ABO Uvemvane Wind Energy Facility 1 (Pty) Ltd

ABO UVEMVANE WIND ENERGY FACILITY 1, LOCATED NEAR HEIDELBERG AND BALFOUR IN THE GAUTENG AND MPUMALANGA PROVINCES

Draft Environmental Impact Assessment Report (Resubmission)

RESUBMISSION REF NO. TBC
OCTOBER 2026

PUBLIC

ABO Uvemvane Wind Energy Facility 1 (Pty) Ltd

ABO UVEMVANE WIND ENERGY FACILITY 1, LOCATED NEAR HEIDELBERG AND BALFOUR IN THE GAUTENG AND MPUMALANGA PROVINCES

Draft Environmental Impact Assessment Report (Resubmission)

FINAL REPORT (VERSION 1) PUBLIC

PROJECT NO. 41106304

OUR REF. NO. RESUBMISSION REF NO. TBC

DATE: OCTOBER 2026

ABO Uvemvane Wind Energy Facility 1 (Pty) Ltd

ABO UVEMVANE WIND ENERGY FACILITY 1, LOCATED NEAR HEIDELBERG AND BALFOUR IN THE GAUTENG AND MPUMALANGA PROVINCES

Draft Environmental Impact Assessment Report (Resubmission)

WSP

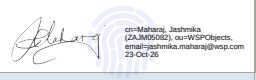
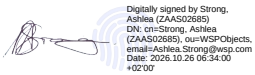
Building 1, Maxwell Office Park
Magwa Crescent West, Waterfall City
Midrand, 1685
South Africa

Phone: +27 11 254 4800

WSP.com

PUBLIC

QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Draft EIA Report	Final EIA Report	Resubmission: Draft EIA Report	
Date	August 2026	October 2026	October 2026	
Prepared by	Palisa Bhengu	Palisa Bhengu	Jashmika Maharaj	
Signature				
Checked by	Jashmika Maharaj	Jashmika Maharaj	Ashlea Strong	
Signature				
Authorised by	Ashlea Strong	Ashlea Strong	Ashlea Strong	
Signature				
Project number	41106304	41106304	41106304	
Report number	01	01	01	
File reference	"Z:\ZA\Projects\41100xxx\41106304 - ABO Uvemvane WEF\41 PA\01-Reports\04-EIA"			

GENERAL SITE INFORMATION

The extent of the proposed project area, which spans two provinces and three local municipalities, necessitates consideration of multiple environmental, social and administrative contexts. While every effort has been made to present information in a clear and accessible manner, the level of detail included in this report is intended to ensure a comprehensive, transparent and balanced assessment of all relevant issues and jurisdictions.

Technical details of the proposed ABO Uvemvane Wind Energy Facility 1		
Location of Site	Approximately 9km west of the town of Balfour in the Mpumalanga Province in the Dipaleseng Local Municipality within the Gert Sibande District Municipality and approximately 14km south-east of the town Heidelberg in the Gauteng Province in the Lesedi & Midvaal Local Municipalities within the Sedibeng District Municipality.	
Description of all affected farm portions and 21-digit SG Codes	**Farm Name**	**21-Digit SG Code**
	The Remaining Extent of Portion 2 of the Farm Lagerspoort Number 406	T0IR00000000040600002
	Portion 17 (a Portion of Portion 3) of the Farm Lagerspoort Nr 406	T0IR00000000040600017
	Remaining Extent of Portion 4 of the Farm De Hoek 411	T0IR00000000041100004
	Portion 45 of the Farm Lagerspoort 406	T0IR00000000040600045
	Portion 7 of the Farm Lagerspoort Number 406	T0IR00000000040600007
	Portion 19 of the Farm De Hoek No 411	T0IR00000000041100019
	Remaining Extent of Portion 2 of the Farm Modderfontein 410	T0IR00000000041000002
	The Farm Orion No 413	T0IR00000000041300000
	Remaining Extent of Portion 5 of the Farm Lagerspoort 406	T0IR00000000040600005
	Portion 7 of the Farm Driefontein 405	T0IR00000000040500007
	Remaining Extent of Portion 9 of the Farm Malanskraal No 407	T0IR00000000040700009
	Remaining Extent of Portion 2 of the Farm Malanskraal 407	T0IR00000000040700002
	Portion 12 (a Portion of Portion 2) of the Farm Malanskraal 407	T0IR00000000040700012
	Remaining Extent of Portion 2 of the Farm Driefontein 405	T0IR00000000040500002
	Remaining Extent of the Farm Driefontein 405	T0IR00000000040500000
	Remainder of Portion 6 (Kingsmead) of the Farm Malanskraal 407	T0IR00000000040700006
	Portion 17 (a Portion of Portion 8) of the Farm Malanskraal No 407	T0IR00000000040700017

Technical details of the proposed ABO Uvemvane Wind Energy Facility 1		
	Farm Bothas Spruit Nr. 404	T0IR00000000040400000
	Portion 16 (a Portion of Portion 4) of the Farm Malanskraal No 407	T0IR00000000040700016
	Remaining Extent of Portion 13 (a Portion of Portion 2) of the Farm Malanskraal 407	T0IR00000000040700013
	Remainder of Portion 18 (a Portion of Portion 3) of the Farm Malanskraal 407	T0IR00000000040700018
	Portion 1 of the Farm Weltevreden Nr. 449	T0IR00000000044900001
Central coordinates of the site and activity location	26°40'4.00"S 28°26'1.58"E	
Total Area of Applicable Farm Portions	A preferred study area with a total combined extent of approximately 8,200 ha was identified as a technically suitable project site for the development of the WEF project, within this an affected area of approximately **6000 ha** has been assessed.	
Design Specifications		
Total Buildable Area (i.e. likely footprint area)	Approximately 67.2 ha: • Turbines/ hardstands/foundations: up to 1Ha per turbine (up to 20ha) • Roads: up to 31km (approx. 18km of which are existing roads to be widened) • Electrical Infrastructure Hub: up to 7ha • Temporary Laydown Areas: 4 x laydown areas (includes concrete batching plant) totalling up to 15ha • Internal Underground Cabling: up to 31km, but nothing beyond proposed roads so has been included in road footprint • 33kV OHL/underground facility connection: Up to 0.02ha	
Export Capacity	Up to 170MWac	
Technology	Wind	
Number of Wind Turbines	Up to 20	
Turbine Specs/ Aspects	Maximum hub height 180 m; Maximum blade length 100 m; Maximum rotor diameter 200 m; Maximum capacity per turbine 10 MW; A transformer at the base of each turbine; Concrete turbine foundations up to 1 ha each; Turbine, crane, and blade hardstands (included in the abovementioned 1 ha).	
Electrical Infrastructure Hub (with collector sub-station, sub-station, and Battery Energy Storage System (BESS) infrastructure)	Three (3) locations have been assessed and all three are being applied for noting that only one will be constructed based on technical feasibility to be confirmed at pre-construction stage (Up to 7ha)	
Construction camp and laydown area	4 temporary laydown areas/ construction compounds (includes concrete batching), totalling up to 15 ha, would be fenced with access control.	

Technical details of the proposed ABO Uvemvane Wind Energy Facility 1	
Access Routes	Five (5) existing routes; four of these are off existing unnamed farm roads (originating from the D1220 and P243/1), and one is off Lagerspoort Road from Heidelberg - Balfour Road (R23). The Details of the access would be as per the recommendations in the Transport Impact Assessment.
Internal Road Lengths	Up to 31km (approx. 18km of which are existing roads to be widened) Primary/main access roads as well as internal road reticulation (note that existing roads/disturbed areas would be used as far as possible, and for the proposed roads, a corridor of up to 12 m wide may be temporarily impacted upon during construction and be rehabilitated to up to 10 m wide after construction), inclusive of stormwater infrastructure where relevant.
Associated infrastructure	Includes the following (to be located within the proposed development footprint): Associated internal electrical reticulation/ cabling (i.e., low- and medium voltage powerlines), underground as far as is feasible, and to run within the proposed road footprint/route as far as possible; A 33kV overhead/underground line to connect the northern and southern portions of the facility; and On-site electrical infrastructure hub (up to 7ha in extent). Note there are three (3) locations assessed as options, however only one will be constructed, consisting of: • On-site substation and associated infrastructure; • Additional step-up/ transformation /collector /switchyard infrastructure; • Auxiliary buildings, including but not limited to O&M building(s), administrative buildings, workshops, gatehouses, security buildings, control centres, offices, visitor centres, warehouses, etc; • The installation of a communications tower (maximum height 32 m) and/or lighting mast (maximum height 25 m); and • BESS.

GLOSSARY

Abbreviation	Definition
ABO	ABO Energy South Africa (Pty) Ltd
ADL	Allowable Development Limit
AIP	Alien Invasive Plant
AIS	Alien and Invasive Species
ATNS	Air Traffic and Navigation Services
BESS	Battery Energy Storage System
BMP	Biodiversity Management Plan
CBA	Critical Biodiversity Area
CBAs	Critical Biodiversity Areas
CARA	Conservation of Agricultural Resources Act, No. 43 of 1983
CTS	Cedar Tower Services
DAFF	Department of Agriculture, Forestry and Fisheries
DLRRD	Department of Land Reform and Rural Development
DARDLEA	Department of Agriculture, Rural Development, Land and Environmental Affairs
DEIR	Draft Environmental Impact Report
DFFE	Department of Forestry, Fisheries and the Environment
DLM	Dipaleseng Local Municipality
DMPR	Department of Mineral and Petroleum Resources
DoA	Department of Agriculture
DoT	Department of Transport
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa

Abbreviation	Definition
ECA	Environment Conservation Act, No. 73 of 1989
EHA	Environmental Health and Safety
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EIAr / EIR	Environmental Impact Assessment Report
EIH	Electrical Infrastructure Hub
EMPr	Environmental Management Programme
ERA	Electricity Regulation Act, No. 4 of 2006
ESA	Ecological Support Area
ESMS	Environmental and Social Management System
FEIR	Final Environmental Impact Report
GDARD	Gauteng Department of Agriculture and Rural Development
GDEnv	Gauteng Department of Environment
GN	Government Notice
GNR	Government Notice Regulation
ha	Hectare
I&AP	Interested and Affected Party
ICAO	International Civil Aviation Organisation
ICASA	Independent Communications Authority of South Africa
IDC	Integrated Development Plan
IEM	Integrated Environmental Management
IFC	International Finance Corporation
IEP	Integrated Energy Plan
ISA	Infrastructure South Africa
JET	Just Energy Transition
km	Kilometre

Abbreviation	Definition
kV	Kilovolt
LLM	Lesedi Local Municipality
MBSP	Mpumalanga Biodiversity Sector Plan
MLM	Midvaal Local Municipality
m	Metre
MW	Megawatt
MWac	Megawatt Alternating Current
N/A	Not Applicable
NDP	National Development Plan
NEMA	National Environmental Management Act, No. 107 of 1998
NEMBA	National Environmental Management: Biodiversity Act, No. 10 of 2004
NEMAQA	National Environmental Management: Air Quality Act, No. 39 of 2004
NEMWA	National Environmental Management: Waste Act, No. 59 of 2008
NGO	Non-Governmental Organisation
NGI	National Geo-spatial Information
O&M	Operations and Maintenance
OHSA	Occupational Health and Safety Act, No. 85 of 1993
OHL	Overhead Line
PPS	Public Participation Specialist
PS	Performance Standard
PSDF	Provincial Spatial Development Framework
PV	Photovoltaic
SACAA	South African Civil Aviation Authority
SANS	South African National Standard
SARPs	Standards and Recommended Practices
SAREM	South African Renewable Energy Masterplan
S&EIR	Scoping and Environmental Impact Report

Abbreviation	Definition
SA	South Africa
SEF	Solar Energy Facility
SER	Stakeholder Engagement Report
SDF	Spatial Development Framework
SIP	Strategic Infrastructure Project
SSVR	Site Sensitivity Verification Report
WBG	World Bank Group
WEF	Wind Energy Facility
WSP	WSP Group Africa (Pty) Ltd
WTG	Wind Turbine Generator

CONTENTS

GENERAL SITE INFORMATION 2

GLOSSARY 5

1 INTRODUCTION 31

1.1 PURPOSE OF THIS REPORT 32
1.2 BACKGROUND INFORMATION 32
1.3 PROJECT LOCATION 34
1.4 KEY ROLE PLAYERS 36
1.5 IMPACT ASSESSMENT TERMS OF REFERENCE 40
1.6 OBJECTIVES OF THE S&EIA PROCESS AS PER THE PROCEDURAL FRAMEWORK 41

2 SCOPING PHASE SUMMARY 46

2.1 PROCEDURAL PROCESS 46
2.2 AUTHORITY CONSULTATION 46
2.3 STAKEHOLDER CONSULTATION 47
2.4 SUMMARY OF IMPACT SIGNIFICANCE SCREENING 50

3 EIA PROCESS 57

3.1 APPLICATION FOR ENVIRONMENTAL AUTHORISATION 57
3.2 BASELINE ENVIRONMENTAL ASSESSMENT 59
3.3 IMPACT ASSESSMENT METHODOLOGY 59
3.4 STAKEHOLDER ENGAGEMENT PROCESS 61
3.5 ASSUMPTIONS AND LIMITATIONS 62

4 PROJECT DESCRIPTION 76

4.1 PROPERTY DETAILS 76

4.2 PROJECT ACTIVITY 81
4.3 PROJECT INFRASTRUCTURE 83
4.4 PROPOSED PROJECT DEVELOPMENT ACTIVITIES 85
4.5 NEED AND DESIRABILITY 88
5 PROJECT ALTERNATIVES 102
5.1 TECHNOLOGY ALTERNATIVES 102
5.2 LOCATION ALTERNATIVES 103
5.3 LAYOUT ALTERNATIVES 104
5.4 NO-GO ALTERNATIVE 112
6 GOVERNMENT FRAMEWORK 117
6.1 NATIONAL ENVIRONMENTAL LEGAL FRAMEWORK 117
6.2 POLICIES AND PLANS 131
6.3 PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK 136
6.4 INTERNATIONAL ENVIRONMENTAL AND SOCIAL STANDARDS 138
6.5 GENERIC EMPR RELEVANT TO AN APPLICATION FOR SUBSTATION AND OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE 143
6.6 BIODIVERSITY MANAGEMENT PLAN (BMP) FOR VULTURES 144
6.7 ADDITIONAL PERMITS AND AUTHORISATIONS 145
7 DESCRIPTION BASELINE ENVIRONMENTAL 147
7.1 PHYSICAL ENVIRONMENT 147
7.2 BIOLOGICAL ENVIRONMENT 167
7.3 SOCIAL AND ECONOMIC ENVIRONMENT 279
8 SITE SENSITIVITY AND VERIFICATION 376
8.1 DFFE WEB BASED ENVIRONMENTAL SCREENING TOOL 376
8.2 CONSOLIDATED SITE SENSITIVITY 382
9 ENVIRONMENTAL IMPACT ASSESSMENT 390

9.1	PHASE OF DEVELOPMENT	390
9.2	ACTIVITIES MATRIX	390
9.3	SOIL, LAND USE AND LAND CAPABILITY	393
9.4	TERRESTRIAL BIODIVERSITY	398
9.5	PLANT SPECIES	403
9.6	ANIMAL SPECIES BIODIVERSITY	407
9.7	AQUATIC BIODIVERSITY	413
9.8	HERITAGE	415
9.9	PALAEONTOLOGICAL IMPACTS	415
9.10	AVIFAUNA	416
9.11	BUTTERFLY HABITAT	423
9.12	BATS	425
9.13	VISUAL	427
9.14	NOISE	443
9.15	TRAFFIC	446
9.16	GEOTECHNICAL	449
9.17	SOCIAL	454
9.18	HEALTH, SAFETY AND ENVIRONMENT RISK	462
10	**CULMULATIVE IMPACT ASSESSMENT**	**468**
10.1	SOIL, LAND USE AND LAND CAPABILITY	473
10.2	TERRESTRIAL BIODIVERSITY, PLANT & ANIMAL SPECIES	473
10.3	AQUATIC	474
10.4	HERITAGE RESOURCES	474
10.5	AVIFAUNA	475
10.6	BUTTERFLY HABITAT	476
10.7	BATS	477
10.8	VISUAL	477
10.9	NOISE	478
10.10	TRAFFIC	478
10.11	SOCIAL	478

10.12 GEOTECH 479
10.13 SHE RISK ASSESSMENT 479
10.14 CUMULATIVE ASSESSMENT PER ASPECT 479
11 DEIR ASSESSED LAYOUT 490
12 ENVIRONMENTAL IMPACT ASSESSMENT 499
12.1 IMPACT SUMMARY 499
12.2 SPECIALIST CONCLUSIONS 511
12.3 ALTERNATIVES ASSESSMENT 523
12.4 RECOMMENDATIONS 525
12.5 AUTHORISATION PERIOD 533
13 CONCLUSION AND WAY FORWARD 535
WAY FORWARD 537

TABLES

Table 1-1 – Key Technical Details of the Project 32
Table 1-2 – Details of Project Proponent 36
Table 1-3 - Competent authority 36
Table 1-4 – Details of the Environmental Assessment Practitioner 37
Table 1-5 – Details of Specialists 38
Table 1-6 – Legislated Report Requirements as detailed in GNR 982 43
Table 2-1 – Dates on which the adverts were published 48
Table 2-2 – Significance of potential construction phase impacts (Scoping Phase) 50
Table 2-3 - Significance of potential operational phase impacts (Scoping Phase) 52
Table 2-4 - Significance of potential decommissioning phase impacts (Scoping Phase) 54
Table 2-5 - Initial Cumulative Impacts (Scoping Phase) 56
Table 3-1 - Motivation for Application of EA in terms of Regulation 21(2)(a)(b)(c) and (d) 57
Table 3-2 – Impact Assessment Criterion and Scoring System 59

Table 4-1 – Affected Farm Portions 79
Table 4-2 - Coordinate Points of the Property Boundaries for the Affected Farm Portions 79
Table 4-3 - Technical details for the Project 84
Table 4-4 – Construction activities 86
Table 4-5 – Part 1: Need 91
Table 4-6 - Desirability 92
Table 4-7 - Consistency of the Project and the EIA Process with the NEMA principles 98
Table 5-1 - Coordinates of Electrical Infrastructure Hub Options 110
Table 6-1 - Applicable National Legislation 117
Table 6-2 - Applicable Regional Policies and Plans 132
Table 6-3 – Provincial and Municipal Plans 137
Table 6-4 - Requirements and Applicability of the Equator Principles 140
Table 6-5 - Additional Permits and Authorisations required for the proposed development 146
Table 7-1 - Summary of the results of the desktop assessment 147
Table 7-2 - Summary of the proposed locations of WTG hardstands and alternative EIH sites with regards to areas of local agricultural land use 150
Table 7-3 - Results of soil and terrain investigations on each WTG hardstand planned for the project 155
Table 7-4 - Information on each farm unit that was assessed in this investigation 159
Table 7-5 - Production area sizes of the different farm units directly related to the project development in the project area 160
Table 7-6 - Production figures (5-year average) of the directly influenced farm units in the project area 160
Table 7-7 - Production areas in relation to WTG's and EIH alternatives in the project area 161
Table 7-8 - Expected agricultural production losses of the different farm units in relation to the areas occupied by WTG hardstands and one EIH in the project area 162
Table 7-9 - Lithostratigraphy of the Area 162
Table 7-10 - Summary of Geological Exposures Encountered Across the Site 165
Table 7-11 – Gauteng Ridge Classification 184
Table 7-12 - Site Ecological Importance of habitat unit in the PAOI 193

Table 7-13 - National Red List flora species that potentially occur in the PAOI 204
Table 7-14 - Provincially Protected flora species observed or potentially occurring in the PAOI 208
Table 7-15 - NEMBA Declared alien invasive species recorded during the PAOI 210
Table 7-16 - Flora species recorded in the RSA that have recognised medicinal value 211
Table 7-17 – Indigenous mammal species recorded in the PAOI 213
Table 7-18 - Mammal species of conservation concern occurring or potentially occurring in the PAOI 222
Table 7-19 - Reptile and amphibian species recorded in the PAOI during the field programme 225
Table 7-20 - Reptile species of conservation concern potentially occurring in the PAOI 227
Table 7-21 - Native fish species recorded in the Suikerbosrand River 231
Table 7-22 - Geomorphological and physical features 243
Table 7-23 - Index of Habitat integrity assessment results and criteria assessed of watercourse 244
Table 7-24 - Classification of wetland areas within the wider study area 244
Table 7-25 - Habitat integrity assessment criteria for palustrine wetlands (Dickens *et al*,2003) 245
Table 7-26 - Results of the EIS assessment for the watercourses 246
Table 7-27 - Results of the EIS assessment for the wetlands 246
Table 7-28 – Calculation of Site Ecological Importance 251
Table 7-29 - Winter 2026 Survey Results 252
Table 7-30 - Winter 2026 Survey Incidental Records 252
Table 7-31 - Winter 2026 Survey Incidental Records 254
Table 7-32 - Collisions Risk Model (Band, 2024) Results 255
Table 7-33 - Butterfly diversity of the study area and species 256
Table 7-34 - Least Concern butterfly species of the Mpumalanga Province and Gauteng Province combined, but flagged as Rare or Critically Rare by Mecenero et al. (2020)* 260
Table 7-35 - Near Threatened butterfly species of the Mpumalanga Province and Gauteng Province combined (Mecenero et al. 2020)* 262
Table 7-36 - Least Concern butterfly species of the Mpumalanga Province and Gauteng Province combined, but flagged as Rare or Critically Rare by Mecenero et al. (2020)* 262
Table 7-37 - Habitat types of the project area in relation to the ascribed sensitivity 264

Table 7-38 - List of species with possible occurrence around the proposed WEF site 265
Table 7-39 - Bat species detected across the Project Area of Influence with their Impact Risk and abundance (BP/H) 271
Table 7-40 - Bat detectors deployed across the Project Area of Influence with the relative abundance recorded at each 272
Table 7-41 - NZASM's FAT project's findings of structures in the vicinity of the project 280
Table 7-42 - Artefacts identified during the field assessment development area 296
Table 7-43 – Visual receptor sensitivity 329
Table 7-44 - Landscape character sensitivity 330
Table 7-45 - Equipment used to measure ambient sound levels 337
Table 7-46 - Sound levels considering various sound level descriptors at WAULTSL01 340
Table 7-47 - Sound level descriptors as measured at WAULTSL02 342
Table 7-48 - Sound level descriptors as measured at WAULTSL03 344
Table 7-49 - Sound level descriptors as measured at WAULTSL04 346
Table 7-50 - Dipaleseng Local Municipality Distribution by Population Group (Stats SA, 2024) 353
Table 7-51 – Distribution of Dipaleseng Local Municipality by language spoken (Stats, SA, 2024) 354
Table 7-52 – Distribution of the levels of education represented in the municipality (Stats SA, 2024) 354
Table 7-53 - Lesedi Local Municipality Distribution by Population Group (Stats SA, 2024)359
Table 7-54 - Distribution of Lesedi Local Municipality by language spoken (Stats SA, 2024) 360
Table 7-55 - Distribution of the levels of education represented in the municipality (Stats SA, 2024) 360
Table 7-56 - Midvaal Local Municipality Distribution by Population Group (Stats SA, 2024) 363
Table 7-57 - Distribution of Midvaal Local Municipality by language spoken (Stats SA, 2024) 363
Table 7-58 - Distribution of the levels of education represented in the municipality (Stats SA, 2024) 364
Table 8-1 - Assessment Protocols and Site Sensitivity Verifications 376
Table 9-1 – Activities Matrix (C – Construction, O – Operation, D – Decommissioning) 391

Table 9-2 – Agricultural land use change because of construction 393
Table 9-3 - Land and soil degradation-construction phase 393
Table 9-4 – Disruption or prevention of farming operations construction phase 395
Table 9-5 – Land and soil degradation operational phase 395
Table 9-6 – Disruption or prevention of farming operations – operational phase 396
Table 9-7 – Positive impacts project lifetime (All Phases) 396
Table 9-8 – Land and soil degradation – decommissioning phase 397
Table 9-9 - Disruption or prevention of farming operations – decommissioning phase 397
Table 9-10 – Terrestrial habitat 398
Table 9-11 – Terrestrial habitat 400
Table 9-12 – Terrestrial habitat 400
Table 9-13 – Terrestrial habitat 401
Table 9-14 – Terrestrial habitat 401
Table 9-15 – Terrestrial habitat 402
Table 9-16 – Terrestrial biodiversity 402
Table 9-17 – Terrestrial biodiversity 402
Table 9-18 – Flora habitat 403
Table 9-19 – Flora habitat 404
Table 9-20 – Flora SCC 405
Table 9-21 – Flora habitat 405
Table 9-22 – Flora habitat 406
Table 9-23 – Flora habitat 406
Table 9-24 – Fauna habitat 407
Table 9-25 – Fauna habitat 408
Table 9-26 – Fauna SCC – Mountain Reedbuck 408
Table 9-27 – Fauna SCC – Grey Rhebok 409
Table 9-28 – Fauna SCC - Serval 410
Table 9-29 – Fauna SCC – Cape Clawless Otter 410
Table 9-30 – Fauna SCC – Southern African Hedgehog 410
Table 9-31 – Fauna SCC – Vlei Rat 411

Table 9-32 – Fauna SCC 411
Table 9-33 – Fauna SCC 411
Table 9-34 – Fauna, incl. SCC 412
Table 9-35 – Aquatic ecosystems 413
Table 9-36 – Aquatic ecosystems 414
Table 9-37 – Aquatic ecosystems 414
Table 9-38 – Archaeological impacts 415
Table 9-39 – Palaeontological impacts 415
Table 9-40 – Displacement through disturbance 416
Table 9-41 – Displacement through habitat loss 417
Table 9-42 – Displacement through disturbance 417
Table 9-43 – Mortality from collisions with turbines 418
Table 9-44 - Mortality from collisions with Overhead Powerlines 419
Table 9-45 - Mortality from electrocutions with overhead powerlines and electrical infrastructure 420
Table 9-46 – Displacement through disturbance 421
Table 9-47 – Displacement through habitat loss 422
Table 9-48 – Direct losses of sensitive species (Threatened, Near Threatened, Rare, Declining or Protected species) 423
Table 9-49 – Loss of habitat/areas that are considered suitable/highly suitable for sensitive butterfly species 423
Table 9-50 - Persistent and exacerbated deterioration of sensitive, natural, range restricted, or untransformed habitat that may be present in the immediate or near vicinity to the development footprints, road fringes 424
Table 9-51 - Disruption of ecological processes, services, ecological functionality 424
Table 9-52 - Increased disruption of local movement and migration patterns, ecological interaction, and ecological processes 425
Table 9-53 – Habitat loss or roost disturbance 425
Table 9-54 – Bat mortality 426
Table 9-55 – Artificial lights 426
Table 9-56 - Residents of homesteads, visitors to tourist accommodation and Protected Areas (within 5km of the proposed WEF) 427

Table 9-57 - Observers travelling along roads (within 5km of the proposed WEF) 428

Table 9-58 - Residents of homesteads and visitors to tourist accommodation (if present) (within 5km of the proposed WEF) 429

Table 9-59 - Observers travelling along roads within 5km of the proposed wind turbine structures 430

Table 9-60 - Residents of homesteads/tourist accommodation (if present) (within 5 – 10km of the proposed WEF) 431

Table 9-61 - Observers travelling along roads (within 5 – 10km of the proposed WEF) 432

Table 9-62 - Residents of homesteads and visitors to tourist accommodation (within a 10 – 20km radius of the proposed turbine structures) 433

Table 9-63 - Visitors to Protected Areas (within a 10 – 20km radius of the proposed WEF) 434

Table 9-64 - Observers travelling along roads (within a 10 – 20km radius of the proposed WEF) 435

Table 9-65 - Residents of homesteads and visitors to tourist accommodation (if present) (located beyond the 20km radius of the proposed WEF) 436

Table 9-66 – Shadow Flicker 437

Table 9-67 - lighting at night on residents/ visitors to homesteads, tourist accommodation and Protected Areas (within 0-5km and potentially up to 10km of the proposed WEF) 438

Table 9-68 - Lighting at night on observers travelling along roads (within 0-5km and potentially up to 10km of the proposed WEF) 438

Table 9-69 - Ancillary infrastructure 439

Table 9-70 – Blade painting 440

Table 9-71 - Sensitive visual receptors (within 5km to the proposed WEF) 442

Table 9-72 - Daytime activities relating to the construction of access roads 443

Table 9-73 - Daytime construction traffic passing NSR 443

Table 9-74 - Daytime Impact Assessment: Daytime WTG construction activities 444

Table 9-75 - Night-time WTG construction activities 444

Table 9-76 - Impact Assessment: Daytime operation of WTG considering a PWL *of 110.5 dBA re 1 pW (relevant for the average expected and worst-case noise levels)* 444

Table 9-77 - Impact Assessment: Night-time operation of WTG considering a PWL of 110.5 dBA re 1 pW (Average expected noise levels) 445

Table 9-78 - Impact Assessment: Night-time operation of WTG *considering a PWL of 110.5 dBA re 1 pW (Potential worst-case noise levels)* 445

Table 9-79 - Potential future decommissioning activities 446
Table 9-80 – Traffic impact 446
Table 9-81 - Noise and dust pollution 447
Table 9-82 - Damage to road surfaces 448
Table 9-83 – Traffic impact 448
Table 9-84 – Slope stability 449
Table 9-85 – Seismic activity 449
Table 9-86 - Soil erosion from clearing of sites for drilling and test pitting 450
Table 9-87 - Potential hydrocarbon (including oil, fuels, chemicals) spillages 450
Table 9-88 - Disturbance of fauna and flora from clearing of sites 451
Table 9-89 - Subsidence 451
Table 9-90 – Slope stability 451
Table 9-91 - Soil erosion 452
Table 9-92 - Potential hydrocarbon (including oil, fuels, chemicals) spillages 452
Table 9-93 - Disturbance of fauna and flora 453
Table 9-94 - Subsidence 453
Table 9-95 – Job creation 454
Table 9-96 – Population influx 456
Table 9-97 – Procurement from local business 457
Table 9-98 – Community health, safety and security 457
Table 9-99 – Job creation 458
Table 9-100 – Population influx 458
Table 9-101 – Procurement from local businesses 459
Table 9-102 – Community, Health, Safety and Security 460
Table 9-103 – Energy generation 460
Table 9-104 – Loss of employment 461
Table 9-105 – Reduced community investment 461
Table 9-106 – Associated infrastructure 462
Table 9-107 - Potential impacts for Health, Safety and Environment Risk - Solid State Lithium-Ion Battery Energy Storage Systems 462

Table 9-108 - Potential impacts for Health, Safety and Environment Risk - Vanadium redox flow battery energy storage systems 465

Table 10-1 - Projects within 50km of the project 1 469

Table 10-2 - Potential Impacts on Terrestrial Biodiversity (M = Magnitude, E = Extent, R = Reversibility, D = Duration, P = Probability, S = Significance, Ca = Character, Con = Confidence) 480

Table 10-3 - Potential Impacts on Plant Species (M = Magnitude, E = Extent, R = Reversibility, D = Duration, P = Probability, S = Significance, Ca = Character, Con = Confidence) 482

Table 10-4 - Potential Impacts on Animal Species (M = Magnitude, E = Extent, R = Reversibility, D = Duration, P = Probability, S = Significance, Ca = Character, Con = Confidence) 483

Table 10-5 - Potential Impacts on Aquatic (M = Magnitude, E = Extent, R = Reversibility, D = Duration, P = Probability, S = Significance, Ca = Character, Con = Confidence) 484

Table 10-6 - Potential Impacts on Avifauna (M = Magnitude, E = Extent, R = Reversibility, D = Duration, P = Probability, S = Significance, Ca = Character, Con = Confidence) 485

Table 10-7 - Potential Impacts on invertebrates (M = Magnitude, E = Extent, R = Reversibility, D = Duration, P = Probability, S = Significance, Ca = Character, Con = Confidence) 485

Table 10-8 - Potential Impacts on Visual- (M = Magnitude, E = Extent, R = Reversibility, D = Duration, P = Probability, S = Significance, Ca = Character, Con = Confidence) 486

Table 10-9 - Potential Impacts on Noise-(M = Magnitude, E = Extent, R = Reversibility, D = Duration, P = Probability, S = Significance, Ca = Character, Con = Confidence) 487

Table 10-10 - Type Caption Here Potential Impacts on Traffic (M = Magnitude, E = Extent, R = Reversibility, D = Duration, P = Probability, S = Significance, Ca = Character, Con = Confidence) 487

Table 11-1 - Buffers recommended by specialist team 493

Table 11-2 - Layout progression through the project period – ABO Uvemvane WEF 1 496

Table 12-1 - Summary of the identified impacts for the Construction Phase. 499

Table 12-2 - Summary of the identified impacts for the Operation Phase. 504

Table 12-3 - Summary of the identified impacts for the Decommissioning Phase. 508

Table 12-4 – Preferred Alternatives 523

FIGURES

Figure 1-1 - Regional locality map for the Project 35
Figure 3-1 - Mitigation Sequence/Hierarchy 61
Figure 4-1 - Layout of the boundary of the properties associated with the proposed Project 77
Figure 4-2 - Preliminary Layout and Coordinates of the boundary of the properties associated with the proposed Project 78
Figure 4-3 - Illustration of the main components of a wind turbine 82
Figure 4-4 - Typical Turbine Hard Standing Requirements (illustration purposes only) 85
Figure 4-5 - Current Installed Electricity Generation Capacity 90
Figure 4-6 – Proposed new electricity generation capacity by 2039 90
Figure 4-7 - Load shedding hours over the years in South Africa 97
Figure 5-1 - Preliminary Layout for ABO Uvemvane Cluster (WEF 1 and WEF 2 – 66 turbines) 106
Figure 5-2 - Scoping Phase - Optimised Layout for the Project (WEF 1) 107
Figure 5-3 - Scoping Phase - Revised Optimised Layout for the Project (WEF 1 – 27 turbines) 108
Figure 5-4 – Final Layout for the ABO Uvemvane WEF 1 (20 turbines: DEIR assessed Layout) 109
Figure 6-1 – CBAs identified are as per the Gauteng C-Plan (2024) and the MBSP (2024) within the PAOI. 122
Figure 7-1 - Protected Agricultural Areas in relation to the project area and layout 149
Figure 7-2 - Field Crop Boundaries associated with the project area and related infrastructure (Crop Estimates Consortium, 2023) 150
Figure 7-3 - Proposed project infrastructure in relation to recorded cultivated lands 151
Figure 7-4 - A recently harvested crop of rainfed maize in the vicinity of the project area 152
Figure 7-5 - A planted pasture of perennial Eragrostis curvula in the vicinity of the project area 152
Figure 7-6 - An old field in the project area that has not been cultivated for more than 20 years 153
Figure 7-7 - Natural, non-arable, grazing veld in the project area 153
Figure 7-8 - Regional Geology of the Area 164
Figure 7-9 - Location of geological exposures on site 166
Figure 7-10 - PAOI in relation to the SANBI (2018) vegetation types 170

Figure 7-11 - PAOI in relation to the Red List of Ecosystems mapping data 173
Figure 7-12 - PAOI in relation to mapped Protected Areas, CBAs and ESAs, as per the Gauteng C-Plan (2024) and the MBSP (2024) 174
Figure 7-13 - CBAs and ESAs that have been disturbed by past/current cultivation activities 175
Figure 7-14 - PAOI in relation to mapped Strategic Water Source Areas 178
Figure 7-15 - PAOI in relation to recognised Freshwater Ecosystem Priority Area 179
Figure 7-16 - Protected areas and environments in the landscape surrounding the PAOI 180
Figure 7-17 - PAOI in relation to provincial Priority Focus Area, as per the Mpumalanga Protected Areas Expansion Strategy – 20 Year Plan 181
Figure 7-18 - PAOI in relation to provincial Priority Focus Area, as per the Mpumalanga Protected Areas Expansion Strategy – 20 Year Plan 182
Figure 7-19 - The PAOI and Key Biodiversity Areas 185
Figure 7-20 - Mpumalanga's Climate Change Corridor Network and the PAOI 186
Figure 7-21 - Intact Grasslands in the landscape surrounding the PAOI 187
Figure 7-22 - Gauteng Rocky Ridge classification and the PAOI 188
Figure 7-23 - Habitat unit map of the PAOI 190
Figure 7-24 - Site Ecological Importance of the PAOI 195
Figure 7-25 - Typical Mountain Bushveld 196
Figure 7-26 - Typical Mountain Bushveld 196
Figure 7-27 - Typical area of Rocky Shrubland and Grassland 198
Figure 7-28 - Area of Rocky Shrubland and Grassland dominated by Protea caffra trees 198
Figure 7-29 - The Suikerbosrand River, flanked by both woody and herbaceous flora species 199
Figure 7-30 - Valley-bottom wetland, with an artificial farm dam 199
Figure 7-31 - Mountain valley, characterised by closed-canopy woodland dominated by Olea europaea 199
Figure 7-32 - Drainage line encroached by Leucosidea sericea thickets 199
Figure 7-33 - Typical example of Natural Dry Grassland in the PAOI 200
Figure 7-34 - Forb dominated area of Natural Dry Grassland 200
Figure 7-35 - Eragrostis dominated Secondary Grassland I. 201
Figure 7-36 - Hyparrhenia hirta dominated Secondary Grassland 201

