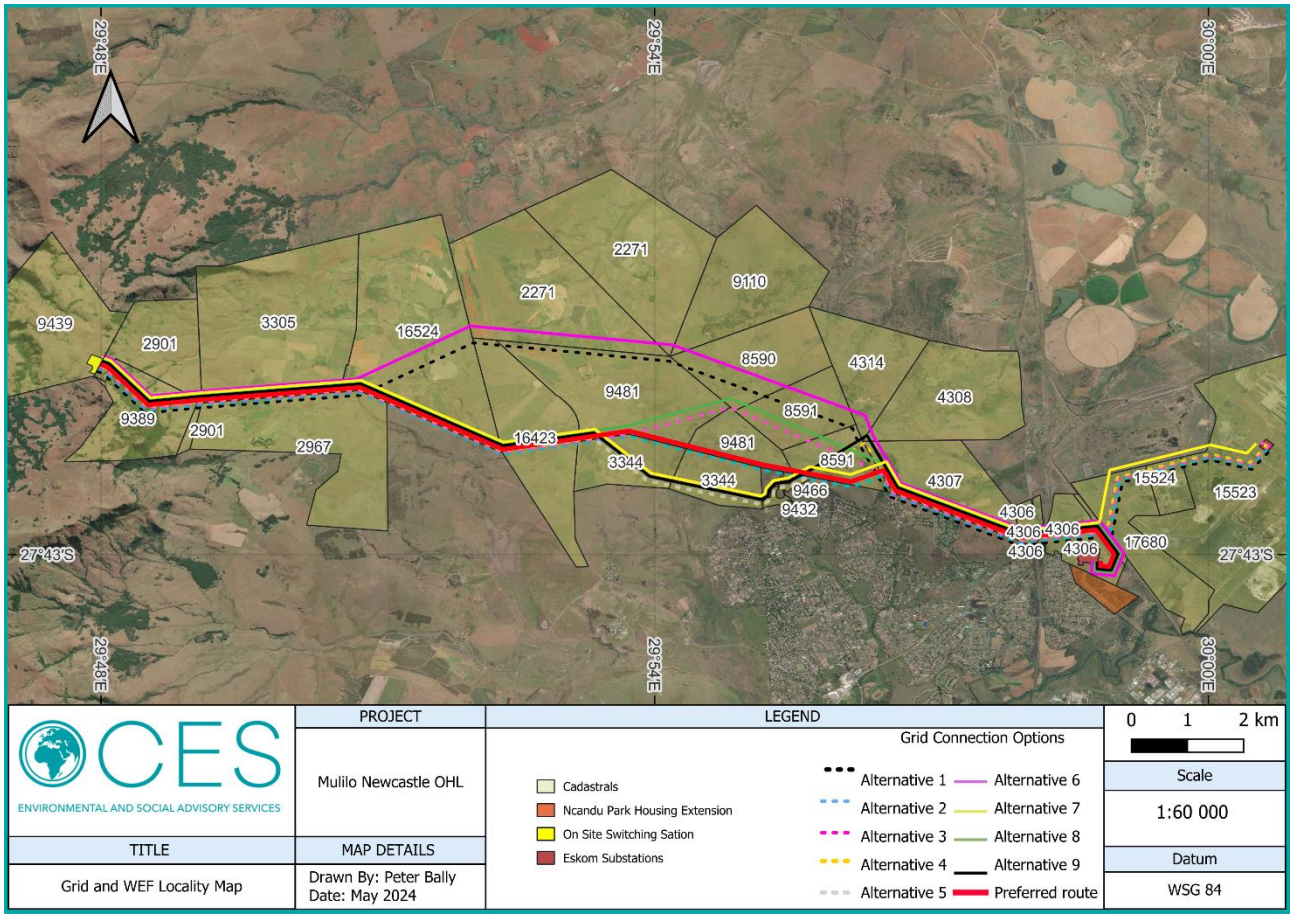

Figure 7.5.1: Final Layout Map for the MNWP Grid Connection

8. KEY SPECIALIST FINDINGS

Appropriately qualified and experienced specialists were appointed to undertake the various assessments identified as being necessary. Specialists gathered baseline information relevant to the study and assessed impacts associated with MNWP Grid Connection. Specialists have also made recommendations to mitigate negative impacts and enhance benefits. The resulting information has been synthesised in the section below, whilst the full specialist reports have been attached to the BAR as a Specialist Report section in Appendix C.

The following Specialist Studies have been completed as part of the BA Process–

- Agricultural Impact Assessment
- Aquatic Impact Assessment;
- Avifaunal and Wetland Impact Assessment;
- Bat Assessment;
- Ecological (Flora and Fauna) Impact Assessment;
- Heritage (Archaeological) Impact Assessment;
- Paleontological Impact Assessment;
- Socio-Economic Impact Assessment; and
- Visual Impact Assessment.

8.1. AGRICULTURAL IMPACT ASSESSMENT

STUDY	Agricultural Impact Assessment
SPECIALIST	Dr Andries Gouws
COMPANY	Index Social Consulting Services
QUALIFICATIONS	PhD Integrated Agricultural Development

8.1.1. CONCLUSION AND SPECIALIST STATEMENT

The specialist has no objection to the authorisation of the proposed MNWP Grid Connection and associated infrastructure project. The direct impact of creating the grid infrastructure is low on agriculture, there will be some loss of high potential land, particularly for Preferred Alternative 1. The loss of land and income will be negligible once the area that is disturbed by the construction process is rehabilitated. The loss of grazing land and associated income is low. Security and stock theft has potentially a moderately high negative impact during construction.

8.1.2. IMPACTS

The following impacts were raised in the Aquatic Impact Assessment Report. Please see Chapter 9 of this report (BAR) and Chapter 6 of the Aquatic Impact Assessment Report for more detail:

- Loss of high and medium potential land – including irrigated land;
- Loss of cultivated land;
- Loss of grazing land;
- Loss of agricultural production (yield and income);
- Loss of agricultural resources – soil loss due to erosion; and
- Loss of farming infrastructure.

8.1.3. MITIGATION MEASURES

The proposed mitigation measures are likely to reduce the significance of negative impacts on agricultural. It is recommended that the following mitigation measures be included in the EMPr and that they are implemented during the various phases of development:

CONSTRUCTION PHASE

- A suitably qualified ECO must be appointed prior to the commencement of the construction phase to deal with agriculture and other environmental issues.
- Cement/concrete must only be mixed in the approved demarcated area.
- Drip trays or other impermeable material, such as plastic sheeting, must be placed under construction machinery to avoid soil contamination.
- Burning, burying or dumping of any waste materials must not occur on the site.
- Refuelling should only take place in demarcated areas.
- The appointed ECO should monitor the sanitation of the work sites and that of the Contractor's campsite.
- All solid waste must be disposed of offsite at an approved registered landfill site.
- Vegetation clearance should be restricted to the demarcated development footprints.
- Soil erosion near the demarcated development footprints must be monitored and managed during construction to prevent the loss of additional grazing land due to degradation.
- Disturbance of soils and clearing of vegetation should be kept to a minimum.
- Where possible, construction vehicles should only make use of the designated access routes and construction activities must be limited to the development footprint to avoid loss of grazing land and the generation of dust.
- All temporary construction footprints must be rehabilitated and re-vegetated, as soon as they are no longer required.
- The appointed ECO must monitor erosion during the construction phase. Remedial action must be taken at the first signs of soil erosion during the construction phase.
- Compacted areas should be ripped to loosen the soil structure.
- Topsoil stockpiles must not be compacted.
- The stripping of topsoil should be undertaken in such a manner as to minimise erosion by wind or runoff.
- All foreign materials, which could reduce the quality of the topsoil, such as construction rubble, litter and alien vegetation, must be stored separately.
- Topsoil and subsoil must be separated and replaced in the same sequence during rehabilitation.
- The ECO must approve the stockpiling location prior to the stockpiling of any topsoil.
- Any excess topsoil, which is not used for rehabilitation, must be removed from the site or spread on vulnerable areas.
- Access to the site must be controlled and monitored during construction.
- No unauthorised individuals should be allowed to access the site without permission from the landowners and/or the developers.
- Construction workers must not handle or remove any livestock or wildlife from the site or the surrounding properties.
- Where reasonable and feasible, proposed developments should be placed on land with low agricultural potential.

OPERATIONAL PHASE

- All maintenance equipment and vehicles should only make use of the designated access routes and internal roads.
- Soil erosion should be monitored during the operational phase and remedial action must be taken at the first signs of increased soil erosion.
- No unauthorised individuals should be allowed to access the site without permission from the landowners and/or the developers.
- Maintenance workers must not handle or remove any livestock or wildlife from the site or surrounding properties.

8.2. AQUATIC AND WETLAND IMPACT ASSESSMENT

STUDY	Aquatic and Wetland Impact Assessment
SPECIALIST	Mr Ryan Edwards| Russell Tate| Ms Juliette Lagesse
COMPANY	Verdant
QUALIFICATIONS	MSc Environmental Science| MSc Aquatic Ecotoxicology| MSc Geography

8.2.1. CONCLUSION AND SPECIALIST STATEMENT

The specialist assessed two activities for the proposed MNWP Grid Connection and associated infrastructure project with Activity 1 being the development of the switching station, powerline and laydown areas and Activity 2 as the development of internal access/ haulage roads. The infield baseline assessment of the watercourses to be impacted by the proposed development activities revealed that the study area has a high density and large abundance of watercourses that are in a good state, highly sensitive and of high ecological importance, especially associated with the higher lying mountain ridges and plateaus.

With the effective implementation of the mitigation measures provided in this report, the impact significance of all impacts for activity 1 and 2 can be reduced to moderately-low or low and acceptable. The most important mitigation measures to implement and adhere to are the planning and design measures and the strict adherence to a detailed method statement for working in rivers and streams. Therefore, the specialist concluded that there are no predicted fatal flaws in terms of impacts to freshwater ecosystems and biodiversity as long as the mitigation measures provided in this report are effectively implemented.

8.2.2. IMPACTS

The specialist assessed two activities for the proposed MNWP Grid Connection and associated infrastructure project with Activity 1 being the development of the powerline and laydown areas and Activity 2 as the development of internal access/ haulage roads. The following impacts were assessed for both activities:

- Direct ecosystem destruction and modification impacts
- Indirect hydrological and geomorphological impacts
- Water quality impacts
- Fragmentation and ecological disturbance impacts

8.2.3. MITIGATION MEASURES

PROJECT PLANNING AND DESIGN PHASE:

- Wetland crossings of concern where re-alignments should be considered.
- The number of wetland and stream / river crossings must be minimised as far as practically possible. Unnecessary watercourses crossings (i.e., proposed crossings that can be re-aligned) must be re-aligned and avoided.
- No pylons or towers must be established in or within 50m of any wetlands or riparian areas.
- No pylons or towers must be established within 50m upstream of active head-cut erosion or springs.
- Where wetland and stream / river crossings are required, every effort should be made to minimize the impacts by considering the following:
  - Crossing points should be aligned along areas or corridors of existing disturbance e.g., along existing road crossings.
  - The length of wetlands and rivers / streams crossed at each crossing must be minimised by adjusting alignments to coincide with narrower sections and ensuring that crossings cross perpendicular to flow.
- All service roads should follow the existing road network as far as practically possible.
- Where new service roads are aligned near wetlands and streams / rivers, a minimum buffer of 50m should be maintained between the wetland / riparian edge and the edge of the road as far as practically possible.

- Where new wetland and stream / river crossings are required, every effort should be made to minimize the impacts by considering the following:
  - For all crossing types and designs, flow through road crossings should not be unnecessarily concentrated (or impeded) and flow velocity should not be increased. In this regard, wetland and stream / river crossings should be via box/portal culverts established across the entire width of the wetland or riparian zone to avoid flow narrowing and concentration. Open bottom box culverts should be used and they should be sized to transport not only water, but the other materials that might be mobilized (i.e. debris). Pipe culverts should be avoided.
  - Erosion protection and energy dissipation measures should be established at all road crossing outlets e.g. stilling basins and reno-mattresses.
  - All culvert inlets and outlets and associated outlet erosion protection structures must not be raised above the wetland/riparian surface and/or stream/river bed and must be established to reflect the natural downstream slope of the wetland/riparian surface and/or stream / river bed.
  - Crossing points should be aligned along areas or corridors of existing disturbance e.g. along existing informal road crossings or cattle crossing routes.
  - The length of wetlands and rivers / streams crossed at each crossing must be minimised by adjusting alignments to coincide with narrower sections and ensuring that crossings are straight and do not involve using long curves and are aligned at right angles to flow.
  - If any road fill is utilised at wetland crossings, a porous layer should be established within the road fill at the appropriate elevation to ensure that wetland interflow and overland flow is able to pass through the road fill.
- For existing watercourse crossings, every effort should be made to minimize the impacts by considering the following:
  - Undersized or under-designed pipe culverts must be replaced with sufficiently sized box or pipe culverts.
  - Erosion protection and energy dissipation measures should be established at all road crossing outlets e.g. stilling basins and reno-mattresses.
  - Every effort must be made to minimise the upgraded footprint of the existing roads at watercourse crossings.
  - No roads should occur within the highly sensitive landscapes characterised by soil piping and sink holes.
- Stormwater generated by the upgraded and new roads should be discharged at regular intervals and many small outlets should be favoured over a few large outlets.
- Stormwater outlets must not be established within wetlands or riparian zones.
- As far as practically possible, stormwater conveyance should be via open drains rather than pipes and conveyance from the road drains to the outlets should via open drains with vegetated or rough surfaces that are armoured with erosion protection.
- All outlets must be designed to dissipate the energy of outgoing flows to levels that present a low erosion risk. In this regard, suitably designed energy for gravel roads will need to be installed at appropriate locations.
- All erosion protection measures must be established to reflect the natural slope of the surface and located at the natural ground-level.

CONSTRUCTION PHASE

- For all watercourses occurring within 50m of the development activities (e.g. turbine sites, access roads, powerline pylons, etc.), the outer edge of the 50m buffer zone to such watercourses must be staked out by a surveyor and demarcated using brightly coloured shade cloth. This must be completed and approved prior to the commencement of any construction activities.
- For all watercourses where activities encroach within the watercourses or buffer zones, the outer edge of the watercourses and/or remaining buffer zone must be staked out by a surveyor and demarcated

using brightly coloured shade cloth. This must be completed and approved prior to the commencement of any construction activities.

- The construction corridor / footprint must be staked out by a surveyor and demarcated using brightly coloured shade cloth. The construction servitude should include the turbine footprints and working area and all new and existing access / haulage roads with a maximum 3m construction working area either side of the access/ haulage roads.
- All areas outside of the delineated construction servitude as defined above and/or within / inside the 50m buffer zone of watercourses must be considered no-go areas for the entire construction phase. Any contractor found working within No-Go areas must be fined as per fining schedule/system setup for the project.
- The demarcation work must be signed off by the Environmental Control Officer (ECO) before any work commences.
- The demarcations are to remain until construction and rehabilitation is complete.

OPERATIONAL PHASE

- Maintenance and management:
  - It is the applicant's responsibility to ensure the proper functioning of infrastructure that is likely to require regular on-going maintenance. This includes the stormwater management infrastructure and road infrastructure.
  - It is important that the location and extent of the rivers and wetlands in the vicinity of project activities be incorporated into all formal maintenance and repair plans for the project.
  - In terms of management, alien invasive plant control must be practiced on an on-going basis in line with the requirements of Section 2(2) and Section 3 (2) the National Environmental Management: Biodiversity Act (NEM:BA), which obligates the landowner/developer to control IAPs on their property.
- Monitoring:
  - The following key aspects should be monitored
    - Erosion and/or sedimentation in the onsite and downstream wetlands
    - Water table monitoring to determine any impacts to subsurface inputs; and
    - Presence of alien invasive plants.
- Remediation/ Rehabilitation:
  - Where appreciable direct vegetation/habitat impacts and/or indirect erosion/sedimentation impacts or hydrological impacts occur resulting from project activities, these must be reported immediately to the relevant environmental authorities, and an independent aquatic or wetland specialist appointed to conduct a site inspection to assess the residual impacts and determine the need for any onsite remediation or rehabilitation requirements. Following this assessment, an implementable remediation and/or wetland rehabilitation plan may need to be compiled and implemented to the satisfaction of KZN EDTEA and DWS.

8.3. AVIFAUNAL IMPACT ASSESSMENT

STUDY	Avifaunal Impact Assessment
SPECIALIST	Dr Owen Davies
COMPANY	ERM
QUALIFICATIONS	PhD Zoology

8.3.1. CONCLUSION AND SPECIALIST STATEMENT

From an avifaunal perspective, Preferred Alternative 5 is favoured to minimise the risk to avifauna, while Preferred Alternative 1 and Preferred Alternative 6 are considered unacceptable. The remaining Alternatives, including the Preferred Route, have a low impact significance but differ slightly in their overall desirability.

From most desirable to least desirable the Alternatives can be ordered as follows: 5, 7, 9, 4, Preferred, 2, 8, 3, 6 and 1.

It is the specialist's opinion that the proposed development can be approved from an avifaunal perspective, provided the mitigation measures detailed herein are implemented.

8.3.2. Impacts

The following key potential impacts on avifauna, arising from the proposed development of the grid connection infrastructure were identified for assessment.