Figure 7-37 - Small stand/windrow of Eucalyptus camaldulensis trees I 202
Figure 7-38 - Stand of Populus x canescens trees encroaching in a wetland in the PAOI I 202
Figure 7-39 - Recently ploughed cultivated field 202
Figure 7-40 - Boophone disticha 209
Figure 7-41 - Protea caffra 209
Figure 7-42 - Aloe verecunda 210
Figure 7-43 - Crinum graminicola 210
Figure 7-44 - Mountain Reedbuck (Redunca fulvorufula fulvorufula) – Endangered 215
Figure 7-45 - Hartebeest (Alcelaphus buselaphus caama) 215
Figure 7-46 - Sable Antelope (*Hippotragus niger niger*) - Vulnerable 216
Figure 7-47 - Giraffe (*Giraffa camelopardalis giraffa*) 216
Figure 7-48 - Serval (*Leptailurus serval*) – Near Threatened 216
Figure 7-49 - Black-backed Jackal (*Canis mesomelas*) 216
Figure 7-50 - Slender Mongoose (*Herpestes sanguineus*) 216
Figure 7-51 - Water Mongoose (*Atilax paludinosus*) 216
Figure 7-52 - Large-spotted Genet (*Genetta maculata*) 217
Figure 7-53 - Porcupine (*Hystrix africaeaustralis*) 217
Figure 7-54 - Warthog (Phacochoerus africanus 217
Figure 7-55 - Bushpig (Potamochoerus larvatus) 217
Figure 7-56 - Xeric Four-stripped Mouse (Rhabdomys species 217
Figure 7-57 - Vlei Rat (Otomys cf. auratus) – Near Threatened 217
Figure 7-58 - Eastern Rock Sengi (*Elephantus myurus*) 218
Figure 7-59 - Rock Hyrax (*Procavia capensis)* 218
Figure 7-60 - Water Monitor (Varanus niloticus) photographed in the PAOI 226
Figure 7-61 - Common River Frog (Amieta dealandii) caught in the PAOI 226
Figure 7-62 - Average monthly rainfall for the area (SA Atlas of Climatology and Agrohydrology, R.E. Schulze, 2009 – obtained from CapeFarmMapper, 2022) 229
Figure 7-63 - Rivers map for study site (red polygon represents the study boundaries, shown in Google Earth 230
Figure 7-64 - National Freshwater Ecosystem Priority Areas for the proposed development area (FBIS, 2025) 233

Figure 7-65 - National Freshwater Ecosystem Priority Areas map for the study site where the red polygon indicates the site boundaries (CapeFarmMapper, 2026) 234

Figure 7-66 - National Wetland map for the study site where the red polygon indicates the study boundaries (CapeFarmMapper, 2027) 236

Figure 7-67 - Provincial Biodiversity and Conservation Plans for the study site, where the top image is for the 2024 Gauteng CBA Map (sourced from SANBI BiodiversityGIS, 2026) and the lower image is of the 2023 Mpumalanga Biodiversity Sector Plan (sourced from MBSP, 2025) 238

Figure 7-68 - 2014 Mpumalanga Highveld Wetland mapping for the project area, overlain in Google Earth 239

Figure 7-69 - Views of Suikerbosrant River upstream (top) and downstream (bottom) of the site 241

Figure 7-70 - Views of some of the tributaries of the Suikerbosrant River within the site 242

Figure 7-71 - Avifaunal Constraints Map 255

Figure 7-72 - Habitat sensitivity for butterfly species within the study area in relation to the project components and layout, with an indication of potential conflict areas 265

Figure 7-73 - Bats captured or collected near the Project Area of Influence 268

Figure 7-74 - Location of protected areas near the Project Area of Influence 270

Figure 7-75 - Locations of sources of water sources that are classified as sensitive to bats with required 200 m buffer applied 274

Figure 7-76 - Ridges located across the Project Area of Influence including required buffers 275

Figure 7-77 - Wooded areas located on the Project Area of Influence including required buffers 276

Figure 7-78 - Buffers for bat sensitive areas 278

Figure 7-79 - Spatialisation of heritage assessments conducted in proximity to the proposed development 283

Figure 7-80 - Heritage Resources Map. Heritage Resources previously identified in proximity to the study area, with SAHRIS Inv. Nos indicated. 284

Figure 7-81 - Cultural Landscape Map. Map indicating sensitive receptors near the proposed development, extracted from the Topo 1:50 000 map 285

Figure 7-82 - Cultural Landscape Map. Map indicating possible stonewalled ruins inside the proposed development, extracted from the historic aerial photography 287

Figure 7-83 - Cultural Landscape Map. Map indicating possible stonewalled ruins inside the proposed development, extracted from the Topo 1:50 000 map 288

Figure 7-84 - First Edition Topo Map. First Edition Topo Map indicating historical farm werfs that still exist 289

Figure 7-85 - First Edition Topo Inset Map A. First Edition Topo Map indicating historical Malanskraal farm werf that still exists, and has an associated historical cemetery 290

Figure 7-86 - Palaeontological sensitivity of the proposed development area 293

Figure 7-87 - Extract from the CGS 2628 East Rand Geology Map indicating that the development area is underlain by Pv: Vryheid Formation in the Ecca Group, Ra: Alberton, and Rw: Westonaria, both in the Rk: Klipriviersberg Group, Rb: Booysens, Rjo: Johannesburg, and Rt: Turffontein Formations in the Central Rand Group, Rg: Government, and Rj: Jeppestown Formations in the West Rand Group, Q-a: Quaternary Alluvium and V-di: Diabase 294

Figure 7-88 - All heritage resources within proximity to the development area 302

Figure 7-89 - Heritage sensitivity map of project based on the findings of the cultural heritage and archaeology assessment 303

Figure 7-90 - Heritage sensitivity map of the project based on the findings of the cultural heritage and archaeology assessment with the proposed layout 304

Figure 7-91 - Heritage sensitivity map of the project based on the findings of the cultural heritage and archaeology assessment with the proposed layout 305

Figure 7-92 - Heritage sensitivity map of the project based on the findings of the cultural heritage and archaeology assessment with the proposed layout 306

Figure 7-93 - Aerial view of assessed access routes 308

Figure 7-94 - Recommended Stopping Sight Distances as per SANRAL Geometric Design Guideline 309

Figure 7-95 - Shoulder Sight Distances as per TRH17 Guidelines 310

Figure 7-96 - Aerial overview of Access route 1 311

Figure 7-97 - Aerial View of intersection P243/1 and farm road 312

Figure 7-98 - View from P243/1 to Farm road toward the project site 313

Figure 7-99 - Aerial View of Access route 2 314

Figure 7-100 - Aerial view of intersections of D1422/D605 and D1422/D1220 315

Figure 7-101 - Aerial View of Access route 3 316

Figure 7-102 - View of existing access road (D1220) on P243/1 317

Figure 7-103 - Aerial View of Access routes 4 (light green) and 5 (dark green) 318

Figure 7-104 - General topography of the site and study area 320

Figure 7-105 - Rural character of the study area interspersed with commercial agricultural 321
Figure 7-106 - land use and land cover occurring within the study area 321
Figure 7-107 - Scattered homesteads and settlements found in and around the site 321
Figure 7-108 - Looking over the site from the R23 322
Figure 7-109 - View over the site from the R103 323
Figure 7-110 - Existing power lines within the study area 323
Figure 7-111 - Moderate to high visual quality of the study area 324
Figure 7-112 - Shaded relief map of the study area 325
Figure 7-113 - Land cover/ broad land use patterns within the study area 326
Figure 7-114 - Schematic representation of a wind turbine from 1, 2, 5 and 10km under perfect viewing conditions 327
Figure 7-115 - Viewshed analysis of the proposed project, indicating the frequency of visual exposure 328
Figure 7-116 - Proximity of the proposed project's development footprint to areas of visual sensitivity 334
Figure 7-117 - Potential noise-sensitive receptors assessed during the EIA phase 336
Figure 7-118 - Localities where ambient sound levels were measured during November 2024 339
Figure 7-119 - Ambient sound levels at WAULTSL01 341
Figure 7-120 - Various sound level descriptors for WAULTSL01 341
Figure 7-121 - Classification of daytime measurements in typical noise districts at WAULTSL01 341
Figure 7-122 - Classification of night-time measurements in typical noise districts at WAULTSL01 341
Figure 7-123 - Ambient sound levels at WAULTSL0 343
Figure 7-124 - Maximum, minimum and statistical values at WAULTSL02 343
Figure 7-125 - Classification of night-time measurements in typical noise districts at WAULTSL02 343
Figure 7-126 - Classification of daytime measurements in typical noise districts at WAULTSL02 343
Figure 7-127 - Ambient sound levels at WAULTSL03 345
Figure 7-128 - Maximum, minimum and statistical values at WAULTSL03 345

Figure 7-129 - Classification of night-time measurements in typical noise districts at WAULTSL03 345
Figure 7-130 - Classification of daytime measurements in typical noise districts at WAULTSL03 345
Figure 7-131 - Ambient sound levels at WAULTSL04 347
Figure 7-132 - Maximum, minimum and statistical values at WAULTSL04 347
Figure 7-133 - Classification of night-time measurements in typical noise districts at WAULTSL04 347
Figure 7-134 - Classification of daytime measurements in typical noise districts at WAULTSL04 347
Figure 7-135 - Daytime ambient sound levels measured in vicinity of project 349
Figure 7-136 - Night-time ambient sound levels measured in vicinity of project 350
Figure 7-137 - Dipaleseng District Municipality (Municipalities of South Africa) 352
Figure 7-138 - DLM age distribution (Stats SA, 2024) 353
Figure 7-139 - DLM unemployment distribution 355
Figure 7-140 - Sedibeng District Municipality (Municipalities of South Africa, 2025) 358
Figure 7-141 - LLM gender distribution (Stats SA, 2024) 359
Figure 7-142 - LLM unemployment distribution 361
Figure 7-143 - MLM gender distribution (Stats SA, 2024) 363
Figure 7-144 - Social receptors surrounding the proposed Project 366
Figure 7-145 - 500m circles around the proposed electrical infrastructure hub where the BESS facility would be located within (Blue) and Location of Occupied Facilities (Red) and Nearby Water Courses/Bodies (Green) in the immediate vicinity of the BESS 367
Figure 7-146 – Diagram 1 of battery structure 369
Figure 7-147 – Diagram 2 of battery structure 370
Figure 7-148 – Diagram 3 of battery structure 371
Figure 7-149 – Diagram 4 of battery structure 372
Figure 8-1 - WEF 1: Consolidated Site Sensitivity Map overlain by Preliminary Project Layout (SSVR Phase) 383
Figure 8-2 - WEF 2: Consolidated Site Sensitivity Map overlain by Preliminary Project Layout (SSVR Phase) 384
Figure 8-3 – WEF 1: Consolidated Site Sensitivity Map overlain by Optimised Project Layout (Pre-Scoping Phase - 31 turbines). 385

Figure 8-4 - WEF 1: Consolidated Site Sensitivity Map overlain by Revised Optimised Project Layout (Scoping Phase - 27 turbines) 386

Figure 8-5 - WEF 1: Map illustrating the Preliminary and Optimised Layouts for comparison 387

Figure 8-6 - WEF 1: Consolidated sensitivity Map illustrating the ABO Uvemvane WEF 1 Final Layout. 388

Figure 8-7 - WEF 1: Map illustrating the ABO Uvemvane WEF 1 Final Layout (without heritage sensitivities). 389

Figure 10-1 - Map showing projects within 50km of the project 472

Figure 11-1 - ABO Uvemvane WEF 1 Final Layout (DIER Assessed Layout). 497

Figure 11-2 - Combined Sensitivity for the ABO Uvemvane WEF 1 Final Layout (DEIR Assessed Layout). 498

APPENDICES

APPENDIX A

EAP CV AND DECLARATION

APPENDIX A.1

EAP DECLARATION

APPENDIX A.2

EAP CV

APPENDIX B

SPECIALIST CV AND DECLARATIONS

APPENDIX B.1

SPECIALIST CV

APPENDIX B.2

SPECIALIST DECLARATIONS

APPENDIX C

DFFE APPROVAL OF SCOPING

APPENDIX D

MAPS

APPENDIX E

STAKEHOLDER ENGAGEMENT REPORT

APPENDIX F

SITE SENSITIVITY VERIFICATION REPORT

APPENDIX G

SPECIALIST REPORTS

APPENDIX G.1

SOIL, LAND USE AND LAND CAPABILITY ASSESSMENT

APPENDIX G.2

TERRESTRIAL BIODIVERSITY ASSESSMENT

APPENDIX G.3

AQUATIC BIODIVERSITY ASSESSMENT

APPENDIX G.4

HERITAGE ASSESSMENT

APPENDIX G.5

AVIFAUNAL ASSESSMENT

APPENDIX G.6

BAT ASSESSMENT

APPENDIX G.7

VISUAL ASSESSMENT

APPENDIX G.8

NOISE ASSESSMENT

APPENDIX G.9

TRAFFIC ASSESSMENT

APPENDIX G.10

GEOTECHNICAL ASSESSMENT

APPENDIX G.11

SOCIAL ASSESSMENT

APPENDIX G.12

PLANT SPECIES ASSESSMENT

APPENDIX G.13

ANIMAL SPECIES ASSESSMENT

APPENDIX G.14

BUTTERFLY HABITAT ASSESSMENT

APPENDIX G.15

SHE RISK ASSESSMENT

APPENDIX H

DFFE SCREENING REPORT

APPENDIX I

PRE-APPLICATION MEETING MINTUES

APPENDIX J

ENVIRONMENTAL MANAGEMENT PROGRAMME

APPENDIX K

BIODIVERSITY OFFSET - TECHNICAL MEMORANDUM

1 INTRODUCTION

All changes and additions made to the original Draft Environmental Impact Assessment Report (DEIR), dated 25 August 2026, have been made in blue font.

WSP Group Africa (Pty) Ltd (WSP) has been appointed by ABO Energy South Africa (Pty) Ltd, on behalf of ABO Uvemvane Wind Energy Facility 1 (Pty) Ltd, to undertake an Environmental Impact Assessment (EIA) to meet the requirements under the National Environmental Management Act (Act 107 of 1998) (NEMA), for the proposed development of the ABO Uvemvane Wind Energy Facility (WEF) 1, near Heidelberg and Balfour in the Gauteng and Mpumalanga Provinces respectively.

The proposed development is subject to a Scoping and Environmental Impact Reporting (S&EIR) Process in terms of NEMA (as amended) and Appendix 2 and 3 of the EIA Regulations, 2014 and GNR 983 (as amended), GNR 984 (as amended) and GNR 985 (as amended). The competent authority for this S&EIR Process is the national Department of Forestry, Fisheries and Environment (DFFE).

An application for EA in terms of the NEMA (Act 107 of 1998) and associated Environmental Impact Assessment (EIA) Regulations, 2014, as amended, was submitted on 23 March 2026 to the DFFE and was allocated the reference number 14/12/16/3/3/2/2803.

The Final Environmental Impact Assessment Report (FEIR) was submitted to the DFFE on 12 October 2026. Email correspondence received from the DFFE on 13 October 2026 informed the Environmental Assessment Practitioner (EAP) and Applicant that the according to the DFFE records the application had lapsed in terms of Regulation 23(1) of GNR 326, as amended, as the FEIR was due in fact due on or before Friday, 09 October 2026.

A notification was sent to all registered Interested and Affected Parties (I&APs), stakeholders and commenting authorities on 16 October 2026, to inform them that WSP will be re-submitting the application for EA for the proposed project in terms of Regulation 21(2) of GNR 326, as amended. This regulation affords the Applicant the option to re-apply and re-submit the FEIR (subject to additional public participation in terms of Regulation 21(2)(d)) to the DFFE within two years of acceptance of the Scoping Report (dated 22 June 2026).

WSP received confirmation from the DFFE on 15 October 2026 that it may proceed with submitting a new application for Environmental Authorisation (EA) in terms of Regulation 21(2). Accordingly, the Final Environmental Impact Assessment Report (EIAr) that was submitted as part of the original application (DFFE Reference No. 14/12/16/3/3/2/2803) is being re-submitted as a DEIR (this report) in support of the re-submission of the EA application (new DFFE reference number to be confirmed).

In addition, according to the DFFE, the pre-application meeting held on 25 November 2024 remains valid and the project will not require a new pre-application meeting. The correspondence confirming this is included in **Appendix E**.

The project will include the following main components, detailed further in **Table 1-1** below:

- Wind Turbines;
- Onsite substation;
- Internal cabling;
- Construction camp and laydown area;

- Operations & Maintenance (O&M) Building;
- Battery Energy Storage System (BESS); and
- Internal Roads.

1.1 PURPOSE OF THIS REPORT

The S&EIR process is an interdisciplinary procedure to ensure that environmental and social considerations are included in decisions regarding projects. Simply defined, the process aims to identify the possible environmental and social effects of a proposed activity and how those impacts can be mitigated.

The Environmental Impact Report (EIR) (this report) aims to provide stakeholders with information on the proposed development including location, layout and technological alternatives, the scope of the environmental assessment and key impacts addressed in the environmental assessment, and the consultation process undertaken through the EIA process.

The extent of the proposed project area, which spans two provinces and three local municipalities, necessitates consideration of multiple environmental, social and administrative contexts. While every effort has been made to present information in a clear and accessible manner, the level of detail included in this report is intended to ensure a comprehensive, transparent and balanced assessment of all relevant issues and jurisdictions.

1.2 BACKGROUND INFORMATION

ABO Uvemvane Wind Energy Facility 1 (Pty) Ltd (the Applicant) proposes the development of ABO Uvemvane WEF1, (hereafter referred to as “the Project”), a commercial wind energy generation facility comprising up to 20 turbines and with a total generation capacity of up to 170 MWac in capacity, as well as associated infrastructure.

A development area (i.e., the full extent of the affected properties as well as beyond, where appropriate) has been identified for the proposed development. Within this identified development area, a development footprint has been defined in a manner which has considered the environmental sensitivities present on the affected properties and intentionally remains outside of highly sensitive areas. All affected properties in their entirety have been considered in this S&EIR process (which includes the independent specialists’ assessments undertaken hereunder) and assessed in terms of the suitability from an environmental and social perspective. The location of the Project and the siting of the project infrastructure within the assessed study area have been informed by the recommendations of the specialists following their field assessments, where relevant.

It is important to note at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering design phase prior to construction (subsequent to the issuing of an EA, should such an authorisation be granted), but that the information provided below (**Table 1-1**) is seen as the maximum development scenario for the proposed development.

Table 1-1 – Key Technical Details of the Project

Aspect	Details
Total Area of Applicable Farm Portions	A preferred study area with a total combined extent of approximately 8,200 ha was identified as a technically suitable project site for the development of the WEF project, within this an affected area of approximately 6000 ha has been assessed.

Aspect	Details
Total Buildable Area (i.e. likely footprint area)	Approximately 67.2 ha: • Turbines/ hardstands/foundations: up to 1Ha per turbine (up to 20ha) • Roads: up to 31km (approx. 18km of which are existing roads to be widened) and up to 33ha • Electrical Infrastructure Hub: up to 7ha • Temporary Laydown Areas: 4 x laydown areas (includes concrete batching plant) totalling up to 15ha • Internal Underground Cabling: up to 31km, but nothing beyond proposed roads so has been included in road footprint • 33kV OHL/underground facility connection: Up to 0.02ha
Export Capacity	Up to 170MWac
Technology	Wind
Number of Wind Turbines	Up to 20
Turbine Specs/ Aspects	• Maximum hub height 180 m; • Maximum blade length 100 m; • Maximum rotor diameter 200 m; • Maximum capacity per turbine 10 MW; • A transformer at the base of each turbine; • Concrete turbine foundations up to 1 ha each; • Turbine, crane, and blade hardstands (included in the abovementioned 1 ha).
Electrical Infrastructure Hub (with collector sub-station, sub-station, and BESS infrastructure)	Three (3) locations have been assessed and are being applied for noting that only one will be constructed based on technical feasibility to be confirmed at pre-construction stage (Up to 7ha)
Construction camp and laydown area	4 temporary laydown areas/ construction compounds (includes concrete batching), totalling up to 15 ha, would be fenced with access control.
Access Routes	Five (5) existing routes; four of these are off existing unnamed farm roads (originating from the D1220 and P243/1), and one is off Lagerspoort Road from Heidelberg - Balfour Road (R23). The Details of the access would be as per the recommendations in the Transport Impact Assessment.
Internal Roads	Up to 31 km length (approx. 18km of which are existing roads to be widened). Primary/main access roads as well as internal road reticulation (note that existing roads/disturbed areas would be used as far as possible, and for the proposed roads, a corridor of up to 12 m wide may be temporarily impacted upon during construction and be rehabilitated to up to 10 m wide after construction), inclusive of stormwater infrastructure where relevant.
Associated infrastructure	Includes the following (to be located within the proposed development footprint): • Associated internal electrical reticulation/ cabling (i.e., low- and medium voltage powerlines), underground as far as is feasible, and to run within the proposed road footprint/route as far as possible; • A 33kV overhead/underground line to connect the northern and southern portions of the facility; and

Aspect	Details
	• On-site electrical infrastructure hub (up to 7 ha in extent). Note there are three (3) locations assessed as options, however only one will be constructed, consisting of: – On-site substation and associated infrastructure; – Additional step-up/ transformation /collector /switchyard infrastructure; – Auxiliary buildings, including but not limited to O&M building(s) administrative buildings, workshops, gatehouses, security buildings, control centres, offices, visitor centres, warehouses, etc.; – The installation of a communications tower (maximum height 32 m) and/or lighting mast (maximum height 25 m); and – BESS.

1.3 PROJECT LOCATION

The proposed Project is located approximately 9km west of the town of Balfour in the Mpumalanga Province in the Dipaleseng Local Municipality within the Gert Sibande District Municipality and approximately 14km south-east of the town Heidelberg in the Gauteng Province in the Lesedi and Midvaal Local Municipalities within the Sedibeng District Municipality (**Figure 1-1**). It is anticipated that the proposed WEF would have a total (permanent) development footprint of up to 67.2 ha, which is approximately 1.12% of the total site (i.e., affected properties) area[1].

[1] *Note regarding proposed facility capacity, footprint, turbine number and maximum turbine capacity: Note that the proposed development entails a proposed maximum development footprint for a combination of factors, namely facility capacity in terms of overall MWac, development footprint in terms of extent turbine numbers which caps the proposed number of turbines that could be developed within the facility as well as maximum turbine capacity for any given turbine, whereby any given aspect has maximum development parameters that has been assessed and the first lowest parameter achieved in this regard would determine the remaining specifications within the said maximum limits (i.e. all maximum parameters could not be achieved simultaneously).*

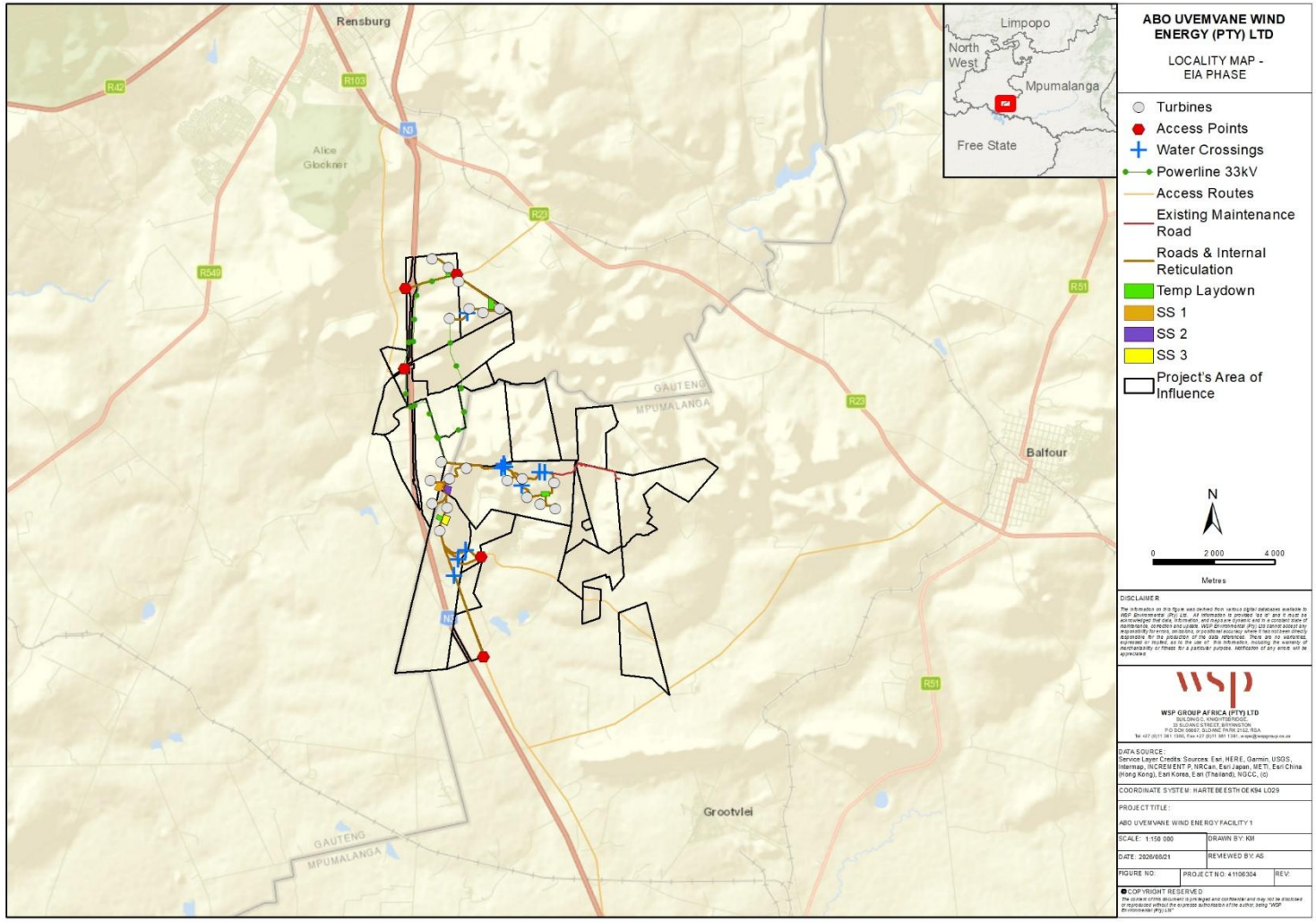


Figure 1-1 - Regional locality map for the Project

1.4 KEY ROLE PLAYERS

1.4.1. PROJECT PROPONENT

Table 1-2 provides the relevant details of the project proponent.

Table 1-2 – Details of Project Proponent

Proponent	ABO Uvemvane Wind Energy Facility 1 (Pty) Ltd
Company Registration	2024/570974/07
Applicant Representative/ Contact Person:	Kelli Ross
Physical Address	Unit 2A, Quantico House, Loerie Park
Postal Address	As above
Telephone:	021 276 3620
Email:	capetown@aboenergy.com Kelli.ross@aboenergy.com

1.4.2. COMPETENT AUTHORITY (CA)

Section 24C(2)(a) of NEMA stipulates that the Minister of Forestry, Fisheries and the Environment ("the Minister") must be identified as the competent authority (CA) if the activity has implications for international environmental commitments or relations. GN 779 of 01 July 2016 identifies the Minister as the CA for the consideration and processing of environmental authorisations and amendments thereto for activities related to the Integrated Resource Plan (IRP) 2010 – 2030. As the proposed project is related to the IRP, DFFE is the CA for the proposed project. provides the relevant details of the competent authority on the Project. **Table 1-3** provides the relevant details of the competent authority on the Project.

Table 1-3 - Competent authority

Aspect	Competent / Commenting Authority	Contact Details
Competent Authority: Environmental Authorisation	Department of Forestry, Fisheries, and the Environment (DFFE)	Case Officer: Thulisile Nyalunga Integrated Environmental Authorisations Email: tnyalunga@dffe.gov.za DFFE Ref: 14/12/16/3/3/2/2803

1.4.3. COMMENTING AUTHORITY OR ENTITIES

The commenting authorities for the project include:

- DFFE Biodiversity and Conservation;
- Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA);
- Gauteng Department of Environment (GDEnv)
- Gauteng Department: Agriculture and Rural Development (GDARD);
- DFFE: National Vulture Task Force (in terms of section 43(2) and 43(3)(c) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), the Minister has

assigned the responsibility for implementation of the Multi-species Biodiversity Management Plan for Vultures in South Africa to the National Vulture Task Force).
- Department of Water and Sanitation (DWS);
- Department of Mineral and Petroleum Resources (DMPR);
- Petroleum Agency of South Africa (PASA);
- Department of Land Reform and Rural Development (DLRRD);
- Department of Agriculture;
- Department of Public Works;
- Department of Defence;
- National Department of Transport;
- South African National Roads Agency Limited (SANRAL);
- South African Heritage Resources Agency (SAHRA);
- South African Civil Aviation Authority (CAA);
- Square Kilometre Array (SKA);
- South African Radio Astronomical Observatory (SARAO);
- South African Weather Service (SAWS);
- Relevant Local Government Authorities in respect of zoning, water services related activities;
- BirdLife South Africa;
- VulPro;
- Endangered Wildlife Trust (EWT); and
- South African National Parks (SANParks).

Refer to the Stakeholder Engagement Report (SER) in **Appendix E** for a full list of commenting authorities.

1.4.4. ENVIRONMENTAL ASSESSMENT PRACTITIONER

WSP has been appointed in the role of Independent Environmental Assessment Practitioner (EAP) to undertake the S&EIR processes for the development of the Project. The CV of the EAP is available in **Appendix A**. The EAP declaration of interest and undertaking is included in **Appendix B**. **Table 1-4** details the relevant contact details of the EAP. In order to adequately identify and assess potential environmental impacts, a number of specialists will support the EAP.

Table 1-4 – Details of the Environmental Assessment Practitioner

Environmental Assessment Practitioner (EAP)	WSP Group Africa (Pty) Ltd
Contact Person:	Ashlea Strong
Postal Address:	Building 1, Maxwell Office Park, Magwa Cres, Midrand, 1685
Telephone:	011 361 1392
Fax:	011 361 1381
E-mail:	Ashlea.Strong@wsp.com
Qualifications:	Masters in Environmental Management, University of the Free State B Tech, Nature Conservation, Technikon SA National Diploma in Nature Conservation, Technikon SA
EAPASA Registration Number:	EAPASA (2019/1005)

Statement of Independence

Neither WSP nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any business, financial, personal, or other interest that could be reasonably regarded as being capable of affecting their independence. WSP has no beneficial interest in the outcome of the assessment.

1.4.5. SPECIALISTS

Specialist input was required in support of this application for Environmental Authorisation (EA). The details of the specialists are provided in **Table 1-5** below. The specialist studies are attached in **Appendix G** and their declarations in **Appendix D.**

Table 1-5 – Details of Specialists

Assessment	Name of Specialists	Company	Sections in Report	Specialist Report attached as
Soil. Land use and Land Capability	Albie Götze	Environment Research Consulting	Section 3.5.2 Section 5.4.1 Section 7.1.1 Section 9.3 Section 10.1 Section 0 Section 12.2.1 Section 12.3.1 Section 12.4.1.1	**Appendix G.1**
Terrestrial Biodiversity	Andrew Zinn	Hawkhead Consulting	Section 3.5.3 Section 5.4.2 Section 7.2.1 Section 9.4 Section 10.2 Section 10.14.1 Section 0 Section 12.2.2 Section 12.3.1	**Appendix G.2**
Aquatic	Antonia Belcher	Blue Science	Section 3.5.6 Section 5.4.5 Section 7.2.4 Section 9.7 Section 10.3 Section 10.14.4 Section 0 Section 12.2.5 Section 12.3.1 Section 12.4.1.3	**Appendix G.3**
Heritage & Palaeontology	Nicholas Wiltshire	Cedar Tower Services (Pty) Ltd t/a CTS Heritage	Section 3.5.7 Section 5.4.6 Section 7.3.1 Section.9.8 Section 9.9 Section 10.4 Section 12.2.6 Section 12.2.5 Section 12.3.1 Section 12.4.1.4	**Appendix G.4**
Avifauna	Anja Albertyn and Dr Miqkayla Stofberg	Holland and Associates	Section 3.5.8 Section 5.4.7 Section 7.2.5	**Appendix G.5**

Assessment	Name of Specialists	Company	Sections in Report	Specialist Report attached as
		Environmental Consultants	Section 9.10 Section 10.5 Section 0 Section 12.2.7	
Invertebrates (Butterfly Assessment)	Riaan Robbeson and Reinier Terblanche	Bathusi Environmental Consulting	Section 3.5.9 Section 5.4.8 Section 7.2.6 Section 10.6 Section 0 Section 12.2.8 Section 12.4.1.6	**Appendix G.14**
Bats	Dr. Low de Vries	Voltant Environmental	Section 0 Section 5.4.9 Section 7.2.7 Section 0 Section 10.7 Section 0 Section 12.2.9 Section 12.3.1 Section 12.4.1.7	**Appendix G.6**
Visual	Lourens du Plessis & Tosca de Villiers	LoGIS Nuleaf Planning	Section 3.5.11 Section 5.4.10 Section 7.3.3 Section 0 Section 10.7 Section 0 Section 0 Section 12.2.10 Section 12.3.1	**Appendix G.7**
Noise	Morné de Jager	Enviro Acoustic Research cc	Section 3.5.12 Section 5.4.11 Section 7.3.4 Section 9.15 Section 10.9 Section 10.14.8 Section 0 Section 12.2.11 Section 12.3.1 Section 12.4.1.8	**Appendix G.8**
Traffic	Iris Wink	iWink Consulting (Pty) Ltd	Section 3.5.13 Section 5.4.12 Section 0 Section 9.15 Section 10.10 Section 10.14.9 Section 0 Section 12.2.12 Section 12.3.1 Section 12.4.1.10	**Appendix G.9**
Geotechnical	Khuthadzo Bulala	WSP Africa (Pty) Ltd	Section 3.5.14 Section 5.4.13 Section 7.1.2 Section 9.16 Section 10.12 Section 0 Section 0 Section 12.2.13	**Appendix G.10**

Assessment	Name of Specialists	Company	Sections in Report	Specialist Report attached as
			Section 12.3.1	
Social	Tumelo Mathulwe	WSP Africa (Pty) Ltd	Section 0 Section 7.3.5 Section 9.17 Section 10.11 Section 0 Section 12.2.14	**Appendix G.11**
Plant Species	Andrew Zinn	Hawkhead Consulting	Section 3.5.4 Section 5.4.3 Section 7.2.2 Section 0 Section 10.14.2 Section 0 Section 12.2.3 Section 12.3.1	**Appendix G.12**
Animal Species	Andrew Zinn	Hawkhead Consulting	Section 3.5.5 Section 5.4.4 Section 7.2.3 Section 0 Section 10.14.3 Section 0 Section 12.2.4 Section 12.3.1	**Appendix G.13**
High-level Safety, Health and Environment Risk Assessment	Debbie Mitchell	ISHECONcc	Section 5.4.14 Section 7.3.6 Section 10.13 Section 12.2.15	**Appendix G.15**

1.5 IMPACT ASSESSMENT TERMS OF REFERENCE

The 2014 Environmental Impact Assessment (EIA) Regulations (GNR 982), as amended, identifies the Project as an activity being subject to an S&EIR process due to the applicability of the EIA Listing Notices 2 (GNR 983 and 984, as amended). For the project to proceed, it will require an EA from the DFFE.

The Scoping Process has been completed and involved consultation with interested and affected parties and the drafting of the Plan of Study (PoS) for EIA, which culminated in the submission of a Final Scoping Report (FSR) to the DFFE on **8 May 2026**. The FSR was resubmitted on 13 May following IT system issues experienced by the DFFE. The DFFE acceptance of the FSR and authorisation to proceed with the EIAr was received on **22 June 2026** (**Appendix C).**

As defined in Appendix 3 of GNR 982, as amended, the objective of the impact assessment process is to, through a consultative process:

- Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- Identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

- Determine the—
  - Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
- Degree to which these impacts-
  - Can be reversed;
  - May cause irreplaceable loss of resources, and
  - Can be avoided, managed or mitigated;
- Identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- Identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- Identify suitable measures to avoid, manage or mitigate identified impacts; and
- Identify residual risks that need to be managed and monitored.
- Public participation is a requirement of the S&EIR process; it consists of a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIR decision-making process. Effective public participation requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the Project. The objectives of the public participation process can be summarised as follows:
- Identify relevant individuals, organisations and communities who may be interested in or affected by the Project;
- Clearly outline the scope of the Project, including the scale and nature of the existing and proposed activities;
- Identify viable Proposed Project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the subsequent specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the Project, issues and solutions

1.6 OBJECTIVES OF THE S&EIA PROCESS AS PER THE PROCEDURAL FRAMEWORK

The S&EIR process consists of various phases with associated timelines as defined in GNR 982. The process can generally be divided into four main phases, namely, (i) a Pre-application Phase, (ii) an Application and Scoping Phase, (iii) an Impact Assessment Phase (current phase) and (iv) Authorisation and Appeal Phase.

The main objectives of the phases can be described as follows:

- Pre-Application Phase (Completed):

- Undertake consultation meetings with the relevant authorities to confirm the required process, the general approach to be undertaken and to agree on the public participation plan;
- Identify stakeholders, including neighbouring landowners/residents and relevant authorities;

- Application and Scoping Phase (Completed):
  - Compile and submit application form to the CA and pay the relevant application fee;
  - Compile a Draft Scoping Report (DSR) describing the affected environment and present an analysis of the potential environmental issues and benefits arising from the proposed project that may require further investigation in the Impact Assessment Phase;
  - Develop draft terms of reference for the specialist studies to be undertaken in the Impact Assessment Phase; and
  - Inform stakeholders of the proposed project, feasible alternatives and the S&EIR process and afford them the opportunity to register and participate in the process and identify any issues and concerns associated with the proposed project.
  - Incorporate comments received from stakeholders during the DSR comment period;
  - Should significant amendments be required, release the updated DSR for an additional 30-day comment period to provide stakeholders with the opportunity to review the amendments as well as provide additional input if required; and
  - Submit the FSR, following the consultation period, to the relevant authorities, in this case the DFFE, for acceptance/rejection.

- Impact Assessment Phase (**Current**):
  - Continue to inform and obtain contributions from stakeholders, including relevant authorities, stakeholders, and the public and address their relevant issues and concerns;
  - Assess in detail the potential environmental and socio-economic impacts of the project as defined in the DSR;
  - Identify environmental and social mitigation measures to avoid and/or address the identified impacts;
  - Develop and/or amend environmental and social management plans based on the mitigation measures developed in the EIAr;
  - Submit the EIAr and the associated EMPr to the CA to undertake the decision-making process;
  - The DFFE to provide written notification of the decision to either grant or refuse EA for the proposed project; and
  - Notify all registered stakeholders of the decision and right to appeal.

- Authorisation and Appeal Phase;
  - The DFFE to provide written notification of the decision to either grant or refuse EA for the proposed project; and
  - Notify all registered stakeholders of the decision and right to appeal.

1.6.1. IMPACT ASSESSMENT REPORT STRUCTURE

Table 1-6 cross-references the sections where the legislated requirements as per Appendix 3 of GNR 982 of 2014 can been located within the DEIR.

Table 1-6 – Legislated Report Requirements as detailed in GNR 982

Appendix 3	Legislated requirements as per the NEMA GNR 982	Relevant Report Section
(a)	Details of	
	the EAP who compiled the report; and	Section 1.4.4 Appendix A
	the expertise of the EAP, including a Curriculum Vitae	Appendix A
(b)	The location of the activity, including-	
	The 21-digit Surveyor code for each cadastral land parcel;	Section 4.1
	Where available, the physical address and farm name	Section 4.1
	Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundary of the property.	N/A
(c)	A plan which locates the proposed activities applied for at an appropriate scale, or, if it is-	
	A linear activity, a description of the corridor in which the proposed activity or activities is to be undertaken; or	N/A
	On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	N/A
(d)	A description of the proposed activity, including-	
	All listed and specified activities triggered and being applied for;	Section 6.1
	A description of the associated structures and infrastructure related to the development;	Section 4.3
(e)	A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Section 6
(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;	Section 4.5
(h)	A full description of the process followed to reach the proposed development footprint within the approved site, including-	
	Details of the development footprint alternatives considered;	Section 5
	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 3.4 Appendix F
	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;	Appendix E
	The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 7
	The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated.	Section 9
	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	Section 3.3

Appendix 3	Legislated requirements as per the NEMA GNR 982	Relevant Report Section
	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 9
	The possible mitigation measures that could be applied and level of residual risk;	Section 9
	If no alternative development locations for the activity were investigated, the motivation for not considering such; and	Section 5
	A concluding statement indicating the preferred alternative development location within the approved site.	Section 12.3
(i)	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including-	
	A description of all environmental issues and risks that were identified during the environmental impact assessment process; and;	Section 9
	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.	Section 9
(j)	An assessment of each identified potentially significant impact and risk, including-	
	Cumulative impacts;	Section 10
	The nature, significance and consequences of the impact and risk;	Section 8
	The extent and duration of the impact and risk;	Section 9
	The probability of the impact and risk occurring;	Section 9
	The degree to which the impact and risk can be reversed;	Section 9
	The degree to which the impact and risk may cause irreplaceable loss of resources; and	Section 9
	The degree to which the impact and risk can be mitigated.	Section 9
(k)	Where applicable, a summary of the findings and recommendations of 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 assessment report.	Section 12.2
(l)	An environmental impact statement which contains-	
	A summary of the key findings of the environmental impact assessment:	Section 11
	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	Section 8.2
	A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	Section 11
(m)	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.	Section 11
(n)	The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment.	Section 5

Appendix 3	Legislated requirements as per the NEMA GNR 982	Relevant Report Section
(o)	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 authorisation;	Section 13
(p)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.	Section 3.5
(q)	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.	Section 13
(r)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised.	N/A
(s)	An undertaking under oath or affirmation by the EAP in relation to-	
	The correctness of the information provided in the report;	Appendix A
	The inclusion of comments and inputs from stakeholders and I&APs;	Appendix A
	The inclusion of inputs and recommendations from the specialist reports where relevant; and	Appendix A
	Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties.	Appendix E
(t)	where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts	N/A
(u)	An indication of any deviation from the approved scoping report, including the plan of study, including-	N/A
	any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and	N/A
	a motivation for the deviation	N/A
(v)	Any specific information required by the competent authority; and	N/A
(w)	Any other matter required in terms of section 24(4)(a) and (b) of the Act	N/A

2 SCOPING PHASE SUMMARY

2.1 PROCEDURAL PROCESS

The application form was compiled and submitted to the DFFE on **13 March 2026** with the (Draft Scoping Report) DSR. The application form was acknowledged on **25 March 2026**.

The DFFE reference number allocated to this application was **14/12/16/3/3/2/2803**. This reference number was included on all official correspondence with the authorities and the public regarding the Project. A copy of the acknowledgement of receipt of the application is included in the SER.

The Draft Scoping Reports were placed on public review for a period of 30 days from **13 March 2026** to **15 April 2026**. The submission of the final scoping report was within 44 days of receipt of the application by the DFFE as required by GNR 982 and was submitted on **08 May 2026** for their review and approval. The FSR was resubmitted on 13 May following IT system issues experienced by the DFFE. Subsequently, the approval of the FSR for the EIA was received on **22 June 2026** (**Appendix E).**

2.2 AUTHORITY CONSULTATION

A virtual pre-application meeting was held on **25 November 2024** with the DFFE to discuss the Project. The minutes of the meetings are included in **Appendix I**. In addition, WSP notified a number of commenting authorities of the Project via a notification letter (12 May 2026), these included:

- DFFE: B&C;
- MDARDLEA;
- GDARD;
- Gauteng Department of Environment (GDEnv);
- DFFE: National Vulture Task Force;
- DWS;
- DMPR;
- Petroleum Agency of South Africa (PASA);
- DLRRD;
- DOA;
- Department of Public Works;
- Department of Defence;
- National DoT;
- SANRAL;
- SAHRA;
- CAA;
- SKA;
- SARAO;
- SAWS;
- Relevant Local Government Authorities in respect of zoning, water services related activities;
- BirdLife SA;
- VulPro;
- EWT; and

- SANParks.

The comments and responses are included in Section 3 of the SER (**Appendix E**).

2.3 STAKEHOLDER CONSULTATION

Stakeholders were identified and will continue to be identified through several mechanisms. These include:

- Utilising existing databases from other projects in the area;
- Networking with local business owners, non-governmental agencies, community-based organisations, and local council representatives;
- Field work in and around the project area;
- Advertising in the press;
- Placement of community notices;
- Completed comment sheets; and
- Attendance registers at meetings.

All Stakeholders identified to date have been registered on the project stakeholder database. The EAP endeavoured to ensure that individuals/organisations from referrals and networking were notified of the Project. Stakeholders were identified at the horizontal (geographical) and vertical extent (organisations level). A list of stakeholders captured in the project database is included in **Appendix A** of the SER.

2.3.1. STAKEHOLDER NOTIFICATION

2.3.1.1 Direct Notification

DSR:

Notification of the DSR availability was issued to potential and existing Stakeholders, via direct correspondence (i.e., site notices, emails, SMSs, etc.) on **13 March 2026**. Copies of the notification letters, proof of email and SMS notification is included in **Appendix E**.

FSR:

Notification of the Project submission and availability of the FSR was issued to existing Stakeholders, via direct correspondence (i.e. emails, SMSs, etc.) on **12 May 2026**. Copies of the notification letters, proof of email and SMS notification have been included in **Appendix E**.

DEIR:

Notification of the Project availability of the DEIR was issued to existing Stakeholders, via direct correspondence (i.e., site notices, emails, SMSs, etc.). Copies of the notification letters, proof of email and SMS notification will be included in the final EIA in **Appendix E**.

FEIR:

Notification of the Project submission and availability of the FEIR will be issued to existing Stakeholders, via direct correspondence (i.e., emails, SMSs, etc.) following submission of the FEIR to DFFE for decision making.

EA DECISION:

Notification of the EA decision will be issued to registered Stakeholders via direct correspondence (i.e., emails and SMSs) upon receipt of the decision from the competent authority. Stakeholders will be provided with details of the decision and, where applicable, information relating to the appeal process in accordance with the EIA Regulations, 2014 (as amended).

2.3.1.2 Newspaper Advertisements

In accordance with the requirements of GNR 982, as amended, the proposed project was advertised in one local newspaper and was published in three languages (English, Afrikaans and IsiZulu). The purpose of the advertisement is to notify the public about the proposed project and to invite them to register as stakeholders.

During the Draft Scoping Phase, DFFE requested that the Project also be advertised in Sesotho. Accordingly, the Project was re-advertised in a local newspaper in Sesotho on 19 August 2026 during the Draft EIA Phase. The related correspondence with DFFE and proof of publication is included in **Appendix E**.

Additionally, the notification of the Applicant's intent to resubmit the Application for EA was advertised in a local newspaper in four languages (English, Afrikaans, IsiZulu and Sesotho) on 28 October 2026. The advertisement publication details are provided in **Table 2-1.**

Table 2-1 – Dates on which the adverts were published

Newspaper	Distribution Type	Language	Reach	Publication Date
Heidelberg Nigel Heraut	Newspaper	English, Afrikaans and IsiZulu	Heidelberg, Ratanda, Balfour	11 March 2026
Heidelberg Nigel Heraut	Newspaper	Sesotho	Heidelberg, Ratanda, Balfour	19 August 2026
Heidelberg Nigel Heraut	Newspaper	English, Afrikaans, IsiZulu and Sesotho	Heidelberg, Ratanda, Balfour	28 October 2026

2.3.1.3 Site Notices

The official site notices were erected as per GNR 982 (as amended), on the boundary fence of the proposed site. In addition, general project notices, announcing the Project and inviting stakeholders to register, were placed at various locations in and around the Project area on 13 March 2026. Proof of placement of site notices is included in the SER (**Appendix E**). A second round of site notices were prepared in Sesotho and were placed at strategic locations near the proposed Project site during the original Draft EIA Phase PPP, which commenced on 24 August 2026. Proof of placement of the second round of site notices has been included in the in the SER (**Appendix E**). Additionally, a third round of site notices was prepared (in four languages, i.e. English, Afrikaans, IsiZulu and Sesotho) and will be placed at strategic locations near the proposed Project site to notify I&APs and stakeholders of the resubmission of the DEIR on the 28 October 2026. Proof of placement will be included in the FEIR.

2.3.1.4 Availability of the DSR

The DSR was placed on public review for a period of 30 days from **13 March 2026 to 15 April 2026**, at the venues as follows:

- Hard Copy: Ratanda Proper Library - Nkomo St, Ratanda, Heidelberg - GP, 1443
- Hard Copy: Heidelberg Public Library - 7 Jacobs St, Heidelberg, Heidelberg - GP, 1441
- Hard Copy: Ward 3 Public Library - Joubert street, Balfour, 2410
- Hard Copy: Grootvlei Power Station Stores - Seventh Street, Grootvlei
- Electronic Copy: WSP Website (https://www.wsp.com/en-ZA/services/public-documents); and
- Electronic Copy: Datafree Website (https://wsp-engage.com/).

The DSR was made available to Commenting Authorities via a One Drive link.
In order to ensure maximum participation of all I&APs, reports were shared on the Datafree website. Proof of display is included in the SER (**Appendix E**).

2.3.1.5 Availability of the Final Scoping Report

The FSR was made available to the public on **12 May 2026** as follows:

- Electronic Copy: WSP Website (https://www.wsp.com/en-ZA/services/public-documents); and
- Electronic Copy: Datafree Website (https://wsp-engage.com/).

2.3.1.6 Availability of the DEIR (Original Application)

The DEIR will be placed on public review from 25 August 2026 to 28 September 2026, at the venues as follows:

- Hard Copy: Ratanda Proper Library - Nkomo St, Ratanda, Heidelberg - GP, 1443
- Hard Copy: Heidelberg Public Library - 7 Jacobs St, Heidelberg, Heidelberg - GP, 1441
- Hard Copy: Ward 3 Public Library - Joubert street, Balfour, 2410
- Hard Copy: Grootvlei Power Station Stores - Seventh Street, Grootvlei
- Electronic Copy: WSP Website (https://www.wsp.com/en-ZA/services/public-documents); and
- Electronic Copy: Datafree Website (https://wsp-engage.com/).

The original DEIR was made available to Commenting Authorities via a One Drive link. In order to ensure maximum participation of all I&APs, the reports were also shared on the Data free website. The comments received and their respective responses was included in the SER.

2.3.1.7 Availability of the DEIR (Resubmission)

The DEIR will be placed on public review from **28 October 2026 to 30 November 2026**, at the venues as follows:

- Hard Copy: Ratanda Proper Library - Nkomo St, Ratanda, Heidelberg - GP, 1443
- Hard Copy: Heidelberg Public Library - 7 Jacobs St, Heidelberg, Heidelberg - GP, 1441
- Hard Copy: Ward 3 Public Library - Joubert street, Balfour, 2410
- Electronic Copy: WSP Website (https://www.wsp.com/en-ZA/services/public-documents); and
- Electronic Copy: Datafree Website (https://wsp-engage.com/).

The DEIR will be made available to Commenting Authorities via a One Drive link. In order to ensure maximum participation of all I&APs, the reports were also shared on the Data free website. The comments received and their respective responses will be included in the SER.

2.3.2. Availability of the FEIR

The FEIR will be made available to the public, following the submission of the FEIR to the competent authority for decision making, as follows:

- Electronic Copy: WSP Website (https://www.wsp.com/en-ZA/services/public-documents); and
- Electronic Copy: Datafree Website (https://wsp-engage.com/).

2.4 SUMMARY OF IMPACT SIGNIFICANCE SCREENING

This section presents a summary outlining the likely significance of potential impacts (without mitigation) identified for the construction phase (**Table 2-2),** operational phase (**Table 2-3**), decommissioning phase (**Table 2-4**) as documented in the FSR, in the form of an impact screening tool which was based on two criteria, namely, probability and consequence (outlined in **Section 3.3**). This was used as a guide to determine whether additional assessment may be required in the EIA phase. Any such assessments were then completed in the EIA phase. Impacts were refined and assessed during the EIA phase.

Table 2-2 – Significance of potential construction phase impacts (Scoping Phase)

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Soil, Land use and land capability	Agricultural land use change	Negative	3	2	**Low**
	Land and soil degradation	Negative	3	2	**Medium**
	Disruption or prevention of farming operations	Negative	3	2	**Low**
	Improvement in financial security and the operations of the farm	Positive	4	3	**High**
Animal species	Direct loss and disturbance of natural habitat	Negative	4	3	**High**
	Fragmentation reducing natural habitat connectivity	Negative	4	2	**Medium**
	Direct loss and disturbance of fauna SCC	Negative	4	2	**Medium**
	Soil erosion and sedimentation of drainage features;	Negative	4	2	**Medium**

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Plant species	Direct loss of flora SCC	Negative	4	2	**Medium**
	Establishment and spread of alien and invasive species;	Negative	4	2	**Medium**
Aquatic Biodiversity	Disturbance of riparian/wetland vegetation	Negative	3	2	**Low**
	Water quality impact	Negative	3	3	**Low**
Heritage, Archaeology and palaeontology	Loss of/ disturbance to heritage resources	Negative	2	3	**Medium**
	Disturbance on fossil heritage	Negative	2	2	**Low**
	Sustainable social and economic benefits	Positive	4	3	**High**
Avifauna	Displacement through disturbance	Negative	2	3	**Low**
	Displacement through habitat loss	Negative	3	2	**Medium**
	Mortality from collisions with turbines	Negative	3	2	**Medium**
	Mortality from electrocutions on electrical infrastructure	Negative	3	2	**Medium**
Bats	Habitat destruction	Negative	3	2	**Medium**
	Roost disturbance or destruction	Negative	3	2	**Medium**
Visual	Visual impact of construction activities	Negative	4	3	**High**
Traffic	Temporary increase in traffic	Negative	4	2	**Medium**
	Noise and dust pollution	Negative	4	2	**Medium**
	Damage to road surfaces	Negative	3	3	**Medium**

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Geotechnical	Slope stability	Negative	2	2	**Low**
	Seismic activity	Negative	3	2	**Medium**
	Soil erosion	Negative	4	2	**Medium**
	Hydrocarbon spillages	Negative	4	2	**Medium**
	Disturbance of flora and fauna	Negative	3	1	**Low**
	Subsidence	Negative	5	3	**High**
Social	Job creation	Positive	3	3	**Medium**
	Loss of agricultural land	Negative	3	3	**Medium**
	income for affected landowners	Positive	3	1	**Low**
	Community health, safety and security	Negative	2	2	**Low**
	Noise	Negative	2	2	**Low**
	Dust	Negative	4	2	**Medium**
	Visual	Negative	4	3	**High**

Table 2-3 - Significance of potential operational phase impacts (Scoping Phase)

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Soil, land use and Land capability	Land and soil degradation	Negative	2	2	**Low**
	Disruption or prevention of farming operations.	Negative	3	1	**Low**
	Improvement in financial security and the operations of the farm	Positive	4	3	**High**

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Animal species	Impacts fauna SCC	Negative	3	2	**Medium**
	Disturbance to fauna SCC	Negative	4	2	**Medium**
Plant species	Establishment and spread of alien and invasive species;	Negative	3	2	**Medium**
	Wildfires	Negative	3	2	**Medium**
Aquatic Biodiversity	Disturbance of riparian and wetland vegetation	Negative	3	1	**Low**
	Modification of surface water runoff	Negative	3	1	**Low**
	Erosion and alien riparian vegetation invasion	Negative	3	1	**Low**
Avifauna	Displacement through disturbance	Negative	3	3	**Medium**
	Displacement through habitat loss	Negative	3	4	**High**
	Mortality from collisions with turbines	Negative	4	4	**Very high**
	Mortality from collisions with overhead powerlines	Negative	3	3	**Medium**
	Mortality from electrocutions on electrical infrastructure	Negative	3	3	**Medium**
Bats	Bats mortality	Negative	4	4	**Very high**
	Artificial lighting	Negative	3	2	**Medium**
Visual	Reduction in visual resource value.	Negative	4	4	**Very high**
Noise	Aerodynamic noise disturbance	Negative	3	1	**Low**
Traffic	Increase in traffic	Negative	2	2	**Low**
Geotechnical	Slope stability	Negative	2	2	**Low**

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
	Seismic activity	Negative	3	2	Medium
	Soil erosion	Negative	4	2	Medium
	Hydrocarbon	Negative	4	2	Medium
	Disturbance of flora and fauna	Negative	3	1	Low
	Subsidence	Negative	4	3	High
Social	Job creation	Positive	3	3	Medium
	Population influx	Negative	3	2	Medium
	Procurement from local businesses	Positive	2	2	Low
	Community health, safety and security	Negative	2	2	Low
	Energy generation	Positive	2	2	Low
	Visual	Negative	4	3	High
	Noise	Negative	3	3	Medium

Table 2-4 - Significance of potential decommissioning phase impacts (Scoping Phase)

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Soil ,landuse and land capability	Land and soil degradation	Negative	2	2	Low
	Disruption or prevention of farming operations.	Negative	3	1	Low
Plant species	Establishment and spread of alien and invasive species;	Negative	4	2	Medium
	Soil erosion and sedimentation of drainage features	Negative	3	2	Medium
Aquatic Biodiversity	Disturbance of riparian vegetation	Negative	2	2	Low
	Water quality impacts (largely sedimentation)	Negative	2	2	Low

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
	Erosion of aquatic features and alien riparian vegetation invasion	Negative	2	2	**Low**
Avifauna	Displacement through disturbance	Negative	3	3	**Medium**
	Displacement through habitat loss	Negative	3	3	**Medium**
	Mortality from collisions with turbines	Negative	3	2	**Medium**
	Mortality from collisions with overhead powerlines	Negative	2	1	**Low**
	Mortality from electrocutions on electrical infrastructure	Negative	2	1	**Low**
Bats	Habitat destruction	Negative	3	2	**Medium**
	Roost disturbance or destruction	Negative	3	2	**Medium**
Visual	Potential visual impacts on sensitive visual receptors	Negative	4	2	**Medium**
	Potential visual impact of decommissioning activities on sensitive visual receptors	Negative	4	2	**Medium**
Traffic	Increase in traffic	Negative	2	2	**Low**
Geotechnical	Subsidence	Negative	4	3	**High**
	Slope stability	Negative	2	2	**Low**
	Soil erosion	Negative	4	2	**Medium**
Social	Loss of employment	Negative	3	3	**Medium**
	Reduced community investment	Negative	3	2	**Medium**
	Associated infrastructure	Negative	4	2	**Medium**

Table 2-5 - Initial Cumulative Impacts (Scoping Phase)

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Aquatic	Aquatic ecosystem degradation	Negative	2	2	**Low**
Social	Employment	Positive	3	2	**Medium**
	Traffic	Negative	3	1	**Low**
	Economic benefits	Positive	3	2	**Medium**
Geotechnical	Seismic activity	Negative	3	2	**Medium**
	Soil erosion	Negative	4	2	**Medium**
	Hydrocarbon spillages	Negative	4	2	**Medium**
	Disturbance of flora and fauna	Negative	3	1	**Low**
	Subsidence	Negative	4	3	**High**
Traffic	Additional traffic impact	Negative	4	2	**Medium**

3 EIA PROCESS

3.1 APPLICATION FOR ENVIRONMENTAL AUTHORISATION

The application phase consisted of a pre-application consultation with DFFE and subsequently completing the appropriate application form as well as the submission and registration of the application for EA with the DFFE. A virtual pre-application meeting was held on **25 November 2024** with the DFFE to discuss the Project. The minutes of the meeting are included in **Appendix F.**

The application to the DFFE was submitted on **13 March 2026**. The DFFE confirmed receipt of the application on **25 March 2026** and allocated the following reference number to the application - **14/12/16/3/3/2/2803**.

As mentioned earlier, the FEIR was submitted to the DFFE on 12 October 2026. However, email correspondence received from the DFFE on 13 October 2026 informed the EAP and Applicant that the according to the DFFE records the application had lapsed in terms of Regulation 23(1) of GNR 326, as amended, as the FEIR was due in fact due on or before Friday, 09 October 2026.

Additionally, a notification was sent to all registered I&APs, stakeholders and commenting authorities to inform them that WSP will be re-submitting the application for EA for the proposed project in terms of Regulation 21(2) of GNR 326, as amended. This regulation affords the Applicant the option to re-apply and re-submit the FEIR (subject to additional public participation in terms of Regulation 21(2)(d)) to the DFFE within two years of acceptance of the Scoping Report (dated 22 June 2026).

WSP received confirmation from the DFFE on 15 October 2026 that it may proceed with submitting a new application for Environmental Authorisation (EA) in terms of Regulation 21(2). Accordingly, the FEIR that was submitted as part of the original application (DFFE Reference No. 14/12/16/3/3/2/2803) is being re-submitted as a DEIR (this report) in support of the re-submission of the EA application. The re-submitted application will receive a new reference number from the DFFE once the application has been submitted and acknowledged.

In addition, according to the DFFE, the pre-application meeting held on 25 November 2024 still remains valid and the project will not require a new pre-application meeting. The correspondence confirming this is included in **Appendix E.**

Please refer to the table below, which outlines how the requirements of Regulation 21(2)(a), (b), (c) and (d) will be met.

Table 3-1 - Motivation for Application of EA in terms of Regulation 21(2)(a)(b)(c) and (d)

Regulation	Motivation
Regulation 21: Submission of scoping report to competent authority:	
(2) Subject to regulation 46, and if the findings of the scoping report is still valid and the environmental context has not changed, the submission of a scoping report as contemplated in subregulation (1) need not be complied with—	The Acceptance of the Scoping Report for the proposed project was received on 23 June 2026 (letter dated 22 June 2026). The Scoping Report is therefore still valid, and the environmental context has not changed.

(a) in cases where a scoping report was accepted as part of a previous application for environmental authorisation and the application has lapsed or was refused because of insufficient information;	The scoping report was accepted as per of the EA application 14/12/16/3/3/2/2803 and lapsed as a result of the late submission of the Final EIAr, and not due to a refusal or insufficient information.
(b) on condition that regulation 16 is complied with and that such application is accompanied by proof that registered interested and affected parties, who participated in the public participation process conducted as part of the previous application, have been notified of this intended resubmission of the application prior to submission of such application;	Regulation 16 has been complied with as part of the EA Application 14/12/16/3/3/2/2803. This letter informs registered interested and affected parties (I&APs) of the application lapse and the intention to resubmit the application. The registered interested and affected parties will also be informed via email and SMS when the application is resubmitted, and the Draft EIA Report is available for public review and comment.
(c) if the application contemplated in paragraph (b) is submitted by the same applicant for the same development, as applied for and lapsed or refused as contemplated in paragraph (a); and	The applicant is ABO Uvemvane Wind Energy Facility 1 (Pty) Ltd and will not change and the proposed development also remains unchanged.
(d) if an environmental impact assessment report inclusive of specialist reports and an EMPr, which must have been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority, is submitted within a period of two years from the date of the acceptance of the scoping report contemplated in paragraph (a).	The first Draft EIA Report, inclusive of specialist report and EMPr, was subject to the legislated public participation process (PPP), in accordance with the law, from 25 August 2026 to 28 September 2026. The PPP conducted in this regard included: • Notification Letters: circulated via email on 24 August 2026. • Site Notices: – First round of site notices was placed in English, Afrikaans, IsiZulu on 13 March 2026 (Draft Scoping Phase). – Second round of site notices placed in Sesotho for the Draft EIA phase (additional local language as requested by DFFE) on 25 August 2026. • Advertisements: – Placed in English, Afrikaans, IsiZulu on 11 March 2026 in the Heidelberg Nigel Heraut Newspaper (Draft Scoping Phase). – Placed in Sesotho for the Draft EIA phase (additional local language as requested by DFFE) on 19 August 2026 in the Heidelberg Nigel Heraut Nwspaper. • SMS: Stakeholders and I&APs were notified via SMS on 25 August 2026. Draft EIA Reports: Uploaded to the WSP Website and DataFree website (free download service). The updated Draft EIA Report inclusive of specialist reports and an EMPr, will be subjected to an additional public participation process of at least 30 days. All comments received during this review period will be incorporated into the Final EIA

	Report. Submission of this Final EIA Report will be undertaken well within a period of two years from the date of the acceptance of the scoping report.

3.2 BASELINE ENVIRONMENTAL ASSESSMENT

The description of the environmental attributes of the Project area was compiled through a combination of desktop reviews and site investigations. Desktop reviews made use of available information including existing reports, aerial imagery, and mapping. The specialist teams undertook site investigations (both wet and dry seasons), between November 2024, and between February 2025, to identify sensitive features on site that informed the sensitivity mapping (see **Section 7**) for the proposed project.

3.3 IMPACT ASSESSMENT METHODOLOGY

3.3.1. ASSESSMENT OF IMPACTS AND MITIGATION

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed Project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct[2], indirect[3], secondary[4] as well as cumulative[5] impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering the criteria[6] presented in **Table 3-2**.

Table 3-2 – Impact Assessment Criterion and Scoring System

Criteria	Score 1	Score 2	Score 3	Score 4	Score 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low:	Low:	Medium: Processes continue but	High:	Very High:

[2] Impacts that arise directly from activities that form an integral part of the Project.
[3] Impacts that arise indirectly from activities not explicitly forming part of the Project.
[4] Secondary or induced impacts caused by a change in the Project environment.
[5] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.
[6] The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

Criteria	Score 1	Score 2	Score 3	Score 4	Score 5
	No impact on processes	Slight impact on processes	in a modified way	Processes temporarily cease	Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
Impact Significance Rating					
Total Score	**4 to 15**	**16 to 30**	**31 to 60**	**61 to 80**	**81 to 100**
Environmental Significance Rating (Negative (-))	**Very low**	**Low**	**Moderate**	**High**	**Very High**
Environmental Significance Rating (Positive (+))	**Very low**	**Low**	**Moderate**	**High**	**Very High**

3.3.2. IMPACT MITIGATION

The impact significance without mitigation measures have been assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option

should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

The mitigation sequence/hierarchy is shown in **Figure 3-1** below:

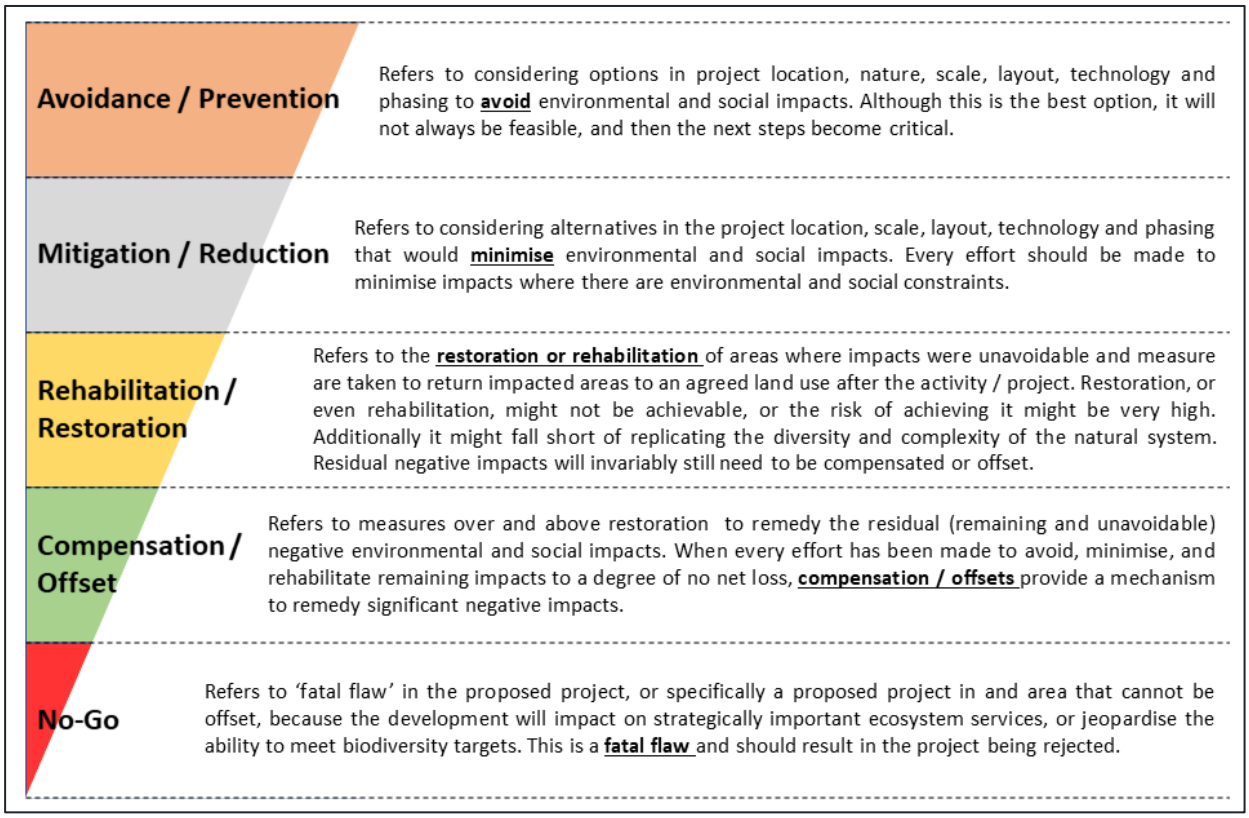


Figure 3-1 - Mitigation Sequence/Hierarchy

3.4 STAKEHOLDER ENGAGEMENT PROCESS

Stakeholder engagement (public participation) is a requirement of the S&EIA process. It consists of a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIA decision-making process. Effective engagement requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the Project. The objectives of the stakeholder engagement process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the proposed project;
- Clearly outline the scope of the proposed Project, including the scale and nature of the existing and proposed activities;

- Identify viable proposed Project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the proposed Project, issues, and solutions.

A SER has been included in **Appendix E**, detailing the Project's compliance with Chapter 6 of the NEMA EIA Regulations 2014, as amended.

3.4.1. STAKEHOLDER IDENTIFICATION

Stakeholders were identified and will continue to be identified through several mechanisms. These include:

- Utilising existing databases from other projects in the area;
- Advertising in the press;
- Placement of community notices; and
- Completed comment sheets.

All Stakeholders identified to date have been registered on the project stakeholder database. The EAP endeavoured to ensure that individuals/organisations from referrals and networking were notified of the proposed Project. Stakeholders were identified at the horizontal (geographical) and vertical extent (organisations level).

A list of stakeholders captured in the project database is included in the SER in **Appendix E**.

3.5 ASSUMPTIONS AND LIMITATIONS

3.5.1. GENERAL ASSUMPTIONS AND LIMITATIONS:

- The EAP hereby confirms that they have undertaken to obtain project information from the client that is deemed to be accurate and representative of the project;
- Site visits have been undertaken to better understand the project and ensure that the information provided by the client is correct, based on site conditions observed;
- The EAP hereby confirms their independence and understands the responsibility they hold in ensuring all comments received are accurately replicated and responded to within the EIA documentation;
- The comments received in response to the public participation process, will be representative of comments from the broader community; and
- Based on the pre-application meeting and subsequent minutes, the CA would not require additional specialist input, in order to make a decision regarding the application.

3.5.2. SOIL, LAND USE AND LAND CAPABILITY:

The following assumptions and limitations are applicable to this assessment:

- Land Capability was classified according to prevailing climatic conditions and current soil restrictions on site.

- Since soils naturally occur in a continuum with infinite variances, it is often problematic to classify any given soil as one form, or another. For this reason, the classifications presented in this report are based on a "closest fit" basis to the latest soil classification system of South Africa (Soil Classification Working Group, 2018).
- Soil fertility was not considered a limitation to crop production because nutrient deficiencies and/or toxicities could be rectified by appropriate organic or inorganic rectifications during cultivation. No soil samples were analysed for soil fertility during this investigation.
- No scientific data was collected or analysed for the calculation of ecological veld condition or grazing capacity. Any comments or observations made in this regard are based on observations, the expert knowledge, and relevant professional experience of the specialist investigator.
- The field assessment specifically relevant to this report was done over two days from 02 to 03 October 2025 and is supported by previous pedological assessments of the affected area conducted between 28 July 2024 to 01 August 2024 (four days). Given the size of the affected area, and the area of cultivated and potentially arable land, is deemed adequate for this assessment and the nature of the proposed development.
- The time of the year in which the assessment was done is deemed acceptable since seasonality has no bearing on the accuracy of land use and land capability assessments.