- Direct habitat loss
- Disturbance/Displacement
- Direct mortality

8.3.3. Mitigation Measures

CONSTRUCTION PHASE

- Laydown and other temporary infrastructure to be placed within Low sensitivity areas, preferably previously transformed areas, wherever possible;
- Appropriate run-off and erosion control measures are to be implemented where required;
- A site-specific Environmental Management Programme (EMPr) must be implemented, which gives appropriate and detailed description of how construction activities must be conducted to reduce unnecessary destruction of habitat (e.g., no open fires outside of designated areas);
- All contractors are to adhere to the EMPr and should apply good environmental practice during construction;
- All hazardous materials should be stored in the appropriate manner to prevent contamination of the site and downstream environments. Any accidental chemical, fuel and oil spills that occur at the site should be cleared and disposed of as appropriate for the nature of the spill;
- Existing roads and farm tracks should be used where possible;
- The minimum footprint areas of infrastructure should be used wherever possible, including road widths and lengths;
- No off-road driving should be permitted in areas not identified for clearing;
- An Environmental Site Officer (ESO) must form part of the on-site team to ensure that the EMPr is implemented and enforced and an Environmental Control Officer (ECO) must be appointed to oversee the implementation activities and monitor compliance for the duration of the construction phase; and
- Following construction, rehabilitation of areas disturbed by temporary laydown areas and facilities must be undertaken.
- A site specific EMPr must be implemented, which gives appropriate and detailed description of how construction activities must be conducted;
- All contractors are to adhere to the EMPr and should apply good environmental practice during construction;
- Environmental Officer to oversee activities and ensure that the site specific EMPr is implemented and enforced;
- Maximum use of existing access road and servitudes;
- Existing and novel access roads are to be suitably upgraded or constructed to prevent damage and erosion resulting from increased vehicular traffic and construction vehicles;
- No off-road driving in undesignated areas;
- Speed limits (40 km/h) should be strictly enforced on site to reduce unnecessary noise;
- Construction camps should be lit with as little light as practically possible, with the lights directed downwards where appropriate;
- The movement of construction personnel should be restricted to the construction areas on the project site;

- No dogs or cats other than those of the landowners should be allowed on site;
- The appointed Environmental Officer must be trained to identify the potential Red Data species, as well as the signs that indicate possible breeding by these species;
- The Environmental Officer must, during audits/site visits, make a concerted effort to look out for such breeding activities of SCCs (e.g., cranes, Secretarybird), and such efforts may include the training of construction staff (e.g., in Toolbox talks) to identify Red Data species, followed by regular questioning of staff as to the regular whereabouts on site of these species;
- If any avifaunal SCCs are confirmed to be breeding (e.g., if a nest site is found), construction activities within 500 m of the breeding site must cease, and an avifaunal specialist is to be contacted immediately for further assessment of the situation and instruction on how to proceed;
- Prior to construction, an avifaunal specialist should conduct a site walkthrough, covering the final road and power line routes, as well as temporary laydown areas and facilities, to identify any nests/breeding/roosting activity of sensitive species; and
- The results of which may inform the final construction schedule in close proximity to that specific area, including abbreviating construction time, scheduling activities around breeding activity, and lowering levels of associated noise;
- Maximum use of existing access road and servitudes;
- No off-road driving in undesignated areas;
- Speed limits (40 km/h) should be strictly enforced on site to reduce probability of vehicle collisions;
- The movement of construction personnel should be restricted to the construction areas on the project site;
- Any holes dug e.g., for foundations of pylons should not be left open for extended periods of time to prevent entrapment by ground dwelling avifauna or their young and only be dug when required and filled in soon thereafter;
- Temporary fencing must be suitably constructed, e.g., if double layers of fencing are required for security purposes, they should be positioned at least 2 m apart to reduce the probability of entrapment by larger bodied species that may find themselves between the two fences; and
- Roadkill is to be reported to the ECO and removed as soon as possible

OPERATION PHASE

- A site specific operational EMPr must be implemented, which gives appropriate and detailed description of how operational and maintenance activities must be conducted to reduce unnecessary disturbance;
- All contractors are to adhere to the environmental management programme and should apply good environmental practice during all operations
- Operational phase bird monitoring, in line with the latest available guidelines, must be implemented.
- Reduction in the traverse of areas identified to be of elevated avifaunal sensitivity as far as practically feasible;
- Pylons to be staggered (where possible) relative to adjacent pylon positions to increase the overall visibility of transmission infrastructure to avifauna;
- Appropriate (approved) Bird flight diverters (BFDs) to be affixed to the entire length of novel overhead power lines;
- All new OTL pylons must be of a design that minimizes electrocution risk by using adequately insulated 'bird friendly' structures, with sufficient clearances between live components to reduce the risk of electrocution;
- Anti-perch devices are to be attached to all potential perches in proximity to energized infrastructure;
- Develop and implement a carcass search and fatality monitoring programme in-line with the latest applicable guidelines;
- Regular reviews of operational phase monitoring data and results to be conducted by an avifaunal specialist. If one or more avifaunal SCC carcasses are located and determined likely to have resulted from collisions with infrastructure in any sensitivity area over the lifespan of the facility the fatality is to be appropriately recorded and reported to an avifaunal specialist to determine the most appropriate action;

- Any fatalities located should be reported to Birdlife South Africa (BLSA) and the Endangered Wildlife Trust (EWT); and
- Prevent birds from nesting in, or perching on substation infrastructure through exclusion covers or spikes if required (determined on a case-by-case basis)

8.4. BAT ASSESSMENT

STUDY	Bat Specialist Letter
SPECIALIST	Mr Craig Campbell
COMPANY	ERM
QUALIFICATIONS	BSc Conservation Ecology

8.4.1. CONCLUSION AND SPECIALIST STATEMENT

The bat specialist letter serves to determine the bat related risks and impacts associated with the proposed construction and long-term presence in the landscape of the 132kV Grid Connection component.

The Preferred Alternative powerline corridor is preferred from an ecological perspective, as it has the shortest length, which is always preferred from an ecological perspective (less area disturbed); however, it is of the specialist's opinion that the difference in the length of all proposed overhead lines is not substantial (ca. 18.4 % as the highest difference), and thus the difference in anticipated impacts is likely to be negligible. As such, the switching station and all ten powerline corridors are endorsed from a bat perspective.

The specialist confirms that the impacts of the proposed MNWP grid connection will have a negligible impact to bats, due to the type of infrastructure being proposed, as well as the level of significance of impacts expected to occur for the taxa under consideration – as a result of the commissioning of such infrastructures. It is of the specialist's opinion that a full specialist bat impact assessment report (as part of the Basic Assessment process) is not required for submission and that the submission of this letter will be sufficient to inform the overall Basic Assessment process.

8.4.2. IMPACTS

The main potential and direct impact of the proposed grid connection to bats (albeit negligible) will be related to potential collision risk with overhead transmission lines. Collision risk will be limited to fruit bats, which do not echolocate and hence may not be able to see (or hear returning echoes from) the powerline cables and avoid them. Insectivorous bats, which do echolocate, are able to detect powerline cables and avoid them, making mortality unlikely. No fruit bats were observed within the proposed MNWP WEF development area when specialist site visits were conducted during the respective bat monitoring campaign (carried out by ERM (formerly Arcus) between 17 August 2021 to 4 December 2022). Moreover, no significant roosting potential for fruit bats were recorded. Based on specialist knowledge of the area and after examining spatial data pertaining to known bat roosting locations, the proposed 300m powerline corridors (the preferred corridor and alternatives 1 to 9) do not overlap with any such known features.

Therefore, it is unlikely that there will be significant negative interactions between fruit bats and the proposed infrastructures associated with the grid connection, reducing the risk of mortality to such species.

Indirect impacts of the grid connection include the alteration of habitat needed when the pylon towers are installed and construction of the switching station. This impact is considered negligible, as the footprint of such pylon towers is limited. Provided that roosts are not disturbed or destroyed during the construction process, no mitigation measures are required. The risk of destroying roosts is considered Negligible, as no known/active bat roosts were detected in the Project area.

8.4.3. Mitigation Measures

None identified.

8.5. Ecological Impact Assessment

STUDY	Ecological Impact Assessment
SPECIALIST	Mr Brian Reeves
COMPANY	CES
QUALIFICATIONS	MSc Zoology

8.5.1. Conclusion and Specialist Statement

The ecological impacts were assessed and considered to be acceptable provided the mitigation measures are implemented. The specialist also recommends that, where feasible, the pylons and access road avoid High sensitivity areas in favour of Medium and Low sensitivity areas.

If environmental authorisation is granted, impacts associated with the construction phase of the proposed development should be mitigated through (1) an assessment before construction to ground-truth the vegetation and to avoid Critical Biodiversity Areas (CBAs), vulnerable ecosystems, and populations of threatened Species of Conservation Concern (SCC), where feasible, and (2) rehabilitation of areas disturbed by construction.

8.5.2. Impacts

The following impacts were assessed:

Construction phase:
- Loss of Low Escarpment Moist Grassland (LC)
- Loss of Northern KwaZulu-Natal Moist Grassland (VU)
- Loss of KwaZulu-Natal Highland Thornveld (LC)
- Loss of Plant Species of Conservation Concern
- Loss of fragmentation of faunal habitat
- Loss of Faunal Species of Conservation Concern
- Impacts on Critical Biodiversity Areas
- Disruption of Ecosystem Function and Process
- Establishment of Alien Plant Species

Operational phase:
- Dispersal barriers and road mortalities

8.5.3. Mitigation Measures

- All necessary permitting and authorisations pertaining to terrestrial biodiversity in the region (i.e., flora and fauna) 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.
- Ground truthing of the site, specifically within the surveyed and demarcated development footprints, must be conducted by an experienced botanist prior to vegetation clearance, to ensure that no populations of restricted range species will be lost. If it is found that there are populations that will be affected, then infrastructure associated with the proposed development (e.g., access tracks and pylons), should be adjusted to avoid these areas.

- A comprehensive Search and Rescue for fauna and flora should be conducted prior to vegetation clearance.
- All SCC which are known to survive translocation must be relocated to nearest appropriate habitat.
- An Erosion Management Plan must be developed prior to the commencement of construction activities to mitigate the unnecessary loss of topsoil and runoff.
- The Alien Invasive Vegetation Management Plan compiled for the proposed Mulilo Newcastle WEF Complex and associated grid infrastructure must be implemented and adhered to during all phases of the proposed development.
- A comprehensive Rehabilitation Management Plan should be compiled and implemented. Only indigenous plant species typical of the local vegetation should be used for rehabilitation purposes.

8.6. HERITAGE IMPACT ASSESSMENT

STUDY	Heritage Impact Assessment
SPECIALIST	Mr Gavin Anderson
COMPANY	Umlando: Archaeological Surveys and Heritage Management
QUALIFICATIONS	M.Phil. Archaeological and Social Psychological

8.6.1. CONCLUSION AND SPECIALIST STATEMENT

A desktop heritage survey was undertaken for the proposed MNWP Grid Connection. This was followed by a field survey to ground truth. The desktop survey noted a total of 68 heritage sites within the 300m corridor; however only 24 sites occur within 50m of the current route. The field survey recorded 25 sites of which 13 occur within 50m of one of the alignments.

All of the sites can be managed through some form of mitigation. The mitigation is firstly to re-locate the position of the pylons. Where this is not possible, mitigation can be in the form of sampling and/or excavations. One site, British Camp, on Preferred Alternative 7 requires a slight re-alignment and possible metal detector survey at affected areas. One site on Preferred Alternative 1 requires realignment as it is directly over an existing household.

There is no preference for a route alignment in terms of the HIA. The final route alignment with the positions of each pylon needs to be verified by a desktop study.

8.6.2. IMPACTS

The desktop survey noted a total of 68 heritage sites within the 300m corridor; however only 24 sites occur within 50m of the current route. The field survey recorded 25 sites of which 13 occur within 50m of one of the alignments.

8.6.3. MITIGATION MEASURES

All of these sites can be avoided with minor re-adjustments to the location and/or angle of the pylon. Alternatively, each site can be mitigated in the following manner of there is no technical possibility of re-aligning the pylon.

Any site within 50m of the pylon requires buffering and demarcation as well as the following:

- Farm houses:
  - Photograph and general map
  - Sample/excavate old middens that will be affected
  - Monitor areas for possible middens during construction

- Existing buildings and/or ruins cannot be disturbed otherwise a permit is required.
- Permit will require additional assessment from the Built Environment specialist.

- Features
  - Fully recorded, map and photograph
  - Permits will be required if (partially) damaged
- General buildings
  - Photograph and general map
  - Permits will be required if (partially) damaged
- Graves
  - May not impact on graves
  - Keep 20m buffer from all graves.
  - No permits will be issued
- Houses
  - Pre-1960 houses need to be mapped and photographed
  - Possibility of subsurface graves
  - Permits will be required if (partially) damaged
- Kraals
  - Fully recorded, map and photograph
  - Assess for graves
  - Permits will be required if (partially) damaged
- Stone walling
  - Fully recorded, map and photograph
  - Assess for graves
  - Permits will be required if (partially) damaged

Any built structure or midden over 60 years in age will require a permit to partially damage/alter/demolish and to sample or excavate.

8.7. SOCIO-ECONOMIC IMPACT ASSESSMENT

STUDY	Socio-Economic Impact Assessment
SPECIALIST	Mrs Marchelle Terblanche
COMPANY	Index Social Consulting Services
QUALIFICATIONS	BA Development Sciences

8.7.1. CONCLUSION AND SPECIALIST STATEMENT

The specialist has no objection to the proposed MNWP Grid Connection. The Project will only realize if the proposed MNWP WEF is constructed. MNWP Grid Connection will enable the WEF to feed the up to 200MW electricity it generates into the grid, thereby enhancing the reliability and stability of supply that would contribute to economic development with a moderate positive significance for the country as a whole.

It is the Specialist's opinion that devaluation of land prices, should it occur, will be a temporary occurrence that will diminish or disappear over the short to medium-term. Although research results on the topic is inconclusive, the possibility of property devaluations (farms and suburban properties) cannot be excluded and impacts on land values for purposes of this study is rated with a low negative significance. Impacts on sense of place cannot be mitigated easily and is rated as moderate negative.

For most of the Alternative Route Alignments the anticipated social and socio-economic impacts and the results of their significance ratings are similar, and as such any of the Alternatives could be implemented. However, the magnitude/consequence of some of the Alternative Alignments' negative impacts are more

intense and likely to manifest, especially during construction, and should be taken into account. These include:

- Preferred Alternative 7, 4 and 9: Intrusion impacts, sense of place and possible impacts on tourism / guest houses, due to their close proximity to the built-up northern suburbs of Newcastle.
- Alternatives 1 and 6: Land use impacts, intrusion impacts and sense of place, due to the line traversing cultivated areas and the close proximity to homesteads.

From a social and socio-economic perspective negative impacts that could manifest for the project are either of low or moderate significance or can be mitigated to acceptable levels. Based on the findings of this SEIA it is the opinion of the Specialist that the proposed MNWP Grid Connection Project may proceed, provided that the mitigation, management measures and requirements as set out in this report be incorporated in the EMPr and implemented wherever applicable

8.7.2. Impact

The below construction and operation phase impacts were identified by the specialist

CONSTRUCTION PHASE

- Temporary employment
- Local procurement
- Induced local economic impacts
- Impacts on livelihoods of directly affected landowners
- Training/skills development/capacity building
- Employment equity
- Impacts associated with an influx of jobseekers/temporary construction workers
- Land use and resource impacts
- Impacts on tourism/accommodation establishments
- Intrusion impacts

OPERATION PHASE

- Contribution to national power supply
- Impacts on land values
- Impacts on sense of place

8.7.3. Mitigation Measures

The following mitigation measures are recommended by the specialist:

- Maximise local employment and local content (the Project's direct sending area) through the Preferential Procurement Plan and Contractor Social Management Plan (CSMP) for all contractors that are used.
- Involve local government structures from the early processes (from financial close already if possible). Determine their existing process with regards to a labour desk and streamline employment processes between the various stakeholders.
- Appoint a Community Employer Relations Officer / Community Liaison Officer (CLO). Communicate with communities through this one channel to ensure transparency, limit unrealistic expectations and to avoid conflict.
- Maximise local content of procurement by procuring from the local and regional study areas as far as possible.
- Join the existing Newcastle LED Forum and establish links with the local trade and industry sectors and suppliers.
- Include minimum thresholds in the CSMP for local employment, BBBEE procurement, SMME targets, local services providers, etc.

- Discuss construction timelines with landowners so that grazing of livestock can take place away from the construction area.
- Negotiate compensation (for e.g. through the lease and/or servitude agreements to be concluded with the project landowners) with farmers whose crops will be affected by dust and/or the construction activities.
- Implement a land use management plan in conjunction with the landowners.
- Include the Newcastle, Dannhauser, Emadlangeni, Phumelela and the Dr Pixley Ka Isaka Seme LM's LED Units in all relevant processes from the onset of the Project.
- The developer is encouraged to take part / slot in with the various municipal initiatives and interventions to develop SMME's to enable them to take part in the Project's construction phase
- Where feasible the developer should:
  - Make the skill requirements clear to the municipalities in advance and do a skills analysis of the available labour force.
  - Do a Value-chain analysis of services required (directly and indirectly related to construction) and communicate this to local and district municipalities in advance so that they are prepared and equipped to take part in the tender process.
  - Require larger contractors to work with small SMMEs to train and transfer skills and include this in their respective CSMP's.
  - Implement on-the-job training for unskilled workers.
  - Capacitate the local government structures by involving them as early as possible in the Project; remain transparent throughout the processes.
  - Negotiate a Memorandum of Understanding (MoU) with the municipalities so that each role player is clearly aware of its roles, responsibilities and timelines in the Project processes.
  - Establish an Environmental Management Committee (EMC) or similar Forum for the duration of construction to aid communication and transparency with local government. Members of the EMC/Forum to meet on a quarterly basis to discuss issues that may arise during the course of the construction period (if feasible).
- Obtain inputs from the respective local and district municipalities on the contents of the Procurement strategy and Employment Equity Plan to be implemented.
- Include targets for the inclusion of Youth, women and the disabled in the Employment Equity Plan and obtain the local and district municipalities' inputs in this regard.
- Clearly identify the beneficiary communities / labour sending area and compile the employment strategy in collaboration with the affected municipalities' LED Units.
- Encourage the affected local municipalities to draw up a cooperation agreement that specifies the percentages of the workforce that will be sourced from each municipality.
- Ensure that the Community Employer Relations Officer / CLO has knowledge of the local communities, is educated with good public relation skills, committed to the cause and is accessible for community members.
- Contractually oblige contractors and sub-contractors to only source labour through the labour desk /job registration database and make this known to the target communities.
- Work through limited communication channels (e.g. Ward Councillors and the Employer Relations Officer / CLO).
- Be vigilant not to raise unrealistic expectations amongst the local communities and workers with regards to employment, skills requirements, local procurement and so forth. Ensure transparency through the Ward Councillors, CLO and the EMC / Forum.
- No recruitment of temporary workers at the access to the construction site.

- As part of their CSMP's, contractors to provide a transport and housing plan: (i) no workers are allowed to be housed on site or in informal housing / settlements; (ii) allow workers that do not live nearby time to return to their families at regular intervals or over weekends.
- No construction workers to remain on site after shifts.
- No informal traders to be allowed on or near the construction site/s.
- It is also recommended that the Developer embarks on a Social Awareness Campaign for the workforce that focuses on sexual health, unwanted pregnancies and related social issues.
- Do a security risk assessment (if required) and base the exact security measures on the detailed assessment of the risks at the site.
- 24-hour security, demarcate and fence the construction site (if possible), material stores to be secured, access control and no trespassing of workers outside designated construction areas.
- Join the local community policing forum and similar initiatives (e.g. Amajuba District Fire Technical Task Team) for the duration of construction.
- Keep the local SAPS, other emergency services, Ward Councillors, landowners and other relevant stakeholders informed about the construction progress and time-lines.
- Develop a Fire / Emergency Management Plan in conjunction with affected and neighbouring landowners.
- Dispose of the various types of waste generated in the appropriate manner at licensed waste landfill sites at regular intervals. Comply with the waste management plan compiled for the construction phase.
- Display “danger” warning signs and “no public access” signs at all potential accesses, paths and along the periphery of the construction areas in English and the local languages.
- If water for construction is obtained from a natural water resource, comply with the Water Use Licence conditions for the duration of the construction period.
- Ensure implementation of the provisions of the Occupational Health and Safety Act No. 85 of 1993 and adhere to the Emergency and Safety plan procedures for the duration of the construction phase.
- Rehabilitate the veld to its original state post construction.
- Keep open communication channels with the landowners and address any potential issues as a matter of priority.
- Make contact details of the main contractor and procedures to lodge complaints available to landowners and the local communities through the Ward Councillors and EMC / Forum.
- Make a complaints register / log book available at the entrance to the construction site and act immediately should issues arise.
- Consult with surrounding landowners whose livestock, private residences and other infrastructure could be affected by dust, noise and other impacts that result from traffic movement and general construction activities.
- Where required, draw up a land use management plan with individual landowners to protect livestock and farmland, which addresses restricted access areas, procedures when farm gates are opened and closed and so forth.
- Rehabilitate the areas post construction and maintain the access roads.
- Implement all relevant measures as proposed by the VIA Specialist to limit visual intrusion to the maximum.
- Maintain the servitude / access track for the duration of the Project.

8.8. VISUAL IMPACT ASSESSMENT

STUDY	Visual Impact Assessment
SPECIALIST	Mr Bryony van Niekerk
COMPANY	NuLeaf Planning and Environmental (Pty) Ltd
QUALIFICATIONS	BSc Honours EMA

8.8.1. CONCLUSION AND SPECIALIST STATEMENT

The construction and operation of the proposed MNWP grid Connection and associated infrastructure may have a visual impact on the study area, especially within a 0.5km radius (and potentially up to a radius of 3km) of the power line structures. The visual impact will differ amongst places, depending on the distance from the infrastructure.

The proposed power line infrastructure is located within an area where there are already existing high voltage powerlines. All Alternatives traverse over existing powerlines in the west, and east towards the Incandu substation. Additionally, the Incandu substation is present. The visual amenity along this power line corridor has already been compromised to a large degree. Admittedly, the frequency of visual exposure to power line infrastructure is expected to increase, but it is still preferable to consolidate the linear infrastructure as much as possible. Therefore, the cumulative visual impact associated with the proposed power line is considered to be within acceptable limits.

8.8.2. IMPACTS

PRIMARY IMPACTS

- Potential visual impact of construction on sensitive visual receptors in close proximity to the facility
- Potential visual impact of facility operations on sensitive visual receptors in close proximity to the proposed infrastructure
- Potential visual impact of facility operations on sensitive visual receptors within the region
- Potential visual impact of associated infrastructure on sensitive visual receptors in close proximity
- Potential visual impact of lighting on sensitive visual receptors in the region

SECONDARY IMPACTS

- Potential visual impact of facility operation on visual character of the landscape and sense of place of the region

8.8.3. MITIGATION MEASURES

The primary visual impact, namely the presence of the Mulilo Newcastle Wind Power Grid Connection is not possible to mitigate. The following is however recommended:

- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
- Plan ancillary infrastructure (i.e., substation and workshop) in such a way and in such a location that clearing of vegetation is minimised. Consolidate existing infrastructure as much as possible and make use of already disturbed areas rather than pristine sites wherever possible.
- Use existing roads wherever possible. Where new roads are required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible and should never traverse slopes at 90 degrees. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
- Access roads, which are not required post-construction, should be ripped and rehabilitated.

- Mitigation of visual impacts associated with the construction phase, albeit temporary, entails proper planning, management and rehabilitation of all construction sites. Construction should be managed according to the following principles:
  - Ensure that vegetation is not unnecessarily cleared or removed during the construction period.
  - Reduce the construction period through careful logistical planning and productive implementation of resources.
  - Plan the placement of lay-down areas and any potential temporary construction camps along the corridor in order to minimise vegetation clearing.
  - Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
  - Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
  - Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).
  - Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.
  - Ensure that all infrastructure and the site and general surrounds are maintained and kept neat.
  - Rehabilitate all disturbed areas, construction areas, roads, slopes etc. immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.
  - Monitor all rehabilitated areas for at least a year for rehabilitation failure and implement remedial action as required. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.

Mitigation of other lighting impacts includes the pro-active design, planning and specification lighting for the substation. The correct specification and placement of lighting and light fixtures will go far to contain rather than spread the light. Additional measures include the following:

- Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself).
- Limiting mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights;
- Making use of minimum lumen or wattage in fixtures.
- Making use of down-lighters, or shielded fixtures.
- Making use of Low-Pressure Sodium lighting or other types of low impact lighting.
- Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.
- During Operations, monitor the general appearance of the facility as a whole as well as all rehabilitated areas. Implement remedial action where required.
- Secondary impacts anticipated as a result of the proposed infrastructure (i.e., impacts on landscape character and sense of place) are not possible to mitigate.
- After decommissioning, all infrastructure should be removed and all disturbed areas appropriately rehabilitated. Monitor rehabilitated areas post-decommissioning and implement remedial actions and consult an ecologist regarding rehabilitation specifications if necessary.

The possible mitigation of both primary and secondary visual impacts as listed above should be implemented and maintained on an on-going basis.

9. IMPACT ASSESSMENT

9.1. CES ASSESSMENT METHODOLOGY

The following standard rating scales have been defined for assessing and quantifying the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed. The identified impacts have been assessed against the following criteria:

Six (6) factors are considered when assessing the significance of the identified issues, namely:

1. **Significance:** Each of the below criterion (points 2-6 below) are ranked with scores assigned, as presented in Table 8.1 to determine the overall significance of an activity. The total scores recorded for the effect (which includes scores for duration; extent; consequence and probability) and reversibility/mitigation are then read off the matrix presented in Table 9.2, to determine the overall significance of the issue. The overall significance is either negative (issue) or positive (benefit).
2. **Consequence:** The consequence scale is used in order to objectively evaluate how severe a number of negative impacts might be on the issue under consideration, or how beneficial a number of positive impacts might be on the issue under consideration.
3. **Extent:** The extent, or the spatial scale, defines the physical extent of the impact.
4. **Duration:** The duration, or the temporal scale, defines the significance of the impact at various time scales, as an indication of the duration of the impact.
5. **The probability of the impact occurring:** The likelihood of impacts taking place as a result of project actions arising from the various alternatives. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident) and might or might not result from the proposed development and alternatives. Although some impacts might have a severe effect, the likelihood of them occurring could affect their overall significance.
6. **Reversibility/Mitigation:** The degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. The four (4) categories used are listed and explained in Table 9.3 below. Both the practical feasibility of the measure, the potential cost and the potential effectiveness are taken into consideration when determining the appropriate degree of difficulty.

The relationship of the issue to the temporal scale, spatial scale and the severity are combined to describe the overall importance rating, namely the significance of the assessed impact. The impact is first classified as a positive (+) or negative (-) impact. The impact then undergoes the evaluation according to the set of criteria.

Table 9.1-1: Ranking of Evaluation Criteria.

EFFECT	**DURATION**	
	Short-term	Less than 5 years.
	Medium-term	Between 5 and 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.
	EXTENT	
	Localised	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area.
	Study area	The proposed site and its immediate surroundings.
	Municipal	Impacts affect the Makana Local Municipality or Sarah Baartman District Municipality, or any towns within the municipality.
	Regional	Impacts affect the wider area or the Eastern Cape Province as a whole.
	National	Impacts affect the entire country.
	CONSEQUENCE	
	Slight	Slight impacts or benefits on the affected system(s) or party(ies).
	Moderate	Moderate impacts or benefits on the affected system(s) or party(ies).
	Severe/Beneficial	Severe impacts or benefits on the affected system(s) or party(ies).

	PROBABILITY	
	Definite	More than 90% sure of a particular fact. Should have substantial supportive data.
	Probable	Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
	Possible	Only over 40% sure of a particular fact, or of the likelihood of an impact occurring.
	Unsure/Unlikely	Less than 40% sure of a particular fact, or of the likelihood of an impact occurring.
REVERSIBILITY/ MITIGATION	**IMPACT REVERSIBILITY/MITIGATION**	
	Easy	The impact can be easily, effectively and cost effectively mitigated/reversed.
	Moderate	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.

Table 9.1-2: Impact Severity Ratings.

IMPACT SEVERITY	
The severity of negative impacts, or how beneficial positive impacts would be on an affected system or affected party.	
VERY SEVERE	**VERY BENEFICIAL**
An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For example, the permanent loss of land.	A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit. For example, the vast improvement of sewage effluent quality.
SEVERE	**BENEFICIAL**
Long-term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming, or some combination of these. For example, the clearing of forest vegetation.	A long-term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these. For example, an increase in the local economy.
MODERATELY SEVERE	**MODERATELY BENEFICIAL**
Medium- to long-term impacts on the affected system(s) or party (ies), which could be mitigated. For example, constructing a sewage treatment facility where there was vegetation with a low conservation value.	A medium- to long-term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way. For example, a 'slight' improvement in sewage effluent quality.
SLIGHT	**SLIGHTLY BENEFICIAL**
Medium- or short-term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary. For example, a temporary fluctuation in the water table due to water abstraction.	A short- to medium-term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.
NO EFFECT	**DON'T KNOW/CAN'T KNOW**
The system(s) or party(ies) is not affected by the proposed development.	In certain cases, it might not be possible to determine the severity of an impact.

Table 9.1-3: Overall Significance Rating.

OVERALL SIGNIFICANCE	
The combination of all the above criteria as an overall significance.	
VERY HIGH NEGATIVE (-)	**VERY BENEFICIAL (VERY HIGH +)**
These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects. *Example: The loss of a species would be viewed by informed society as being of VERY HIGH significance.* *Example: The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.*	
HIGH NEGATIVE (-)	**BENEFICIAL (HIGH +)**
These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long-term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light. *Example: The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated.*	

Example: The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.
MODERATE NEGATIVE (-) / **SOME BENEFITS (MODERATE +)**
These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium-term change to the (natural and/or social) environment. These impacts are real but not substantial. *Example: The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.*
LOW NEGATIVE (-) / **FEW BENEFITS (LOW +)**
These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short-term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect. *Example: The temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels.* *Example: The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people who live some distance away.*
NO SIGNIFICANCE
There are no primary or secondary effects at all that are important to scientists or the public. *Example: A change to the geology of a particular formation may be regarded as severe from a geological perspective but is of NO significance in the overall context.*
DON'T KNOW
In certain cases, it might not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the available information. *Example: The effect of a development on people's psychological perspective of the environment.*

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 Process. 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).

9.2. GENERAL IMPACTS

Table 9.2.1-1 contains the summarised direct and indirect general impacts associated with the proposed Mulilo Newcastle Wind Power Grid Connection project. This table provides a summary of direct and indirect general impacts before and after mitigation during planning and design, construction, operations and decommissioning phases of the proposed MNWP Grid Connection project.

The full assessment of each impact as per Table can be found in Appendix G1 of this Report. For each impact identified, this table includes:

- Direct/indirect impacts
- Cumulative impacts
- No-go alternative

For each identified general impact, the table at Appendix G1 includes the following detail: issues, impact description, nature of impact, duration, extent, consequence, probability, reversibility, mitigation potential, significance of impact pre- and post-mitigation, and mitigation measures. For the summary related to Specialist Impacts, please see Section 9.3.

9.2.1. Identification of General Impacts

Table 9.2.1-1: General Impacts Significance Pre-mitigation and Post-mitigation

IMPACT	ALL LAYOUT ALTERNATIVES		CUMULATIVE	NO-GO ALTERNATIVE
GENERAL IMPACTS	PRIOR TO MITIGATION	POST-MITIGATION		
PLANNING AND DESIGN PHASE				
STORAGE OF HAZARDOUS SUBSTANCES	MODERATE -	LOW -	N/A	N/A
ENVIRONMENTAL LEGISLATION AND POLICY COMPLIANCE	HIGH -	LOW -	HIGH -	LOW -
STORMWATER MANAGEMENT AND EROSION	MODERATE -	LOW -	MODERATE -	LOW -
MANAGEMENT OF GENERAL WASTE	HIGH -	MODERATE -	HIGH -	N/A
SCHEDULING CONSTRUCTION	MODERATE -	LOW -	HIGH -	N/A
CONSTRUCTION PHASE				
NUISANCE DUST	MODERATE -	LOW -	MODERATE -	LOW -
FIRE	HIGH -	MODERATE -	HIGH -	HIGH -
STORMWATER MANAGEMENT	MODERATE -	LOW -	MODERATE -	LOW -
DEGRADATION OF DRAINAGE LINES FROM EARTHWORKS	HIGH -	LOW -	MODERATE -	LOW -
HAZARDOUS SUBSTANCES	MODERATE -	LOW -	N/A	N/A
MANAGEMENT OF GENERAL WASTE	MODERATE -	LOW -	LOW -	N/A
MANAGEMENT OF CONSTRUCTION WASTE	MODERATE -	LOW -	MODERATE -	N/A
WATER QUALITY	MODERATE -	LOW -	MODERATE -	N/A
INFILLING, EXCAVATION IN A WATERCOURSE	MODERATE -	LOW -	LOW -	N/A
DISPOSAL OF SPOIL MATERIAL	MODERATE -	LOW -	MODERATE -	N/A
OPERATIONAL PHASE				
WASTE MANAGEMENT	MODERATE -	LOW -	LOW -	LOW -
AIR QUALITY AND CLIMATE CHANGE	HIGH +	HIGH +	HIGH +	LOW -
ARCHITECTURE OF ANCILLARY INFRASTRUCTURE	MODERATE -	LOW -	MODERATE -	N/A
HAZARDOUS CHEMICAL STORAGE	HIGH -	MODERATE -	N/A	N/A
INCREASED STORMWATER RUNOFF	MODERATE -	LOW -	LOW -	LOW -
DECOMMISSIONING PHASE				
POLLUTION	MODERATE -	LOW -	MODERATE -	N/A
	MODERATE -	LOW -	MODERATE -	N/A
DUST	MODERATE -	LOW -	MODERATE -	N/A

It can be seen from the above table that most of the negative direct and indirect general impacts associated with the proposed MNWP Grid Connection are MODERATE (17) with five (5) HIGH impacts pre-mitigation. However, ALL negative impacts can be reduced to either MODERATE (2) or LOW (23) post-mitigation. In addition, most activities do not result in any no-go impacts. There is only one (1) HIGH no-go impact pre-mitigation which relates to fire risks and the rest are LOW (6).

9.3. SPECIALIST IMPACTS

This section provides an overview of the scope and scale of the impacts that been identified and assessed by the various specialist studies, including:

- Agricultural Impact Assessment
- Ecological Impact Assessment
- Aquatic Impact Assessment
- Avifaunal Impact Assessment
- Heritage (Archaeological) Impact Assessment ∑
- Socio-Economic Impact Assessment
- Visual Impact Assessment

The table at Appendix G2 provides the detailed results of the various specialist impact assessments associated with the proposed MNWP Grid Connection project. For each impact identified, the table includes:

- Direct/indirect impacts
- Cumulative impacts
- No-go alternative

For each identified specialist impact, the table at Appendix G2 includes the following detail: issues, impact description, nature of impact, duration, extent, consequence, probability, reversibility, mitigation potential, significance of impact pre- and post-mitigation, and mitigation measures.