3.5.3. TERRESTRIAL ASSESSMENT:

The following assumptions, uncertainties and gaps in knowledge are highlighted for this biodiversity assessment:

- It is assumed that flora and fauna species data (e.g., species lists and distribution records) obtained from online databases are accurate and up to date. However, it is acknowledged that these resources may contain limitations or discrepancies due to outdated information or misidentifications;
- The field programme comprised two five-day field surveys: July/August 2024 (mid-winter dry season) and January 2025 (mid-summer wet season). The dry- and wet season surveys coincided with periods of high fauna presence and activity and were thus optimal to assess fauna community composition. With respects to flora, the wet season survey was conducted following adequate rainfall. Vegetation was actively growing and flowering and conditions were therefore optimal for assessing flora species composition and vegetation condition. Seasonality was therefore not considered a limiting factor with respects to this specialist assessment;
- Notwithstanding the above, it is possible that certain herbaceous taxa (e.g., annuals and geophytes) that are most readily visible or distinguishable at other periods during the year, may not have been detected during the field survey;
- The absence or non-recording of a specific fauna species, at a particular time, does not necessarily indicate that 1) the species does not occur there; 2) the species does not utilise resources in that area; or 3) the area does not play an ecological support role in the ecology of that species; and
- Given the difficulty of fully sampling and characterising the abundance and distribution of fauna species in the PAOI during the short period of time allocated to field work, the baseline descriptions were qualitative.

3.5.4. PLANT SPECIES ASSESSMENT:

The following assumptions, uncertainties and gaps in knowledge are highlighted for the Plant Species Specialist Assessment:

- It is assumed that the flora species data (e.g., species lists and distribution records) obtained from online databases are accurate and up to date. However, it is acknowledged that these resources may contain limitations or discrepancies due to outdated information or misidentifications;
- The field survey was conducted over a five-day period in January 2025. The timing of the field survey coincided with mid wet-season. Sufficient rain had fallen prior to the field survey and vegetation was actively growing. Conditions at this time were therefore optimal to assess vegetation condition and flora species composition. Seasonality is therefore not considered a limiting factor; and
- Notwithstanding the above, it is possible that certain herbaceous taxa (e.g., annuals and geophytes) that are most readily visible or distinguishable at other periods during the yearly cycle, may not have been detected during the field survey.

3.5.5. ANIMAL SPECIES ASSESSMENT:

The following assumptions, uncertainties and gaps in knowledge are highlighted for this specialist study:

- It is assumed that the fauna species data (e.g., species lists and distribution records) obtained from online databases are accurate and up to date. However, it is acknowledged that these resources may contain limitations or discrepancies due to outdated information or misidentifications;
- The field programme comprised two five-day field surveys covering the mid-winter dry season and the mid-summer wet season periods. This accounted for potential seasonal variability in fauna species presence and ecological activity, and accordingly, seasonality is not considered a limiting factor;
- Notwithstanding the above, given the extent of the PAOI and the duration of fieldwork, it remains possible that certain rare, cryptic, migratory, transient, or low-detection probability fauna species were not present and/or were not observed during the field programme;
- The absence or non-recording of a specific fauna species, at a particular time, does not necessarily indicate that 1) the species does not occur there; 2) the species does not utilise resources in that area; or 3) the area does not play an ecological support role in the ecology of that species; and
- Given the difficulty of fully sampling and characterising the abundance and distribution of fauna species in the PAOI during the short period of time allocated to field work, the baseline descriptions were qualitative.

3.5.6. AQUATIC ASSESSMENT:

The following should be noted in terms of the assumptions, knowledge gaps and limitations associated with the project:

- Limitations and uncertainties often exist within the various techniques adopted to assess the condition of aquatic ecosystems. The methodologies and techniques used in this assessment

have been developed nationally. They are typically of a rapid nature, as is required for this freshwater impact assessment.

- No baseline long-term monitoring was undertaken as part of this assessment. There is also very little existing information available for the aquatic features within the study area. Data was utilised from adjacent aquatic ecosystems where available, and the site visit and field assessment were undertaken for this project.
- The nature of the proposed activities allows them to be placed some distance (these are referred to as the recommended buffer areas) from any mapped aquatic features, such that the likely impacts would be very low.
- It is usually the associated infrastructure that has the potential to have a greater impact on the aquatic features. The impacts of roads and powerlines on the aquatic features are, however, well understood and can be effectively mitigated to ensure the impacts remain low.
- The preferred mitigation measure is to limit the disturbance to aquatic features as far as possible by avoiding and minimising the number of crossings and providing adequate buffer areas. This will also ensure that the cumulative impacts will remain low.
- The level of aquatic assessment undertaken was considered to be adequate for this study.
- No further fieldwork will be required. The ground-truthing of aquatic features was undertaken at the end of the rainy season, and when the use of vegetation as an indicator was possible.
- As it was not possible to cover the entire project area of influence in a high level of detail, extrapolation of the areas ground-truthed to those not covered was done using the latest available aerial imagery for the project area of influence.
- Cumulative impacts of the proposed project were assessed by reviewing all available documentation for the other renewable energy facilities within a 30 km radius of the development footprint, particularly in terms of the aquatic features occurring in and adjacent to the development footprint; the proposed mitigation measures and the indicated potential impacts to these ecosystems as well as the association of these ecosystems with that within the study area.

3.5.7. HERITAGE ASSESSMENT:

The significance of the sites and artefacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

It should be noted that archaeological and palaeontological deposits often occur below ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted, and it would be required that the heritage consultants are notified for an investigation and evaluation of the find(s) to take place.

However, despite this, sufficient time and expertise was allocated to provide an accurate assessment of the heritage sensitivity of the area.

Constraints and limitations:

The terrain assessed in the WEF Cluster varies widely from flat, level terrain around the boundaries of the WEF's central area, to extremely rugged, mountainous terrain in the centre, especially either side of the valley cut by the Suikerbosrantrivier. The vegetation is well-established and dense in the mountainous areas as these have not previously been ploughed due to the rugged terrain. The

lowlands also varied where cattle grazing had not recently taken place and surface visibility was low due to the dense grass cover. The survey relied heavily on the use of historical satellite imagery obtained from the NGI (NGI aerial photographs 1944) and the historic satellite imagery from 2009 and 2011 from Google Earth to locate possible areas for Iron Age enclosures and historical settlements before returning to the field to verify these sites in the field. The combination of the two methods worked very well and a great number of sites were located using this method.

3.5.8. AVIFAUNAL ASSESSMENT:

It is assumed that all information provided by the Applicant and EAP is correct and true.

This report is based on baseline data collected during a site inspection and six avifaunal surveys, each conducted over approximately 12 days, in line with applicable Best Practice Guidelines, over a period of 13 months, as well as two additional winter nest surveys conducted over three days in August 2024 and five days in June 2026. The timings of the surveys are deemed ideal; however, inter-annual variations are not accounted for. A precautionary approach was therefore used in the assessment of impacts.

A precautionary approach was taken in the analysis and interpretation of data. All flights recorded at heights between 20 and 300 m were considered potentially at-risk heights to account for observer error and future changes in turbine design. If height was not recorded, the flight was assumed to be at risk height for data analysis.

All unidentified species recorded on Vantage Points were assumed to be Priority Species and included in the calculations of overall passage rates of priority species.

Avifaunal monitoring is prone to observer bias, in particular when estimating heights and distances. The recorded flight maps and resulting maps are therefore considered to be estimates of the location and not accurate recordings. Observer skills also vary, particularly in the identification of small passerine species. Therefore, in the interpretation of the data, more emphasis was placed on overall abundance recorded on walked transects than on the species and number of species recorded.

As the final turbine model has not yet been selected, the CRM was run using the maximum proposed dimensions (180 m hub height, 200 m rotor diameter). If smaller turbines are selected, the physical rotor swept area will decrease, likely resulting in a lower actual collision risk. Standard 10 MW turbine class averages were applied. The CRM assumes the turbines are spinning constantly at the average rotation speed during all daylight hours. The model does not account for variable-speed, feathering, or downtime during maintenance or periods of low/extreme wind, which alters the true collision probability.

Literature-derived averages for bird wingspan, body length, and flight speed were used in the CRM, and individual variations due to age and sex are not accounted for. The CRM assumes that flight speed is constant, based on the literature available for the specific species or similar species. In reality, priority species have highly variable speeds depending on whether they are utilising thermal updrafts, gliding, or foraging.

The applied avoidance rates (95% to 98%) are based on international best-practice guidelines for similar species (Band, 2024), as avoidance rate estimates for South African avifauna do not exist yet. These rates also assume a consistent behavioural avoidance response and do not account for

site-specific variables that can impair lower avoidance, such as poor weather, fog, or distraction during territorial disputes or hunting.

The extrapolation of transits assumes active flying during a standard 12-hour daylight period. While accurate for diurnal raptors, this may underestimate or overestimate exposure for species capable of nocturnal or crepuscular movement (such as Greater Flamingo).

The CRM assumes an even distribution of approach angle. A bird approaching obliquely or moving rapidly downwind faces a different probability of collision than the average used.

It was assumed that the combination of turbine placement outside of high flight risk areas and blade patterning is able to achieve a mitigation efficiency of 72% (which is a percentage recorded for blade patterning alone). The Band CRM aggregates all flight times and divides them by the total observation volume. This assumes that bird flight activity is distributed uniformly across the entire observed 2 km viewshed area and does not take into account the lower collision risk from turbine placements outside of high-risk areas. The actual efficacy of these mitigation measures at this site will only be verifiable through post-construction carcass monitoring, but the 72% estimate is considered conservative. This approach was chosen to account for a potential underestimation of fatality rates due to the viewshed on all VPs possibly being overestimated due to topographical variations.

PBR calculations were calculated using a highly conservative approach in the absence of population viability analysis for specific species. However, results rely on a number of estimates and assumptions for each species and must be interpreted with caution.

3.5.9. INVERTEBRATES:

Findings, results, observations, conclusions and recommendations presented in this report are based on the authors best scientific and professional knowledge as well as the interpretation of information available to them at the time of compiling this report.

Due care and diligence were exercised by the authors in rendering services, preparing this document and executing responsibilities as specialist consultants.

It is assumed that third party information (obtained from government, academic/research institution, non-governmental organisations) is accurate and true.

Even though care is taken to ensure the accuracy of surveys, data analysis and other aspects of this report, it should be noted that ecological/ biodiversity studies, notably for EIA purposes, are limited in time, budget and scope. It is not the purpose of this report to present exhaustively detailed information. Decisions and discussions are therefore, and to some extent, based on reasonable and informed decisions and assumptions that are extracted from bona fide information sources and from deductive reasoning (Precautionary Principle).

To obtain a comprehensive understanding of the dynamics of terrestrial ecological and diversity patterns, with particular reference to endemic, rare, or threatened species in any area, biodiversity assessments should ideally consider investigations at different time scales (across seasons/years) and through replication. However, such long-term studies are generally not part of the terms of reference for EIA assessments.

Results presented in this report are based on a snapshot investigation of the study area and not on detailed and long-term investigations of all environmental attributes and the varying degrees of

biological diversity that may be present in the study area. Specifically, no discipline-specific, long-term survey methods were used in the collation of data from the site. Although as much as possible data was obtained from opportunistic observations during the brief survey period, these surveys are customarily limited by budgetary and time constraints – results presented in this report need to be interpreted with these limitations in mind.

Background information that was used to inform and augment the assessment was limited to data and GIS coverage available for the project site on a relevant scale. A paucity of site-specific data is typical of these data sources and should be accepted as a norm.

Notably, rare and endemic species normally do not occur in great densities and, because of customary limitations in the search and identification of Red Listed species, the detailed investigation of these species was not possible. Results are ultimately based on estimations and specialist interpretation of imperfect data.

It is emphasised that information, as presented in this document, only have bearing on the sites as indicated on accompanying maps. This information cannot be applied to any other area, however similar in appearance or any other aspect, without proper investigation.

Additional or supplementary information may become known during a later stage of the process or development. The authors therefore reserve the right to modify aspects of the report, including findings and recommendations, should new information become available from ongoing research or additional work performed in the immediate region of this specific area, or any forthcoming information pertaining to this investigation after the submission of this report.

The respective companies and specialists therefore do not accept any liability for conclusions, suggestions, limitations and recommendations made in good faith, based on available information, or based on data that was obtained from surveys of a brief nature.

This report should always be considered in its entirety. Reading and representing portions of the report in isolation could lead to incorrect conclusions and assumptions. In case of any uncertainty, the authors should be contacted to clarify any viewpoints, recommendations and/ or results.

The client, by accepting this document and submitting it as part of the application procedure, indemnifies Anthene Ecological cc, Bathusi Environmental Consulting cc, its members, consultants and/or specialist investigators against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from, or in connection with, services rendered, directly or indirectly by the specialists and by the use of the information contained in this document.

3.5.10. BATS ASSESSMENT:

The assumption was made that all sources of information used during the completion of this report, are reliable and accurate.

Distribution records of bats in southern Africa are still poorly reported and limited for many species. In addition, migratory patterns of bats are largely unknown in South Africa. Studies have reported that bats do migrate, but the exact routes followed are not known (Pretorius *et al.*, 2020). The same is true for breeding behaviour and the formation of maternity colonies for many bat species.

Publicly available WEF reports for bats are reliant on in-depth site inspection and reporting echolocation calls (if no bat mortality data from adjacent facilities are available), but without echolocation call libraries, accurate identification of calls are not always possible. Published libraries created from release and handheld calls from captured bats are available for southern Africa but are geographically limited. The echolocation calls of a particular species from different regions in South Africa are known to vary to some degree (Monadjem *et al.*, 2020), and as such call libraries created in different regions are not always comparable. Lack of public access to existing monitoring reports for WEFs and Solar Energy Facility (SEFs) is a recurring problem in the industry and one that severely hampers pre-construction monitoring studies and the recommendations therein, a problem to be addressed by relevant NGOs and the governmental institutions.

3.5.11. LANDSCAPE /VISUAL ASSESSMENT:

This Report has been prepared by LOGIS at the request of the WSP as the appointed Environmental Assessment Practitioner (EAP) on behalf of the Project Developer to provide them with an independent specialist assessment. Unless otherwise agreed by LOGIS in writing, LOGIS does not accept responsibility or legal liability to any person other than the WSP for the contents of, or any omissions from, this Report.

To prepare this Report, LOGIS utilised only the documents and information provided by WSP or any third parties directed to provide information and documents by WSP. LOGIS has not consulted any other documents or information in relation to this Report, except where otherwise indicated.

The findings, recommendations and conclusions given in this report are based on the author's best scientific and professional knowledge, as well as the available information. This report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken. LOGIS reserve the right to modify aspects of the report including the recommendations if and when new information may become available from on-going research or further work in this field or pertaining to this investigation.

Although LOGIS exercises due care and diligence in rendering services and preparing documents, LOGIS accepts no liability, and WSP, by receiving this document, indemnifies LOGIS and its directors, managers, agents and employees against all actions, claims, demands, losses, liabilities, costs, damages, and expenses arising from or in connection with the services rendered, directly or indirectly by the use of the information contained in this document.

This report may not be altered or added to without the prior written consent of the author. This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If this report is used as part of a main report, the report in its entirety must be included as an appendix or separate section to the main report.

This assessment was undertaken during the planning stage of the project and is based on information available at that time.

This Visual Impact Assessment and all associated mapping have been undertaken according to the worst-case scenario such as mapping undertaken at the maximum turbine heights (i.e. tip-heights), predominately negative I&AP perceptions, no VAC taken into account of the environment, perfect weather conditions and atmospheric visibility, etc.

3.5.12. NOISE ASSESSMENT:

3.5.12.1 Limitations - Acoustical Measurements

Ambient sound levels are the cumulative effects of innumerable sounds generated at various instances both far and near. A high measurement may not necessarily mean that the area is always noisy. Similarly, a low sound level measurement will not necessarily mean that the area is always quiet, as sound levels will vary over seasons, time of day, dependant on faunal characteristics (mating season, dawn chorus[7] early hours of the morning, temperature etc.), vegetation in the area and meteorological conditions (especially wind).

Selecting an ideal measurement location could be difficult, with various criteria assessed to identify the viability of a certain location as a point to define ambient sound levels. When selecting a measurement location, the most important criteria would be:

1. Security of the instrument (minimise risk to the technician; prevent theft; sabotage of the equipment);
2. Safety of the equipment (ensure that it does not prevent, interfere or limit typical agricultural or household activities; ensure that the instrument are not in a location where an animal could damage the instrument); and lastly,
3. The suitability of the measurement location to define ambient sound levels (the presence of certain trees or equipment, wetland or other water resources will influence ambient sound level significantly).

As such, after ensuring that the instrument is safe and secure, there are various environmental factors that could influence ambient sound levels measured. These constraints and limitations are discussed below and could include:

- Seasonal changes in the surrounding environment can influence typical ambient sound levels, as many faunal species are more active during warmer periods than the colder periods. As an example, cicada is usually only active during warmer periods. Certain cicada species can generate noise levels up to 120 dB for mating or distress purposes, sometimes singing in synchronisation magnifying noise levels they produce from their tymbals(8);

---

[7] Environ. We Int. Sci. Tech. *Ambient noise levels due to dawn chorus at different habitats in Delhi*. 2001. Pg. 134.

[8] Clyne, D. *"Cicadas: Sound of the Australian Summer, Australian Geographic"* Oct/Dec Vol 56. 1999.

- Defining ambient sound levels using the result of one 10-minute measurement may be very inaccurate (very low confidence level in the results) relating to the reasons mentioned above, and measurements over a longer-term period is critical;
- Some equipment that could influence measurements may be missed when deploying instruments, or the equipment may not the audible. This could include equipment such as hidden water pumps and associated pipelines and outflows, ESKOM stepdown transformers, hidden compressors, inverters, condensers or other electrical equipment, etc. While not audible during deployment, such equipment may significantly influence ambient sound levels during quiet periods;
- Type, the number and sizes of trees in the vicinity of the instrument, as well as the distances between the microphone and these trees. Certain trees, especially fruiting trees could attract birds and other animals that will significantly impact on ambient sound levels;
- Type and number of animals in the vicinity of the microphone. Dogs, chickens, geese, etc. generate different noises randomly both night and day, and other livestock (sheep, goats, cattle, horses, etc.) kept in enclosures will also raise noise levels, especially if these animals are penned in large numbers;
- Measurements over wind speeds of 3 m/s could provide data influenced by wind-induced noises. However, when determining the ambient sound levels associated with increased wind speeds, it is desired to measure ambient sound levels at higher wind speeds;
- Ambient sound levels recorded near rivers, streams, wetlands, trees and bushy areas can be high due to faunal activity which can dominate the sound levels around the measurement point (specifically during summertime, rainfall event or during dawn chorus of bird songs). This generally is still considered naturally quiet and accepted as features of the natural environment, and in various cases sought after and pleasing. Ambient sound level data measured in such area however should not be used to develop an opinion in the potential prevailing ambient sound levels in the larger area;
- Exact location of a sound level meter in an area in relation to structures, infrastructure, vegetation, wetlands and external noise sources will influence measurements. It may determine whether you are measuring anthropogenic sounds from a receptors dwelling, or environmental ambient baseline contributors of significance (faunal, roads traffic, railway traffic movement etc.); and
- As a residential area develops the presence of people will result in increased dwelling related sounds. These are generally a combination of traffic noise, voices, animals and equipment (incl. TV's and Radios). The result is that ambient sound levels will increase as an area matures.

3.5.12.2 Calculating noise emissions – Adequacy of predictive methods

Limitations due to the calculations of the noise emissions into the environment include the following:

- Many sound propagation models do not consider sound characteristics as calculations are based on an equivalent level (with the appropriate correction implemented e.g. tone or impulse). These other characteristics include intrusive sounds or amplitude modulation;
- Most sound propagation models do not consider refraction through the various temperature layers (specifically relevant during the night-times);
- Most sound propagation models do not consider the low frequency range (third octave 16 Hz – 31.5 Hz). This would be relevant to facilities with a potentially low frequency issue;

- Many environmental models consider sound to propagate in hemi-spherical way. Certain noise sources (e.g. a speaker, exhausts, fans) emit sound power levels in a directional manner;
- The impact of atmospheric absorption is simplified and very uniform meteorological conditions are considered. This is an over-simplification and the effect of this in terms of sound propagation modelling is difficult to quantify;
- Many environmental models are not highly suited for close proximity calculations; and Acoustical characteristics.

3.5.12.3 Adequacy of underlying Assumptions

Noise experienced at a certain location is the cumulative result of innumerable sounds emitted and generated both far and close, each in a different time domain, each having a different spectral character at a different sound level. Each of these sounds is also impacted differently by surrounding vegetation, structures and meteorological conditions that result in a total cumulative noise level represented by a few numbers on a sound level meter.

As previously mentioned, it is not the purpose of noise modelling to accurately determine a likely noise level at a certain receptor but to calculate a noise rating level that is used to identify potential issues of concern.

3.5.12.4 Uncertainties associated with mitigation measures

Any noise impact can be mitigated to have a low significance; however, the cost of mitigating this impact may be prohibitive, or the measure may not be socially acceptable (such as the relocation of an NSR). These mitigation measures may be engineered, technological or due to management commitment. The potential significance of a noise impact can be reduced by reducing noise levels, but also by changing the probability that the increased noise levels annoy NSR (by improving attitudes towards the project).

For the purpose of the determination of the significance of the noise impact mitigation measures were selected that are feasible, mainly focussing on management of noise impacts using rules, policy and require a management commitment. This, however, does not mean that noise levels cannot be reduced further, only that to reduce the noise levels further may require significant additional costs (whether engineered, technological or management).

It was assumed the mitigation measures proposed for the construction phase, if any is included and proposed in this report, will be considered during the planning phase, implemented during the construction phase and continued during the operational phase.

3.5.12.5 Uncertainties of Information Provided

While it is difficult to define the character of a measured noise in terms of numbers (third octave sound power levels), it is especially challenging to accurately model noise levels at a receptor from any operation. The projected noise levels are the output of a numerical model with the accuracy depending on the assumptions made during the setup of the model. The assumptions include the following:

- It is technically difficult and time-consuming to improve the measurement of spectral distribution of large equipment in an industrial setting. This is due to the many correction

factors that need to be considered (e.g., other noise sources active in the area, adequacy of average time setting, surrounding field non-uniformity etc.9 as per SANS 9614-3:2005);

- That octave sound power levels selected for processes and equipment accurately represent the sound character and power levels of these processes and equipment. The determination of octave sound power levels in itself is subject to errors, limitations and assumptions with any potential errors carried over to any model making use of these results;
- Sound power emission levels from processes and equipment changes depending on the load the process and equipment are subject to. While the octave sound power level is the average (equivalent) result of a number of measurements, this measurement relates to a period that the process or equipment was subject to a certain load (work required from the engine or motor to perform action). Normally these measurements are collected when the process or equipment is under high load. The result is that measurements generally represent a worst-case scenario;
- As it is unknown which processes and equipment will be operational (when and for how long), modelling considers a scenario where processes and equipment are under full load for a set time period. Modelling assumptions comply with the precautionary principle and operational time periods are frequently overestimated. The result is that projected noise levels would likely be over-estimated;
- Modelling cannot capture the potential impulsive character of a noise that can increase the potential nuisance factor, nor the potential effect of the modulation of amplitude of the noise;
- The XYZ topographical information is derived from the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Global Digital Elevation Model (DEM) data, a product of Japan's Ministry of Economy, Trade, and Industry (METI) and the National Aeronautical and Space Administration (NASA). There are known inaccuracies and artefacts in the data set, yet this is still one of the most accurate data sets to obtain 3D-topographical information;
- The impact of atmospheric absorption is simplified and very uniform meteorological conditions are considered. This is an over-simplification and the effect of this in terms of sound propagation modelling is difficult to quantify;
- Receiver height will be assumed at a 4m height above surface level as recommended by the Institute of Acoustics (IOA, 2013) for the worst-case scenario;
- Atmospheric conditions relating to an air temperature of 10oC and a 70% air humidity will be used to minimize the effect of air absorption as recommended (Bass JH et al, (1996); IOA (2013) Kaliski K & Duncan E (2008)); and
- Acoustical characteristics of the ground are over-simplified with ground conditions accepted as uniform. Fifty (50%) and Seventy-five percent (75%) hard ground conditions will be modelled for the construction (50%) and operational (both 50% and 75% will be considered) phases

[9] SANS 9614-3:2005. "Determination of sound power levels of noise sources using sound intensity – Part 3: Precision method for measurement by scanning".

respectively, representing a potential worst-case scenario (Bass JH et al, (1996); IOA (2013) Kaliski K & Duncan E (2008)

Due to the uncertainties highlighted in **Section 3.5.12.2 and 3.5.12.5**, modelling generally could be out with as much as 10 dBA (the potential noise level is rather over-modelled), although realistic values ranging from less than 1 dBA to 5 dBA are more common in practice.

3.5.13. TRAFFIC ASSESSMENT:

The following assumptions and limitations apply:

- This study is based on the project information provided by the client as available at commencement of the assessment.
- According to the Eskom Specifications for Power Transformers (Eskom Power Series, Volume 5: Theory, Design, Maintenance and Life Management of Power Transformers), the following dimensional limitations need to be kept when transporting the transformer – total maximum height 5 000 mm, total maximum width 4 300 mm and total maximum length 10 500 mm.
- It is envisaged that for this project, the inverter, transformer, and switchgear will be transported to site in containers on a low bed truck and trailer. Besides the turbine blades and tower sections as well as nacelle, a mobile crane and transformers will be transported to site with abnormal load vehicles. The crane will be utilised for offloading equipment, such as the transformers.
- Maximum vertical height clearances along the haulage route are 5.2 m for abnormal loads.
- If any elements are manufactured within South Africa but not on-site, these will be transported from their respective manufacturing centres.
- All haulage trips will occur on either surfaced national and provincial roads or existing gravel roads.
- Material for the construction of internal access roads will be sourced locally as far as possible.
- The maximum number of turbines to be constructed for the project was estimated to be up to 20.
- The final access points are to be determined during the detailed design stage. Only recommended access points at conceptual level can be given at this stage.
- Projects in the vicinity of the site to be considered as part of the EIA cumulative impacts.
- A maximum construction period of 24-months was assumed for the purpose of this study.

3.5.14. GEOTECHNICAL ASSESSMENT:

Your attention is drawn to Appendix E of the Geotechnical Specialist assessment report **Appendix G.10**.

- The statements presented in the document are intended to advise you of what your realistic expectations of this report should be, and to present you with recommendations on how to minimize the risks associated with the groundworks for this project. The document is not intended to reduce the level of responsibility accepted by WSP, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

3.5.15. SOCIAL ASSESSMENT:

The following assumptions have been made for this assessment:

- The conclusions and findings of the Social Impact Assessment (SIA) are limited by the information available for the desktop assessment (Stats SA, municipal reports, etc.).
- Information was gathered from the IDPs, updated every five years; thus, the information can be outdated.
- Information was gathered from the SDFs and updated every 5 years; thus, it may be outdated.
- It is assumed that the client's information is current and correct.
- The PPP in the EA process has been undertaken in the scoping phase and continue throughout the EA process. Comments, opinions and concerns received from Interested and Affected Parties will be considered in the impact assessment phase of the SIA.
- Secondary data are assumed to reflect the local social context accurately.

3.5.16. SHE RISK ASSESSMENT:

3.5.16.1 CONTRIBUTORS

The validity, results and conclusions of this assessment are based on the expertise, skills and information provided by the following contributing team members:

NAME	ORGANISATION	DISCIPLINE
Ms. Jashmika Maharaj	WSP	Project Manager and Senior EAP
Ms. Kelli Ross	ABO Energy South Africa (Pty) Ltd	Project Development

3.5.16.2 DISCLAIMER

Although every effort has been made by ISHECON to obtain the correct information and to carry out an appropriate, independent, impartial and competent study, it remains the responsibility of the Contractor to ensure suitable Process Safety Measures are in place. ISHECON cannot be held liable for any accident or incident, due to negligence by the owner/operator, which directly or indirectly relates to the plant, equipment, facilities and systems analysed in this document and which may have an effect on the client or any other third party.

3.5.16.3 CONFIDENTIALITY

ISHECON will keep all information, results and findings confidential, and will not pass these on to other parties without the permission of the Client. However, as an Approved Inspection Authorities for Department of Employment and Labour, ISHECON is also under legal obligation to the Department of Employment and Labour to report any obvious violations of the OHS Act during site inspections.

4 PROJECT DESCRIPTION

This section provides a description of the location of the project area and the site location alternatives considered for the project. The descriptions encompass the activities to be undertaken during the construction and operational phases as well as the consideration for site accessibility, water demand, supply, storage, and site waste management. This section also considers the need and desirability of the project in accordance with Appendix 1 of GNR 326.

4.1 PROPERTY DETAILS

The project area is located within the Dipaleseng Local Municipality (Ward 5), Lesedi Local Municipality (Ward 6) and the Midvaal Local Municipality (Ward 01), in the Mpumalanga and Gauteng Provinces (**Figure 1-1).**

The details of the property associated with the project, including the 21-digit Surveyor General (SG) codes for the cadastral land parcels are outlined in **Table 4-1**. The property boundaries associated with the proposed project are shown in **Figure 4-1**.

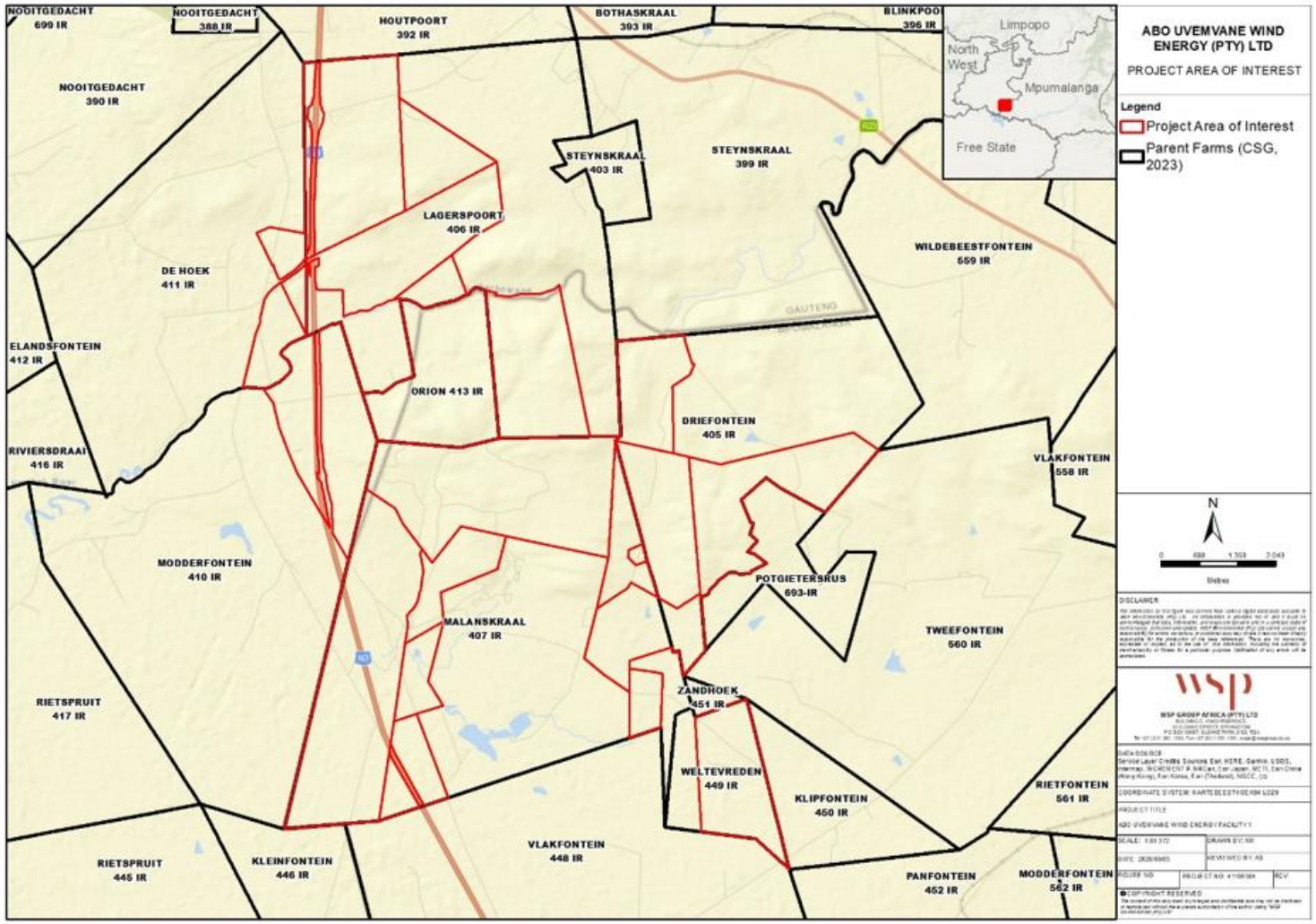


Figure 4-1 - Layout of the boundary of the properties associated with the proposed Project

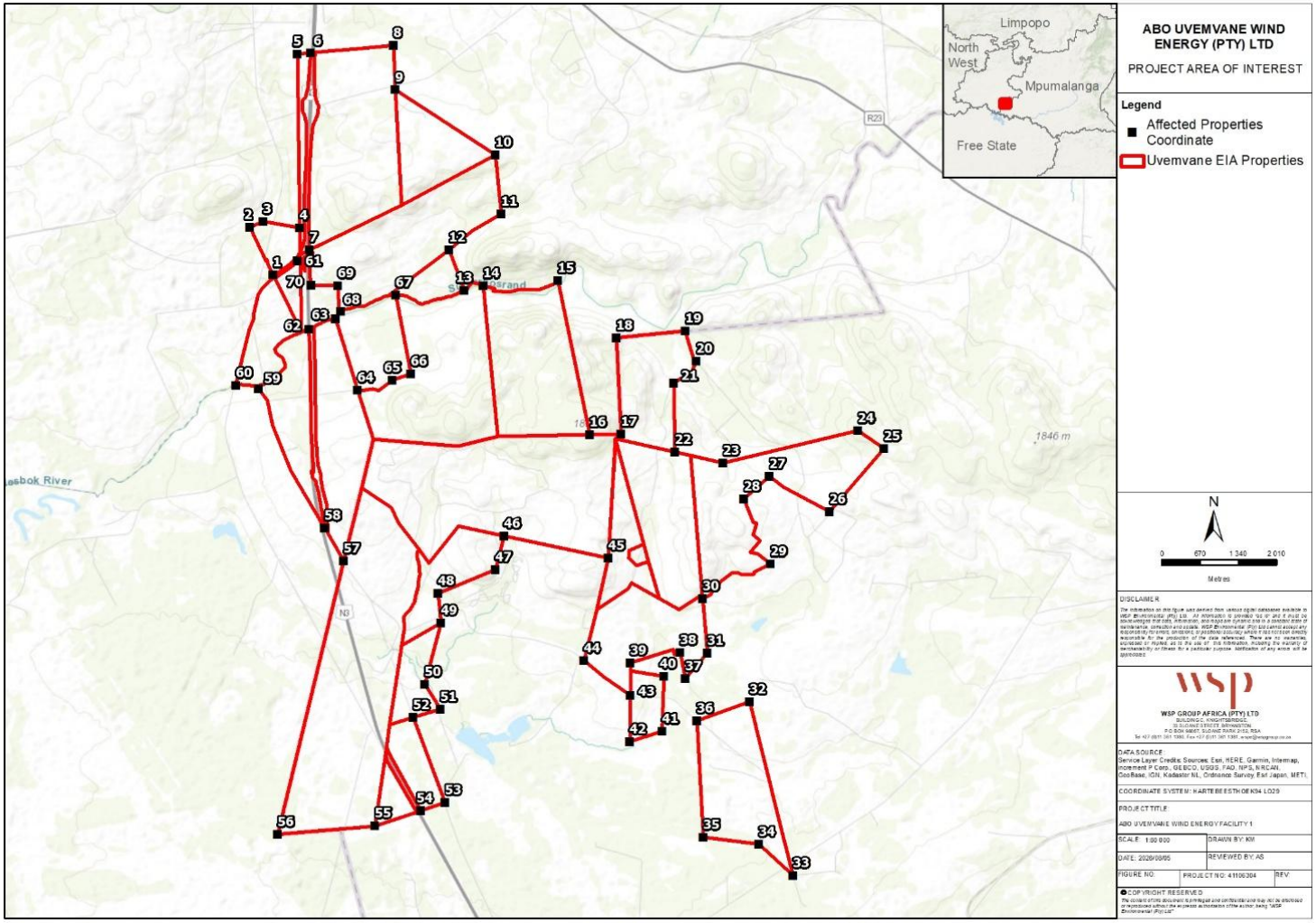


Figure 4-2 - Preliminary Layout and Coordinates of the boundary of the properties associated with the proposed Project