The following section provides a summary of the specialist assessments at Appendix G2 for:

- Direct/indirect impacts
- No-go alternative

IMPACT	PREFERRED ROUTE & ALL ALTERNATIVES		CUMULATIVE	NO-GO ALTERNATIVE
	PRIOR TO MITIGATION	POST-MITIGATION		
PLEASE NOTE: SHOULD ANY OF THE MITIGATION MEASURES IN THE SPECIALIST IMPACTS SECTION CONTRADICT THE MITIGATION MEASURES WHICH HAVE BEEN RECOMMENDED UNDER GENERAL IMPACTS, THE SPECIALISTS'				
PLANNING AND DESIGN PHASE				
HERITAGE IMPACT ASSESSMENT				
FARMHOUSES	**TO BE DETERMINED**	**LOW -**	**TO BE DETERMINED**	**NO IMPACT**
FEATURES	**TO BE DETERMINED**	**LOW -**	**TO BE DETERMINED**	**NO IMPACT**
GENERAL BUIDLINGS	**TO BE DETERMINED**	**LOW -**	**TO BE DETERMINED**	**NO IMPACT**
GRAVES	**HIGH**	**LOW -**	**HIGH**	**NO IMPACT**
HOUSES	**TO BE DETERMINED**	**LOW -**	**TO BE DETERMINED**	**NO IMPACT**
KRAALS	**TO BE DETERMINED**	**LOW -**	**TO BE DETERMINED**	**NO IMPACT**
STONE WALLING	**TO BE DETERMINED**	**LOW -**	**TO BE DETERMINED**	**NO IMPACT**
OPEN STONE WALLING	**LOW**	**LOW**	**LOW**	**NO IMPACT**
CONSTRUCTION PHASE				
AGRICULTURAL IMPACT ASSESSMENT				
LOSS OF HIGH POTENTIAL LAND	**LOW -**	**LOW -**	**LOW-**	**NO IMPACT**

IMPACT	PREFERRED ROUTE & ALL ALTERNATIVES		CUMULATIVE	NO-GO ALTERNATIVE
	PRIOR TO MITIGATION	POST-MITIGATION		
LOSS OF CULTIVATED LAND	LOW -	LOW -	LOW-	NO IMPACT
LOSS OF GRAZING LAND	LOW -	LOW -	LOW-	NO IMPACT
LOSS OF AGRICULTURAL PRODUCTION	LOW -	LOW -	LOW-	NO IMPACT
LOSS OF AGRICULTURAL RESOURCES	LOW -	LOW -	LOW-	NO IMPACT
SECURITY AND STOCK THEFT	MODERATE -	LOW -	LOW-	NO IMPACT
ACCESS TO FARMS	LOW	LOW -	LOW-	NO IMPACT
BLASTING AND NOISE	MODERATE -	LOW -	LOW-	NO IMPACT
DUST POLLUTION	LOW	LOW -	LOW-	NO IMPACT
AQUATIC IMPACT ASSESSMENT				
DIRECT ECOSYSTEM DESTRUCTION AND MODIFICATION	MODERATE -	LOW -	LOW -	NO IMPACT
INDIRECT HYDROLOGICAL AND GEOMORPHOLOGICAL	MODERATE -	LOW -	LOW -	NO IMPACT
WATER QUALITY	LOW -	LOW -	LOW -	NO IMPACT
FRAGMENTATION AND ECOLOGICAL DISTURBANCE	LOW -	LOW -	LOW -	NO IMPACT
AVIFAUNAL IMPACT ASSESSMENT				
DIRECT HABITAT DESTRUCTION	LOW -	LOW -	LOW -	NO IMPACT
DISTURVBANCE AND DISPLACEMENT	LOW -	LOW -	LOW -	NO IMPACT
DIRECT MORTALITY	LOW -	LOW -	LOW -	NO IMPACT
ECOLOGICAL IMPACT ASSESSMENT				
LOSS OF LOW ESCARPMENT MOIST GRASSLAND (LC)	LOW -	LOW -	LOW -	LOW -
LOSS OF THE NORTHERN KWAZULU-NATAL MOIST GRASSLND	MODERATE -	LOW -	MODERATE -	MODERATE -
LOSS OF KWAZULU-NATAL HIGHLAND THORNVELD	LOW -	LOW -	LOW -	LOW -
LOSS OF PLANT SPECIES OF CONSERVATION CONCERN	MODERATE -	LOW -	MODERATE -	LOW -
LOSS OF FRAGMENTATION OF FAUNAL HABITAT	MODERATE -	LOW -	MODERATE -	NEGLIGEBLE
LOSS OF FAUNAL SPECIES OF CONSERVATION CONCERN	LOW -	LOW -	LOW -	NEGLIGEBLE
IMPACTS ON CRITICAL BIODIVERSITY AREAS	MODERATE -	LOW -	MODERATE -	LOW -
DISRUPTION OF ECOSYSTEM FUNCTION AND PROCESS	LOW -	LOW-	MODERATE -	LOW -
ESTANLISHMENT OF ALIEN PLANT SPECIES	MODERATE -	LOW -	MODERATE -	MODERATE -
HERITAGE IMPACT ASSESSMENT				
FARMHOUSES	TO BE DETERMINED	LOW -	TO BE DETERMINED	NO IMPACT
FEATURES	TO BE DETERMINED	LOW -	TO BE DETERMINED	NO IMPACT
GENERAL BUIDLINGS	TO BE DETERMINED	LOW -	TO BE DETERMINED	NO IMPACT
GRAVES	HIGH	LOW -	HIGH	NO IMPACT
HOUSES	TO BE DETERMINED	LOW -	TO BE DETERMINED	NO IMPACT
KRAALS	TO BE	LOW -	TO BE	NO IMPACT

IMPACT	PREFERRED ROUTE & ALL ALTERNATIVES		CUMULATIVE	NO-GO ALTERNATIVE
	PRIOR TO MITIGATION	POST-MITIGATION		
	DETERMINED		DETERMINED	
STONE WALLING	TO BE DETERMINED	LOW -	TO BE DETERMINED	NO IMPACT
OPEN STONE WALLING	LOW	LOW	LOW	NO IMPACT
SOCIO-ECONOMIC IMPACT ASSESSMENT				
TEMPORARY EMPLOYMENT	MODERATE +	MODERATE +	HIGH +	MODERATE -
LOCAL PROCUREMENT	MODERATE +	MODERATE +	MODERATE +	MODERATE -
INDUCED LOCAL ECONOMIC IMPACTS	LOW +	LOW +	MODERATE +	LOW -
IMPACTS ON LIVELIHOODS OR DIRECTLY AFFECTED LANDOWNERS	LOW -	LOW -	LOW -	N/A
TRAINING/SKILLS DEVELOPMENT/CAPACITY BUILDING	LOW +	MODERATE +	LOW +	LOW -
EMPLOYMENT EQUITY	LOW +	MODERATE +	HIGH +	LOW -
INFLUX OF JOBSEEKERS/TEMPORARY CONSTRUCTION WORKERS	MODERATE -	LOW -	MODERATE -	N/A
LAND USE AND RESOURCE IMPACTS	LOW -	LOW -	DON'T KNOW	N/A
IMPACTS ON TOURISM/ACCOMODATION ESTABLISHMENTS	LOW -	LOW +	LOW -	N/A
INTRUSION IMPACTS	MODERATE -	LOW -	MODERATE -	N/A
VISUAL IMPACT ASSESSMENT				
POTENTIAL VISUAL IMPACT ON VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE NFRASTRUCTURE	HIGH -	MODERATE -	MODERATE -	NO IMPACT
OPERATIONAL PHASE				
AGRICULTURAL IMPACT ASSESSMENT				
NO OPERATIONAL IMPACTS HAVE BEEN IDENTIFIED BY THE AGRICULTURAL SPECIALIST				
AQUATIC IMPACT ASSESSMENT				
DIRECT ECOSYSTEM DESTRUCTION AND MODIFICATION IMPACTS	MODERATE -	LOW -	LOW -	NO IMPACT
INDIRECT HYDROLOGICAL AND GEOMORPHOLOGICAL IMPACTS	MODERATE -	LOW -	LOW -	NO IMPACT
WATER QUALITY IMPACTS	MODERATE -	LOW -	LOW -	NO IMPACT
FRAGMENTATION AND ECOLOGICAL DISTURBANCE IMPACTS	LOW -	LOW -	LOW -	NO IMPACT
AVIFAUNAL IMPACT ASSESSMENT				
DISTURBANCE AND DISPLACEMENT	LOW -	LOW -	LOW -	NO IMPACT
DIRECT MORTALITY	LOW -	LOW -	LOW -	NO IMPACT
ECOLOGICAL IMPACT ASSESSMENT				
ESTABLISHMENT OF ALIEN PLANT SPECIES	HIGH -	LOW-	HIGH -	HIGH -
DISPERSAL BARRIERS AND ROAD MORTALITIES	LOW -	LOW -	MODERATE -	N/A
HERITAGE IMPACT ASSESSMENT				
FARMHOUSES	TO BE DETERMINED	LOW -	TO BE DETERMINED	NO IMPACT
FEATURES	TO BE DETERMINED	LOW -	TO BE DETERMINED	NO IMPACT

IMPACT	PREFERRED ROUTE & ALL ALTERNATIVES		CUMULATIVE	NO-GO ALTERNATIVE
	PRIOR TO MITIGATION	POST-MITIGATION		
GENERAL BUIDLINGS	TO BE DETERMINED	LOW -	TO BE DETERMINED	NO IMPACT
GRAVES	HIGH	LOW -	HIGH	NO IMPACT
HOUSES	TO BE DETERMINED	LOW -	TO BE DETERMINED	NO IMPACT
KRAALS	TO BE DETERMINED	LOW -	TO BE DETERMINED	NO IMPACT
STONE WALLING	TO BE DETERMINED	LOW -	TO BE DETERMINED	NO IMPACT
OPEN STONE WALLING	LOW	LOW	LOW	NO IMPACT
SOCIO-ECONOMIC IMPACT ASSESSMENT				
CONTRIBUTION TO NATIONAL POWER SUPPLY	MODERATE +	N/A	HIGH +	MODERATE -
IMPACTS ON LAND VALUES	LOW -	LOW -	DON'T KNOW	N/A
IMPACTS ON SENSE OF PLACE	MODERATE -	MODERATE -	HIGH	N/A
VISUAL IMPACT ASSESSMENT				
POTENTIAL VISUAL IMPACTS ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPSED INFRASRTUCTURE	HIGH -	HIGH -	HIGH -	NO IMPACT
POTENTIAL VISUAL IMPACTS ON SENSITIVE VISUAL RECEPTORS WITHIN THE REGION	MODERATE -	MODERATE -	MODERATE -	NO IMPACT
VISUAL IMPACTS OF FACILITY OPERATIONS ON LANDSCAPE CHARACTER AND SENSE OF PLACE WITHIN THE REGION	MODERATE -	MODERATE -	MODERATE -	NO IMPACT
DECOMMISSIONING PHASE				
The proposed Mulilo Newcastle Wind Power Grid Connection is likely to be used over an extensive period due to the lifespan of the MNWP WEF Infrastructure be decommissioned in the long-term, the impacts associated with the decommissioning phase will be similar to those for the construction phase and the mitigation measures stipulated for the construction phase will therefore be relevant. However, it is recommended that the EMPr is updated at the time of decommissioning, based on the environmental conditions and relevant legislation at the time, and implemented throughout the decommissioning of the Mulilo Newcastle Wind Power Grid Connection development.				

10. SENSITIVITY ANALYSIS

A site development sensitivity map (Figure 10-1) was developed based on specialist and general site information gathered, and the site was classified into areas of low and conditional sensitivity as well as **NO-GO** (no development).

- **NO-GO** areas included areas of very high or high sensitivity indicated by the various specialists, including identified heritage sites, delineated wetlands, rocky outcrops and buffers around existing infrastructure.
- **Conditional Sensitivity** areas are areas where construction is conditional on the fulfilment of one or another aspect-specific requirement. For example, all construction in the Heritage conditional sensitivity areas will require sign-off by a palaeontologist to ensure that no fossils (if found) are damaged or destroyed. Other conditional sensitivity areas include areas of moderate sensitivity identified where permits will be required, e.g. WULs.
- **Low Sensitivity** areas are areas where construction may take place without limitation.

The main objective of the sensitivity analysis is to guide development away from sensitive areas and have development footprints located in areas of lower sensitivity. We have previously used the terms go area; go-but area; and no-go area.

The limitation of the above is that a no-go area is just that – one cannot do anything in this area, because it is **no-go.** But in certain cases, development is required. A road crossing over a stream, or some other linear infrastructure, which can be developed, provided there is sound mitigation and other constraints are applied. So, it is not no-go but rather developmentally constrained.

It is, therefore, preferable to use and map the following categories:
LOW CONSTRAINT/NONE IDENTIFIED – These areas can be easily developed, as there are only minor constraints, and little mitigation and management is required (aside from normal building design and construction restrictions outlined in the EMPr).
LOW-MODERATE CONSTRAINT – These areas can be developed but require mitigation and management as per the general management conditions of the EMPr.
MODERATE CONSTRAINT – These areas can accommodate development, but there are constraints. Mitigation and management will be required to reduce significant environmental impacts to acceptable levels, and appropriate technology (sewage, waste etc.) and design will be required to reduce impacts and ensure sustainability. Sound arguments as to why the development cannot be located in less sensitive areas will be required to justify locating development in moderately constrained areas.
MODERATE-HIGH CONSTRAINT – These areas can accommodate development, but there are strict constraints. Mitigation and management will be required to reduce significant environmental impacts to acceptable levels. Sound arguments as to why the development cannot be located in less sensitive areas will be required to justify locating development in moderate-high constrained areas.
HIGH CONSTRAINT – If development takes place in these areas, considerable effort (and most likely expense) will be required to design out, mitigate or manage negative environmental impacts. In many cases this will not be possible and in general no development should take place in these areas. Only facilities that are location dependent should be permitted in these areas. For example, a road crossing a sensitive riparian area, or a mine pit that must be located where the resources are.
NO-GO CONSTRAINT – These include areas of very high or high sensitivity indicated, for example by the bird specialists (specific to powerline pylons as an example, and not to the rest of the infrastructure), identified heritage sites and buffers around existing infrastructure.

The proposed Mulilo Newcastle 132kV OHL avoids all **NO-GO (VERY HIGH)** areas identified by the various specialists. Figure 10-1 overlays all sensitive areas identified by these specialists. The following sensitivities are relevant to the proposed SPVF site:

- All specialist constraints (including **NO-GO**, **HIGH**, **MODERATE-HIGH**, **LOW-MODERATE** and **LOW/NONE**)

- Critical Biodiversity Areas, KZN:
  - CBA 1 (WHERE VERIFIED BY SPECIALISTS) **MODERATE-HIGH**
  - CBA 2 (WHERE VERIFIED BY SPECIALISTS) **LOW-MODERATE**
  - ESAs **LOW-MODERATE**
- NBA (2018) Threatened Ecosystems:
  - Critical **NO-GO**
  - Endangered **HIGH**
  - Vulnerable **MODERATE-HIGH**
- NPAES (2011)
  - Focus Areas **MODERATE**
- NBA (2018) and NFEPA (2011/14) Wetlands **HIGH**
  - Wetlands 500m buffer **MODERATE**
- Rivers and drainage lines **HIGH**
  - River 100m Buffer **MODERATE**