Table 4-1 – Affected Farm Portions

Farm Name	21 Digit Surveyor General Code of Each Cadastral Land Parcel
The Remaining Extent of Portion 2 of the Farm Lagerspoort Number 406	T0IR00000000040600002
Portion 17 (a Portion of Portion 3) of the Farm Lagerspoort Nr 406	T0IR00000000040600017
Remaining Extent of Portion 4 of the Farm De Hoek 411	T0IR00000000041100004
Portion 45 of the Farm Lagerspoort 406	T0IR00000000040600045
Portion 7 of the Farm Lagerspoort Number 406	T0IR00000000040600007
Portion 19 of the Farm De Hoek No 411	T0IR00000000041100019
Remaining Extent of Portion 2 of the Farm Modderfontein 410	T0IR00000000041000002
The Farm Orion No 413	T0IR00000000041300000
Remaining Extent of Portion 5 of the Farm Lagerspoort 406	T0IR00000000040600005
Portion 7 of the Farm Driefontein 405	T0IR00000000040500007
Remaining Extent of Portion 9 of the Farm Malanskraal No 407	T0IR00000000040700009
Remaining Extent of Portion 2 of the Farm Malanskraal 407	T0IR00000000040700002
Portion 12 (a Portion of Portion 2) of the Farm Malanskraal 407	T0IR00000000040700012
Remaining Extent of Portion 2 of the Farm Driefontein 405	T0IR00000000040500002
Remaining Extent of the Farm Driefontein 405	T0IR00000000040500000
Remainder of Portion 6 (Kingsmead) of the Farm Malanskraal 407	T0IR00000000040700006
Portion 17 (a Portion of Portion 8) of the Farm Malanskraal No 407	T0IR00000000040700017
Farm Bothas Spruit Nr. 404	T0IR00000000040400000
Portion 16 (a Portion of Portion 4) of the Farm Malanskraal No 407	T0IR00000000040700016
Remaining Extent of Portion 13 (a Portion of Portion 2) of the Farm Malanskraal 407	T0IR00000000040700013
Remainder of Portion 18 (a Portion of Portion 3) of the Farm Malanskraal 407	T0IR00000000040700018
Portion 1 of the Farm Weltevreden Nr. 449	T0IR00000000044900001

Table 4-2 - Coordinate Points of the Property Boundaries for the Affected Farm Portions

Point	Longitude	Latitude
1	26° 37' 44.224" S	28° 22' 57.294" E
2	26° 37' 17.033" S	28° 22' 42.838" E
3	26° 37' 13.725" S	28° 22' 51.187" E
4	26° 37' 17.588" S	28° 23' 14.534" E

Point	Longitude	Latitude
5	26° 35' 38.555" S	28° 23' 13.563" E
6	26° 35' 37.929" S	28° 23' 21.923" E
7	26° 37' 30.108" S	28° 23' 20.577" E
8	26° 35' 34.005" S	28° 24' 14.316" E
9	26° 35' 59.110" S	28° 24' 15.569" E
10	26° 36' 36.603" S	28° 25' 18.574" E
11	26° 37' 10.063" S	28° 25' 22.311" E
12	26° 37' 30.485" S	28° 24' 48.989" E
13	26° 37' 53.750" S	28° 24' 58.591" E
14	26° 37' 51.069" S	28° 25' 10.558" E
15	26° 37' 48.267" S	28° 25' 58.226" E
16	26° 39' 16.195" S	28° 26' 17.780" E
17	26° 39' 15.949" S	28° 26' 37.715" E
18	26° 38' 21.012" S	28° 26' 35.160" E
19	26° 38' 17.447" S	28° 27' 18.823" E
20	26° 38' 34.612" S	28° 27' 25.476" E
21	26° 38' 47.167" S	28° 27' 11.329" E
22	26° 39' 26.343" S	28° 27' 11.875" E
23	26° 39' 32.674" S	28° 27' 42.287" E
24	26° 39' 14.498" S	28° 29' 8.089" E
25	26° 39' 24.844" S	28° 29' 24.578" E
26	26° 40' 0.813" S	28° 28' 49.637" E
27	26° 39' 40.473" S	28° 28' 11.716" E
28	26° 39' 53.203" S	28° 27' 55.377" E
29	26° 40' 30.277" S	28° 28' 11.942" E
30	26° 40' 49.838" S	28° 27' 29.039" E
31	26° 41' 20.844" S	28° 27' 31.865" E
32	26° 41' 48.863" S	28° 27' 58.340" E
33	26° 43' 27.835" S	28° 28' 25.629" E
34	26° 43' 10.000" S	28° 28' 3.991" E
35	26° 43' 5.928" S	28° 27' 28.785" E
36	26° 41' 59.395" S	28° 27' 25.085" E
37	26° 41' 35.515" S	28° 27' 17.634" E
38	26° 41' 20.602" S	28° 27' 14.716" E
39	26° 41' 26.493" S	28° 26' 42.924" E
40	26° 41' 34.094" S	28° 27' 4.190" E

Point	Longitude	Latitude
41	26° 42' 5.245" S	28° 27' 2.878" E
42	26° 42' 11.268" S	28° 26' 42.169" E
43	26° 41' 44.974" S	28° 26' 42.761" E
44	26° 41' 24.796" S	28° 26' 13.479" E
45	26° 40' 26.654" S	28° 26' 29.397" E
46	26° 40' 13.801" S	28° 25' 23.202" E
47	26° 40' 32.943" S	28° 25' 17.447" E
48	26° 40' 46.243" S	28° 24' 40.992" E
49	26° 41' 3.126" S	28° 24' 42.770" E
50	26° 41' 37.930" S	28° 24' 32.483" E
51	26° 41' 52.212" S	28° 24' 42.138" E
52	26° 41' 56.682" S	28° 24' 24.909" E
53	26° 42' 45.574" S	28° 24' 44.959" E
54	26° 42' 50.103" S	28° 24' 29.482" E
55	26° 42' 58.421" S	28° 24' 0.202" E
56	26° 43' 3.108" S	28° 22' 58.656" E
57	26° 40' 27.546" S	28° 23' 41.326" E
58	26° 40' 8.779" S	28° 23' 29.202" E
59	26° 38' 49.098" S	28° 22' 47.830" E
60	26° 38' 47.086" S	28° 22' 33.384" E
61	26° 37' 36.511" S	28° 23' 12.934" E
62	26° 38' 15.301" S	28° 23' 19.954" E
63	26° 38' 9.606" S	28° 23' 37.062" E
64	26° 38' 50.091" S	28° 23' 50.813" E
65	26° 38' 44.582" S	28° 24' 12.623" E
66	26° 38' 40.937" S	28° 24' 24.489" E
67	26° 37' 55.993" S	28° 24' 15.098" E
68	26° 38' 5.395" S	28° 23' 40.090" E
69	26° 37' 50.776" S	28° 23' 38.379" E
70	26° 37' 50.414" S	28° 23' 21.539" E

4.2 PROJECT ACTIVITY

4.2.1. WIND ENERGY POWER GENERATION PROCESS

Wind power is the conversion of wind energy into a useful form of energy, such as electricity, using modern and highly reliable wind turbines. Wind Power is non-dispatchable, meaning that for economic operation, all the available output must be taken when it is available.

Wind turbines, like windmills, are mounted on a tower to harness wind energy at an increased level above the ground where wind is faster and less turbulent. The kinetic energy of the wind is used to turn the blades of the turbine to generate electricity. Wind turbines can operate at varying wind speeds, with the amount of energy the wind transfers to the rotor depending on the density of the air, the rotor area and the wind speed.

The electricity generated by the wind turbines is passed through the step-up transformer and then transmitted via either underground or overhead cables to a central substation, which connects the wind energy facility to a high voltage network. Wind turbines are designed to operate automatically with minimal maintenance for approximately 20-25 years.

Figure 4-3 illustrates the following main components of a wind turbine:

- The rotor consists of three (3) blades which are attached to a hub. The blades collect energy from the wind and converts the wind energy into rotational shaft motion/energy to turn the generator;
- The nacelle houses the equipment at the top of the tower as well as a gearbox, a generator that converts the turning motion/mechanical energy of the blades into electricity and coupling and brake;
- The tower supports the nacelle and rotor and allows the blades to be distanced safely off the ground so as to reach the stronger winds found at higher elevations; and
- Turbine step-up transformer which can be indoor or outdoor, depending on the turbine model whose function is to increase the voltage capacity of the electricity generated by the turbine to a higher grid equivalent.

The foundation unit ensures the stability of the turbine structure.

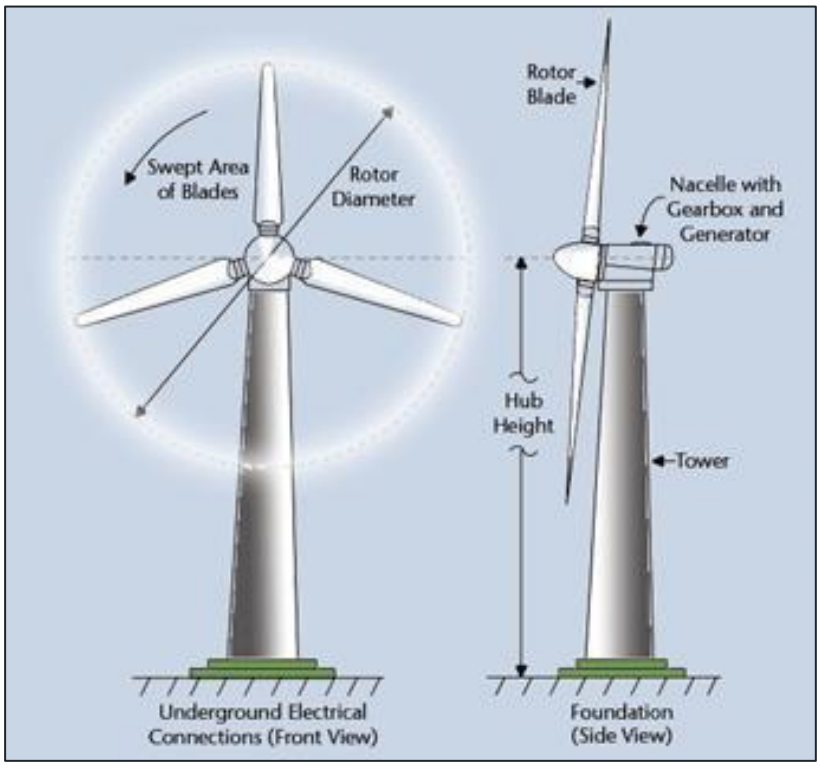


Figure 4-3 - Illustration of the main components of a wind turbine

4.2.2. BESS TECHNOLOGY

Given the ongoing improvement in battery storage technology and the significant advantages of combining battery storage with wind farms, it makes sense to include a battery facility with a WEF.

With regard to the proposed BESS, the technology thereof is dynamic and so the specific type/technology to be developed would be selected based on market demands and technology availability at the time of construction. Solid state battery technology is still in developmental stages but proposes to present a safer alternative to lithium-ion batteries as is an alternative that could be considered. Therefore, both Lithium-ion and redox-flow are assessed as technology alternatives, with Lithium-ion being the current preferred technology:

- Lithium-ion Battery (LIB)

One type of battery technology being considered for the BESS is Lithium-ion Battery (LIB) which consists of multiple battery cells that are assembled together to form modules. Each cell contains a positive electrode, a negative electrode and an electrolyte which can contain a small amount of liquid/polymer. The BESS will comprise of multiple battery units or modules housed in shipping containers and/or an applicable housing structure which is delivered pre-assembled to the project site. Containers are usually raised slightly off the ground and laid out is rows. They can be stacked if required although this may increase the risk of events in one container spreading to another container. Supplementary infrastructure and equipment may include substations, power cables, transformers, power converters, substation buildings & offices, HV/MV switch gear, inverters and temperature control equipment that may be positioned between the battery containers.

- Vanadium Redox Flow Batteries

One of the types of battery technology being considered for the BESS would be Redox Flow Batteries, typically Vanadium chemistry-based Vanadium Redox Flow Batteries (VRFB). These energy storage systems can be supplied either as containerized units or as a fixed installation within a building etc. For this project containerized units are envisioned. However, in order to present contrasting hazards with the containerized lithium batteries in the section above, this report will discuss redox flow systems housed within a large battery building. If containerized systems are used, the essential hazards remain the same but may just be slightly smaller in magnitude. For this project (up to 500 MW or 2000MWh) there are expected to be up to 720 containers, each with six 25m^3 tanks of electrolyte within the containers, hence approximately 108000 m^3 of electrolyte in the entire project. Each container acts as bund (secondary containment) able to hold at least the volume of one tank. In addition, a bund mound/trench (tertiary containment primarily for any runoff) will be constructed around the entire facility.

4.3 PROJECT INFRASTRUCTURE

The Project will be developed to allow for up to 170MWac for export from the facility. The proposed total development footprint is approximately 67.2 ha. Approximately 8 200 ha was identified as a technically suitable project site for the development of the WEF and within this an affected area, approximately 6000 ha was assessed. The development footprint includes the wind turbines, and all associated infrastructures as indicated in **Table 4-3. Figure 4-4** illustrates the typical turbine hard-standing requirements.

Table 4-3 - Technical details for the Project

Aspect	Details
Total Area of Applicable Farm Portions	A preferred study area with a total combined extent of approximately 8,200 ha was identified as a technically suitable project site for the development of the WEF project, within this an affected area of approximately 6000 ha has been assessed.
Total Buildable Area (i.e. likely footprint area)	Approximately 67.2 ha: • Turbines/ hardstands/foundations: up to 1Ha per turbine (up to 20ha) • Roads: up to 31km (approx. 18km of which are existing roads to be widened) and up to 33ha • Electrical Infrastructure Hub: up to 7ha • Temporary Laydown Areas: 4 x laydown areas (includes concrete batching plant) totalling up to 15ha • Internal Underground Cabling: up to 31km, but nothing beyond proposed roads so has been included in road footprint • 33kV OHL/underground facility connection: Up to 0.02ha
Export Capacity	Up to 170MWac
Technology	Wind
Number of Wind Turbines	Up to 20
Turbine Specs/ Aspects	Maximum hub height 180 m; Maximum blade length 100 m; Maximum rotor diameter 200 m; Maximum capacity per turbine 10 MW; A transformer at the base of each turbine; Concrete turbine foundations up to 1 ha each; Turbine, crane, and blade hardstands (included in the abovementioned 1 ha).
Electrical Infrastructure Hub (with collector sub-station, sub-station, and BESS infrastructure)	Three (3) locations have been assessed and are being applied for noting that only one will be constructed based on technical feasibility to be confirmed at pre-construction stage (Up to 7ha)
Construction camp and laydown area	4 temporary laydown areas/ construction compounds (includes concrete batching), totalling up to 15 ha, would be fenced with access control.
Access Routes	Five (5) existing routes; four of these are off existing unnamed farm roads (originating from the D1220 and P243/1), and one is off Lagerspoort Road from Heidelberg - Balfour Road (R23). The Details of the access would be as per the recommendations in the Transport Impact Assessment.
Internal Roads	Up to 31 km length (approx. 18km of which are existing roads to be widened). Primary/main access roads as well as internal road reticulation (note that existing roads/disturbed areas would be used as far as possible, and for the proposed roads, a corridor of up to 12 m wide may be temporarily impacted upon during construction and be rehabilitated to up to 10 m wide after construction), inclusive of stormwater infrastructure where relevant.

Aspect	Details
Associated infrastructure	Includes the following (to be located within the proposed development footprint): • Associated internal electrical reticulation/ cabling (i.e., low- and medium voltage powerlines), underground as far as is feasible, and to run within the proposed road footprint/route as far as possible; • A 33kV overhead/underground line to connect the northern and southern portions of the facility; and • On-site electrical infrastructure hub (up to 7 ha in extent). Note there are three (3) locations assessed as options, however only one will be constructed, consisting of: • On-site substation and associated infrastructure; • Additional step-up/ transformation /collector /switchyard infrastructure; • Auxiliary buildings, including but not limited to O&M building(s) administrative buildings, workshops, gatehouses, security buildings, control centres, offices, visitor centres, warehouses, etc.; • The installation of a communications tower (maximum height 32 m) and/or lighting mast (maximum height 25 m); and • BESS.

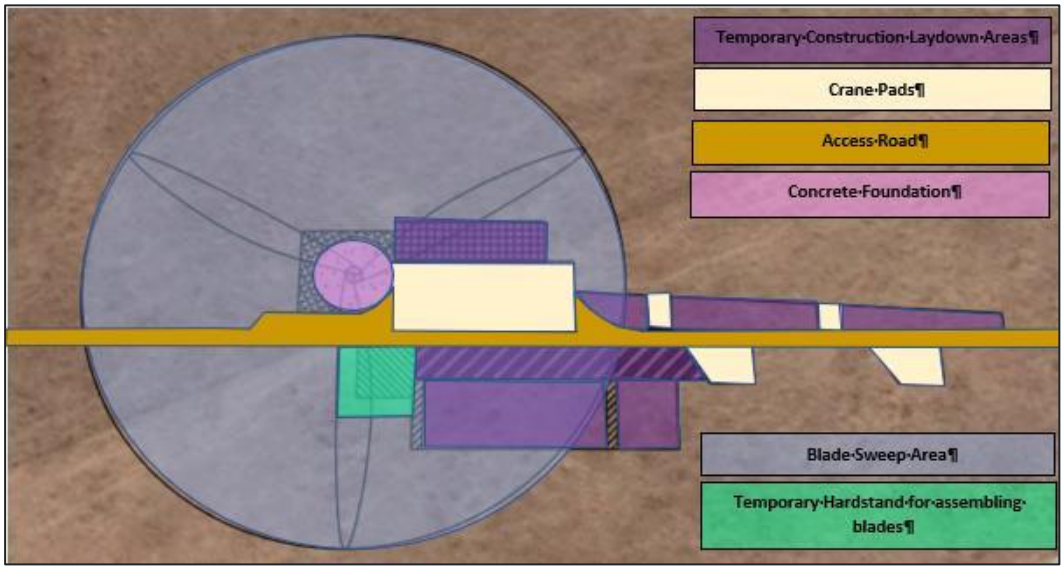


Figure 4-4 - Typical Turbine Hard Standing Requirements (illustration purposes only)

4.4 PROPOSED PROJECT DEVELOPMENT ACTIVITIES

4.4.1. CONSTRUCTION PHASE

The construction process will follow industry standard methods and techniques. Key activities associated with the construction phase are described in **Table 4-4**.

The grid connection (EGI) component of the project will be subject to separate environmental impact assessments, following the current process.

Table 4-4 – Construction activities

Activity	Description
Duration and start date	• Up to approximately 12-24 months, start date is dependent upon award of a bid. Construction activities could take place concurrently.
Establishment of access and internal roads	• Existing farm roads will be utilised as far as reasonably possible and upgraded where necessary. • New internal service roads will need to be established, and these would either comprise farm (compacted dirt/gravel) roads or be paved (see layout). Five (5) access points are proposed, four (4) of these are off existing unnamed farm roads (originating from the D1220 and P243/1), and one is off Lagerspoort Road from Heidelberg - Balfour Road (R23). The Details of the access would be as per the recommendations in the Traffic Impact Assessment (Appendix G.9). • Up to 10m wide (with a corridor width of up to 12m wide that may be temporarily impacted during construction and then rehabilitated to road width), and 31 km in length (approx. 18km of which are existing roads to be widened).
Site preparation and establishment	• Site establishment will include clearing of vegetation and topsoil at the footprint of each turbine, for laydown areas and along access and cable routes. The temporary laydown area will be constructed, including establishment of the construction camp (temporary offices, storage containers, concrete batching plant, concrete wind tower factory, etc). Site establishment will also entail the installation and/or connection of services (sanitation, electricity etc). • Four (4) Temporary laydown areas during the construction phase, to be fenced and access controlled and rehabilitated post-construction.
Transport of components and equipment to site	• Bulk materials (aggregate, steel etc.), infrastructure components (masts, blades, tower sections etc), lifting and construction equipment (excavators, trucks, compaction equipment etc.) will be sourced and transported to site via suitable National and provincial routes and designated access roads. • The infrastructure components may be defined as abnormal loads in terms of the Road Traffic Act (Act 29 of 1989) due to their large size and abnormal lengths and loads for transportation. A permit may be required for the transportation of these loads on public roads.
Excavation and earthworks	• Subject to the determination of founding specifications, earthworks will be required. This is likely to entail: • Excavations for foundations to a depth of approximately 4.5m and pouring of concrete foundations of approximately 950m3 from the batching plant. Concrete foundations will be constructed at each turbine location • Levelling of the construction camp area, substation area, and O&M building area, and excavation of foundations prior to construction. • Excavation of trenches for the installation of underground cables. • Earthworks for access roads and crane pads will be performed as per the turbine' specific transport, delivery and erection requirements.

Activity	Description
Construction of wind turbines, site substation and BESS	Construction of the proposed facility would entail the following: 1. Final design and micro-siting of the infrastructure within the limits of proposed development footprint based on geotechnical, topographical conditions and environmental sensitivities, and following obtaining required environmental permits. 2. Vegetation clearance, within proposed (and approved, if EA granted) development footprint, and construction of access roads (where required) 3. Establishment of laydown area for equipment 4. Transportation of materials and equipment to site, and personnel to and from site; 5. Stockpiling of top-soil, where necessary 6. Excavations and Construction of foundations 7. Construction, assembly and erection of infrastructure on site 8. Rehabilitation of disturbed areas 9. Continued maintenance
Services: Water	Use: • During construction phase, the proposed development will use water for activities such as cleaning of equipment, drinking, cement mixing, etc. • Water would be used during the operation phase for staff (drinking and washing hands, food, etc) as well as for cleaning of equipment, and scheduled internal cleaning of building, and dust control on internal roads (where needed). Source: • Water would ideally be sourced from the local municipality, in terms of a Service Level Agreement established between the Municipality and the Proponent. If this is not possible, then further options, such as sourcing water from a private services provider, etc, will be investigated. Volume: • Construction: 22 000m^3 / year • Operation: 300m^3 / year Storage: • Where required, a storage tank (i.e., Jo-Jo/ conventional plastic storage tank) of up to approximately 10,000L may be used on site for water storage. Saving Measures: • Construction phase EMPr includes water-saving measures to be implemented during the construction phase. • Operationally, staff would be encouraged to use water sparingly.
Services: Sewage/ Effluent	Source: • Sanitation for auxiliary buildings would be connected to the existing municipal sewage system. If the Municipality does not approve, or have capacity for, such a connection, sewage will be stored in the conservancy tank and collected either by a honey-sucker truck or by a service provider (Contractor) for treatment at a licensed disposal site. Alternatively, a standalone system would be used (i.e. porta-loos) which would be regularly serviced by an independent contractor. Note that it is not intended to make use of soakaways or on-site treatment solutions. Construction and Operation Sanitation Requirements: Volume (m^3/ year) • 1000 m^3 sewage/wastewater per year in the construction phase (i.e. 70% of water demand for water used by people) • 160 m^3 sewage/wastewater per year in the operational phase (i.e. 70% of water demand for water used by people)

Activity	Description
	• Any new sewage lines (if required) would be construction within the road limits of either existing or new internal roads, noting that these would be limited as they are only necessary for servicing the auxiliary buildings.
Services: Refuse	Source: • Construction phase waste such as oily rags, containers, rubble, etc would be produced. This would be managed through specifications contained in the EMPr. The Contractor would be responsible for waste management in this regard. There may be some minor quantities of hazardous substances such as paint, oils, etc. which emanate as waste from the construction phase. • Operational waste would emanate from the auxiliary buildings and would largely comprise office-type waste such as packaging, paper, food waste, as well as waste from the maintenance aspects which would comprise packaging, metals, cement, glass, etc. These wastes would also be controlled through the operational EMPr. The operational waste would either be removed by the Municipality as part of the regular service delivery in this regard, or it would be removed by a private contractor. Volume: • Construction: Estimated at 50 m^3 per month of construction. • Operation: approx. 2 x 240l wheelie bin (i.e. 0,48 m^3) per week.

4.4.2. OPERATIONAL PHASE

During operation the key activities will include inspection and maintenance of the wind turbines, substations, BESS, and other associated infrastructure.

4.4.3. DECOMMISSIONING PHASE

Following the initial 20-year operational period of the WEF, the continued economic viability will be investigated. If the facility is still deemed viable, the life of the facility will be extended. The facility will only be decommissioned once it is no longer economically viable. If a decision is made to completely decommission the facility, this will be subject to a separate authorisation and impact assessment process, all the components will be disassembled, reused and recycled or disposed.

The decommissioning phase will include activities similar to that of the construction phase as indicated in **Table 4-4**.

The site will be rehabilitated and returned to its current use i.e., agriculture.

4.5 NEED AND DESIRABILITY

This section evaluates the need for, and desirability of, the proposed Project in accordance with the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), the Environmental Impact Assessment Regulations, 2014, as amended, and the Department of Environmental Affairs Guideline on Need and Desirability (Government Notice 792 of 2012). The assessment considers whether the Project responds to a legitimate societal need, whether the proposed location and timing are appropriate, and whether environmental, social and economic considerations have been integrated into decision-making.

The need for proposed Project is considered within a policy environment that prioritises reliable electricity supply, a diversified generation mix, lower emissions and inclusive economic development. The Project is relevant to the National Development Plan 2030, the Integrated Resource Plan 2025,

the Just Energy Transition Implementation Plan 2023–2027, the South African Renewable Energy Masterplan 2025 and the Renewable Energy Independent Power Producer Procurement Programme.

INTEGRATED RESOURCE PLAN 2025

The Integrated Resource Plan 2025 (IRP 2025), published on 28 October 2025, is South Africa's long-term electricity planning framework. It seeks to maintain security of supply by balancing demand with adequate generation capacity while considering system cost and environmental impacts. The plan supports a diversified electricity mix and provides for substantial additional wind generation capacity through 2039.

The proposed Project is directly aligned with this policy timeframe because it would add approximately 170 MWac of wind generation capacity during the IRP 2025 planning horizon to 2039. Wind generation supports diversification of the electricity mix and produces electricity without fuel combustion during operation. The Project therefore responds to the supply-security and emissions-reduction objectives of the IRP 2025.

NATIONAL DEVELOPMENT PLAN 2030

Provides a national planning horizon to 2039, a diversified generation mix and substantial additional wind capacity. The proposed Project would contribute approximately 170 MWac of wind capacity within this period and support supply security and emissions reduction.

JUST ENERGY TRANSITION IMPLEMENTATION PLAN 2023–2027.

Promotes decarbonisation together with social inclusion, skills development and economic diversification. The Project is particularly relevant to Mpumalanga’s transition from a coal-dependent economy.

SOUTH AFRICAN RENEWABLE ENERGY MASTERPLAN 2025

Promotes renewable-energy deployment, localisation, industrial development, job creation and skills development. The Project may stimulate demand within the renewable-energy value chain and support local procurement.

Figure 4-5 and **Figure 4-6** below provide the national electricity-system context relevant to the need for the Project. They show the current installed generation mix, the proposed new generation capacity to 2039 and the historical extent of load-shedding.

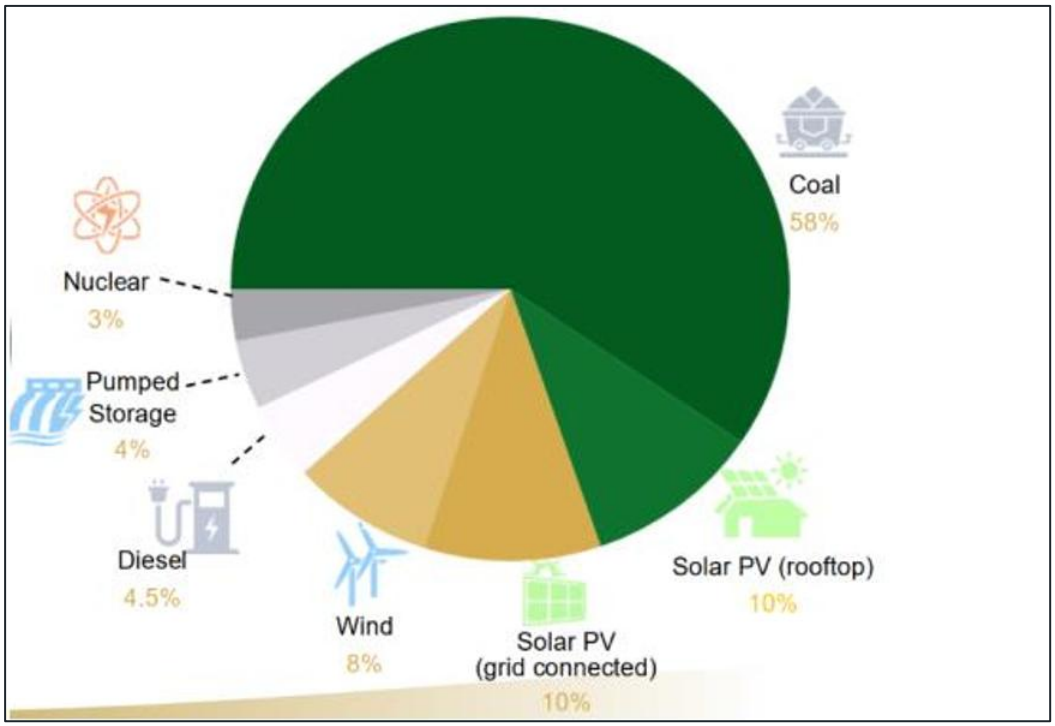


Figure 4-5 - Current Installed Electricity Generation Capacity

Source: Integrated Resource Plan 2025 infographic.

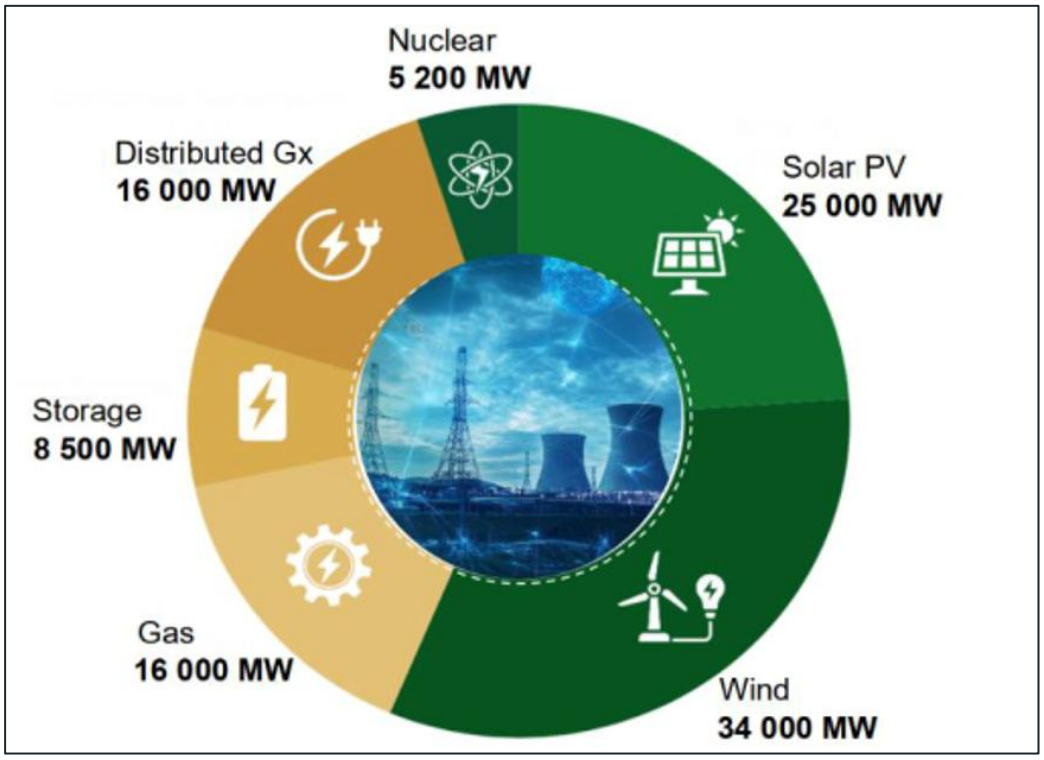


Figure 4-6 – Proposed new electricity generation capacity by 2039

Source: Integrated Resource Plan 2025 infographic.

The Needs and Desirability Guidelines, in terms of the EIA Regulations, Government Notice 792 of 2012, as amended, highlights the need to consider how the Project may impact ecosystems and biological diversity; pollution; and renewable and non-renewable resources. It should also consider how the development may affect or promote justifiable economic and social development. The Need and Desirability is assessed in **Table 4-5** and **Table 4-6** respectively.

Table 4-5 – Part 1: Need

Question	Response
Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved Strategic Development Framework (SDF) agreed to be the relevant environmental authority? Should the development, or if applicable, expansion of the town/area concerned in terms of this land use occurs here at this point in time?	Yes. The applicable local planning instruments are the Dipaleseng IDP 2022-2027 (2025/26 review) and 2019 SDF review, Lesedi IDP 2021-2026 and municipal SDF, and Midvaal IDP 2022-2027 (2025/26 review) and SDF 2022-2027 (reviewed May 2023). These instruments support coordinated infrastructure, economic development and spatially responsible investment during their current planning cycles. No explicit municipal deadline requiring a renewable-energy facility by 2030 was confirmed; however, the Project's timing falls within the current municipal planning periods and the IRP 2025 national horizon to 2039. The limited permanent footprint and continuation of farming across most of the affected properties support compatibility with the rural spatial context.
Does the community/area need the activity and the associated land use concerned? This refers to the strategic as well as local level.	Yes. At a national level, South Africa continues to experience electricity supply constraints and the possibility of load shedding and recognises the need to diversify its energy mix away from coal-based generation. The proposed Project will contribute approximately 170 MWac of renewable energy to the national grid, thereby supporting energy security and climate change mitigation objectives. At a local level, the project will contribute to employment creation, local procurement opportunities, skills development, and broader economic stimulation within the affected municipalities as presented and assessed in this report.
Are the necessary services with adequate capacity currently available (at the time of application) or must additional capacity be created to cater for the development? Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of the services and opportunity cost)?	The project is designed to make use of existing infrastructure where feasible. Grid connection infrastructure will be developed in consultation with Eskom, while water, sanitation and waste services will be sourced through authorised service providers. However, the grid connection is excluded from this current EIA process. Existing roads will be upgraded where necessary to accommodate construction traffic. The traffic impact assessment has confirmed that the local traffic network can accommodate the additional traffic associated with the construction and operation of the project. The project is not anticipated to result in significant additional demand on municipal infrastructure and may contribute to local infrastructure improvements.

Question	Response
Is the project part of a national programme to address an issue of national concern or importance?	Yes. The Project supports national priorities relating to electricity security, climate-change mitigation, infrastructure investment, industrial development, employment and a just transition. It is aligned with the Integrated Resource Plan 2025 (published 28 October 2025; planning horizon to 2039), National Development Plan 2030, Just Energy Transition Implementation Plan 2023-2027, South African Renewable Energy Masterplan 2025 and the objectives of the REIPPPP. Furthermore, the project has been submitted for registration10 as a Strategic Integrated Project (SIP) under SIP 9: Green Energy in Support of the South African Economy (REIPPP), which is aimed at accelerating renewable energy infrastructure development and attracting private sector investment into the energy sector. SIP 9 supports the delivery of South Africa's renewable energy procurement objectives through the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), including the current Bid Window 7 (BW7), which seeks to procure 5,000 MW of wind and solar generation capacity. The project's alignment with SIP 9 demonstrates its strategic importance in addressing national energy challenges, expanding renewable energy capacity, supporting economic growth and job creation, and advancing South Africa's just energy transition objectives.

Table 4-6 - Desirability

Question	Response
Is the development the best practicable environmental option for this land/site?	Yes. Site selection and layout optimisation considered environmental sensitivities, wind resource availability, access requirements, proximity to grid infrastructure, and landowner agreements. The current land-use of the project area is largely agricultural, including industrial agriculture activities, which could continue across most of the properties in conjunction with renewable energy generation. The site is furthermore located within a region that has historically contributed significantly to South Africa's electricity generation and where a transition away from

[10]The SIP registration application was submitted in March 2026 and acknowledged by Infrastructure South Africa (ISA) on 11 March 2026. The latest update received from ISA on 14 August 2026 confirmed that a date for consideration by the Validation Committee had not yet been secured and would be communicated once confirmed.