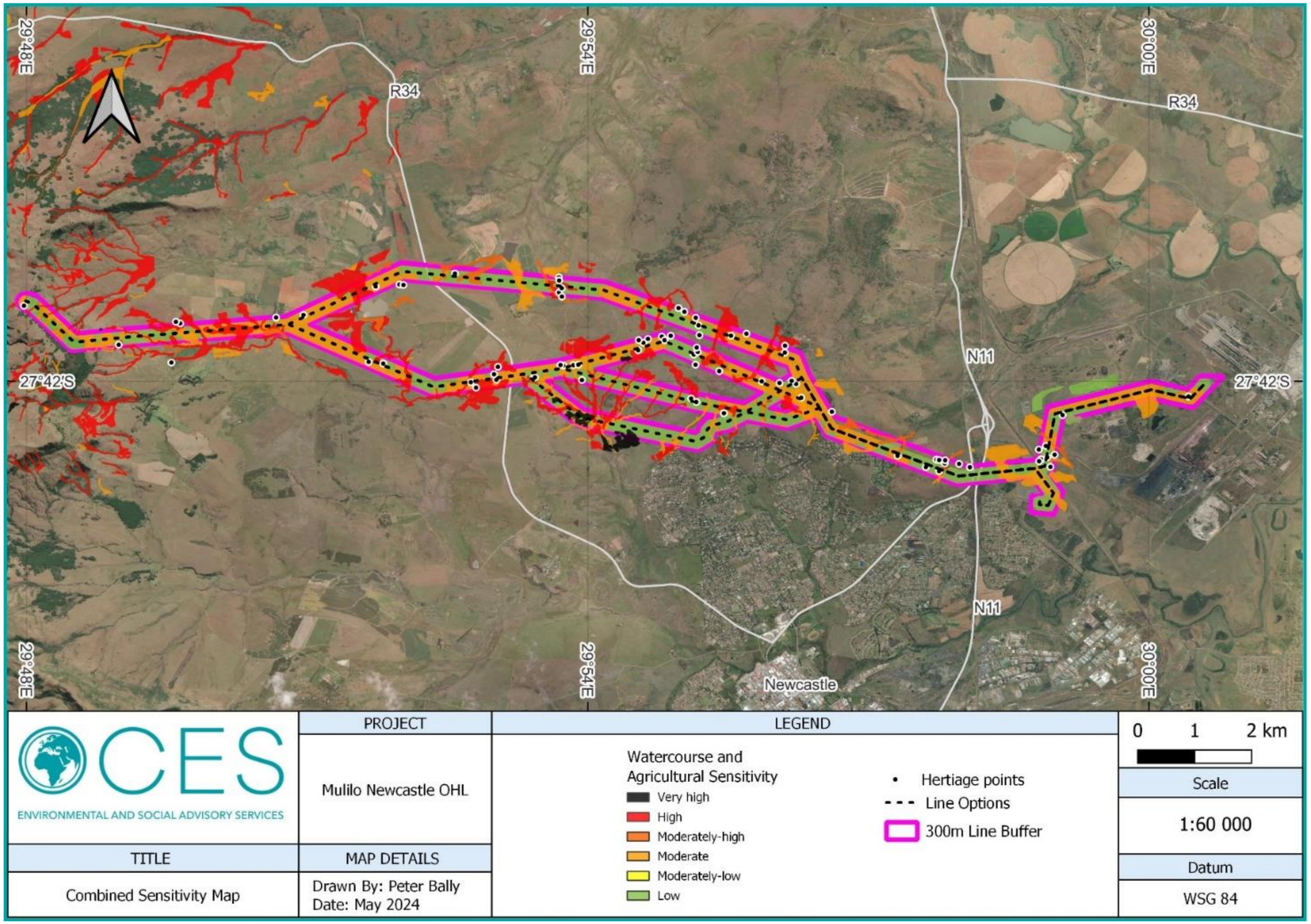

Figure 9.3.1: MNWP Grid Connection Combined Sensitivity Map

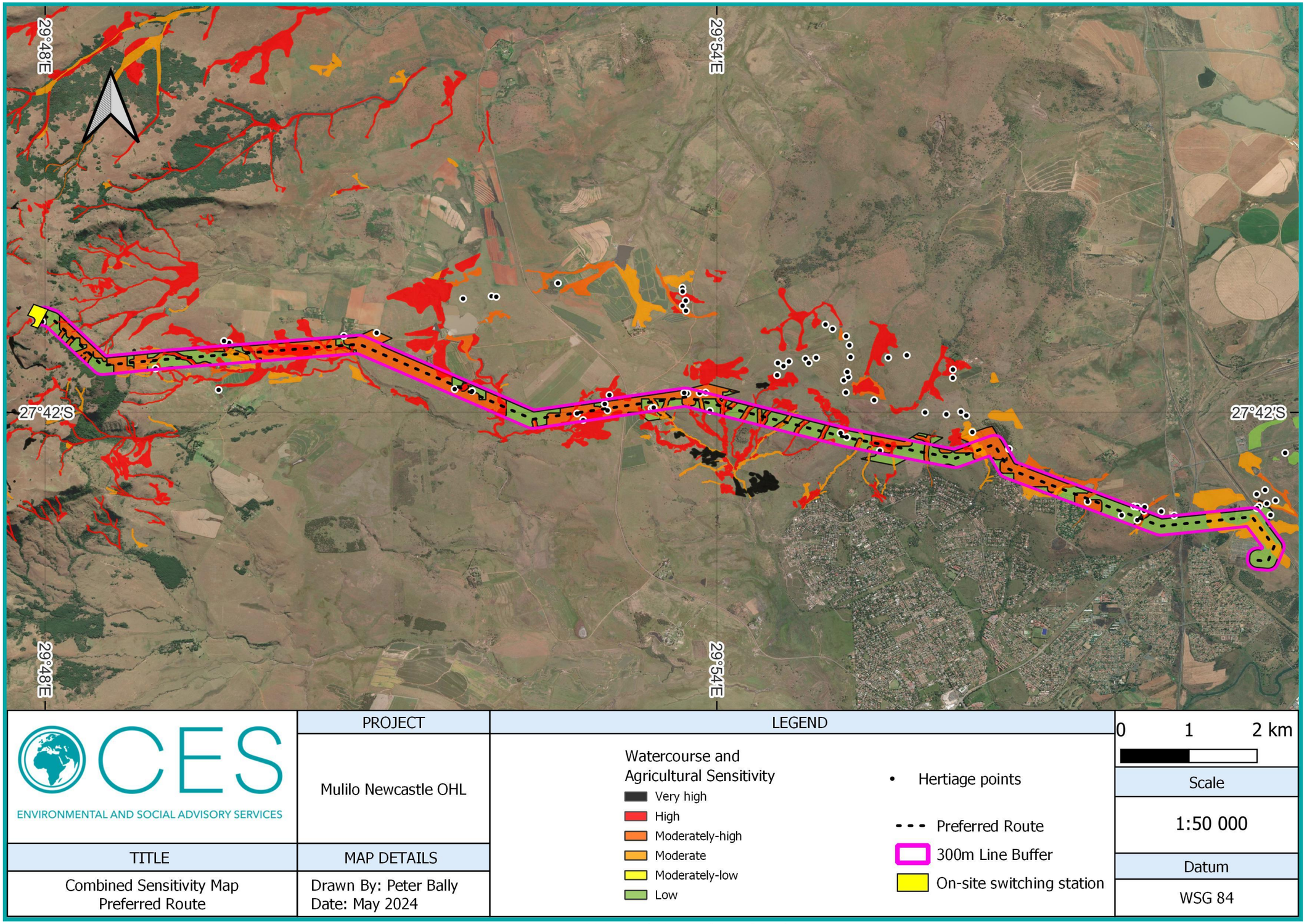

Figure 9.3.2: Sensitivity Analysis Map for Preferred Route

11. PUBLIC PARTICIPATION PROCESS

11.1. ACTIVITY ON LAND OWNED BY A PERSON OTHER THAN THE APPLICANT

In accordance with Section 39 (1), stipulated in Chapter 6 of the NEMA EIA Regulations (2014, as amended), which states that "If the proponent [Applicant] is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land." Mulilo Newcastle Wind Power (Pty) Ltd has engaged with the landowners regarding the proposed activities on the proposed properties. In addition to this, land agreements are in place and consent has been obtained to conduct the various studies required to implement the proposed MNWP Grid Connection project.

11.2. OBJECTIVES OF THE PPP

In accordance with Section 40 (1), stipulated in Chapter 6 of the NEMA EIA Regulations (2014, as amended), the purpose of public participation is to provide all potential or registered I&APs, including the Competent Authority, with the opportunity to access the relevant documents and information which could reasonably or potentially influence any decision with regards to the proposed MNWP Grid Connection Application for EA. The Public Participation Process (PPP) aims to:

- Disclose activities planned by the project proponent and the EIA team;
- Identify issues and concerns from I&APs;
- Harness local expertise, needs and knowledge from the I&APs;
- Respond to grievances and enquiries from I&APs;
- Identify additional or new stakeholders and people affected by, or interested in, the proposed project;
- Gather perceptions and comments on the proposed terms of reference for the specialist assessments;
- Ensure that all issues raised by I&APs have been adequately addressed and/or assessed;
- Share the findings of the EIA and specialists assessments, such as significant impacts, mitigation measures, management actions, and monitoring programmes; and
- Include any new concerns or comments that arise.

This information is used to:

- Identify underestimated or unanticipated impacts;
- Alert the project to possible communication breakdowns and emerging problems and concerns;
- Encourage the use of local resources and knowledge in the project;
- Identify development opportunities and community projects; and
- Ensure that all issues and concerns raised during scoping are dealt with adequately in the EIA Process. This is achieved through the preparation of an IRT, also referred to as a Comments Report (CR).

The PPP must include consultation with the following key members –

- The Competent Authority: Provincial KZN EDTEA;
- All state departments which have laws relating to the proposed activity or the proposed location of the activity;
- The affected landowners and surrounding landowners;
- All organs of the state which have jurisdiction relating to the proposed activity or the proposed location of the activity; and
- The registered and potential I&APs.

11.3. LEGISLATIVE CONTEXT RELATED TO PPP

According to Regulation 41(2) of the NEMA Amended EIA Regulations (2017) - "the person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by:

a) *Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of –*
   (i) The site where the activity to which the application or proposed application relates is or is to be undertaken; &
   (ii) *Any alternative site."*

The notice board must –
- Be at least 60 cm x 42 cm in size;
- Specify whether a Basic Assessment Process or Scoping and EIA Process is triggered by the proposed activity;
- Indicate the nature and location of the activity to which the application relates;
- Explain where further information can be obtained; and
- Stipulate the manner in which and the person to whom correspondence relating to the application or proposed application may be made.

b) *Giving written notice, in any of the manners provided for in Section 47D of the Act, to:*
   (i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
   (ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
   (iii) The municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
   (iv) The municipality which has jurisdiction in the area;
   (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and
   (vi) Any other party as required by the competent authority

c) *Placing an advertisement in:*
   (i) One local newspaper; or
   (ii) Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

d) *Placing an advertisement in at least one provincial newspaper or national newspaper,* ***if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken****: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph.*

e) *Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to-*

11.4. NOTIFICATION OF INTERESTED AND AFFECTED PARTIES

Public consultation is a legal requirement throughout the BA Process. Developers, or the appointed independent EAP, are required to conduct public consultation throughout the BA Process. Formal BA

documents are required to be made available for public review and comment by the proponent [or the EAP on behalf of the Applicant], these include the Basic Assessment Report, EMPrs and Specialist Reports. The method of public consultation to be used depends largely on the location of the development and the affected parties. Required means of public consultation include:

- Site notice(s);
- Newspaper advertisement(s);
- Community interviews and focus group meetings;
- Letter of Notification and information to affected landowner(s), stakeholders and registered I&APs (Proof: e-mail, SMSes where relevant, registered letters to DFFE);
- Public meeting and/or focus group meetings (Attendance register and meeting minutes); and
- Authority and Stakeholder engagement (DFFE, DWS, SAHRA, DEDEAT, KZN AMAFA, etc.).

Please note that all proof of public notification has been attached as APPENDIX H.

11.4.1. On-Site Notice

An appropriate site notice was placed on the boundary of the proposed properties that will be affected (See Proof of PPP, Appendix H).

11.4.2. Advertisement

The advert was published on the Newcastle Advertiser on the 13th of May 2024. (See Proof of PPP, Appendix H).

11.4.3. Interested and Affected Parties (I&APs) Identification and Notification

In addition to the above notification, certain I&APs were identified based on their potential interest in the project, as shown in Table 11.4.3.1 below.

Table 11.4.3.1: I&AP database

Stakeholder	Contact Person
KZN Department of Economic Development & Tourism and Environmental Affairs: Director: Environmental Management Head Office	Mr Bonginkosi Dlamini
KZN Department of Economic Development & Tourism and Environmental Affairs: Acting Chief Director: Environmental Management	Zakhele Dlamini
KZN Department of Economic Development & Tourism and Environmental Affairs: Director: Environmental Management Head Office	Mr Bhekumuzi Mathenjwa
KZN Department of Economic Development & Tourism and Environmental Affairs: Southern Region	Mr Samuel Ngcobo
KZN Department of Economic Development, Tourism and Environmental Affairs	Ms Zama Mbanjwa
KZN Department of Economic Development & Tourism and Environmental Affairs: HoD	Nhlakanipho Nkontwana
KZN Department of Economic Development & Tourism and Environmental Affairs: Acting Deputy Director General: Sector Development & Business Governance	Fikiswa Pupuma
KZN Department of Economic Development & Tourism and Environmental Affairs: Deputy Director General Sector Dev. & Business Governance	Sihle Mkhize
KZN Department of Economic Development & Tourism and Environmental Affairs: Deputy Director General: Integrated Economic Development Services	Sibusiso Myeza

STAKEHOLDER	CONTACT PERSON
KZN Department of Economic Development & Tourism and Environmental Affairs: Chief Director: Local Economic Development	Ranveer Persad
KZN Department of Economic Development & Tourism and Environmental Affairs: Chief Director: Tourism Development	Sibonelo Nzimande
KZN Department of Economic Development & Tourism and Environmental Affairs: person in charge of Amajuba District Municipality	Gugu Sibisi
KZN Department of Economic Development & Tourism and Environmental Affairs	Poovie Moodley
	Bongiwe Msomi
	Ntokozo Nkosi
	Nonkululeko Mabaso
	Khethiwe Sibisi
	Samkelisiwe Vana
	Samukelisiwe Sithole
Department of Forestry, Fisheries and the Environment (DFFE)	Mmamohale Kabasa
	Jay Jay Mpelane
	Constance Musemburi
	Azrah Essop
	Kevin Mathebula
	Ms Thoko Buthelezi
	Ms Mashudu Marubini
	Bathandwa Ncube
	Ephron Maradwa
	Mmamohale Kabasa
Department of Environmental Affairs: Biodiversity & Conservation	Simon Malete
	BC Admin
	Seoka Lekota
	Thivhulawi Nethonoda
Department of Human Settlements	Mr Mduduzi Zungu
Department of Agriculture & Rural Development	Ms Nondumiso Ndlovu
Department of Cooperative Governance and Traditional Affairs (COGTA)	KZN Head of Department
Department of Transport	Ms Beular Wagner
Department of Health (District Director)	Dr Sandile Tshabalala
Department of Water Affairs	Ms Zethu Makwabasa
Department of Energy	Ms Mokgadi Mathekgana
Department of Mineral Resources	Ms Ncamisile Mtshali
Department of Rural Development and Land Reform	Mr Patrick Maqabangqa
Eskom: Renewable Energy	Mr John Geerigh
Eskom	Ms Tshililo Nekhalali
	Mr Eddie Leach
Eskom: Land & Rights Section	Ms Michelle Nicol
Ezemvelo KZN Wildlife	Mr Dominic Wieners
Ezemvelo KZN Wildlife: District Conservation Officer, Underberg Region	Brent Coverdale
Ezemvelo KZN Wildlife: Regional Ecologist	Richert van der Westhuizen
Ezemvelo KZN Wildlife: Ecological Advice Division	Ms Dinesree Thambu
Ezemvelo KZN Wildlife: KZN Biodiversity Stewardship Programme	Ms Felicity Elliott
Ezemvelo KZN Wildlife: Avifaunal unit	Mr Kishaylin Chetty
Ezemvelo KZN Wildlife: Integrated Environmental Management	Mr Andy Blackmore

STAKEHOLDER	CONTACT PERSON
Ezemvelo KZN Wildlife: District Conservation Officer, Underberg Region	Mr Richard Schutte
Ezemvelo KZN Wildlife: Regional Ecologist	Ms Sonja Kruger
Ezemvelo KZN Wildlife: Ecological Advice Division	Mr Ian Rushworth
Ezemvelo KZN Wildlife: KZN Biodiversity Stewardship Programme	Mr Greg Martindale
Ezemvelo KZN Wildlife: Avifaunal unit	Mr Athol Marchant
Ezemvelo KZN Wildlife: District Ecologist	Mr Petros Ngwenya
Ezemvelo KZN Wildlife	
Amajuba DM Manager	Mr Linda Africa
Newcastle Local Municipality: Dev. Planning & Human Settlements Community Services (Env) is now also Parks and Cemeteries	Bafana Mseleku Nomthandazo Mavuso
Newcastle Local Municipality Municipal Manager	Zamokwakhe Wesley Mcineka
SANRAL	Ms Nanna Gouws
SKA	Dr Adrian Tiplady
Civil Aviation Authority	Ms Lizelle Stroh
Air Traffic and Navigation Services (ATNS): Vryheid and Newcastle airports	Mr Dylan Fryer Ms Annie van der Venter
AMAFA / Heritage KwaZulu Natal	Ms Bernadette P
South African Heritage Resources Agency (SAHRA)	Mariagrazia Galimberti
Endangered Wildlife Trust: CEO	Natasha Higgitt
Endangered Wildlife Trust: Head of Conservation Science	Admin
Birdlife South Africa	Carina Pienaar
Endangered Wildlife Trust: African Crane Conservation Programme Field Officer	Mr John Gibbs
Endangered Wildlife Trust: Wildlife & Energy Programme	Mr Daniel Marnewick
WESSA KZN Region	Dr Hanneline Smit-Robinson
Birdlife South Africa: Birds and Renewable Energy Manager	Ms Samantha Ralson
Endangered Wildlife Trust: CEO	Ms Yolan Friedman
Endangered Wildlife Trust: Head of Conservation Science	Dr Harriet Davies-Mostert
Endangered Wildlife Trust: African Crane Conservation Programme Manager	Ms Kerryn Morrison
Endangered Wildlife Trust: African Crane Conservation Programme Field Officer	Ms Glenn Ramke
Endangered Wildlife Trust: Wildlife & Energy Programme	Mr Lourens Leeuwner
WESSA KZN Region	Ms Jenny Duvenage
WESSA KZN Region: Conservation Project Manager	Mr Chris Galliers
WESSA KZN Region: Conservation Director	Mr Garth Barnes
WESSA KZN Regional Representative	Pieter Burger
WESSA KZN Regional Committee: Regional Chair	Margaret Burger
WESSA KZN Branch Sani Wildlife	Russel Suchet
WESSA KZN Regional Representatives in northern areas	Paul Bartels
The Bat Interest Group of KwaZulu-Natal	John Wesson
Utrecht Farmers Association	Leanne Ray
Wildlife Ranching RSA	Ms Ankie Stroebel
Sneeuwberg Protected Environment - protected under Birdlife SA	Nick Theron
Seekoeivlei Nature Reserve (Destea) resort	Elton Mangani
Potberg Private Nature Reserve (potberg Game Ranch)	Willem Koch
WWF: Enkangala Grasslands Project South Africa	Mr Angus Burns
The Bat Interest Group of KwaZulu-Natal	Ms Wendy White

STAKEHOLDER	CONTACT PERSON
Utrecht Farmers Association	Ms Michelle van Staden
Ingogo Farmers Association	Mr Jan Smit
Groenvlei Farmers Association	Mr Christoff Joubert
Vryheid Farmers Association	Ms Lurien Jacobsz
Battlefields Route Association KZN	Mr Dave Sutclifft
Endangered Wildlife Trust	Dr Damian Walters
SANPARKS	Ms Maretha Alant
SANBI - National Grassland Programme	Mr Nick De Goede
Mulilo Renewable Project Developments	Ms Catherine Dreyer
G7 Energies	Ms Kristal Maze
WWF SA Ecosystems Partnership Manager	Therese Brinkcate
WWF SA Grasslands Programme Manager	Angus Burns
WWF SA Grasslands Programme Assistant	Sam Mnguni
SANBI Coordinator - National Grassland Programme	Brent Corcoran
SANBI - National Grassland Programme	Anthea Stephens
Mulilo Renewable Project Developments	Andrew Pearson
G7 Energies	Veronique Fyfe
	Colette Alisha Stander
	Caryn Clarke
	J.J. Uys
	Jaco Meyer

11.4.4. SURROUNDING AND AFFECTED LANDOWNERS

Letters of notification and Background Information Documents have been sent out via email. All landowners and surrounding landowners were contacted by email or telephonically in order to obtain and confirm contact details and preferred methods of communication.