Question	Response
	coal-fired power generation is planned. The planned decommissioning of the Grootvlei Power Station, located less than 20 km from the site, will contribute to the need for replacement generation capacity as part of South Africa's JET Implementation Plan 2023–2027. Renewable energy developments in areas with existing grid infrastructure are therefore strategically important for maintaining energy security while reducing greenhouse gas emissions. The proximity of the site to existing grid infrastructure and the presence of numerous overhead power lines in the surrounding area make the site particularly suitable for renewable energy development. Establishing a grid connection within a landscape already characterised by electricity transmission infrastructure is generally less disruptive to the receiving environment than introducing similar infrastructure into an undeveloped area, as it limits additional habitat fragmentation, visual intrusion and land disturbance associated with new transmission corridors. Specialist studies informed the refinement of the layout, within the framework of the mitigation hierarchy, to avoid and minimise impacts on sensitive biodiversity features, wetlands, heritage resources and other environmental aspects where feasible. At has been confirmed through specialist studies that environmental impacts associated with the development alternative can be mitigated to acceptable levels of significance while resulting in positive socio-economic impacts.
Would the approval of this application compromise the integrity of the existing approved and credible IDP and SDF as agreed to by the relevant authorities?	No material conflict has been identified with the Dipaleseng IDP 2022-2027 (2025/26 review) and 2019 SDF review, Lesedi IDP 2021-2026 and municipal SDF, or Midvaal IDP 2022-2027 (2025/26 review) and SDF 2022-2027 (reviewed May 2023). The Project supports strategic infrastructure, investment and economic-development objectives during the applicable planning cycles. It does not require wholesale conversion of the rural landscape, and agriculture can continue across most affected properties. Final land-use approvals must remain consistent with the applicable municipal spatial proposals.
Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g., as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	The Gauteng Conservation Plan (Version 4, reflected in the 2024 project mapping) and the Mpumalanga Biodiversity Sector Plan (2024) are the principal provincial biodiversity plans applicable to the site. They identify CBAs and ESAs that inform provincial and municipal spatial planning. The layout has been revised to avoid and minimise impacts on CBA 1 and CBA 2: turbines and most other infrastructure have

Question	Response
	been positioned outside CBAs, while any unavoidable small access-road intersections require specialist mitigation, rehabilitation and monitoring. Most infrastructure in the Gauteng portion is located in ESA1 rather than CBA. This demonstrates application of the mitigation hierarchy and links the Project layout directly to biodiversity-planning priorities.
Do location factors favour this land use at this place? (this relates to the contextualization of the proposed land use on this site within its broader context).	Yes. The project area has favourable wind resources, suitable topography, access to existing transportation infrastructure, proximity to electricity transmission infrastructure, and a land-use context that remains largely agricultural, including industrial agriculture. These characteristics make the site suitable for renewable energy development while enabling continued agricultural activities across most of the properties, while diversifying revenue streams for affected farming units, which has the potential to provide stability during periods of weather extremes.
How will the activity of the land use associated with the activity being applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	Potential impacts on biodiversity features, wetlands, avifauna, bats, heritage resources and visual receptors were assessed through specialist studies. Layout refinement and mitigation measures have been incorporated to avoid or minimise impacts on sensitive environmental and cultural features. Monitoring, rehabilitation and environmental management measures are proposed to further reduce residual impacts. The findings of the EIA show that all impacts on the environment can be mitigated to acceptable levels of impact significance.
How will the development impact on people's health and well-being? (E.g. In terms of noise, odours, visual character and sense of place, etc.)?	Potential impacts include changes to the visual character of the landscape, construction-related disturbances and operational noise. These impacts have been assessed and can be managed through appropriate mitigation measures to acceptable levels of significance. Positive impacts include employment opportunities, local economic stimulation, skills development and contributions to a more secure electricity supply.
Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs	No. The permanent development footprint represents a small proportion of the overall site area, allowing agricultural activities to continue over most of the project area. The proposed activity of renewable energy generation, and the economic and employment benefits associated with the project outweigh the limited loss of land which could potentially be used for alternative uses. The principles of sustainable development require the balancing of environmental, social and economic considerations which this EIA

Question	Response
	process has considered in full alignment with the National Environmental Management Act (NEMA). The implementation of the no-go alternative will result in the positive impacts of the project being foregone.
Will the proposed land use result in unacceptable cumulative impacts?	No unacceptable cumulative impacts were identified that would preclude development. Cumulative impacts relating to biodiversity, visual character, avifauna and socio-economic factors were assessed and can be managed through mitigation, monitoring and implementation of the EMPr.

4.5.1. INTERNATIONAL, NATIONAL & LOCAL PERSPECTIVE

Renewable energy development is regarded as an important contribution to meeting international and national targets of reducing reliance on fossil fuels, such as coal, which contribute towards greenhouse gas emissions and resultant climate change. The need and desirability of the proposed project has been considered from an international, national, and regional perspective.

4.5.1.1 International Perspective

The proposed project will align with internationally recognised and adopted agreements, protocols, and conventions. This includes the Kyoto Protocol (1997) which calls for countries internationally to reduce their greenhouse gas emissions through cutting down on their reliance on fossil fuels and investing in renewable energy technologies for electricity generation. The proposed project will therefore add capacity to the energy sector and generate electricity without greenhouse gas emissions and meet international requirements in this regard.

South Africa is also signatory to the United Nations' Development Programmes' (UNDP) Sustainable Development Goals (SDGs), particularly SGD 7 relating to affordable and clean energy. The proposed project qualifies as a clean technology that will generate up to 170 MWac of affordable energy to contribute to South Africa's energy mix.

The project will also greatly contribute to the countries' efforts to reduce their carbon emissions and play their role as part of the Paris Climate Accord. The Paris Agreement is a legally binding international treaty signed by 196 countries at the COP 21 in Paris, on the 12th of December 2015 to combat climate change. The goal of the Paris Accord is to limit global warming to well below 2 degrees Celsius, compared to industrial levels to avoid catastrophic natural disasters which are driven by the global temperature increase. Therefore, to achieve this long-term temperature goal, countries aim to reach global peaking of greenhouse gas emissions as soon as possible to achieve a climate-neutral world by 2050.

At COP27 President Sameh Shoukry announced the Sharm el-Sheikh Adaptation Agenda[11], enhancing resilience for people living in the most climate-vulnerable communities by 2030. The cover decision, known as the Sharm el-Sheikh Implementation Plan, highlights that a global transformation to a low-carbon economy is expected to require investments of at least USD 4-6 trillion a year. The Sharm el-Sheikh Implementation Plan emphasises the urgent need for reduced global greenhouse gas emissions through the use of renewable energy, just energy transition partnerships and other cooperative actions. The Plan further highlights that this is a critical decade of action that requires rapid transformation towards renewable energy.

This renewable energy project aligns with the goals of the Sharm el-Sheikh Implementation Plan and the need to reduce greenhouse gas emissions and rapidly transform towards renewable energy.

4.5.1.2 National Perspective

The South African Government, through the IRP (2010-2030), has set a target to secure 17 800 MW of renewable energy by 2030. This is an effort to diversify the country's energy mix in response to the growing electricity demand and promote access to clean sources of energy.

The National Development Plan (NDP) is aimed at reducing and eliminating poverty in South Africa by 2030. The NDP also outlines the need to increase electricity production by 2030, with 20 000 MW of electricity capacity generated from renewable sources in order to move to less carbon-intensive electricity production. The Plan also envisages that South Africa will have an energy sector that provides reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.

The authorisation of the project will further align with South Africa's National Climate Response White Paper which outlines the countries efforts to manage the impacts of climate change and to contribute to the global efforts to stabilize the greenhouse gases concentrations in the atmosphere.

The proposed project will pave the way for the JET in South Africa and promote the transition from a fossil fuel-based economy to a low carbon economy. The project aims towards the aforementioned national energy targets of diversification of energy supply and the promotion of clean energy. Wind energy developments contribute to reduced emissions and subsequently climate change whilst promoting industrial development and job creation. The project is also aligned with the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) and contributes to the delivery of the South African Renewable Energy Masterplan (SAREM), which aims to accelerate renewable energy deployment while driving local manufacturing, skills development, localisation, and inclusive economic growth through the renewable energy value chain. By increasing renewable energy generation capacity, reducing greenhouse gas emissions, and supporting a just energy transition, the project contributes to national efforts to address the country's energy constraints, strengthen economic competitiveness, and build a more sustainable, lower-carbon economy.

[11] https://unfccc.int/news/cop27-reaches-breakthrough-agreement-on-new-loss-and-damage-fund-for-vulnerable-countries

The project will also aid in overcoming possible future power cuts. In 2022, South Africa witnessed its longest recorded hours of load shedding, with the power being off for 1 949 hours between January and September 2022 as shown in **Figure 4-7**. The South African Government has taken strides to try reducing these power cuts through the implementation of bid Windows in REIPPP, but it is still expected that the country will undergo more load shedding. Over the years the construction of Solar and Wind facilities has become more cost-effective, and less time-consuming. Thus, acting as a faster and more efficient method of meeting the ever-growing demand for electricity in the country. Renewable energy is a key factor in the national energy mix and will help assist in ensuring that load shedding is prevented in South Africa.

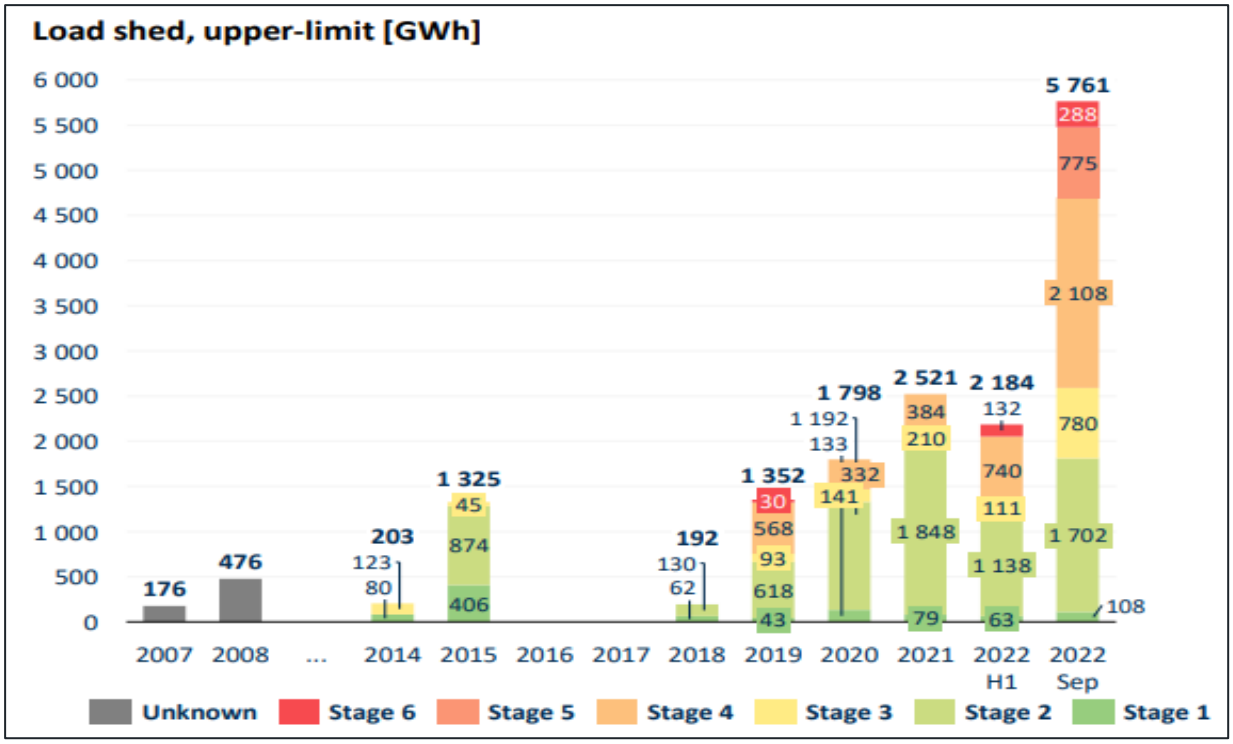


Figure 4-7 - Load shedding hours over the years in South Africa

Source: CSIR (2022)

4.5.1.3 Regional and Local Perspective

Just Energy Transition

Coal power stations and the coal mining industry play a vital component in the economic and social components of the l economy. Shifting to a low carbon economy will thus need to offset or exceed the benefits being realized by fossil fuels in the province. Thus, a key factor to ensuring the success of the JET is not only to focus on the transition from fossil fuels to renewable energy resources but to simultaneously ensure the Just Transition of jobs and skills. Locally, the Grootvlei Power Station is expected to be decommissioned by 2030 as a part of the JET plans.

The transition towards renewable energy will improve the socio-economic conditions of the Gert Sibande District Municipality and the Sedibeng District Municipality (**Appendix G.11**). The Gert Sibande DM recorded an unemployment rate of 26.7% in 2017, with the majority of its residents employed in the trade and community services sector. In Sedibeng DM, the most recent IDP (2025/26)

indicates an unemployment rate of approximately 55.2%, based on 2023 labour-market data. The Project will aid in solving two of the leading challenges faced by the district municipalities, namely the cost of electricity and lack of adequate employment opportunities.

The renewable industry will create job opportunities throughout the supply chain. The renewable industry will contribute to the Just transition in South Africa to ensure that there are no job losses but rather job transfers and skill exchange. For these opportunities to arise, renewable energy projects need to be approved in the Mpumalanga and Gauteng Provinces to ensure that the transition from fossil fuels to renewable energy happens gradually and takes off effectively.

4.5.2. CONSISTENCY WITH NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA) PRINCIPLES

Table 4-7 outlines the project's consistency with the NEMA Principles.

Table 4-7 - Consistency of the Project and the EIA Process with the NEMA principles

NEMA Principles	Discussion
(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.	The EIA process considered the interests of affected communities, landowners and surrounding settlements through specialist social assessments, stakeholder engagement and public participation undertaken throughout the EIA process. Project benefits and potential impacts on livelihoods, wellbeing and quality of life were assessed and mitigation measures developed where required. Refer to **Section 9** and **13** of this resubmitted DEIR.
(3) Development must be socially, environmentally and economically sustainable.	The EIA assessed the environmental, social and economic implications of the proposed development to ensure sustainable development principles are upheld. Mitigation measures have been incorporated into the EMPr (**Appendix J**) to minimise impacts and enhance positive outcomes. Refer to **Sections 9, 11** and **12** of this resubmitted DEIR.
(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;	Detailed biodiversity, avifaunal, bat and aquatic specialist studies informed the identification of environmentally sensitive areas. The project layout was refined to avoid and minimise impacts on sensitive ecological features where feasible. Refer to **Sections 8, 9** and **12** of this resubmitted DEIR.
(ii) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;	Potential sources of pollution and environmental degradation were identified and assessed during the EIA process. Mitigation measures relating to waste management, erosion control, hazardous substances and rehabilitation have been incorporated into the EMPr (**Appendix J**). Refer to **Sections 9** and **12** of this resubmitted DEIR.

NEMA Principles	Discussion
(iii) that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;	Specialist visual and heritage impact assessments were undertaken to identify sensitive landscapes and heritage resources. The layout was refined where practicable, and mitigation measures have been proposed to reduce residual impacts. (Refer to **Sections 8, 9, 11** and **12** of this resubmitted DEIR).
(iv) 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.	Waste generation associated with the construction, operation and decommissioning phases was assessed. Waste management measures and monitoring requirements have been incorporated into the EMPr (**Appendix J**) to ensure responsible handling, storage, recycling and disposal practices. Refer to **Sections 9** and **12** of this resubmitted DEIR.
(v) that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;	The project promotes a transition from fossil fuel-based energy generation to renewable wind energy, thereby reducing dependence on non-renewable resources and supporting long-term sustainability objectives. Refer to **Sections 9** and **11** of this resubmitted DEIR.
(vi) that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;	Specialist studies assessed the receiving environment and identified mitigation measures to ensure that the development does not compromise ecological functioning or environmental integrity beyond acceptable thresholds. Refer to **Sections 8, 9** and **12** of this resubmitted DEIR.
(vii) that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and	The impact assessment considered uncertainties and adopted a precautionary approach through specialist investigations, impact rating methodologies, buffer application and mitigation planning. Refer to **Sections 8, 9** and **11** of this resubmitted DEIR.
(viii) that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.	In line with the mitigation hierarchy, potential negative impacts on environmental and social receptors were identified, assessed and addressed through avoidance, mitigation, rehabilitation and monitoring measures included in the EMPr. Refer to **Sections 9** and **12** of this resubmitted DEIR.
(4) (b) Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.	An integrated assessment process was undertaken by a multidisciplinary team of specialists. Environmental sensitivities, technical constraints and socio-economic considerations informed the selection of the preferred development alternative. The no-go alternative has also been assessed. Refer to **Sections 8, 9, 10** and **11** of this resubmitted DEIR.
(4) (c) Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.	The EIA considered the distribution of project benefits and impacts across affected communities and landowners to ensure that impacts are not unfairly borne by vulnerable groups. Public participation processes were undertaken to ensure inclusive

NEMA Principles	Discussion
	engagement. Refer to **Sections 9** and **13** of this resubmitted DEIR.
(4) (d) Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.	The project is expected to contribute to energy security, local economic development and employment opportunities while ensuring environmental impacts are appropriately managed. Refer to **Sections 9** and **13** of this resubmitted DEIR.
(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.	Environmental management measures have been developed for the construction, operational and decommissioning phases of the project and are contained within the EMPr. Refer to **Sections 9** and **12** of this resubmitted DEIR.
(4) (f) The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.	A comprehensive Public Participation Process was undertaken in accordance with the EIA Regulations, ensuring Interested and Affected Parties were provided with opportunities to review and comment on the project. Refer to **Section 13** of this resubmitted DEIR.
(4) (g) Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognizing all forms of knowledge. Including traditional and ordinary knowledge.	Inputs received from stakeholders, landowners, government authorities and interested and affected parties have informed the impact assessment and project planning process. Refer to **Sections 9, 11** and **13** of this resubmitted DEIR.
(4) (h) Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.	The project provides opportunities for employment, skills transfer, local procurement and economic development, contributing to community wellbeing and empowerment. Refer to **Sections 9** and **13** of this resubmitted DEIR.
(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.	The EIA process included a comprehensive assessment of environmental, social and economic impacts, together with cumulative impacts and alternatives analysis, to inform decision-making. Refer to **Sections 9, 10** and **11** of this resubmitted DEIR.
(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.	Occupational health and safety requirements and environmental management obligations will be implemented during all phases of the project in accordance with applicable legislation and the EMPr (**Appendix J**). Refer to **Section 12** of this resubmitted DEIR.
(4) (k) Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.	Information relating to the project was made available to stakeholders throughout the EIA process, and opportunities for review and comment were provided in accordance with legislative requirements. Refer to **Section 13** of this resubmitted DEIR.

NEMA Principles	Discussion
(4) (l) There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.	Relevant competent authorities, commenting authorities and stakeholders were consulted throughout the EIA process to support coordinated decision-making and regulatory compliance. Refer to **Section 13** of this resubmitted DEIR.
(4) (m) Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.	The EIA process provides a transparent platform through which regulatory authorities can review technical findings and provide input to facilitate informed decision-making. Refer to **Section 13** of this resubmitted DEIR.
(4) (n) Global and international responsibilities relating to the environment must be discharged in the national interest.	The project contributes to South Africa's renewable energy and climate change objectives by supporting the reduction of greenhouse gas emissions and the transition to a lower-carbon energy mix. Refer to **Sections 9 and 11** of this resubmitted DEIR.
(4) (o) The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.	The EIA process assessed impacts on environmental resources and incorporated mitigation measures to ensure that environmental resources are protected and managed in the public interest. Refer to **Sections 8, 9** and **12** of this resubmitted DEIR.
(4) (p) The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.	The Applicant will be responsible for implementing all mitigation, rehabilitation, monitoring and corrective measures identified in the EMPr throughout the project lifecycle. Refer to **Section 12** of this resubmitted DEIR.
(4) (q) The vital role of women and youth in environment management and development must be recognised and their full participation therein must be promoted.	Public participation and socio-economic development opportunities associated with the project are intended to be inclusive and accessible to all sectors of the affected communities, including women and youth. Refer to **Sections 9** and **13** of this resubmitted DEIR.
(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.	Sensitive biodiversity features, wetlands and ecological corridors were identified through specialist studies and sensitivity mapping and informed the project layout and mitigation measures. Refer to **Sections 8, 9, 10** and **12** of this resubmitted DEIR.

5 PROJECT ALTERNATIVES

The EIA Regulations of 2014 (as amended) require that the S&EIR process must identify and describe alternatives to the proposed activity that were considered or provide a motivation for not considering alternatives. Different types or categories of alternatives could be considered including different locations, technology types, and project layouts. At the scoping level the evaluation of alternatives is provided at a high level in the absence of detailed environmental comparators for each alternative; due to the two-staged nature of the S&EIA process it is more suitable to identify and describe the potential alternatives on a high-level basis within scoping, and to perform a more detailed analysis of alternatives (with environmental comparators) in the EIA phase of the project. As such, the S&EIR has holistically assess the impacts and risks of each alternative comparatively, as required by Appendix 2 of the EIA Regulations of 2014 (as amended).

All alternatives outlined below are considered both feasible and reasonable with no apparent advantages or disadvantages at this stage of the project. All alternatives were described and assessed in more detail during the EIA Phase.

Extensive consideration of alternatives and avoidance of impacts took place in the screening/design phase. This is discussed in detail in the section below.

5.1 TECHNOLOGY ALTERNATIVES

5.1.1. WIND TECHNOLOGY

The project will utilise wind technology to generate power. Therefore, no technology alternatives are being considered for this project. The motivation for the use of wind technology for this project is provided below:

5.1.1.1 Wind resource

The Project site was primarily selected on the availability of very good wind resource in the region. The availability of the wind resource is the main driver of project viability. The Project site was identified by the proponent through a pre-feasibility analysis based on available wind energy data. The average annual wind speed for the site was considered sufficient to ensure the economic viability of a wind energy facility. This viable wind resource ensures the best value for money is gained from the project, allowing for competitive pricing and maximum generation potential, with the resulting indirect benefits for the South African economy.

5.1.1.2 Topography

The surrounding landscape has a rolling hill topography which is suitable for the development of a wind project (and unsuitable for other technologies, e.g. Solar PV). The Project site itself is located on the highest lying ground in the area thus has the greatest wind resource within the immediate area.

5.1.1.3 Competition

There is minimal competition in the area with regards to authorised or operational WEFs.

5.1.2. BESS TECHNOLOGY

With regard to the proposed BESS, the technology thereof is dynamic and so the specific type/technology to be developed would be selected based on market demands and technology

availability at the time of construction. Therefore, both Lithium-ion and redox-flow are assessed as technology alternatives, with Lithium-ion being the current preferred technology.

5.2 LOCATION ALTERNATIVES

The selection of the project site is the outcome of a feasibility assessment by the proponent, which inter alia served to identify site options that would be optimal for energy production and grid interconnection. The project site was selected because it is strategically located due to the following factors:

- **Proximity to the Eskom grid** – The proposed Project requires connection to the Eskom grid to transmit the generated electricity. The preferred Project site was selected due to its proximity to the National Grid which will have sufficient capacity to allow the Project to connect to it. The transmission network is well established within the Project area and a relatively short grid connection could be realised either via a direct connection to one of two nearby substations or via a loop-in-loop-out connection into overhead lines in close proximity (a separate environmental application will be made for the grid connection options).
- **Land Availability and Landowner Support** – The availability of land is a key feasibility criterion in the site selection process. The Project site is of a suitable land size for the proposed development. A preferred study area with a total combined extent of approximately 8,200 ha was identified as a technically suitable project site for the development of the WEF project, within this an affected area of approximately 6000 ha has been assessed, providing a substantial amount of land for the development of an up to 170MWac WEF. The proponent has secured sufficient land for the development of the proposed WEF with landowners within the respective cadastral portions comprising the development footprint, indicating their support and willingness for the project to proceed to development via entering into agreements with the developer. After intensive desktop investigations across the affected provinces, through analysing the aforementioned factors, it was determined that this site has ideal conditions for the Project.
- **Strategic Approach** – Four (4) of Eskom's coal-fired power stations are targeted for decommissioning in the short term. These include the Komati, Camden, Grootvlei, and Hendrina power stations. These power stations range between 50 - 60 years of age. According to the 2019 IRP, over an 11-year period Eskom are expected to decommission over 11 GW of its coal fired capacity. Power generated from the WEF can therefore be used to replace a portion of the generation capacity lost from the decommissioned power stations and also help replace some of the jobs that would have been potentially lost due to the decommissioning of the power plants. The Grootvlei power station is located some 10 km from the PAOI, and the Balfour 88Kv switching station is situated approximately 8.5 km from the PAOI.
- **Road and labour pool accessibility** – The Project site can be accessed easily via Five (5) proposed access points are, four (4) of these are off existing unnamed farm roads (originating from the D1220 and P243/1), and one (1) is off Lagerspoort Road from Heidelberg - Balfour Road (R23). Access route details are provided in the Transport Impact Assessment (**Appendix G.9** of this resubmitted DEIR) which concluded that additional traffic generated from the project could be managed by the existing road network with minimal road upgrades.

- **Topography** - The surrounding landscape has a mountainous topography which is suitable for the development of a wind project. The Project site itself is located on a high lying landscape that has the highest wind resource within the immediate area.
- **Competition** - With regards to renewable energy facilities, there is minimal competition in the area in terms of existing operational projects. Should the project proceed, it will act as one of the pioneering developments in the area and will open opportunities for other renewable developments. It will also serve as a large-scale case study for wind resource in the provinces, showing that commercially viable wind energy facilities are suitable for certain parts of the Mpumalanga and Gauteng Provinces.

The site is considered suitable for the reasons provided. There is no site alternative for the project. It should be noted that at the inception of the Project during the SSV phase, the development was proposed to consist of two separate Wind Energy Facilities (*ABO Uvemvane Wind Energy Facility 1 (WEF 1) and ABO Uvemvane Wind Energy Facility 2 (WEF 2)*). However, based on preliminary environmental screening and specialist input, the project was consolidated and reduced to a single WEF.

5.3 LAYOUT ALTERNATIVES

5.3.1. PRELIMINARY LAYOUT

As per the SSVR (**Appendix F**) WEF 1 was previously proposed as part of a WEF Cluster, comprising of ABO Uvemvane Wind Energy Facility 1 and ABO Uvemvane Wind Energy Facility 2. The preliminary layout for the ABO Uvemvane WEF Cluster identified up to 66 turbine positions, which was proposed to form part of two (2) WEFs and associated grid connection. Both projects were intended to obtain stand-alone EAs, thus requiring separate applications and reporting. However, the verified sensitivity of the Project site required significant changes to the original layout and the project design was optimised in response, resulting in a single WEF and associated layout. The preliminary layout consisting of two WEFs and 66 turbines is illustrated in **Figure 5-1.**

5.3.2. OPTIMISED LAYOUT – SCOPING PHASE

The results of the scoping phase sensitivity mapping overlain by the preliminary layout are illustrated in **Section 8** of this report. The layout was optimised to accommodate the specialist recommendations and the turbines reduced to **31**. The optimised scoping phase layout is illustrated in **Figure 5-2**.

5.3.3. REVISED OPTIMISED LAYOUT – SCOPING PHASE

Based on the outcome of the specialist scoping reports, the number of proposed turbines was then further reduced to **27**, as depicted in the revised optimised layout below. The revised optimised layout was proposed for further assessment during the EIA Phase. The revised optimised layout is illustrated in **Figure 5-3.**

5.3.4. DEIR ASSESSED LAYOUT

During the EIA phase, the revised optimised layout was further refined based on specialist recommendations and turbine technology options, resulting in the DEIR Assessed layout which is the layout being put forward for final comment. The DEIR Assessed layout is illustrated in **Figure 5-4**. It should be noted that the development footprint has been significantly reduced (from 110 ha to 67.2 ha), and the number of turbines has reduced from 27 **(Figure 5-3**) to **20**. The layout also includes a reduction in the total development footprint of proposed roads as well as the removal of an electrical

infrastructure hub location option and two temporary laydown areas. In addition, alternative alignments and configurations for the associated 33 kV facility connection infrastructure, comprising overhead and underground powerline sections with a combined disturbance footprint of up to 0.02 ha, were assessed during the EIA process, with the preferred option incorporated into the Final Layout (**Figure 5-4**). **This layout formed the basis of the EIA Phase specialist assessments.**

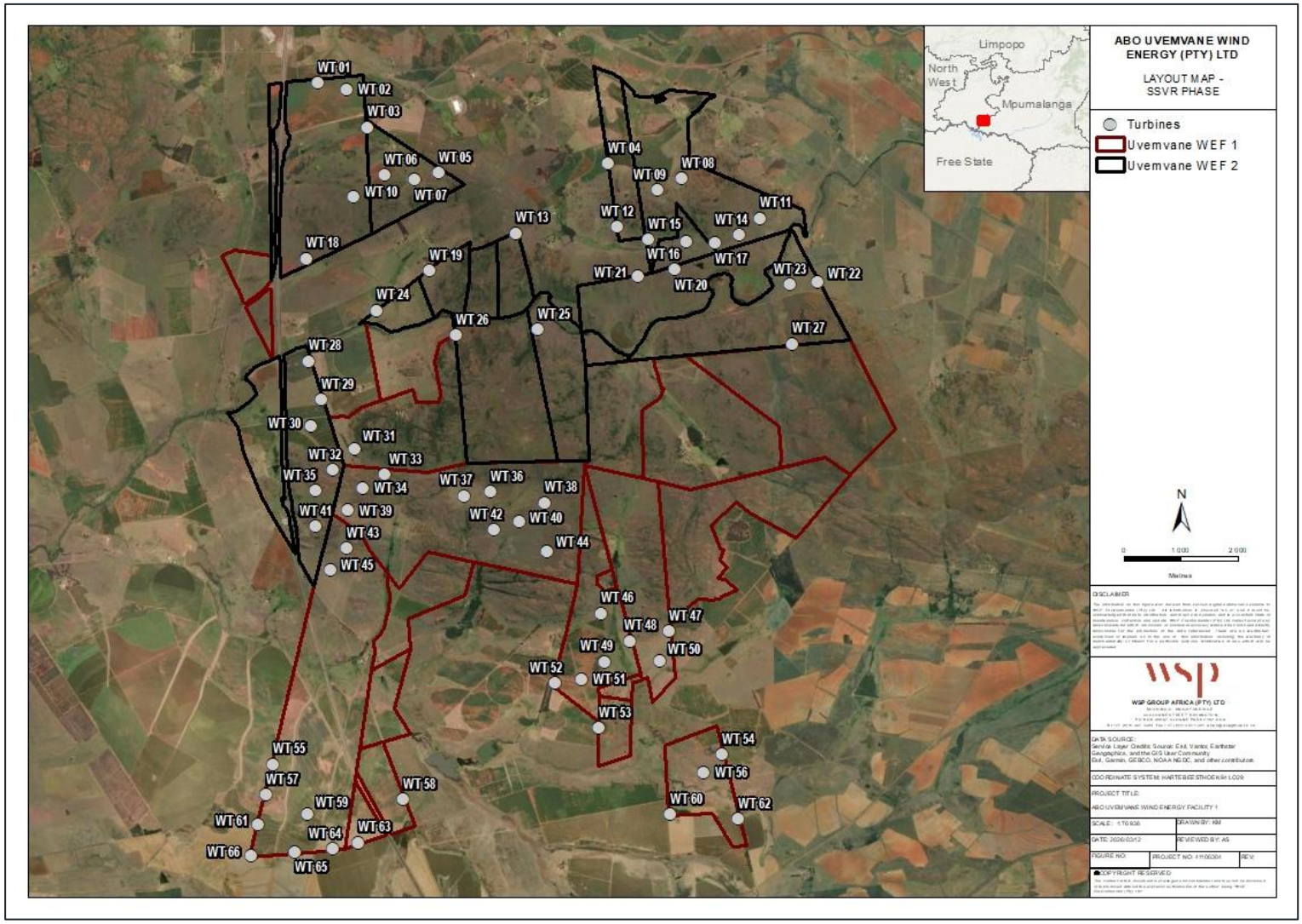


Figure 5-1 - Preliminary Layout for ABO Uvemvane Cluster (WEF 1 and WEF 2 – 66 turbines)

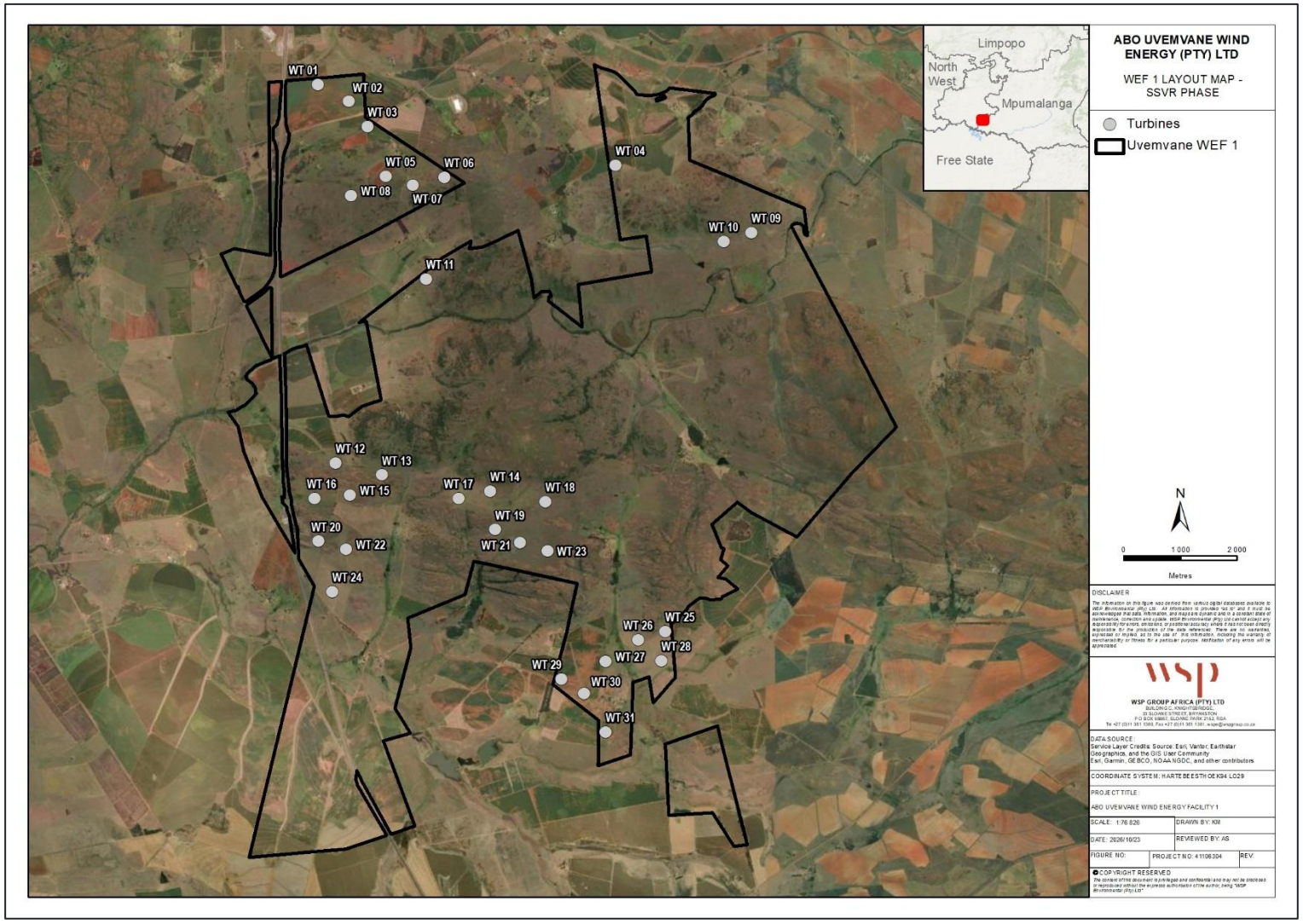


Figure 5-2 - Scoping Phase - Optimised Layout for the Project (WEF 1 – 31 Turbines)