11.4.5. REGISTERED I&APS

Other than I&APs initially identified, all persons who requested to be registered as I&APs have been included in the I&AP database.

Please see Appendix H for Proof of PPP.

11.4.6. PUBLIC PARTICIPATION PROCESS THAT HAS BEEN FOLLOWED:

The public participation process followed included:

- Release of the Draft Basic Assessment Report for Authority, Stakeholder and Public review.
- The Draft Basic Assessment Report was available for public review from the 24th of June 2024 to the 24th of July 2024 (30 days).
  - **(a)** Hard copies of the Draft Basic Assessment Report were made available in Newcastle [Newcastle Public Library, 66 Scott Street, Newcastle CBD, Newcastle, 2940]
  - **(b)** Electronic copies were made available on the CES website (https://www.cesnet.co.za/public-documents)

11.4.7. COMMENTS AND RESPONSE REPORT

The Comments and Response Report (CRR) can be found in Appendix H of this report. The CRR includes all issues raised and comments received, as well as the EAP, specialist and/or Applicant responses to these comments.

12. RECOMMENDATIONS & CONCLUSIONS

12.1. DESCRIPTION OF THE PROPOSED ACTIVITY

Mulilo Newcastle Wind Power (Pty) Ltd (the Applicant) plans to develop the Mulilo Newcastle Wind Power (MNWP) Grid Connection to connect the authorised Mulilo Newcastle Wind Power Wind Energy Facility (WEF) to the national grid approximately 15 km northwest of the town of Newcastle, in the KwaZulu-Natal Province. The project site is situated in the Newcastle Local Municipality (LM) which forms part of the Amajuba District Municipality (DM).

The proposed MNWP Grid Connection will connect to an existing Substation, near Newcastle, via a 132 kV onsite switching station and a single or double circuit 132 kV overhead transmission line with a total length of up to 40 km, depending on the alternative route used, with the preferred route alternative being up to 21 km.

12.2. NEED AND DESIRABILITY

When considering the overall need for the development of the proposed MNWP Grid Connection, the social and economic benefits are clearly in support in terms of need and desirability, from a planning and policy perspective, on a national level, but also at the provincial, district, and local levels. These are two of the key drivers of sustainable development, from an environmental perspective (which is the third arm of sustainable development) careful planning is required. This Basic Assessment process, inclusive of all specialist assessments, aims to achieve this balance.

The construction and operation of the proposed MNWP Grid Connection will contribute to local developmental objectives of poverty eradication and other social and socio-economic benefits that are integral to the REIPPPP process. The development of the MNWP Grid Connection attracts significant direct foreign financial investment into South Africa and local communities. REIPPPP local content requirements can lead to the creation of local industry and both skilled and un-skilled jobs in the renewable energy industrial sector.

Additionally, the proposed MNWP Grid Connection and associated infrastructure is required to supplement the development of the authorised Mulilo Newcastle Wind Power Energy Facility (WEF) (DFFE Ref: 14/12/16/3/3/2/2457). Furthermore, the project is regarded as a Strategic Integrated Project (SIP) No. 20c under the Embedded Generation National Program (EGNP), to be expedited in terms of Schedule 2 (Section 17(2)) of the Infrastructure Development Act (IDA) (Act No. 23 of 2014). Therefore, to reiterate, the project need and desirability also relate to the need and desirability of renewable energy on a local, district, provincial, national and international level.

12.3. ASSUMPTIONS, LIMITATIONS AND GAPS IN KNOWLEDGE

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

- This report is based on a project description and site plan, provided to CES by the Applicant, which has not been approved by KZN DEDTEA at this stage of the project. The project description and site plan have undergone iterations and refinements. This Final BAR submission is the first step in this process.
- Descriptions of the natural and social environments are based on limited fieldwork and available literature.
- It should be emphasised that information, as presented in this document, only has reference to the study area as indicated on the accompanying maps. Therefore, this information cannot be applied to any other area without a detailed investigation being undertaken.

12.4. Environmental Cost-Benefit Analysis

A total of 248 impacts were identified during the BA Process. Of the identified impacts, 238 are NEGATIVE pre-mitigation and 10 are POSITIVE pre-mitigation.

12.4.1. Negative Impacts

49% of the negative impacts are LOW pre-mitigation, 33% are MODERATE pre-mitigation and 18% are HIGH pre-mitigation. Key negative pre-mitigation impacts relate to the following:

- Visual impact of the facility.
- Alien vegetation.
- Risk of fire.

81% of the negative impacts are LOW post-mitigation, 6% are MODERATE post-mitigation and 9% are HIGH post-mitigation. Key post-mitigation impacts relate to the following:

- Visual impact of the facility.

12.4.2. Positive Impacts

20% of the positive impacts are LOW pre-mitigation, 4% are MODERATE pre-mitigation and 40% are HIGH pre-mitigation:

- Contribution towards renewable energy targets.
- Social upliftment

30% of the positive impacts are LOW post-mitigation, 50% are MODERATE post-mitigation and 20% are HIGH post-mitigation.

Table 12.4.2-1: Cost-benefit Analysis

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
GENERAL																
Planning & Design	2	0	4	0	5	0	0	0	11	0	0	0	0	0	0	0
Construction	4	0	13	0	4	0	0	0	18	0	0	0	0	0	0	0
Operations	5	0	4	0	1	2	0	0	8	0	1	0	0	2	0	0
Decommissioning	0	0	6	0	0	0	0	0	6	0	0	0	0	0	0	0
AGRICULTURE																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	13	0	2	0	0	0	0	0	14	0	0	0	0	0	0	0
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AQUATIC																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations	1	0	3	0	0	0	0	0	4	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AVIFAUNA																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	33	0	0	0	0	0	0	0	33	0	0	0	0	0	0	0
Operations	20	0	6	0	2	0	0	0	20	0	0	0	2	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ECOLOGICAL																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	16	0	18	0	0	0	0	0	29	0	0	0	0	0	0	0
Operations	3	0	1	0	4	0	0	0	6	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
HERITAGE																
Planning & Design	2	0	0	0	2	0	0	0	16	0	0	0	0	0	0	0
Construction	2	0	0	0	2	0	0	0	16	0	0	0	0	0	0	0
Operations	2	0	0	0	2	0	0	0	16	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOCIAL																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	11	2	7	3	0	2	0	0	9	3	1	5	0	0	0	0
Operations	1	0	2	1	1	0	0	0	1	0	1	0	1	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VISUAL																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	0	0	10	0	0	0	0	0	0	0	10	0	0	0
Operations	0	0	11	0	10	0	0	0	0	0	11	0	10	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**117**	**2**	**79**	**4**	**42**	**4**	**0**	**0**	**207**	**3**	**14**	**5**	**23**	**2**	**0**	**0**

12.5. Negatives vs Positives

The key areas of concern for the proposed MNWP Grid Connection are related to the potential visual impact, while the key areas of promise for the proposed MNWP Grid Connection are related to the potential impact on the socio-economic aspects of the area and the project's contribution to renewable energy.

It is with this in mind that the EAP is able to conclude, based on the assessments undertaken, that the significance of the potential positive impacts does exceed the significance of the potential negative impacts of this proposed project, in terms of severity.

12.6. Cumulative Impact Statement

There are no operational Wind Energy Facilities and renewable energy Grid Connection projects in the area (at this stage). The key consideration of surrounding Grid Connection project is that all Grid Connection project must have an approved EMPr, inclusive of appropriate management plans related to stormwater, erosion, fire, etc. From a visual perspective the cumulative impact remains high, while other impacts should be mitigated on a project-by-project basis, negating the potential of severe cumulative impacts related to avifauna, aquatic biodiversity, terrestrial biodiversity, archaeology, amongst others. The full impacts tables (Appendix G2) include cumulative impact assessments on each impact assessed during the BAR process. Overall, the cumulative impact of the proposed MNWP Grid Connection, considering that no large-scale operational Wind Energy Facilities and Grid Connection projects are present within 30km of the site is MODERATE.

12.7. Fatal Flaws

It is the opinion of the EAP, that based on the information gathered during the BA Process, including specialist studies, the impacts described do not represent any fatal flaws regarding the proposed MNWP Grid Connection. There are no additional studies recommended as part of the BA process, based on the findings and opinions of the EAP and all specialists.

12.8. Opinion of the EAP

It is the opinion of the EAP that the proposed MNWP Grid Connection and associated infrastructure development is acceptable in terms of the environmental and social setting, as contained in this report, and

can be approved. Both Technology Connection Alternatives (OHPL or underground lines) are deemed acceptable and no fatal flaws have been identified. The connection must be routed through the least sensitive sections of the assessed connection corridor. All impact management actions stipulated in the associated EMPrs must be implemented during the MNWP Grid Connection and Associated Grid Infrastructure development to reduce the potential and likely adverse impacts and to increase the benefits.

The Preferred Route site is considered suitable for the reasons provided in Chapter 7 of the Final BAR. As this powerline alternative will only traverse a distance of approximately 20 km and serves as the shortest and most direct route to the authorised grid infrastructure, it is favoured as the preferred alternative from an environmental and engineering perspective.

12.9. RECOMMENDATIONS

It is recommended that the following general and specialist mitigation measures are included in the EMPr for the Mulilo Newcastle Wind Power Grid Connection and associated infrastructure development.

12.9.1. GENERAL IMPACT RECOMMENDATIONS AND MITIGATION

GENERAL IMPACTS - PLANNING & DESIGN PHASE MITIGATION FOR EMPR

- All hazardous substances such as paints, diesel and cement must be stored in a bunded area with an impermeable surface beneath them.
- Cement mixing must be conducted at a single location which must be centrally located, where practical. This mixing must take place on an impermeable surface, and dried waste cement must be disposed of with building rubble at a suitably registered disposal site.
- Ensure that all relevant legislation and policy is consulted and ensure that the project is compliant with such legislation and policy.
- Planning for the construction and operation of the proposed overhead line and associated grid infrastructure must consider available best practice guidelines.
- Where possible, monopoles should be placed at least 32 m away from rivers, tributaries and drainage lines.
- A Stormwater Management Plan must be designed prior to the commencement of the construction phase.
- The plan must also include management mitigation measures for water pollution, wastewater management and the management of surface erosion e.g. by considering the applicability of contouring, etc.
- A Waste Management Plan must be developed prior to the commencement of the construction phase.
- During the planning and design phase, a suitable area should be designated to the temporary storage of waste prior to disposal at a licenced facility.

GENERAL IMPACTS - CONSTRUCTION PHASE MITIGATION FOR EMPR

- Nuisance dust should be reduced by implementing one of or a combination of the following:
  1. Damping down of cleared areas;
  2. Retention of vegetation where possible;
  3. Excavations and clearing activities should only be undertaken during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas; and
  4. A speed limit of 40km/h must not be exceeded on dirt roads.

- Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.
- Cleared vegetation and any other construction-related waste must not be burned on site during the construction phase.
- Open fires must not be permitted within the site during the construction phase.
- Smoking on site must be confined to a designated area and this area must be equipped with the necessary fire extinguishers and cigarette disposal facilities.
- The Contractor must ensure that all site personnel are aware of the risk of fires, the procedure to be followed in the event of a fire and that all site personnel have access to the relevant contact details of the nearest Fire and Emergency Services.
- The recommendations of the Stormwater Management Plan must be implemented to reduce runoff and reduce the risk of soil erosion and sedimentation in tributaries.
- Stockpiled materials must not be stored within 50 m of a tributary or wetland.
- Stockpile areas must be suitably bunded to prevent waterborne erosion of exposed soils where there is a likelihood that the soils will be washed into nearby watercourses.
- The Waste Management Plan, incorporating recycling and waste minimisation, must be implemented throughout the construction phase. The Waste Management Plan must be explained to all employees as part of the environmental education training.
- All construction vehicles must be in sound working order and meet the necessary noise level requirements.
- The Contractor must comply with all municipal by-laws with regards to noise control.
- The Contractor must comply with the Noise Induced Hearing Loss Regulations published under the Occupational Health and Safety Act.
- Construction workers must not make use of portable radios, vehicle radios, whistles, etc., which generate excessive noise, while they are on the construction site.
- Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act (Act No. 85 of 1993) must be adhered to. This applies to solvents and other chemicals which could potentially be used during the construction phase.
- The storage of fuels and hazardous materials must be located away from sensitive water resources.
- All hazardous substances (e.g. diesel, oil drums, etc.) must be stored in a bunded area.
- The recommendations of the Stormwater Management Plan must be implemented during construction.
- Vehicles should not be refuelled within 50 m of tributaries or any highly sensitive environmental areas.
- Drip trays must be placed under all stationary construction plant.
- If a spill occurs on an impermeable surface, such as fuel or oil, the surface spill must be contained using oil absorbent materials or the appointed ECO must determine the precise method of treatment of polluted soil.
- The Waste Management Plan must be implemented throughout the construction phase.
- All waste must be disposed of at an appropriately licensed landfill site.
- All construction materials must be stored in a central and secure location with an appropriate impermeable surface.
- The recommendations of the Stormwater Management Plan must be implemented to mitigate the impacts of potentially polluted runoff.
- Any stockpiling of gravel, cut, fill or any other material including spoil must only be in areas that have been approved by the ECO within the defined working area.
- The Contractor should ensure that the material does not blow or wash away. If the stockpiled material is in danger of being washed or blown away, the Contractor should spray it with Dustex (or suitable equivalent) or cover it with a suitable material, such as hessian or plastic. Stockpiles of topsoil must not be covered with plastic.
- Areas from which the topsoil is to be removed must be cleared of any foreign material which could form part of the topsoil during removal including any waste material, litter, excess vegetation and any other material which could reduce the quality of the topsoil.

- Topsoil stockpiles should not exceed 2 m in height.
- The removal and stockpiling of topsoil must be carried out in accordance with the approved EMPr.
- Stripping of topsoil should be undertaken in such a manner as to minimise erosion by wind or runoff.
- Stockpiled topsoil must not be compacted.
- No stockpiling of any material will be allowed within
- 20 m of any "no-go" areas.

GENERAL IMPACTS - OPERATIONAL PHASE MITIGATION FOR EMPR

- A Waste Management Plan incorporating recycling and waste minimisation must be implemented. The Waste Management Plan must be explained to all employees as part of the environmental induction training.

GENERAL IMPACTS - DECOMMISSIONING PHASE RECOMMENDATIONS FOR EMPR

As per the temporal scales indicated in the significance statement for the operational phase in the section above, the proposed Mulilo Newcastle Wind Power Grid Connection is likely to be used over an extensive period due to the lifespan of the Mulilo Newcastle WEF and decommissioning is not foreseen in the near future. Should the Mulilo Newcastle Wind Power Grid Connection be decommissioned in the long-term, the impacts associated with the decommissioning phase will be similar to those for the construction phase and the mitigation measures stipulated for the construction phase will therefore be relevant. However, it is recommended that the EMPr is updated at the time of decommissioning, based on the environmental conditions and relevant legislation at the time, and implemented throughout the decommissioning of the Mulilo Newcastle Wind Power Grid Connection and associated infrastructure.

12.9.2. SPECIALIST IMPACT RECOMMENDATIONS AND MITIGATION

SPECIALISTS' IMPACTS – PLANNING & DESIGN PHASE MITIGATION FOR EMPR

- **AQUATIC IMPACT ASSESSMENT**The number of wetland and stream / river crossings must be minimised as far as practically possible. Unnecessary watercourses crossings (i.e., proposed crossings that can be re-aligned) must be re-aligned and avoided.
- No pylons or towers must be established within or within 50m of any wetlands or riparian areas.
- No pylons or towers must be established within 50m upstream of active head-cut erosion or springs.
- Where wetland and stream / river crossings are required, every effort should be made to minimize the impacts by considering the following:
  - Crossing points should be aligned along areas or corridors of existing disturbance e.g., along existing road crossings.
  - The length of wetlands and rivers / streams crossed at each crossing must be minimised by adjusting alignments to coincide with narrower sections and ensuring that crossings cross perpendicular to flow.

- No new road watercourse crossings should be established as part of the development of the service roads.
- All service roads should follow the existing road network as far as practically possible.
- Where new service roads are aligned near wetlands and streams / rivers, a minimum buffer of 50m should be maintained between the wetland / riparian edge and the edge of the road as far as practically possible.