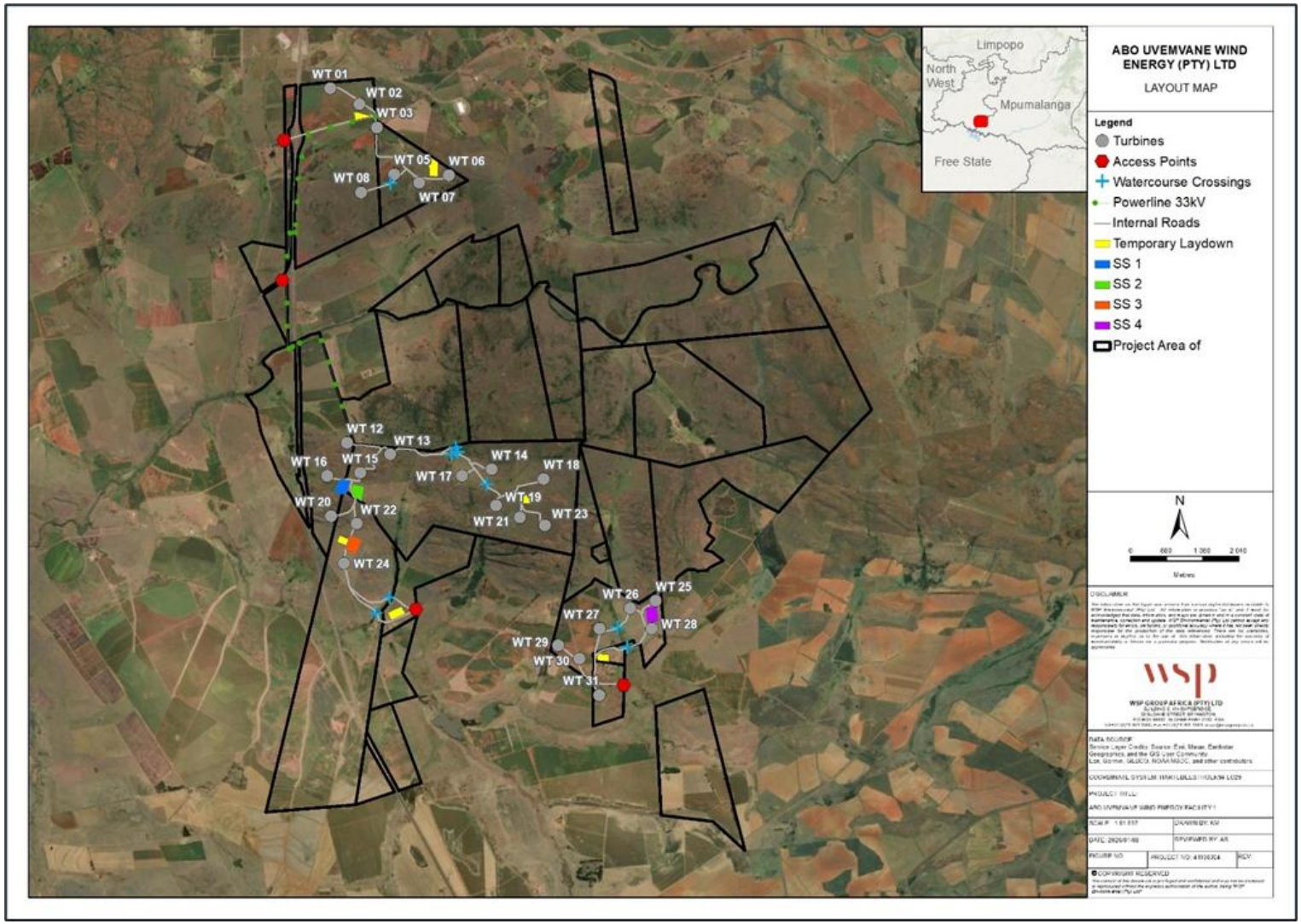


Figure 5-3 - Scoping Phase - Revised Optimised Layout for the Project (WEF 1 – 27 turbines)

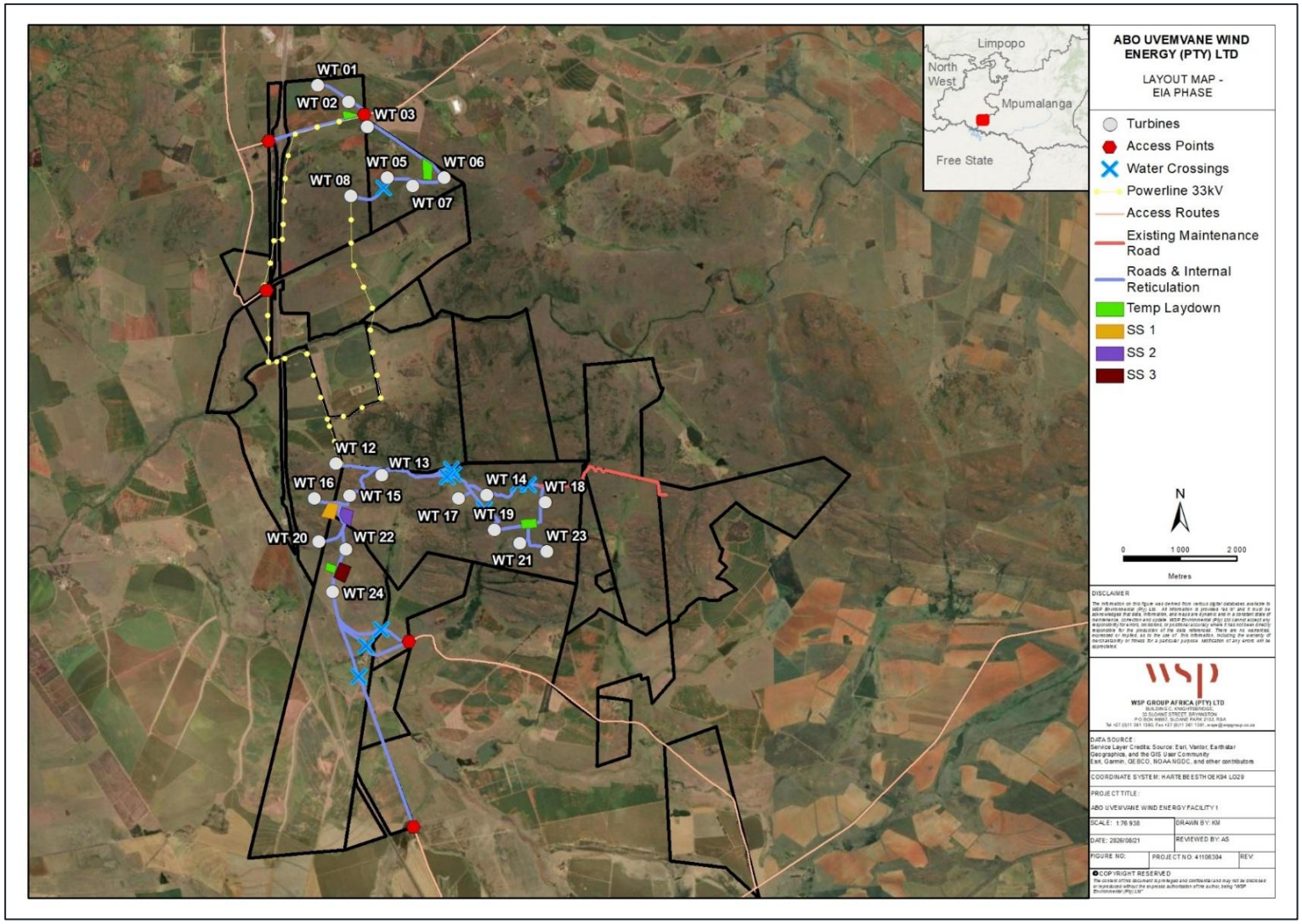


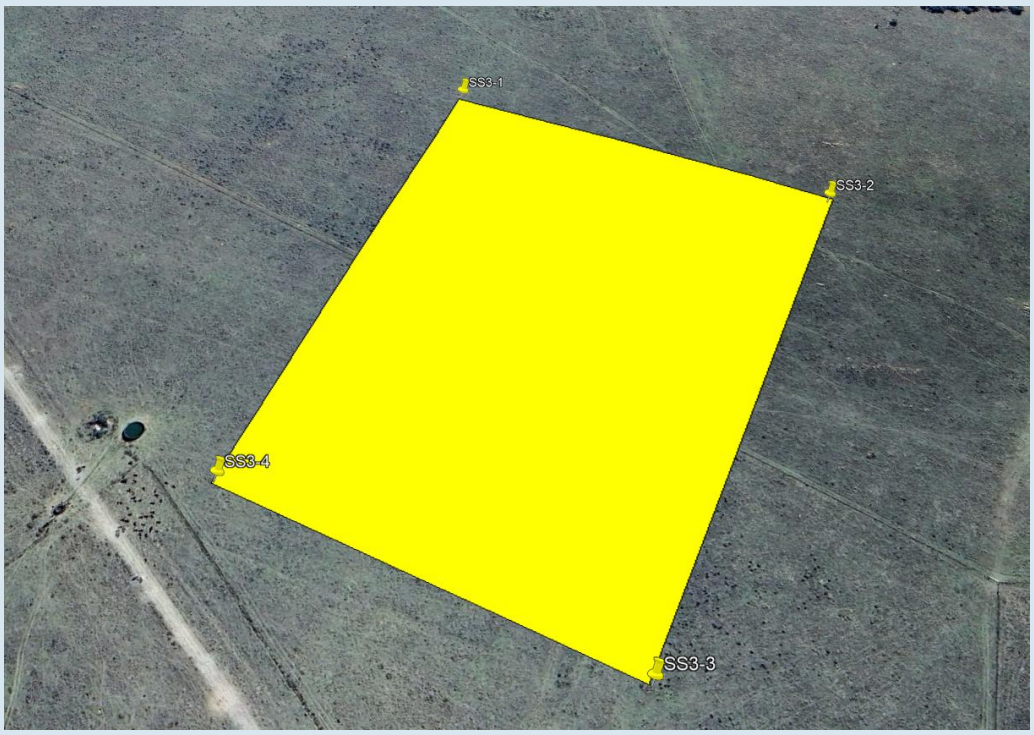
Figure 5-4 – Final Layout for the ABO Uvemvane WEF 1 (20 turbines: DEIR assessed Layout)

Three locations for the electrical infrastructure hub (up to 7ha in extent to include the on-site substation and associated electrical infrastructure, O&M buildings and BESS facility) have been assessed and are being applied for, noting that only one will be built based on technical feasibility to be determined at pre-construction stage. All options have been micro-sited based accessibility, topography and distance to turbines, and avoids environmentally sensitive features, areas and associated buffers. The coordinates for the hub location options are listed below in **Figure 5-1**.

Table 5-1 - Coordinates of Electrical Infrastructure Hub Options

Point	Latitude	Longitude
Electrical Infrastructure Hub 1 (Option 1)		
SS1-1	26° 39.787'S	28° 23.772'E
SS1-2	26° 39.816'S	28° 23.905'E
SS1-3	26° 39.672'S	28° 23.955'E
SS1-4	26° 39.657'S	28° 23.843'E
Electrical Infrastructure Hub 2 (Option 2)		

Point	Latitude	Longitude
SS2-1	26° 39.705'S	28° 23.990'E
SS2-2	26° 39.765'S	28° 23.970'E
SS2-3	26° 39.834'S	28° 24.003'E
SS2-4	26° 39.882'S	28° 24.080'E
SS2-5	26° 39.737'S	28° 24.112'E
Electrical Infrastructure Hub 3 (Option 3)		

Point	Latitude	Longitude
		
SS3-1	26° 40.228'S	28° 23.963'E
SS3-2	26° 40.274'S	28° 24.085'E
SS3-3	26° 40.423'S	28° 24.017'E
SS3-4	26° 40.370'S	28° 23.902'E

5.4 NO-GO ALTERNATIVE

The no-go alternative would be if the project were not to be developed.

The No-go alternative has also been assessed, noting that the property does hold existing development rights (i.e., Agriculture) and so, not developing the proposed development does not necessarily mean that there would be no changes or impacts on the site.

In the “no project” alternative, the proposed project will not be developed. In this scenario, there could be a missed opportunity to address the need for a just energy transition within the affected Provinces and Nationally. This project will also support the need to increase renewable energy generation in an effort to mitigate against concerns of climate change and exploitation of non-renewable resources. The no-go alternative would not assist in responding to the growing electricity demand in South Africa and would not contribute to the reliability of electricity supply at a national scale.

In considering the No-Go Alternative, it is important to recognise that an assessment of need and desirability extends beyond the avoidance of site-specific environmental impacts. Consistent with the principles of sustainable development contained in the National Environmental Management Act

(NEMA), consideration must also be given to the broader environmental, social and economic implications of maintaining the status quo. While the No-Go Alternative would avoid the direct impacts associated with the construction and operation of the proposed wind energy facility, it would also result in a missed opportunity to contribute to South Africa's renewable energy objectives, climate change mitigation commitments and Just Energy Transition (JET) goals. In addition, the socio-economic benefits associated with the project, including employment opportunities, local investment and economic development, would not be realised.

The No-Go Alternative must also be considered within the context of South Africa's ongoing energy security challenges and the need to replace ageing, carbon-intensive generation infrastructure with cleaner energy sources. The proposed development would contribute renewable electricity to the national grid and support the transition towards a lower-carbon energy future in alignment with local, provincial, national and international policy objectives. Consequently, the No-Go Alternative is not considered to represent the most sustainable environmental outcome. When weighed against the broader benefits of renewable energy generation, including reduced greenhouse gas emissions, enhanced energy security, economic growth and job creation, the localised environmental impacts of the proposed development are not considered sufficient to justify foregoing the project. Accordingly, the No-Go Alternative is not regarded as the preferred alternative.

The “no project” alternative was considered in the EIA phase as a baseline against which the impacts of the proposed project were assessed. Specialist findings on the no-go alternative are presented in the subsections which follow. The no-go alternative will be discussed in more detailed during the EIA Phase.

5.4.1. SOIL, LAND USE AND LAND CAPABILITY

The no-go alternative considers the option of ‘doing nothing’ and maintaining the status quo. The site is currently zoned as agricultural. Should the proposed activity not proceed, the site will continue to be used for agricultural production purposes. This, however, does not necessarily imply that no future changes or impacts will be experienced by the natural resources within the assessed project area.

Should the project not proceed, the potential opportunity costs in terms of adding wind energy generation to the current land use would be lost, and therefore all positive impacts and socio-economic opportunities and associated regional economic growth will also be lost.

Furthermore, the development offers an additional income source to the landowner and thus to the local agro ecosystem, without excluding agriculture production from the land. Therefore, the negative agricultural impact of the no-go alternative is more significant than that of the development and subsequently, from an agricultural impact perspective, the proposed development is preferred above the no-go option.

5.4.2. TERRESTRIAL BIODIVERSITY

Should the proposed Project not proceed, it is anticipated that existing agricultural and game farming activities will persist across the PAOI. Consequently, the ecological condition of on-site natural habitats and the composition of flora and fauna communities will probably remain unchanged from the current status quo. It is, however, noted that the on-site properties hold existing agricultural development rights, and it is therefore possible that portions of the land may be converted for agricultural use (e.g., cultivation) in the future.

5.4.3. PLANT SPECIES

Should the proposed Project not proceed, it is anticipated that existing agricultural and game farming activities will persist across the PAOI. Consequently, it is probable that the ecological condition of on-site natural habitats will remain unchanged from the current status quo. It is, however, noted that the on-site properties hold existing agricultural development rights, and it is therefore possible that portions of the land may be converted for agricultural use (e.g., cultivation) in the future.

5.4.4. ANIMAL SPECIES

Should the proposed Project not proceed, it is anticipated that existing agricultural and game farming activities will persist across the PAOI. Consequently, the ecological condition of on-site natural habitats and the composition of the general fauna community, and specifically that of populations of SCC, will probably remain unchanged from the current status quo. It is, however, noted that the on-site properties hold existing agricultural development rights, and it is therefore possible that portions of the land may be converted for agricultural use (e.g., cultivation) in the future.

5.4.5. AQUATIC BIODIVERSITY

The no-go alternative implies that there would be no change from the current activities within the project area of influence, and thus also no change in the impacts on the aquatic ecosystems within the area of influence. The tributaries of the Suikerbosrant River and the associated wetlands within the project area would thus be expected to remain in current ecological state, with no change in aquatic ecosystem impacts from the current. The proposed project area avoids the aquatic features and allows for the recommended buffer of 50 m from the delineated watercourses and would also be unlikely to alter the current ecological condition.

5.4.6. HERITAGE

The No-go alternative has also been assessed, noting that the property does hold existing development rights (i.e., Agriculture) and so, not developing the proposed development does not necessarily mean that there would be no changes or impacts on the site.

The areas identified as having very high sensitivity should be considered as no-go for new infrastructure, areas of high heritage sensitivity should be considered as “tread-lightly” and the areas identified as having moderate sensitivity must be considered more closely for development activities.

5.4.7. AVIFAUNA

The No-go alternative has also been assessed, noting that the property does hold existing development rights (i.e., Agriculture) and so, not developing the proposed development does not necessarily mean that there would be no changes or impacts on the site.

5.4.8. INVERTEBRATES (BUTTERFLIES)

The following aspects were considered:

- Proposed development sites will include several comparatively small footprints, which include a mixture of natural and deteriorated habitat types within a wider region that already exhibits moderate to significant levels of transformation.
- The regional importance of natural or pristine habitat types, from the perspective of butterfly habitat sensitivity, is considered high. It is however worth noting that most of the High or Very

High Sensitivity areas have been effectively avoided through the iterative changes that have been implemented since the scoping phase.

- Natural habitat types within the project area exhibit high levels of butterfly diversity and are therefore considered important on a local and regional scale.
- The likely presence of sensitive butterfly species within remaining portions of natural habitat has been indicated in this report. It is nonetheless worth noting that most of the High or Very High Sensitivity areas have been effectively avoided through iterative changes to the project component layouts since the scoping phase of the project.
- The continuous, timeous and comprehensive implementation of the recommended mitigation approach is expected to ameliorate impacts to an acceptable level.

No impact was identified that would cause irresponsible, unavoidable, unacceptable, or unmanageable consequences on the butterfly components of the project area. Considering the status of the receiving environment and the anticipated significance of impacts on ecological attributes, the No Go option is therefore not considered appropriate for this project.

5.4.9. BATS

Should the proposed Project not proceed, it is anticipated that existing agricultural and game farming activities will persist across the PAOI. Consequently, the ecological condition of on-site natural habitats and the composition of bat roosts will probably remain unchanged from the current status quo.

5.4.10. VISUAL

Should the proposed ABO Uvemvane WEF 1 not be undertaken then no visual impact is expected as the status quo of the receiving environmental shall remain unchanged.

5.4.11. NOISE

The ambient sound levels will remain as is and the area would keep the rural noise character.

5.4.12. TRAFFIC

This alternative considers the option of ‘do nothing’ and maintaining the status quo. Should the proposed activity not proceed, the site will remain unchanged and will continue to be used for agricultural purposes. The potential opportunity costs in terms of alternative land use income through rental for energy facility and the supporting social and economic development in the area would be lost if the status quo persists.

5.4.13. GEOTECHNICAL

The no-go alternative would be if the project were not to be developed. If the proposed Project does not proceed, it is expected that the existing/current land use practices (i.e., agricultural farming, cattle and wildlife grazing) will continue. Consequently, the condition and character of on-site natural habitat will likely remain unchanged. However, subsidence may still occur whether the project is a Go or No-Go.

5.4.14. SHE RISK ASSESSMENT

For most projects, from an acute health and safety point of view, the No-Go option will usually be a preferred option since there are no immediate health and safety risks associated with not doing a project, i.e. no one can get hurt if something does not exist. However, some projects aim to reduce

adverse effects elsewhere and can be viewed at offsetting either current or future risks. In this case, renewable energy projects should help to mitigate possible adverse impacts of climate change, create jobs and contribute to sustainable energy, i.e. the project risks are offset against future social risk reduction.

5.4.1. Social

While the No-Go Alternative would maintain the current social environment and avoid the impacts associated with the Project, it would also result in the loss of potential socioeconomic benefits that may accrue to affected communities and stakeholders. These benefits include employment and procurement opportunities during the construction phase, increased expenditure within the local economy, and contributions towards regional development, as outlined in the sections below.

The No-Go Alternative would also mean that the Project would not contribute to South Africa's ongoing transition towards a more diversified energy mix. As demand for electricity continues to increase due to population growth and economic development, the need for reliable and secure sources of energy remains a key national priority. The proposed Project would contribute additional renewable energy generation capacity to the national grid and support the strengthening of the existing electricity network, thereby contributing to long-term energy security.

6 GOVERNMENT FRAMEWORK

6.1 NATIONAL ENVIRONMENTAL LEGAL FRAMEWORK

African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Different authorities at both national and regional levels carry out environmental protection functions. The applicable legislation and policies are shown in **Table 6-1.**

As per the NEMA EIA Regulations 2014, as amended, Appendix 2 of GNR 982 Section (d), the listed activities triggered by the proposal are outlined in **Table 6-1.**

Table 6-1 - Applicable National Legislation

Legislation	Description of Legislation and applicability
The Constitution of South Africa (No. 108 of 1996)	The Constitution underpins the international principle that everyone has the right to an environment that is not harmful to their health or well-being. This fundamental human right is affected in Section 24 of the Constitution. The Constitution cannot manage regulate environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld on an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights. NEMA is the principal environmental statute which regulates environmental management and seeks to give effect to the environmental right enshrined in section 24 of the Constitution.
National Environmental Management Act (No. 107 of 1998)	NEMA provides that an Environmental Authorisation (EA) is required by any person that intends to undertake certain listed activities that are considered likely to have a detrimental impact on the environment and have been identified in Listing Notice 1 (GN R983, GG 38282 of 4 December 2014), Listing Notice 2 (GN R984, GG 38282 of 4 December 2014), or Listing Notice 3 (GN R985, GG 38282 of 4 December 2014) published under the Environmental Impact Regulations (EIA Regulations). No construction/development (broadly defined in the EIA Regulations) activities may commence without an EA being granted by the relevant competent authority (and/or where such EA has been suspended by virtue of, for example, an appeal having been lodged). The regulations outlining the procedures required for authorisation are published in the EIA Regulations of 2014 (GNR 982) (as amended). Listing Notice 1 identifies activities that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require an S&EIR process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 3 identifies activities within specific high biodiversity areas that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. WSP undertook a legal review of the listed activities according to the proposed project description to conclude that the activities listed in in this section are considered applicable to the development: A S&EIR process must be followed. An EA is required and has been applied for with the DFFE.
Listing Notice 1: GNR 983	*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.*

Legislation	Description of Legislation and applicability
	(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or *(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more;* *excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —* *(a) temporarily required to allow for maintenance of existing infrastructure;* *(b) 2 kilometres or shorter in length;* *(c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development* **Description**: This activity will be triggered as the project is located outside of an urban area and includes internal grid infrastructure with a capacity of up to 33kV, onsite IPP substation including a 33/132kV step-up transformer[12], and an over the fence cable up to 132kV to connect the onsite IPP substation to the existing Eskom infrastructure.
	Activity 12(ii)(a)(c) – *The development of—* *(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or* *(ii) infrastructure or structures with a physical footprint of 100 square metres or more* *(a) within a watercourse* *(b) in front of a development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.* *excluding—* *(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such development occurs within an urban area; [or]* *(ee) where such development occurs within existing roads, [or] road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.* **Description:** The Facility will require the development of internal roads and/or access roads and electrical cabling (both above and underground) within the site. The physical footprint of internal access

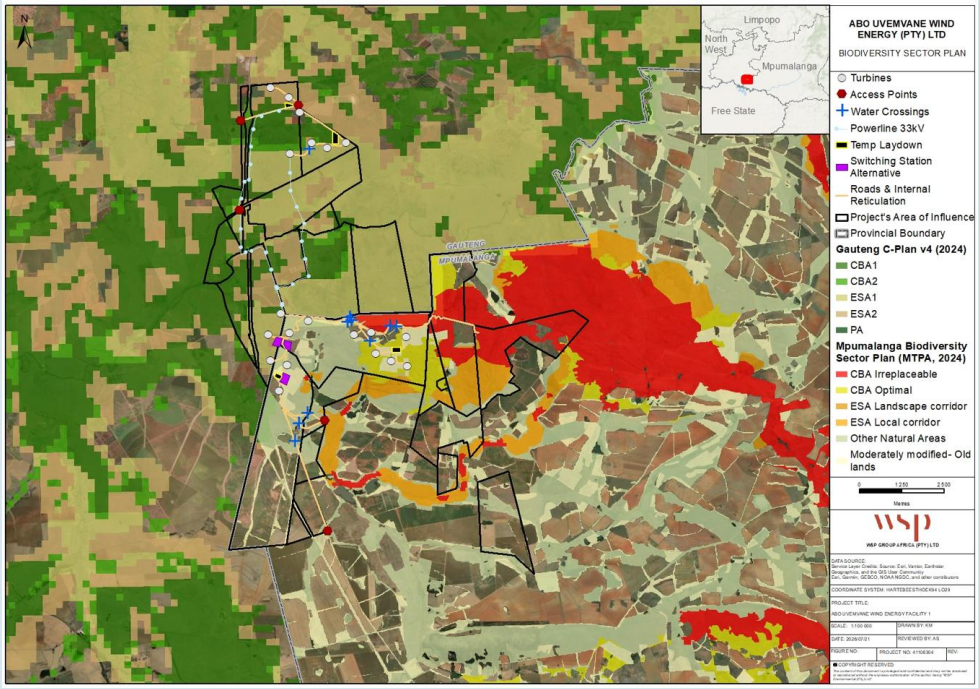
[12] Note: The final grid connection voltage, transformer capacity, and associated electrical infrastructure specifications will be determined by Eskom's connection requirements and scope of works, as well as the findings and approvals of the separate environmental assessment process for the grid connection infrastructure.

Legislation	Description of Legislation and applicability
	roads and electrical cabling required to connect the various components of the Facility will either traverse the delineated watercourses on site or be located within 32m of the outer extent of the delineated watercourses on site.
	Activity 14 – *The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.* **Description:** The Facility will require storage and handling of dangerous goods, including fuel, cement, and chemical storage onsite, that will be greater than 80m^3 but not exceeding 500 m^3. This activity will also be applicable in the event that Lithium-ion technology is considered preferred for the BESS.
	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.* *but excluding where such infilling, depositing, dredging, excavation, removal or moving—* *(a) will occur behind a development setback;* *(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;* *(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;* *(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or* *(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.* **Description:** While the layout of the proposed wind energy facility has been designed to avoid the identified surface water features / watercourses as far as possible, internal access roads and stormwater control infrastructure, as well as electrical cabling required to connect the various components of the Facility will collectively require the excavation, infilling or removal of soil exceeding 10 m^3 from delineated watercourses on site. Based on the current design assumptions, the estimated quantity of material to be excavated, infilled, or removed at the watercourse crossings is approximately 4000 m^3[13].
	Activity 24(ii) – *The development of a road:* *(i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or* *(ii) A road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres* *but excluding a road—*

[13] The estimated volume presented herein is a high-level approximation intended for environmental assessment and planning purposes only. The estimate is based on the assumed disturbance footprint within the watercourse buffer, and a nominal excavation depth of 0.5 m. Actual volumes may differ, and the final earthworks volumes will be determined during the detailed design phase through appropriate engineering surveys.

Legislation	Description of Legislation and applicability
	a) which is identified and included in activity 27 in Listing Notice 2 of 2014; *(b) where the entire road falls within an urban area; or (c) which is 1 kilometre or shorter* **Description:** Existing access roads will be used wherever possible. However, the Facility will require the development of internal roads and/or access roads within the site. A corridor of up to 12 m wide may be temporarily impacted upon during construction and be rehabilitated to up to 10 m wide after construction (inclusive of stormwater infrastructure where relevant).
	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:* *(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or* *(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare. excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes* **Description:** The Facility is considered commercial and/or industrial development and is located on several farm portions zoned for agricultural use outside an urban area, used for agricultural purposes. The total area to be developed for the Facility (total development footprint) is up to 67.2 ha.
	Activity 48(i)(a)(c) – *The expansion of—* *(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or* *(ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more* *where such expansion occurs—* *(a) within a watercourse;* *(b) in front of a development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;* *excluding—* *(aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such expansion occurs within an urban area; or* *(ee) where such expansion occurs within existing roads, road reserves or railway line reserves* **Description:** Transport of large infrastructure components related to the facility will require the expansion of existing access and/or internal roads, culverts or similar drainage crossing infrastructure collectively exceeding 100 m^2 or more beyond existing road or road reserves located within

Legislation	Description of Legislation and applicability
	delineated watercourses on site, or within 32m of the outer extent of the delineated watercourses on site.
	Activity 56(i)(ii) – *The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre— (i) where the existing reserve is wider than 13,5 meters; or* *(ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.* **Description:** Transport of large infrastructure components related to the facility will require the widening and lengthening of existing access and/or internal roads where no reserve exists and where such road is wider than 8 metres.
Listing Notice 2: GNR 984	*Activity 1(a) –* *The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more,* *excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs:* *(a) within an urban area; or* *(b) on existing infrastructure* **Description**: The proposed energy generation technology (i.e. Wind) will generate 170 MW of electricity output from a renewable resource.
	Activity 15(i) – *The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.* **Description**: The non-linear components of the facility will result in the clearance of at least 20ha or more of indigenous vegetation. The approximate development footprint is 42ha.
Listing Notice 3: GNR 984	***Mpumalanga:*** *The CBAs identified are as per the Mpumalanga Biodiversity Sector Plan (MBSP) formally adopted by the MEC (Member of Executive Council) for Agriculture, Rural Development, Land and Environmental Affairs in the Provincial Gazette No 2535 of 26 May 2023 (Provincial Gazette Notice 279 of 2023).* ***Gauteng:*** *The CBAs identified are as per the Gauteng Conservation Plan(C-Plan) Version 4 (2024). The Gauteng C-Plan (2024) delineations designate large areas of the Gauteng portion of the Project Area as ESAs with smaller areas designated as CBA 1 and CBA2. Triggering criteria for the Gauteng C-Plan's CBAs include Red List plant, bird and invertebrate habitats, Orange List plant habitat, bioclimatic zones, priority quaternary catchments, and primary vegetation. Most proposed Project infrastructure have been positioned, as far as possible, to avoid CBAs or align with existing disturbance footprints, portions of the proposed access road network traverse CBA patches and may result in losses and disturbances.* **Figure 6-1** below illustrates the geographical areas applicable in terms of Listing Notice 3:

Legislation	Description of Legislation and applicability
	 **Figure 6-1 – CBAs identified are as per the Gauteng C-Plan (2024) and the MBSP (2024) within the PAOI.**
	Activity 4 – *The development of a road wider than 4 metres with* *a reserve less than 13,5 metres.* *f. Mpumalanga* *(i) Outside urban areas:* *(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* *C. Gauteng* *(iv).Sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans* **Description:** Internal roads with a width of up to approximately 10m (a corridor of up to 12 m wide may be temporarily impacted) will provide access to each wind turbine as well as the electrical infrastructure hub. Existing roads will be used wherever possible, although new access/internal roads will be constructed where necessary. While most proposed Project infrastructure has been positioned, as far as possible, to avoid CBAs or align with existing disturbance footprints, there will be the minor development of new roads, within patches of CBAs located in Gauteng, with a footprint of approximately 0.5ha and within patches of CBA located in Mpumalanga with an approximate footprint of 0.03ha. The development of new roads in Gauteng with a footprint of approximately 4ha of ESA1 and 3ha of ESA2 is also proposed.
	Activity 10 –

Legislation	Description of Legislation and applicability
	The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. *f. Mpumalanga* *i. Outside urban areas:* *(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* *(hh) Areas within a watercourse or wetland, or within 100 metres of a watercourse or wetland;* *C. Gauteng* *(iv).Sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans* **Description:** The Facility will require storage and handling of dangerous goods, including fuel, cement, and chemical storage onsite, that will be greater than 30 m^3 but not exceeding 80 m^3 within the specified geological areas. Storage contemplated above may be located within and will require vegetation clearance in sensitive areas. The storage areas may also be located within delineated watercourses on site, or within 100m of the outer extent of the delineated watercourses on site. The project area contains areas classified as Critical Biodiversity Areas (CBA) as identified in the Mpumalanga Biodiversity Sector Plan (MBSP) (2024) as well as the Gauteng Conservation Plan (C-Plan) (Version 4, 2024). However, it should be noted that only the proposed internal and access roads would fall within these sensitive areas and wind turbines will remain out of CBAs.
	Activity 12 – *The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* *(f) Mpumalanga (ii) Within critical biodiversity areas identified in bioregional plans; or* *C. Gauteng* *(ii) Within critical biodiversity areas identified in bioregional plans* **Description:** The development of the Facility will require the clearance of indigenous vegetation in excess of 300 m² for turbines, access roads, hardstands, electrical infrastructure, and associated facilities. In Mpumalanga, there will be clearance of vegetation of approximately 2.5ha within CBAs. In Gauteng, there will be vegetation clearance of approximately 1.44ha within CBAs and approximately 39.42ha within ESAs.
	Activity 14(ii)(a)(c) – *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;* *(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;*

Legislation	Description of Legislation and applicability
	f. Mpumalanga *i. Outside urban areas:* *(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* *b. Gauteng* *(iv) Sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;* **Description:** The Facility will require the development of internal roads and/or access roads within the site. The physical footprint of internal access roads, stormwater control infrastructure and electrical cabling required to connect the various components of the Facility will either traverse the delineated watercourses on site or be located within 32 m of the outer extent of the delineated watercourses on site. There are ESAs and CBAs located across the Project Area.
	Activity 18 – *The widening of a road by more than 4 metres, or the* *lengthening of a road by more than 1 kilometre.* *f. Mpumalanga* *i. Outside urban areas:* *(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *c. Gauteng* *v. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;* **Description:** Transport of large infrastructure components related to the facility will require the widening of existing access and/or internal roads by more than 4 metres or the lengthening of existing access and/or internal roads by more than 1km within the Mpumalanga Province and outside urban areas. The Project area contains CBAs.
	Activity 23(ii)(a)(c) – *The expansion of—* *(ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs —* *(a) within a watercourse;* *(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;* *f. Mpumalanga* *i. Outside urban areas:* *(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* *c. Gauteng*

Legislation	Description of Legislation and applicability
	(iv) Sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans **Description:** The Facility will require the expansion of existing internal roads and/or access roads within the site. The physical footprint of the expansion activities will either traverse the delineated watercourses on site or be located within 32 m of the outer extent of the delineated watercourses on site. There are ESAs and CBAs located across the Project Area.
Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes (GNR 320, 20 March 2020 and GNR 1150, 30 October 2020)	The protocols provide the criteria for specialist assessment and minimum report content requirements for impacts for various environmental themes for activities requiring environmental authorisation. The protocols replace the requirements of Appendix 6 of the EIA Regulations, 2014, as amended. The assessment and reporting requirements of the protocols are associated with a level of environmental sensitivity identified by the national web based environmental screening tool (screening tool). The Screening Report was generated for the project on 28 November 2025 (**Appendix H**). The following environmental themes were applicable to the project: • Agricultural Theme; • Animal Species Theme; • Aquatic Biodiversity Theme; • Archaeological and Cultural Heritage Theme; • Avian (Wind) Theme; • Bats (Wind) Theme; • Civil Aviation Theme; • Defence Theme; • Flicker Theme; • Palaeontology Theme; • Plant Species Theme; • Noise Theme; • Landscape (Wind theme); • Terrestrial Biodiversity Theme; and • Vulture Theme.
National Environmental Management: Waste Act (59 of 2008) (NEM:WA)	This Act provides for regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation. The Act also provides for the licensing and control of waste management activities through GNR. 921 (2013): List of Waste Management Activities that Have, or are Likely to Have, a Detrimental Effect on the Environment. The proposed project does not constitute a Listed Activity requiring a Waste Management Licence (WML) as defined in GNR 921. The Environmental Management Programme (EMPr) that accompanies the EIA Report, includes reasonable measures for the prevention of pollution and good international industry practice (GIIP).
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) was promulgated in June 2004 within the framework of NEMA to provide for the management and conservation of national biodiversity. The NEMBA's primary aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. In addition, the NEMBA provides for the establishment and functions of a South African National Biodiversity Institute (SANBI). SANBI was established by the NEMBA with the primary purpose of reporting on the status of the country's biodiversity and conservation status of all listed threatened or protected species and ecosystems.