- Where new wetland and stream / river crossings are required, every effort should be made to minimize the impacts by considering the following:
  - For all crossing types and designs, flow through road crossings should not be unnecessarily concentrated (or impeded) and flow velocity should not be increased. In this regard, wetland and stream / river crossings should be via box/portal culverts established across the entire width of the wetland or riparian zone to avoid flow narrowing and concentration. Open bottom box culverts should be used and they should be sized to transport not only water, but the other materials that might be mobilized (i.e. debris). Pipe culverts should be avoided.
  - Erosion protection and energy dissipation measures should be established at all road crossing outlets e.g. stilling basins and reno-mattresses.
  - All culvert inlets and outlets and associated outlet erosion protection structures must not be raised above the wetland/riparian surface and/or stream/river bed and must be established to reflect the natural downstream slope of the wetland/riparian surface and/or stream / river bed.
  - Crossing points should be aligned along areas or corridors of existing disturbance e.g. along existing informal road crossings or cattle crossing routes.
  - The length of wetlands and rivers / streams crossed at each crossing must be minimised by adjusting alignments to coincide with narrower sections and ensuring that crossings are straight and do not involve using long curves and are aligned at right angles to flow.
  - If any road fill is utilised at wetland crossings, a porous layer should be established within the road fill at the appropriate elevation to ensure that wetland interflow and overland flow is able to pass through the road fill.
- For existing watercourse crossings, every effort should be made to minimize the impacts by considering the following:
  - Undersized or under-designed pipe culverts must be replaced with sufficiently sized box or pipe culverts.
  - Erosion protection and energy dissipation measures should be established at all road crossing outlets e.g. stilling basins and reno-mattresses.
  - Every effort must be made to minimise the upgraded footprint of the existing roads at watercourse crossings.
  - No roads should occur within the highly sensitive landscapes characterised by soil piping and sink holes.
- Stormwater generated by the upgraded and new roads should be discharged at regular intervals and many small outlets should be favoured over a few large outlets.
- Stormwater outlets must not be established within wetlands or riparian zones.
- As far as practically possible, stormwater conveyance should be via open drains rather than pipes and conveyance from the road drains to the outlets should via open drains with vegetated or rough surfaces that are armoured with erosion protection.
- All outlets must be designed to dissipate the energy of outgoing flows to levels that present a low erosion risk. In this regard, suitably designed energy for gravel roads will need to be installed at appropriate locations.
- All erosion protection measures must be established to reflect the natural slope of the surface and located at the natural ground-level.

HERITAGE IMPACT ASSESSMENT

- There is no preference for a route alignment in terms of the Heritage Impact Assessment (HIA). All of the sites can be managed through some form of mitigation. The mitigation is firstly to re-locate the position of the pylons. Where this is not possible, mitigation can be in the form of sampling and/or excavations. One site, British Camp, on the Preferred Alignment requires a slight re-alignment and possible metal detector survey at affected areas. One site on Alternative 1 requires realignment as it is directly over an existing household. The final route alignment with the positions of each pylon needs to be verified by a desktop study.

SPECIALISTS' IMPACTS - CONSTRUCTION PHASE MITIGATION FOR EMPR

AGRICULTURAL IMPACT ASSESSMENT

- A suitably qualified ECO must be appointed prior to the commencement of the construction phase to deal with agriculture and other environmental issues.
- Cement/concrete must only be mixed in the approved demarcated area.
- Drip trays or other impermeable material, such as plastic sheeting, must be placed under construction machinery to avoid soil contamination.
- Burning, burying or dumping of any waste materials must not occur on the site.
- Refuelling should only take place in demarcated areas.
- The appointed ECO should monitor the sanitation of the work sites and that of the Contractor's campsite.
- All solid waste must be disposed of offsite at an approved registered landfill site.
- Vegetation clearance should be restricted to the demarcated development footprints.
- Soil erosion near the demarcated development footprints must be monitored and managed during construction to prevent the loss of additional grazing land due to degradation.
- Disturbance of soils and clearing of vegetation should be kept to a minimum.
- Where possible, construction vehicles should only make use of the designated access routes and construction activities must be limited to the development footprint to avoid loss of grazing land and the generation of dust.
- All temporary construction footprints must be rehabilitated and re-vegetated, as soon as they are no longer required.
- The appointed ECO must monitor erosion during the construction phase. Remedial action must be taken at the first signs of soil erosion during the construction phase.
- Compacted areas should be ripped to loosen the soil structure.
- Topsoil stockpiles must not be compacted.
- The stripping of topsoil should be undertaken in such a manner as to minimise erosion by wind or runoff.
- All foreign materials, which could reduce the quality of the topsoil, such as construction rubble, litter and alien vegetation, must be stored separately.
- Topsoil and subsoil must be separated and replaced in the same sequence during rehabilitation.
- The ECO must approve the stockpiling location prior to the stockpiling of any topsoil.
- Any excess topsoil, which is not used for rehabilitation, must be removed from the site or spread on vulnerable areas.
- Access to the site must be controlled and monitored during construction.
- No unauthorised individuals should be allowed to access the site without permission from the landowners and/or the developers.
- Construction workers must not handle or remove any livestock or wildlife from the site or the surrounding properties.
- Where reasonable and feasible, proposed developments should be placed on land with low agricultural potential.

AQUATIC IMPACT ASSESSMENT

- For all watercourses occurring within 50m of the development activities (e.g. turbine sites, access roads, powerline pylons, etc.), the outer edge of the 50m buffer zone to such watercourses must be staked out by a surveyor and demarcated using brightly coloured shade cloth. This must be completed and approved prior to the commencement of any construction activities.
- For all watercourses where activities encroach within the watercourses or buffer zones, the outer edge of the watercourses and/or remaining buffer zone must be staked out by a surveyor and demarcated using brightly coloured shade cloth. This must be completed and approved prior to the commencement of any construction activities.

- The construction corridor / footprint must be staked out by a surveyor and demarcated using brightly coloured shade cloth. The construction servitude should include the turbine footprints and working area and all new and existing access / haulage roads with a maximum 3m construction working area either side of the access/ haulage roads.
- All areas outside of the delineated construction servitude as defined above and/or within / inside the 50m buffer zone of watercourses must be considered no-go areas for the entire construction phase. Any contractor found working within No-Go areas must be fined as per fining schedule/system setup for the project.
- The demarcation work must be signed off by the Environmental Control Officer (ECO) before any work commences.
- The demarcations are to remain until construction and rehabilitation is complete.

AVIFAUNAL IMPACT ASSESSMENT

- Laydown and other temporary infrastructure to be placed within Low sensitivity areas, preferably previously transformed areas, wherever possible;
- Appropriate run-off and erosion control measures are to be implemented where required;
- A site-specific Environmental Management Programme (EMPr) must be implemented, which gives appropriate and detailed description of how construction activities must be conducted to reduce unnecessary destruction of habitat (e.g., no open fires outside of designated areas);
- All contractors are to adhere to the EMPr and should apply good environmental practice during construction;
- All hazardous materials should be stored in the appropriate manner to prevent contamination of the site and downstream environments. Any accidental chemical, fuel and oil spills that occur at the site should be cleared and disposed of as appropriate for the nature of the spill;
- Existing roads and farm tracks should be used where possible;
- The minimum footprint areas of infrastructure should be used wherever possible, including road widths and lengths;
- No off-road driving should be permitted in areas not identified for clearing;
- An Environmental Site Officer (ESO) must form part of the on-site team to ensure that the EMPr is implemented and enforced and an Environmental Control Officer (ECO) must be appointed to oversee the implementation activities and monitor compliance for the duration of the construction phase; and
- Following construction, rehabilitation of areas disturbed by temporary laydown areas and facilities must be undertaken.
- A site specific EMPr must be implemented, which gives appropriate and detailed description of how construction activities must be conducted;
- All contractors are to adhere to the EMPr and should apply good environmental practice during construction;
- Environmental Officer to oversee activities and ensure that the site specific EMPr is implemented and enforced;
- Maximum use of existing access road and servitudes;
- Existing and novel access roads are to be suitably upgraded or constructed to prevent damage and erosion resulting from increased vehicular traffic and construction vehicles;
- No off-road driving in undesignated areas;
- Speed limits (40 km/h) should be strictly enforced on site to reduce unnecessary noise;
- Construction camps should be lit with as little light as practically possible, with the lights directed downwards where appropriate;
- The movement of construction personnel should be restricted to the construction areas on the project site;
- No dogs or cats other than those of the landowners should be allowed on site;
- The appointed Environmental Officer must be trained to identify the potential Red Data species, as well as the signs that indicate possible breeding by these species;

- The Environmental Officer must, during audits/site visits, make a concerted effort to look out for such breeding activities of SCCs (e.g., cranes, Secretarybird), and such efforts may include the training of construction staff (e.g., in Toolbox talks) to identify Red Data species, followed by regular questioning of staff as to the regular whereabouts on site of these species;
- If any avifaunal SCCs are confirmed to be breeding (e.g., if a nest site is found), construction activities within 500 m of the breeding site must cease, and an avifaunal specialist is to be contacted immediately for further assessment of the situation and instruction on how to proceed;
- Prior to construction, an avifaunal specialist should conduct a site walkthrough, covering the final road and power line routes, as well as temporary laydown areas and facilities, to identify any nests/breeding/roosting activity of sensitive species; and
- The results of which may inform the final construction schedule in close proximity to that specific area, including abbreviating construction time, scheduling activities around breeding activity, and lowering levels of associated noise;
- Maximum use of existing access road and servitudes;
- No off-road driving in undesignated areas;
- Speed limits (40 km/h) should be strictly enforced on site to reduce probability of vehicle collisions;
- The movement of construction personnel should be restricted to the construction areas on the project site;
- No dogs or cats other than those of the landowners should be allowed on site;
- Any holes dug e.g., for foundations of pylons should not be left open for extended periods of time to prevent entrapment by ground dwelling avifauna or their young and only be dug when required and filled in soon thereafter;
- Temporary fencing must be suitably constructed, e.g., if double layers of fencing are required for security purposes, they should be positioned at least 2 m apart to reduce the probability of entrapment by larger bodied species that may find themselves between the two fences; and
- Roadkill is to be reported to the ECO and removed as soon as possible

ECOLOGICAL IMPACT ASSESSMENT

- All necessary permitting and authorisations pertaining to terrestrial biodiversity in the region (i.e., flora and fauna) 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.
- Ground truthing of the site, specifically within the surveyed and demarcated development footprints, must be conducted by an experienced botanist prior to vegetation clearance, to ensure that no populations of restricted range species will be lost. If it is found that there are populations that will be affected, then infrastructure associated with the proposed development (e.g., access tracks and pylons), should be adjusted to avoid these areas.
- A comprehensive Search and Rescue for fauna and flora should be conducted prior to vegetation clearance.
- All SCC which are known to survive translocation must be relocated to nearest appropriate habitat.
- An Erosion Management Plan must be developed prior to the commencement of construction activities to mitigate the unnecessary loss of topsoil and runoff.
- The Alien Invasive Vegetation Management Plan compiled for the proposed Mulilo Newcastle WEF Complex and associated grid infrastructure must be implemented and adhered to during all phases of the proposed development.
- A comprehensive Rehabilitation Management Plan should be compiled and implemented. Only indigenous plant species typical of the local vegetation should be used for rehabilitation purposes.

HERITAGE IMPACT ASSESSMENT

All of these sites can be avoided with minor re-adjustments to the location and/or angle of the pylon. Alternatively, each site can be mitigated in the following manner of there is no technical possibility of re-aligning the pylon.

Any site within 50m of the pylon requires buffering and demarcation as well as the following:

- Farm houses:
  - Photograph and general map
  - Sample/excavate old middens that will be affected
  - Monitor areas for possible middens during construction
  - Existing buildings and/or ruins cannot be disturbed otherwise a permit is required.
  - Permit will require additional assessment from the Built Environment specialist.
- Features
  - Fully recorded, map and photograph
  - Permits will be required if (partially) damaged
- General buildings
  - Photograph and general map
  - Permits will be required if (partially) damaged
- Graves
  - May not impact on graves
  - Keep 20m buffer from all graves.
  - No permits will be issued
- Houses
  - Pre-1960 houses need to be mapped and photographed
  - Possibility of subsurface graves
  - Permits will be required if (partially) damaged
- Kraals
  - Fully recorded, map and photograph
  - Assess for graves
  - Permits will be required if (partially) damaged
- Stone walling
  - Fully recorded, map and photograph
  - Assess for graves
  - Permits will be required if (partially) damaged

Any built structure or midden over 60 years in age will require a permit to partially damage/alter/demolish and to sample or excavate

SOCIO-ECONOMIC IMPACT ASSESSMENT

- Maximise local employment and local content (the Project's direct sending area) through the Preferential Procurement Plan and Contractor Social Management Plan (CSMP) for all contractors that are used.
- Involve local government structures from the early processes (from financial close already if possible). Determine their existing process with regards to a labour desk and streamline employment processes between the various stakeholders.
- Appoint a Community Employer Relations Officer / Community Liaison Officer (CLO). Communicate with communities through this one channel to ensure transparency, limit unrealistic expectations and to avoid conflict.
- Maximise local content of procurement by procuring from the local and regional study areas as far as possible.
- Join the existing Newcastle LED Forum and establish links with the local trade and industry sectors and suppliers.
- Include minimum thresholds in the CSMP for local employment, BBBEE procurement, SMME targets, local services providers, etc.

- Discuss construction timelines with landowners so that grazing of livestock can take place away from the construction area.
- Negotiate compensation (e.g. through conditions of lease and/or servitude agreements) with farmers whose crops will be affected by dust and/or the construction activities.
- Implement a land use management plan in conjunction with the landowners.
- Include the Newcastle, Dannhauser, Emadlangeni, Phumelela and the Dr Pixley Ka Isaka Seme LM's LED Units in all relevant processes from the onset of the Project.
- The developer is encouraged to take part / slot in with the various municipal initiatives and interventions to develop SMME's to enable them to take part in the Project's construction phase
- Where feasible the developer should:
  - Make the skill requirements clear to the municipalities in advance and do a skills analysis of the available labour force.
  - Do a Value-chain analysis of services required (directly and indirectly related to construction) and communicate this to local and district municipalities in advance so that they are prepared and equipped to take part in the tender process.
  - Require larger contractors to work with small SMMEs to train and transfer skills and include this in their respective CSMP's.
  - Implement on-the-job training for unskilled workers.
  - Capacitate the local government structures by involving them as early as possible in the Project; remain transparent throughout the processes.
  - Negotiate a Memorandum of Understanding (MoU) with the municipalities so that each role player is clearly aware of its roles, responsibilities and timelines in the Project processes.
  - Establish an Environmental Management Committee (EMC) or similar Forum for the duration of construction to aid communication and transparency with local government. Members of the EMC/Forum to meet on a quarterly basis to discuss issues that may arise during the course of the construction period (if feasible).
- Obtain inputs from the respective local and district municipalities on the contents of the Procurement strategy and Employment Equity Plan to be implemented.
- Include targets for the inclusion of Youth, women and the disabled in the Employment Equity Plan and obtain the local and district municipalities' inputs in this regard.
- Clearly identify the beneficiary communities / labour sending area and compile the employment strategy in collaboration with the affected municipalities' LED Units.
- Encourage the affected local municipalities to draw up a cooperation agreement that specifies the percentages of the workforce that will be sourced from each municipality.
- Ensure that the Community Employer Relations Officer / CLO has knowledge of the local communities, is educated with good public relation skills, committed to the cause and is accessible for community members.
- Contractually oblige contractors and sub-contractors to only source labour through the labour desk /job registration database and make this known to the target communities.
- Work through limited communication channels (e.g. Ward Councillors and the Employer Relations Officer / CLO).
- Be vigilant not to raise unrealistic expectations amongst the local communities and workers with regards to employment, skills requirements, local procurement and so forth. Ensure transparency through the Ward Councillors, CLO and the EMC / Forum.
- No recruitment of temporary workers at the access to the construction site.
- As part of their CSMP's, contractors to provide a transport and housing plan: (i) no workers are allowed to be housed on site or in informal housing / settlements; (ii) allow workers that do not live nearby time to return to their families at regular intervals or over weekends.

- No workers to remain on site after shifts.
- No informal traders to be allowed on or near the construction site/s.
- It is also recommended that the Developer embarks on a Social Awareness Campaign for the workforce that focuses on sexual health, unwanted pregnancies and related social issues.
- Do a security risk assessment (if required) and base the exact security measures on the detailed assessment of the risks at the site.
- 24-hour security, demarcate and fence the construction site (if possible), material stores to be secured, access control and no trespassing of workers outside designated construction areas.
- Join the local community policing forum and similar initiatives (e.g. Amajuba District Fire Technical Task Team) for the duration of construction.
- Keep the local SAPS, other emergency services, Ward Councillors, landowners and other relevant stakeholders informed about the construction progress and time-lines.
- Develop a Fire / Emergency Management Plan in conjunction with affected and neighbouring landowners.
- Dispose of the various types of waste generated in the appropriate manner at licensed waste landfill sites at regular intervals. Comply with the waste management plan compiled for the construction phase.
- Display “danger” warning signs and “no public access” signs at all potential accesses, paths and along the periphery of the construction areas in English and the local languages.
- If water for construction is obtained from a natural water resource, comply with the Water Use Licence conditions for the duration of the construction period.
- Ensure implementation of the provisions of the Occupational Health and Safety Act No. 85 of 1993 and adhere to the Emergency and Safety plan procedures for the duration of the construction phase.
- Rehabilitate the veld to its original state post construction.
- Keep open communication channels with the landowners and address any potential issues as a matter of priority.
- Make contact details of the main contractor and procedures to lodge complaints available to landowners and the local communities through the Ward Councillors and EMC / Forum.
- Make a complaints register / log book available at the entrance to the construction site and act immediately should issues arise.
- Consult with surrounding landowners whose livestock, private residences and other infrastructure could be affected by dust, noise and other impacts that result from traffic movement and general construction activities.
- Where required, draw up a land use management plan with individual landowners to protect livestock and farmland, which addresses restricted access areas, procedures when farm gates are opened and closed and so forth.
- Rehabilitate the areas post construction and maintain the access roads.
- Implement all relevant measures as proposed by the VIA Specialist to limit visual intrusion to the maximum.
- Maintain the servitude / access track for the duration of the Project.

VISUAL IMPACT ASSESSMENT

- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
- Plan ancillary infrastructure (i.e., substation and workshop) in such a way and in such a location that clearing of vegetation is minimised. Consolidate existing infrastructure as much as possible and make use of already disturbed areas rather than pristine sites wherever possible.
- Use existing roads wherever possible. Where new roads are required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible and should never traverse slopes at 90 degrees. Construction of roads should

be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
- Access roads, which are not required post-construction, should be ripped and rehabilitated.
- Mitigation of visual impacts associated with the construction phase, albeit temporary, entails proper planning, management and rehabilitation of all construction sites. Construction should be managed according to the following principles:
  - Ensure that vegetation is not unnecessarily cleared or removed during the construction period.
  - Reduce the construction period through careful logistical planning and productive implementation of resources.
  - Plan the placement of lay-down areas and any potential temporary construction camps along the corridor in order to minimise vegetation clearing.
  - Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
  - Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
  - Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).
  - Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.
  - Ensure that all infrastructure and the site and general surrounds are maintained and kept neat.
  - Rehabilitate all disturbed areas, construction areas, roads, slopes etc. immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.
  - Monitor all rehabilitated areas for at least a year for rehabilitation failure and implement remedial action as required. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.

Mitigation of other lighting impacts includes the pro-active design, planning and specification lighting for the substation. The correct specification and placement of lighting and light fixtures will go far to contain rather than spread the light. Additional measures include the following:

- Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself).
- Limiting mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights;
- Making use of minimum lumen or wattage in fixtures.
- Making use of down-lighters, or shielded fixtures.
- Making use of Low-Pressure Sodium lighting or other types of low impact lighting.
- Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.

- During Operations, monitor the general appearance of the facility as a whole as well as all rehabilitated areas. Implement remedial action where required.
- Secondary impacts anticipated as a result of the proposed infrastructure (i.e., impacts on landscape character and sense of place) are not possible to mitigate.
- After decommissioning, all infrastructure should be removed and all disturbed areas appropriately rehabilitated. Monitor rehabilitated areas post-decommissioning and implement remedial actions and consult an ecologist regarding rehabilitation specifications if necessary.

The possible mitigation of both primary and secondary visual impacts as listed above should be implemented and maintained on an on-going basis.

SPECIALISTS' IMPACTS – OPERATIONAL PHASE MITIGATION FOR EMPR

AGRICULTURAL IMPACT ASSESSMENT

- All maintenance equipment and vehicles should only make use of the designated access routes and internal roads.
- Soil erosion should be monitored during the operational phase and remedial action must be taken at the first signs of increased soil erosion.
- No unauthorised individuals should be allowed to access the site without permission from the landowners and/or the developers.
- Maintenance workers must not handle or remove any livestock or wildlife from the site or surrounding properties.

AQUATIC IMPACT ASSESSMENT

- Maintenance and management:
  - It is the applicant's responsibility to ensure the proper functioning of infrastructure that is likely to require regular on-going maintenance. This includes the stormwater management infrastructure and road infrastructure.
  - It is important that the location and extent of the rivers and wetlands in the vicinity of project activities be incorporated into all formal maintenance and repair plans for the project.
  - In terms of management, alien invasive plant control must be practiced on an on-going basis in line with the requirements of Section 2(2) and Section 3 (2) the National Environmental Management: Biodiversity Act (NEM:BA), which obligates the landowner/developer to control IAPs on their property.
- Monitoring:
  - The following key aspects should be monitored
    - Erosion and/or sedimentation in the onsite and downstream wetlands
    - Water table monitoring to determine any impacts to subsurface inputs; and
    - Presence of alien invasive plants.
- Remediation/ Rehabilitation:
  - Where appreciable direct vegetation/habitat impacts and/or indirect erosion/sedimentation impacts or hydrological impacts occur resulting from project activities, these must be reported immediately to the relevant environmental authorities, and an independent aquatic or wetland specialist appointed to conduct a site inspection to assess the residual impacts and determine the need for any onsite remediation or rehabilitation requirements. Following this assessment, an implementable remediation and/or wetland rehabilitation plan may need to be compiled and implemented to the satisfaction of KZN EDTEA and DWS.

AVIFAUNAL IMPACT ASSESSMENT

- A site specific operational EMPr must be implemented, which gives appropriate and detailed description of how operational and maintenance activities must be conducted to reduce unnecessary disturbance;
- All contractors are to adhere to the environmental management programme and should apply good environmental practice during all operations
- Operational phase bird monitoring, in line with the latest available guidelines, must be implemented.
- Reduction in the traverse of areas identified to be of elevated avifaunal sensitivity as far as practically feasible;
- Pylons to be staggered (where possible) relative to adjacent pylon positions to increase the overall visibility of transmission infrastructure to avifauna;
- Appropriate (approved) Bird flight diverters (BFDs) to be affixed to the entire length of novel overhead power lines;

- All new OTL pylons must be of a design that minimizes electrocution risk by using adequately insulated 'bird friendly' structures, with sufficient clearances between live components to reduce the risk of electrocution;
- Anti-perch devices are to be attached to all potential perches in proximity to energized infrastructure;
- Develop and implement a carcass search and fatality monitoring programme in-line with the latest applicable guidelines;
- Regular reviews of operational phase monitoring data and results to be conducted by an avifaunal specialist. If one or more avifaunal SCC carcasses are located and determined likely to have resulted from collisions with infrastructure in any sensitivity area over the lifespan of the facility the fatality is to be appropriately recorded and reported to an avifaunal specialist to determine the most appropriate action;
- Any fatalities located should be reported to Birdlife South Africa (BLSA) and the Endangered Wildlife Trust (EWT); and
- Prevent birds from nesting in, or perching on substation infrastructure through exclusion covers or spikes if required (determined on a case-by-case basis)

ECOLOGICAL IMPACT ASSESSMENT

- All necessary permitting and authorisations pertaining to terrestrial biodiversity in the region (i.e., flora and fauna) 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.
- Ground truthing of the site, specifically within the surveyed and demarcated development footprints, must be conducted by an experienced botanist prior to vegetation clearance, to ensure that no populations of restricted range species will be lost. If it is found that there are populations that will be affected, then infrastructure associated with the proposed development (e.g., access tracks and pylons), should be adjusted to avoid these areas.
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  - Sample/excavate old middens that will be affected
  - Monitor areas for possible middens during construction
  - Existing buildings and/or ruins cannot be disturbed otherwise a permit is required.
  - Permit will require additional assessment from the Built Environment specialist.
- Features
  - Fully recorded, map and photograph
  - Permits will be required if (partially) damaged
- General buildings

- Photograph and general map
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- Graves
  - May not impact on graves
  - Keep 20m buffer from all graves.
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- Houses
  - Pre-1960 houses need to be mapped and photographed
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- Include minimum thresholds in the CSMP for local employment, BBBEE procurement, SMME targets, local services providers, etc.
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- Negotiate compensation with farmers (e.g. through conditions of lease and/or servitude agreements) whose crops will be affected by dust and/or the construction activities.
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- Include the Newcastle, Dannhauser, Emadlangeni, Phumelela and the Dr Pixley Ka Isaka Seme LM's LED Units in all relevant processes from the onset of the Project.
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- Where feasible the developer should:
  - Make the skill requirements clear to the municipalities in advance and do a skills analysis of the available labour force.

- Do a Value-chain analysis of services required (directly and indirectly related to construction) and communicate this to local and district municipalities in advance so that they are prepared and equipped to take part in the tender process.
- Require larger contractors to work with small SMMEs to train and transfer skills and include this in their respective CSMP's.
- Implement on-the-job training for unskilled workers.
- Capacitate the local government structures by involving them as early as possible in the Project; remain transparent throughout the processes.
- Negotiate a Memorandum of Understanding (MoU) with the municipalities so that each role player is clearly aware of its roles, responsibilities and timelines in the Project processes.
- Establish an Environmental Management Committee (EMC) or similar Forum for the duration of construction to aid communication and transparency with local government. Members of the EMC/Forum to meet on a quarterly basis to discuss issues that may arise during the course of the construction period (if feasible).

- Obtain inputs from the respective local and district municipalities on the contents of the Procurement strategy and Employment Equity Plan to be implemented.
- Include targets for the inclusion of Youth, women and the disabled in the Employment Equity Plan and obtain the local and district municipalities' inputs in this regard.
- Clearly identify the beneficiary communities / labour sending area and compile the employment strategy in collaboration with the affected municipalities' LED Units.
- Encourage the affected local municipalities to draw up a cooperation agreement that specifies the percentages of the workforce that will be sourced from each municipality.
- Ensure that the Community Employer Relations Officer / CLO has knowledge of the local communities, is educated with good public relation skills, committed to the cause and is accessible for community members.
- Contractually oblige contractors and sub-contractors to only source labour through the labour desk /job registration database and make this known to the target communities.
- Work through limited communication channels (e.g. Ward Councillors and the Employer Relations Officer / CLO).
- Be vigilant not to raise unrealistic expectations amongst the local communities and workers with regards to employment, skills requirements, local procurement and so forth. Ensure transparency through the Ward Councillors, CLO and the EMC / Forum.
- No recruitment of temporary workers at the access to the construction site.
- As part of their CSMP's, contractors to provide a transport and housing plan: (i) no workers are allowed to be housed on site or in informal housing / settlements; (ii) allow workers that do not live nearby time to return to their families at regular intervals or over weekends.
- No workers to remain on site after shifts.
- No informal traders to be allowed on or near the construction site/s.
- It is also recommended that the Developer embarks on a Social Awareness Campaign for the workforce that focuses on sexual health, unwanted pregnancies and related social issues.
- Do a security risk assessment (if required) and base the exact security measures on the detailed assessment of the risks at the site.
- 24-hour security, demarcate and fence the construction site (if possible), material stores to be secured, access control and no trespassing of workers outside designated construction areas.
- Join the local community policing forum and similar initiatives (e.g. Amajuba District Fire Technical Task Team) for the duration of construction.
- Keep the local SAPS, other emergency services, Ward Councillors, landowners and other relevant stakeholders informed about the construction progress and time-lines.

- Develop a Fire / Emergency Management Plan in conjunction with affected and neighbouring landowners.
- Dispose of the various types of waste generated in the appropriate manner at licensed waste landfill sites at regular intervals. Comply with the waste management plan compiled for the construction phase.
- Display “danger” warning signs and “no public access” signs at all potential accesses, paths and along the periphery of the construction areas in English and the local languages.
- If water for construction is obtained from a natural water resource, comply with the Water Use Licence conditions for the duration of the construction period.
- Ensure implementation of the provisions of the Occupational Health and Safety Act No. 85 of 1993 and adhere to the Emergency and Safety plan procedures for the duration of the construction phase.
- Rehabilitate the veld to its original state post construction.
- Keep open communication channels with the landowners and address any potential issues as a matter of priority.
- Make contact details of the main contractor and procedures to lodge complaints available to landowners and the local communities through the Ward Councillors and EMC / Forum.
- Make a complaints register / log book available at the entrance to the construction site and act immediately should issues arise.
- Consult with surrounding landowners whose livestock, private residences and other infrastructure could be affected by dust, noise and other impacts that result from traffic movement and general construction activities.
- Where required, draw up a land use management plan with individual landowners to protect livestock and farmland, which addresses restricted access areas, procedures when farm gates are opened and closed and so forth.
- Rehabilitate the areas post construction and maintain the access roads.
- Implement all relevant measures as proposed by the VIA Specialist to limit visual intrusion to the maximum.
- Maintain the servitude / access track for the duration of the Project.

VISUAL IMPACT ASSESSMENT

- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
- Plan ancillary infrastructure (i.e., substation and workshop) in such a way and in such a location that clearing of vegetation is minimised. Consolidate existing infrastructure as much as possible and make use of already disturbed areas rather than pristine sites wherever possible.
- Use existing roads wherever possible. Where new roads are required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible and should never traverse slopes at 90 degrees. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
- Access roads, which are not required post-construction, should be ripped and rehabilitated.
- Mitigation of visual impacts associated with the construction phase, albeit temporary, entails proper planning, management and rehabilitation of all construction sites. Construction should be managed according to the following principles:
  - Ensure that vegetation is not unnecessarily cleared or removed during the construction period.
  - Reduce the construction period through careful logistical planning and productive implementation of resources.
  - Plan the placement of lay-down areas and any potential temporary construction camps along the corridor in order to minimise vegetation clearing.
  - Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.

- Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
- Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).
- Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.
- Ensure that all infrastructure and the site and general surrounds are maintained and kept neat.
- Rehabilitate all disturbed areas, construction areas, roads, slopes etc. immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.
- Monitor all rehabilitated areas for at least a year for rehabilitation failure and implement remedial action as required. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.

Mitigation of other lighting impacts includes the pro-active design, planning and specification lighting for the substation. The correct specification and placement of lighting and light fixtures will go far to contain rather than spread the light. Additional measures include the following:

- Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself).
- Limiting mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights;
- Making use of minimum lumen or wattage in fixtures.
- Making use of down-lighters, or shielded fixtures.
- Making use of Low-Pressure Sodium lighting or other types of low impact lighting.
- Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.

- During Operations, monitor the general appearance of the facility as a whole as well as all rehabilitated areas. Implement remedial action where required.
- Secondary impacts anticipated as a result of the proposed infrastructure (i.e., impacts on landscape character and sense of place) are not possible to mitigate.
- After decommissioning, all infrastructure should be removed and all disturbed areas appropriately rehabilitated. Monitor rehabilitated areas post-decommissioning and implement remedial actions and consult an ecologist regarding rehabilitation specifications if necessary.

The possible mitigation of both primary and secondary visual impacts as listed above should be implemented and maintained on an on-going basis.

SPECIALISTS' IMPACTS – DECOMMISSIONING PHASE MITIGATION FOR EMPR

The proposed Mulilo Newcastle Wind Power Grid Connection are likely to be used over an extensive period due to the lifespan of the Mulilo Newcastle WEF and decommissioning is not foreseen in the near future.

Should the Mulilo Newcastle Wind Power Grid Connection be decommissioned in the long-term, the following is recommended:

- All infrastructure should be removed and all disturbed areas appropriately rehabilitated. Monitor rehabilitated areas post-decommissioning and implement remedial actions and consult an ecologist regarding rehabilitation specifications if necessary.

12.10. RECOMMENDATIONS BY STAKEHOLDERS AND/OR I&APS

The following Stakeholder mitigation measures were received during the PPP of the MNWP Grid Connection Basic Assessment process. These mitigation measures must be audited as part of the listed mitigation measures above, as well as the EA conditions.

12.10.1. DFFE: BIODIVERSITY AND CONSERVATION

- The proposed project layout plan must prioritise the development in areas of low ecological importance and ensure that all activities within a sensitive area that will result with significant negative residual impacts after mitigation are prohibited.
- Disturbed areas must be rehabilitated as soon as possible after construction with locally indigenous plants to enhance the conservation of existing natural vegetation on site.
- The 'no-go' areas of the development property must be clearly demarcated and excluded from the final layout plan. No construction camps, temporary or permanent laydown areas or any activities associated with the development are to be located within the National Protected Areas Expansion Strategy focus area (NPAES).
- The facility must be designed in a manner such that infrastructure components that could be used as perching or roosting substrates by birds and bats must be prohibited.
- Anti-collision devices such as bird flappers must be installed where power lines cross avifaunal corridors (e.g. grasslands, rivers, wetlands, and dams). The input of an avifaunal specialist must be obtained. For the fitting of the anti-collision devices onto specific sections of the line once the exact positions of the towers have been surveyed and pegged. Additional areas of high sensitivity along the preferred alignment must also be identified by the avifaunal specialist for the fitment of anti-collision devices. These devices must be according to Eskom's Transmission and EWT's Guidelines.
- A pre-construction walk through on the selected power line alignment by avifaunal specialist and ecologist, must be conducted to ensure that the micro-siting of the power line has the least possible impact, there are no nests sites of priority species on or close to the construction corridor and all species of conservation concern which might be impacted are identified. This is to ensure that the correct permits are applied for but also to identify any new features (such as nests) prior to the commencement of the construction phase.
- The development must comply with the generic Environmental Management Programme report (EMPr) for the development and expansion for overhead electricity transmission and distribution infrastructure.

13. APPENDIX A: CURRICULUM VITAE OF THE ENVIRONMENTAL TEAM

→ Dr Alan Carter (CES, *Executive and Principal Consultant*)
→ Ms Sinazo Nyudwana (CES, *Environmental Consultant*)

14. APPENDIX B: EAP DECLARATION

15. APPENDIX C: SPECIALIST REPORTS & DECLARATIONS

PLEASE SEE THE SEPARATE SPECIALIST REPORTS, AS LISTED BELOW

- Agricultural Impact Assessment (Index)
- Aquatic & Wetland Ecosystem Impact Assessment (Verdant)
- Avifaunal Impact Assessment (ERM)
- Ecological Impact Assessment (CES)
- Heritage and Palaeontological Impact Assessment (Umlando)
- Socio-Economic Impact Assessment (Index)
- Visual Impact Assessment (Nuleaf)

16. APPENDIX D: SPECIALIST CVs & DECLARATIONS

PLEASE SEE THE SEPARATE SPECIALIST CVS AND DECLARATIONS

17. APPENDIX E: ENVIRONMENTAL MANAGEMENT PROGRAMMES

PLEASE SEE THE SEPARATE GENERIC EMPR POWERLINE & GENERIC EMPR SUBSTATION

18. APPENDIX F: SITE SENSITIVITY

PLEASE SEE THE SEPARATE REPORTS, AS LISTED BELOW.

- → F1: DFFE Screening Tool Report
- → F2: Site Sensitivity Verification Report

19. APPENDIX G: IMPACTS TABLES

PLEASE SEE THE SEPARATE IMPACTS TABLES, AS LISTED BELOW.

- G1: General Impacts Table
- G2: Specialist Impacts Table

20. APPENDIX H: PROOF OF PPP

THIS SECTION WILL BE UPDATED IN THE FINAL BAR, AFTER THE 30-DAY PUBLIC REVIEW PERIOD.

21. APPENDIX I: SITE PHOTOGRAPHS

PLEASE SEE THE SITE PHOTOGRAPHS