Legislation	Description of Legislation and applicability
	The biodiversity assessment identifies CBAs which represent biodiversity priority areas which should be maintained in a natural to near natural state. The CBA maps indicate the most efficient selection and classification of land portions requiring safeguarding in order to meet national biodiversity objectives. According to the description for the Terrestrial Assessment categories, CBAs are areas that are required to meet biodiversity targets (for biodiversity pattern and ecological process features). The management approach is that they should remain in a natural state. CBAs are areas of high biodiversity value which are usually at risk of being lost and usually identified as important in meeting biodiversity targets, except for Critically Endangered Ecosystems or Critical Linkages. Both the MBSP and the Gauteng C-plan recognise two CBA ranks, *viz*. CBA Irreplaceable and CBA Optimal under the MBSP, and CBA Irreplaceable Area and CBA Important Area under the Gauteng C-Plan. *Four regional vegetation types characterise the PAOI, of which two are threatened according to NEMBA Threatened Ecosystems (2021), namely Soweto Highveld Grassland (Vulnerable) and Tsakane Clay Grassland (Endangered). Large areas of the PAOI are also classified as CBAs and ESAs according to the delineations of the MBSP (2024) and the Gauteng C-Plan (2024).* Supplementary baseline terrestrial ecology studies were undertaken during the EIA phase to inform the assessment of impacts and will include flora and fauna surveys of the project footprint to determine the presence of flora and fauna species of conservation concern (SCC), and bird surveys of the area to define the potential risks to bird SCC. *Fauna SCC, including the Mountain Reedbuck (EN) were recorded on-site during the field programme, and habitat suitability assessments suggest that several other fauna SCC and indeed flora SCC may be present on-site. The DFFE screening tool rated the Terrestrial Biodiversity Theme for the PAOI as 'Very High' sensitivity, and the findings of this study confirm this sensitivity rating for patches of natural habitat.* The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) Regulations with regards to alien and invasive species have been superseded by the National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004) – Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014. Specific management measures for the control of alien and invasive plants have been included in the EMPr. Furthermore, the Multi-species Biodiversity Management Plan for Vultures in South Africa has been developed in terms of section 43(1)(b) and (c) and 43(3)(a) and (b) of the NEMBA.
National Biodiversity Offset Guideline (2023)	The National Biodiversity Offset Guideline (2023), published under the National Environmental Management Act (NEMA), provides a nationally consistent framework for determining when biodiversity offsets are required and how they should be designed and implemented. The guideline promotes the application of the mitigation hierarchy, prioritising the avoidance, minimisation, rehabilitation and restoration of biodiversity impacts before offsets are considered as a measure of last resort. Its objective is to achieve no net loss, and where possible a net gain, of biodiversity where significant residual impacts cannot be avoided. The guideline is applicable to applications for Environmental Authorisation (EA) in terms of section 24 of NEMA and may also inform other administrative processes involving biodiversity offsetting. Biodiversity is fundamental to human well-being, economic activity and socio-economic development. The National Biodiversity Assessment (2018) recognises South Africa's biodiversity assets and ecological infrastructure as important contributors to national development priorities. Biodiversity offsetting, when appropriately applied, supports the environmental right contained in section 24 of the Constitution by promoting conservation and helping to secure ecologically sustainable development while enabling justifiable economic and social development. Where a biodiversity offset is required, the process includes identifying the need for an offset, determining offset requirements, selecting and securing an offset site, preparing the required management and implementation measures, and incorporating appropriate conditions into the EA. The proposed project was assessed against the guideline to determine whether biodiversity offset requirements apply. The revised layout demonstrates substantive application of the mitigation hierarchy through the avoidance of sensitive biodiversity features, reduction of the development

Legislation	Description of Legislation and applicability
	footprint and alignment of infrastructure with existing disturbed corridors. Based on the terrestrial biodiversity, plant, animal and aquatic specialist assessments, all residual impacts were rated low or very low following mitigation. Accordingly, the Biodiversity Offset Technical Memo concluded that the project is not expected to trigger a biodiversity offset under the National Biodiversity Offset Guideline (2023). As stated in the Terrestrial Biodiversity Assessment (**Appendix G.2**), implementation of the recommended mitigation measures reduces the post-mitigation impact significance to Low. The assessment therefore concludes that no biodiversity offset is required for the proposed project and recommends that all relevant mitigation and management measures be incorporated into an integrated Biodiversity Management/Action Plan during the pre-construction phase.
National Environmental Management Protected Areas Act (No. 57 of 2003)	The purpose of the National Environmental Management Protected Areas Act (No. 57 of 2003) (NEMPAA) is to, inter alia, provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. To this end, it provides for the declaration and management of various types of protected areas. Section 50(5) of NEMPAA states that "no development, construction or farming may be permitted in a nature reserve or world heritage site without the prior written approval of the management authority." There are no protected areas within the study area. "According to the delineations of the National Protected Area Expansion Strategy (NPAES) (2018), large portions of the PAOI are mapped as Priority Focus Areas. These are mirrored across the portions of the PAOI that fall within Mpumalanga Province, according to the Mpumalanga's Protected Area Expansion Strategy – 20 Year Plan. Certain components of the proposed Project infrastructure fall within mapped Priority Focus Areas. Many of these components have, however, been located within patches of Secondary Grassland (old lands) rather than in areas of intact natural habitat. This positioning reduces potential negative impacts on the ecological functioning of the affected and adjacent portions of the Priority Focus Area network".
National Forest Act (No. 84 of 1998)	The National Forests Act (No 84 of 1998) (NFA) was promulgated to reform the law on forests, The NFA regulates the protection of certain forests and trees. The NFA provides that a licence or exemption must be obtained in order to: • cut, disturb, damage or destroy (i) any indigenous tree in a natural forest; or (ii) any protected tree; or • possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any tree, or any forest product derived from (i) an indigenous tree in a natural forest; or (ii) a protected tree.
The National Water Act (No. 36 of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides the framework to protect water resources against over exploitation and to ensure that there is water for social and economic development, human needs and to meet the needs of the aquatic environment. The Act defines water source to include watercourses, surface water, estuary or aquifer. A watercourse is defined in the Act as a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows, and any collection of water that the Minister may declare a watercourse. Section 21 of the Act outlines a number of categories that require a water user to apply for a Water Use License (WUL) and Section 22 requires water users to apply for a General Authorisation (GA) with the Department of Water and Sanitation (DWS) if they are under certain thresholds or meet certain criteria. The list of water uses applicable to the proposed Project include: • Taking water from a water resource; • Impeding or diverting the flow of water in a watercourse; • Disposing of waste in a manner which may detrimentally impact on a water resource; • Altering the bed, banks, course or characteristics of a watercourse; The DWS will make the final decision on water uses that are applicable to the project through a pre-application meeting after which a Water Use Authorisation Application (WULA) as determined

Legislation	Description of Legislation and applicability
	by the risk assessment will be undertaken in compliance with procedural regulations published by the DWS within General Notice 267 (GN267). These regulations specify required information per water use and the reporting structure of required supporting technical information.
Water Services Act (No. 108 of 1997)	The Water Services Act (No. 108 of 1997) (WSA) regulates the supply of water services by water services authorities and water services providers. According to section 6 of the WSA, no person may use water supply and sanitation services from a source other than a water services provider nominated by the water services authority (such as a municipality) having jurisdiction in the area in question, without the approval of that water services authority. The definition of "water services" in the WSA includes "water supply services" and "sanitation services" If it is indented that the Project will receive water from a municipal system then the Water Services Act may be triggered, i.e. if the project will require water for construction and or later operational purposes other than from a bore hole, say from the municipality, then the Municipality will have to provide a confirmation letter to this effect. The applicant is engaging the local municipalities separate to this EIA process.
The National Heritage Resources Act (No. 25 of 1999)	The National Heritage Resource Act (Act No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. The NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resources Agency (SAHRA), and lists activities that require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development. Part 2 of the NHRA details specific activities that require a Heritage Impact Assessment (HIA) that will need to be approved by SAHRA. Parts of Section 35, 36 and 38 apply to the proposed project, principally: • Section 35 (4) - No person may, without a permit issued by the responsible heritage resources authority- • destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite; • destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite. • Section 38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as- • any development or other activity which will change the character of a site— (i) exceeding 5 000 m^2 in extent, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of such development on heritage resources is required in ᵗerms of any other legislation (such as NEMA), provided that the consenting authority ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. However, should heritage resources of significance be affected by the proposed project, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the SAHRA Permit Regulations (GN R668). A Heritage Impact Assessment Report (**Appendix G.4**) has been carried out by a suitably qualified specialist, revealing: • Heritage resources in the study area consist of structures and ruins older than 60 years, burial sites; • Graves and cemeteries have been identified in the vicinity; • Early Stone Age artefacts dated to more than 200 000 years ago • sensitivity according to SAHRIS, and additional studies are required for the EIA phase;

Legislation	Description of Legislation and applicability
	• To comply with the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and with cognisance of known heritage resources in the area, the development footprint should be subjected to a field-based Heritage Impact Assessment (HIA) of the final impact areas. The proposed project will be loaded onto the SAHRIS portal for comment by the SAHRA.
Mineral and Petroleum Resources Development Act (No. 28 of 2002)	The aim of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) is to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources. Section 53(1) of the MPRDA provides that any person who intends to use the surface of any land in any way that may be contrary to any object of the MPRDA, or which is likely to impede any such object, must apply to the Minister of Mineral Resources (the Minister) for approval. Section 53 of the MPRDA provides a mechanism for ensuring that, inter alia, the mining of mineral resources is not detrimentally affected through the use of the surface of land and which may, for example, result in the sterilisation of a mineral resource. A Section 53 consent will be required due to the fact that the project is located on various mining right areas. The Amendment Regulations (GNR 420 of 27 March 2020) introduced a template for section 53 applications (Form Z) and the specific information that applicants will need to provide as part of a section 53 application.
Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	In South Africa, environmental noise control has been in place for three decades, beginning in the 1980s with codes of practice issued by the South African National Standards (formerly the South African Bureau of Standards, SABS) to address noise pollution in various sectors of the country. Under the previous generation of environmental legislation, specifically the Environmental Conservation Act 73 of 1989 (ECA), provisions were made to control noise from a National level in the form of the Noise Control Regulations (GNR 154 of January 1992). In later years, the ECA was replaced by the National Environmental Management Act 107 of 1998 (NEMA) as amended. The National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) was published in line with NEMA and contains noise control provisions under Section 34: 1) The minister may prescribe essential national standards – a) for the control of noise, either in general or by specific machinery or activities or in specified places or areas; or b) for determining – i. a definition of noise; and ii. the maximum levels of noise. 2) When controlling noise, the provincial and local spheres of government are bound by any prescribed national standards. Under NEMAQA, the Noise Control Regulations were updated and are to be applied to all provinces in South Africa. The Noise Control Regulations give all the responsibilities of enforcement to the Local Provincial Authority, where location specific by-laws can be created and applied to the locations with approval of Provincial Government. Where province-specific regulations have not been promulgated, acoustic impact assessments must follow the Noise Control Regulations. Furthermore, NEMAQA prescribes that the Minister must publish maximum allowable noise levels for different districts and national noise standards. These have not yet been accomplished and as a result all monitoring and assessments are done in accordance with the South African National Standards (SANS) 10103:2008 and 10328:2008. The Noise Impact Assessment (**Appendix G.8**) undertaken as part of the EIA aligns with this legislation.
Conservation of Agricultural Resources Act (No. 43 of 1983)	The Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) provides for the implementation of control measures for soil conservation works as well as alien and invasive plant species in and outside of urban areas.

Legislation	Description of Legislation and applicability
	In terms of the amendments to the regulations under the CARA, landowners are legally responsible for the control of alien species on their properties. Various Acts administered by the DFFE and the DWS, as well as other laws (including local by-laws), spell out the fines, terms of imprisonment and other penalties for contravening the law. Although no fines have yet been placed against landowners who do not remove invasive species, the authorities may clear their land of invasive alien plants and other alien species entirely at the landowners' cost and risk. The CARA Regulations with regards to alien and invasive species have been superseded by NEMBA Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014. Rehabilitation after disturbance to agricultural land is managed by the Conservation of Agricultural Resources Act (Act 43 of 1983 - CARA). A consent in terms of CARA is required for the cultivation of virgin land. Cultivation is defined in CARA as "any act by means of which the topsoil is disturbed mechanically". The purpose of this consent for the cultivation of virgin land is to ensure that only land that is suitable as arable land is cultivated. Therefore, despite the above definition of cultivation, disturbance to the topsoil that results from construction of infrastructure does not constitute cultivation as it is understood in CARA. This has been corroborated by Anneliza Collett (Acting Scientific Manager: Natural Resources Inventories and Assessments in the Directorate: Land and Soil Management of the Department of Agriculture, Land Reform and Rural Development (DLRRD)). The construction and operation of the facility will therefore not require consent from the Department of Land Reform and Rural Development in terms of this provision of CARA.
Civil Aviation Act (No. 13 of 2009)	Civil aviation in South Africa is governed by the Civil Aviation Act (Act 13 of 2009). This Act provides for the establishment of a stand-alone authority mandated with controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. This mandate is fulfilled by South African Civil Aviation Authority (SACAA) as an agency of the Department of Transport (DoT). SACAA achieves the objectives set out in the Act by complying with the Standards and Recommended Practices (SARPs) of the International Civil Aviation Organisation (ICAO), while considering the local context when issuing the South African Civil Aviation Regulations (SA CARs). As of the 1st of May 2021, Air Traffic and Navigation Services (ATNS) has been appointed as the new Obstacle application Service Provider for Windfarms and later Solar Plants. Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Windfarms and in due time Power Plant assessments. The DFFE Screening Tool Report identified Civil Aviation as having Low- sensitivity for the proposed WEF. An Application for the Approval of Obstacles has been submitted to ATNS. SACAA has been included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought from these authorities as applicable.
Occupational Health and Safety Act (No. 85 of 1993)	The National Occupational Health and Safety Act (No. 85 of 1993) (OHSA) and the relevant regulations under the Act are applicable to the proposed project. This includes the Construction Regulations promulgated in 2014 under Section 43 of the Act. Adherence to South Africa's OHSA and its relevant Regulations is essential.
National Energy Act (No. 34 of 2008)	The National Energy Act aims to ensure that diverse energy resources are available, in sustainable quantitates, and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account environmental management requirements and interactions amongst economic sectors. The main objectives of the Act are to: • Ensure uninterrupted supply of energy to the Republic; • Promote diversity of supply of energy and its sources; • Facilitate effective management of energy demand and its conservation; • Promote energy research; • Promote appropriate standards and specifications for the equipment, systems and processes used for producing, supplying and consuming energy;

Legislation	Description of Legislation and applicability
	• Ensure collection of data and information relating to energy supply, transportation and demand; • Provide for optimal supply, transformation, transportation, storage and demand of energy that are planned, organised and implemented in accordance with a balanced consideration of security of supply, economics, consumer protection and a sustainable development; • Provide for certain safety, health and environment matters that pertain to energy; • Facilitate energy access for improvement of the quality of life of the people of Republic; • Commercialise energy-related technologies; • Ensure effective planning for energy supply, transportation, and consumption; and • Contribute to sustainable development of South Africa's economy. In terms of the act, the Minister of Energy is mandated to develop and, on an annual basis, review and publish the Integrated Energy Plan (IEP) in the Government Gazette. The IEP analyses current energy consumption trends within different sectors of the economy (i.e. agriculture, commerce, industry, residential and transport) and uses this to project future energy requirements, based on different scenarios. The IEP and the Integrated Resource Plan are intended to be updated periodically to remain relevant. The framework is intended to create a balance between energy demand and resource availability so as to provide low-cost electricity for social and economic development, while taking into account health, safety and environmental parameters.
Electricity Regulation Act (No. 4 of 2006)	The Electricity Regulation Act (No. 4 of 2006) (ERA) aims to: Achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa; Ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency. effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic: • Facilitate investment in the electricity supply industry; • Facilitate universal access to electricity; • Promote the use of diverse energy sources and energy efficiency; • Promote competitiveness and customer and end user choice; and • Facilitate a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public. The Act establishes a National Energy Regulator as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licenses and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated.
Environment Conservation Act No 73 of 1989	The Environment Conservation Act (No 73 of 1989) (ECA) requires that any person who constructs works for the supply of light, heat or power by means of electricity, must notify electronic communications network service licensees of the proposed works; provide such licensees with a plan of the proposed works and any further information that may be required; and comply with any requirements imposed by such licensees. Section 29(1)(b) of the ECA provides that electronic communications network service licensees (e.g.; Vodacom, MTN, ICASA…) must be notified at least 30 days prior to commencement of construction.

6.2 POLICIES AND PLANS

Table 6-2 summarised key policies and plans as an outline of the governance framework for the project.

Table 6-2 - Applicable Regional Policies and Plans

Applicable Policy	Description of Policy
National Development Plan 2030	The National Development Plan aims to eliminate poverty and reduce inequality by 2030. The NDP identifies several enabling milestones. Of relevance to the proposed development the NDP refers to the need to produce sufficient energy to support industry at competitive prices and ensure access for poor households, while reducing carbon emissions per unit of power by about one-third. In this regard the infrastructure is not just essential for faster economic growth and higher employment. It also promotes inclusive growth, providing citizens with the means to improve their own lives and boost their incomes. Infrastructure is essential to development. Chapter 3, Economy, and Employment, identifies some of the structural challenges specific to South Africa, including an energy constraint that will act as a cap on growth and on options for industrialisation. The NDP notes that from an environmental perspective South Africa faces several related challenges. The reduction of greenhouse gas emissions and shift to a green low-carbon economy, is one of these challenges. In terms of implementation the NDP identifies three phases. The first two are of specific relevance to the proposed project. The first phase (2012–2017) notes that ensuring the supply of energy and water is reliable and sufficient for a growing economy. The second phase (2018–2023) involves building on the first phase to lay the foundations for more intensive improvements in productivity. The provision of affordable and reliable energy is a key requirement for this to take place. Chapter 4, Economic infrastructure, notes that economic infrastructure provides the foundation for social and economic development. In this regard South Africa must invest in a strong network of economic infrastructure designed to support the country's medium- and long-term economic and social objectives. The plan envisages that, by 2030, South Africa will have an energy sector that promotes: Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation. Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change. More specifically, South Africa should have adequate supply security in electricity and in liquid fuels, such that economic activity, transport, and welfare are not disrupted. The plan sets out steps that aim to ensure that, in 20 years, South Africa's energy system looks very different to the current situation. In this regard coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources, will play a much larger role.
Integrated Resource Plan 2025	Integrated Resource Plan (IRP) 2025 is South Africa’s official national electricity planning policy, published under the Electricity Regulation Act, and gazetted in October 2025. It sets out how South Africa will meet its electricity demand over the long term, using a mix of generation technologies at the lowest overall cost, while balancing energy security, environmental impacts, and socio-economic goals. The proposed project aligns with the Integrated Resource Plan (IRP) 2025, which identifies renewable energy, including wind power, as a key component of South Africa’s future electricity generation mix to ensure security of supply and reduce greenhouse gas emissions.
Integrated Resource Plan 2010 – 2030	The IRP is an electricity capacity plan which aims to provide an indication of the country's electricity demand, how this demand will be supplied and what it will cost. On 6 May 2011, the then Department of Energy (DoE) released the Integrated Resource Plan 2010-2030 (IRP 2010) in respect of South Africa’s forecast energy demand for the 20-year period from 2010 to 2030. The promulgated IRP 2010–2030 identified the preferred generation technology required to meet expected demand growth up to 2030. It incorporated government objectives such as affordable electricity, reduced greenhouse

Applicable Policy	Description of Policy
	gas (GHG) emissions, reduced water consumption, diversified electricity generation sources, localisation and regional development. The IRP recognises that Solar photovoltaic (PV), wind and concentrated solar power (CSP) with storage present an opportunity to diversify the electricity mix, to produce distributed generation and to provide off-grid electricity. Renewable technologies also present huge potential for the creation of new industries, job creation and localisation across the value chain.
New Growth Path	Government released the New Economic Growth Path Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years and reflects government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: energy, transport, communication, water, and housing.
National Infrastructure Plan	The South African Government adopted a National Infrastructure Plan (NIP) in 2012. The NIP aims to transform the South African economic landscape while simultaneously creating significant numbers of new jobs and strengthening the delivery of basic services. It outlines the challenges and enablers which needs to be addressed in the building and developing of infrastructure. The Presidential Infrastructure Coordinating Commission (PICC) was established by the Cabinet to integrate and coordinate the long-term infrastructure build. The plan also supports the integration of African economies. In terms of the plan Government will invest R827 billion over the next three years to build new and upgrade existing infrastructure. The aim of the investments is to improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. The plan also notes that investment in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to improved economic growth.
Integrated Energy Plan	The development of a National IEP was envisaged in the White Paper on the Energy Policy of the Republic of South Africa of 1998 and, in terms of the National Energy Act, 2008 (Act No. 34 of 2008), the Minister of Energy is mandated to develop and, on an annual basis, review and publish the IEP in the Government Gazette. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development. The IEP notes that South Africa needs to grow its energy supply to support economic expansion and in so doing, alleviate supply bottlenecks and supply-demand deficits. In addition, it is essential that all citizens are provided with clean and modern forms of energy at an affordable price. As part of the Integrated Energy Planning process, eight key objectives are identified, namely: Objective 1: Ensure security of supply. Objective 2: Minimise the cost of energy. Objective 3: Promote the creation of jobs and localisation. Objective 4: Minimise negative environmental impacts from the energy sector. Objective 5: Promote the conservation of water. Objective 6: Diversify supply sources and primary sources of energy. Objective 7: Promote energy efficiency in the economy. Objective 8: Increase access to modern energy. The IEP provides an assessment of current energy consumption trends within different sectors of the economy (i.e., agriculture, commerce, industry, residential and transport) and uses this information to identify future energy requirements, based on different scenarios. The scenarios are informed by different assumptions on economic development and the structure of the economy and consider the impact of key policies

Applicable Policy	Description of Policy
	such as environmental policies, energy efficiency policies, transport policies and industrial policies, amongst others. Based on this information the IEP then determines the optimal mix of energy sources and technologies to meet those energy needs in the most cost-effective manner for each of the scenarios. The associated environmental impacts, socio-economic benefits and macroeconomic impacts are also analysed. The IEP is therefore focused on determining the long-term energy pathway for South Africa, considering a multitude of factors which are embedded in the eight objectives. As part of the analysis four key scenarios were developed, namely the Base Case, Environmental Awareness, Resource Constrained and Green Shoots scenarios: The Base Case Scenario assumes that existing policies are implemented and will continue to shape the energy sector landscape going forward. It assumes moderate economic growth in the medium to long term. The Environmental Awareness Scenario is characterised by more stringent emission limits and a more environmentally aware society, where a higher cost is placed on externalities caused by the supply of energy. The Resource Constrained Scenario in which global energy commodity prices (i.e. coal, crude oil and natural gas) are high due to limited supply. The Green Shoots Scenario describes an economy in which the targets for high economic growth and structural changes to the economy, as set out in the National Development Plan (NDP), are met. The IEP notes that South Africa should continue to pursue a diversified energy mix which reduces reliance on a single or a few primary energy sources. In terms of existing electricity generation capacity, the IEP indicates that existing capacity starts to decline notably from 2025, with significant plant retirement occurring in 2031, 2041 and 2048. By 2050 only 20% of the current electricity generation capacity remains. As a result, large investments are required in the electricity sector in order to maintain an adequate supply in support of economic growth. By 2020, various import options become available, and some new coal capacity is added along with new wind, solar and gas capacity. The mix of generation capacity technologies by 2050 is considerably more diverse than the current energy mix, across all scenarios. The main differentiating factors between the scenarios are the level of demand, constraints on emission limits and the carbon dioxide externality costs. In all scenarios the energy mix for electricity generation becomes more diverse over the period to 2050, with coal reducing its share from about 85% in 2015 to 15–20% in 2050 (depending on the scenario). Solar, wind, nuclear, gas and electricity imports increase their share. The Environmental Awareness and Green Shoots scenarios take on higher levels of renewable energy. An assessment of each scenario against the eight objectives with reference to renewable energy notes while all scenarios seek to ensure that costs are minimised within the constraints and parameters of each scenario, the Base Case Scenario presents the least cost followed by the Environmental Awareness, Resource Constrained and Green Shoots scenarios respectively when total energy system costs are considered. In terms of promoting job creation and localisation potential the Base Case Scenario presents the greatest job creation potential, followed by the Resource Constrained, Environmental Awareness and Green Shoots scenarios respectively. In all scenarios, approximately 85% of total jobs are localisable. For electricity generation, most jobs result from solar technologies followed by nuclear and wind, with natural gas and coal making a smaller contribution. The Environmental Awareness Scenario, due to its stringent emission constraints, shows the lowest level of total emissions over the planning horizon. This is followed by the Green Shoots, Resource Constrained and Base Case scenarios. These trends are similar when emissions are considered cumulatively and individually by type.
Just Energy Transition	Provides South Africa's roadmap for transitioning to a low-carbon economy while promoting energy security, economic growth, job creation, skills development, and

Applicable Policy	Description of Policy
Implementation Plan 2023–2027	social inclusion. The plan prioritises the expansion of renewable energy infrastructure and supports economic diversification, particularly in regions historically dependent on the coal value chain. The proposed wind energy facility supports the JET Implementation Plan by contributing renewable electricity to the national grid, reducing reliance on carbon-intensive energy sources, and supporting South Africa's decarbonisation objectives. The project will create employment opportunities during construction and operation, contribute to local economic development, and support growth of the renewable energy sector. The project is particularly aligned with the Mpumalanga Just Transition objectives through investment in alternative energy infrastructure and economic diversification within the province.
South African Renewable Energy Masterplan, 2025	SAREM aims to expand South Africa's renewable energy and energy storage sectors to support energy security, industrialisation, localisation, job creation, skills development, and a just energy transition. The proposed wind energy facility aligns with these objectives by contributing renewable energy generation capacity, supporting the decarbonisation of the electricity sector, creating employment opportunities, and promoting investment in the renewable energy value chain.
National Protected Area Expansion Strategy, 2018	The National Protected Area Expansion Strategy 2018 (NPAES) areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2018). According to the screening tool, there are areas within the study area that have been identified as priority areas for inclusion in future protected areas. "According to the delineations of the National Protected Area Expansion Strategy (2018), large portions of the PAOI are mapped as Priority Focus Area. These are mirrored across the portions of the PAOI that fall within Mpumalanga Province, according to the Mpumalanga's Protected Area Expansion Strategy – 20 Year Plan. Certain components of the proposed Project infrastructure fall within mapped Priority Focus Areas. Many of these components have, however, been located within patches of Secondary Grassland (old lands) rather than in areas of intact natural habitat. This positioning reduces potential negative impacts on the ecological functioning of the affected and adjacent portions of the Priority Focus Area network".
Multi-species Biodiversity Management Plan for Vultures in South Africa	The Multi-species Biodiversity Management Plan for Vultures in South Africa aims to implement comprehensive strategic conservation actions that cover the geographic ranges of all nine vulture species found in South Africa, with a particular focus on the seven resident breeding species. The plan also aims to strengthen concerted, collaborative, and coordinated international efforts to recover these populations to acceptable levels by 2033. The BMP is published at an opportune time after the publication of the White Paper on Conservation and Sustainable Use of South Africa's Biodiversity. The BMP is aligned with the goals and enablers of the White Paper. As explicitly recognised that the responsibility rests with a range of stakeholders, including, but not limited to, the State, traditional leaders, traditional health practitioners, communities, private landowners, industry, academia, non-government organisations and civil society, this BMP provides the platform to showcase and uphold what is contained in the White Paper. It is a clear demonstration of how stakeholders involved with vulture conservation are working together to ensure that all South Africans will continue to benefit from the ecosystem services provided by vultures. In terms of section 43(2) and 43(3)(c) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), the Minister has assigned the responsibility

Applicable Policy	Description of Policy
	for implementation of the Multi-species Biodiversity Management Plan (BMP) for Vultures in South Africa to the National Vulture Task Force. The proposed Project has been assessed and monitored in accordance with the latest *BirdLife South Africa and Endangered Wildlife Trust Birds and Wind-Energy Best Practice Guidelines*, which provide a nationally recognised framework for identifying, assessing, and mitigating potential impacts on birds during the planning, construction, operation, and decommissioning phases of wind energy developments. These guidelines require risk-based avifaunal investigations, including pre-construction monitoring and species-specific assessments where applicable, to inform project design, avoid sensitive habitats and flight paths, and ensure that appropriate mitigation and adaptive management measures are implemented to minimise bird mortality and disturbance.
BirdLife South Africa -Best Practice Guidelines	BirdLife South Africa (2025) best-practice guidelines provide a framework for assessing and managing impacts of wind energy facilities on avifauna. They promote early site screening to avoid high-sensitivity areas (e.g. IBAs and threatened species habitats), and a tiered assessment approach including scoping, pre-construction monitoring, impact assessment, and post-construction monitoring. The guidelines emphasise the mitigation hierarchy, prioritising avoidance and layout refinement, and require assessment of key risks such as collision, electrocution, habitat loss, and displacement. Ongoing monitoring and adaptive management are recommended, with consideration of cumulative impacts across the wider landscape to support informed decision-making. The guidelines were taken into account by the avifauna impact assessment.
The South African Bat Assessment Association	The South African Bat Assessment Association (SABAA) provides best-practice guidelines for assessing and managing impacts of wind energy facilities on bats. These guidelines emphasise pre-construction acoustic surveys and roost assessments to inform site selection and reduce risk. They require post-construction monitoring (including acoustic monitoring and carcass searches) to quantify mortality and identify high-risk periods. The guidelines highlight key risks such as collision and barotrauma, and promote mitigation measures where thresholds are exceeded. A precautionary approach, including avoidance of sensitive areas and application of adaptive management, is recommended to minimise impacts on bat populations. The guidelines were taken into account by the bat impact assessment. The proposed Project has been assessed in accordance with the *South African Bat Assessment Association (SABAA) Best Practice Guidelines for Pre-construction Monitoring of Bats at Wind Energy Facilities,* which provide the accepted methodology for evaluating bat activity, identifying sensitive habitats and roosting areas, and assessing potential collision and barotrauma risks associated with wind turbines. These guidelines inform project planning and turbine layout by requiring appropriate pre-construction monitoring and risk assessment to avoid, minimise and mitigate impacts on bat populations throughout the lifecycle of the development.

6.3 PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK

Table 6-3 summarised key provincial and municipal plans as an outline of the governance framework for the project.

Table 6-3 – Provincial and Municipal Plans

Applicable Plan	Description of Plan
Dipaleseng Local Municipality Integrated Development Plan 2025-2026 Lesedi Local Municipality Integrated Development Plan 2021-2026 Midvaal Local Municipality Draft Integrated Development Plan 2025-2026	The plan serves as a strategic plan document for the municipality. It details the respective municipality's short-term and long-term objectives and strategies aligned with the Provincial and National Development Plan.
Gauteng Spatial Development Framework 2030 Draft Review	The GSDF 2030 Draft Review provides a provincial framework for coordinating land use, infrastructure investment, economic development, environmental management, and climate resilience to promote a more sustainable and efficient spatial form. The proposed Uvemvane WEF aligns with the framework by supporting strategic energy infrastructure development, contributing to energy security and economic growth, and incorporating environmental considerations into project planning and design.
Mpumalanga Vision 2030 Strategic Implementation Framework 2013-2030	Mpumalanga Vision 2030 provides a long-term development framework aimed at promoting economic growth, employment creation, environmental sustainability, improved service delivery, and social development within the province. The proposed Uvemvane WEF aligns with these objectives by supporting renewable energy generation, contributing to energy security, creating employment opportunities, and facilitating sustainable economic development within Mpumalanga.
Dipaleseng Local Municipality Spatial Development Framework.	The SDF is a required tool to address historically distorted, unviable, and unsustainable spatial patterns and challenges caused by apartheid planning.
Provincial Biodiversity Permits	The project will be required to obtain Provincial Biodiversity Permits relating to activities relating to: • carry out a restricted activity involving a specimen of a listed threatened or protected species; and • carry out a restricted activity in relation to a specimen or an alien species or listed invasive species. A “restricted activity” is defined very broadly in NEMBA and almost any action in respect of a listed threatened or protected species or in respect of an alien species or listed invasive species would require a permit prior to undertaking that activity. Permits may be required in terms of the Nature Conservation Amendment Ordinance, No. 5 of 1986.
Mpumalanga Biodiversity Sector Plan (MBSP, 2024)	The MBSP has been formally adopted by the Mpumalanga Provincial Government (Provincial Gazette, 26 May 2023). The MBSP (2024) is Mpumalanga Province’s official, spatial biodiversity planning tool. It identifies where biodiversity is most important and provides land-use guidance so that

Applicable Plan	Description of Plan
	development, environmental authorisations, and spatial planning can take place without undermining critical ecosystems. Areas identified as CBAs and ESAs in the MBSP are treated as “sensitive areas” under the EIA Regulations (Listing Notice 3), which can trigger additional authorisation requirements
Gauteng Conservation Plan (Version 4)	The Gauteng Conservation Plan (Version 4) is a province-wide spatial biodiversity plan developed by the Gauteng Department of Agriculture and Rural Development (GDARD) using systematic conservation planning methods. The Gauteng Conservation Plan (Version 4), commonly referred to as C-Plan 2.3, is Gauteng Province’s official systematic biodiversity planning tool. It identifies where biodiversity must be conserved or carefully managed and is used to guide land-use planning, environmental authorisations, and EIAs in the province.
Gauteng Provincial Environmental Management Framework (GPEMF)	The GPEMF is a spatial planning tool that guides sustainable development by identifying environmentally sensitive areas, development constraints, and preferred development zones within Gauteng. The proposed Uvemvane WEF has been assessed with reference to the GPEMF to identify environmental sensitivities and inform project planning, impact assessment, and mitigation measures. The proposed Project, south of Heidelberg falls within the area covered by the GPEMF and must be considered in the context of the framework’s environmental sensitivity mapping, development zones, and spatial planning objectives to ensure environmentally sustainable development. The GPEMF provides a decision-support tool for environmental authorisation by identifying environmental opportunities and constraints within the project area, thereby informing site selection, impact assessment, specialist study requirements, and appropriate mitigation measures

6.4 INTERNATIONAL ENVIRONMENTAL AND SOCIAL STANDARDS

6.4.1. IFC PERFORMANCE STANDARDS

The IFC Performance Standards (PS) are internationally recognized guidelines for managing environmental and social risks. While this EIA focuses on meeting South African regulatory requirements under NEMA, the IFC PS are acknowledged as part of the project’s future commitments to international standards, particularly for financial close.

At this stage, the EIA process is not designed to fully comply with IFC Performance Standards (PS), as these standards extend beyond what is required under South African regulations. However, the process includes specialist studies, such as social impact assessments, biodiversity assessments, and stakeholder consultations, which provide a foundation for future alignment with international standards.

Compliance with IFC PS will be addressed during later stages of the project lifecycle, should the project proceed, through the development of detailed action plans and a comprehensive Environmental and Social Management System (ESMS).

6.4.2. WORLD BANK GROUP ENVIRONMENTAL HEALTH AND SAFETY GUIDELINES

The World Bank Group (WBG) Environmental Health and Safety (EHS) Guidelines are technical reference documents that provide guidance on managing environmental, health, and safety risks. These guidelines are relevant for international financing requirements but are not mandatory for compliance with South African EIA regulations under NEMA.

While the EHS Guidelines have not been applied during the EIA process, they provide a valuable framework for identifying and mitigating risks. Should the project progress to the financing stage, the guidelines will be reviewed and applied, along with the IFC Performance Standards, to ensure alignment with international standards.

Future alignment with the Wind Energy Guidelines (2015) and General EHS Guidelines will address key issues such as:

Biodiversity impacts (e.g., effects on birds and bats).
Noise, shadow flicker, and visual impacts during construction and operation.
Community health and safety, including transportation risks.

These guidelines will be incorporated into detailed planning and mitigation measures at a later stage, as part of the project's commitment to international best practices.

6.4.3. EQUATOR PRINCIPLES

The Equator Principles (EPs) provide a globally recognized framework for assessing and managing environmental and social risks in projects. They establish a minimum standard for due diligence and promote alignment with responsible environmental and social practices. While typically adopted by financial institutions for projects seeking international funding, the EPs are also used to guide internal standards for companies aiming to align with global best practices.

For the project, compliance with the EPs is not a requirement during the Environmental Impact Assessment (EIA) process under South African regulations. However, alignment with the EPs will be required before financial close to meet the internal standards set by Copenhagen Infrastructure Partners (CIP), as the majority shareholder in Mulilo.

Instead of conducting a full Environmental and Social Impact Assessment (ESIA), any gaps identified during the EIA process will be addressed through additional specialist studies. These studies will focus on enhancing compliance with EP standards and ensuring the project meets the requirements for financial institutions that adopt the EP framework. This approach ensures a balance between meeting South African EIA regulatory requirements and the more extensive international standards required by the EPs.

The principles emphasize areas such as stakeholder engagement, grievance mechanisms, independent monitoring, and adherence to host country laws while addressing any additional requirements under the IFC Performance Standards or World Bank Group Environmental, Health, and Safety Guidelines for non-designated countries like South Africa.

By addressing the identified gaps and incorporating EP-aligned processes before financial close, the project will ensure robust environmental and social governance throughout its lifecycle. The requirements and applicability of the EPs are outlined in **Table 6-4**.

Table 6-4 - Requirements and Applicability of the Equator Principles

Requirement		Project Specific Applicability
Principle 1: Review and Categorisation		
Overview	When a project is proposed for financing, the EPFI will, as part of its internal social and environmental review and due diligence, categorise such project based on the magnitude of its potential impacts and risks in accordance with the environmental and social screening criteria of the IFC. Using categorisation, the EPFI's environmental and social due diligence is commensurate with the nature, scale, and stage of the Project, and with the level of environmental and social risks and impacts. The categories are: Category A: Projects with potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible or unprecedented; Category B: Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures; and Category C: Projects with minimal or no adverse environmental and social risks and/or impacts.	Based upon the significance and scale of the Project's environmental and social impacts, the proposed project is regarded as a Category B project i.e., a project with potential limited adverse environmental or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.
Principle 2: Environmental and Social Assessment		
Overview	For all Category A and Category B Projects, the EPFI will require the client to conduct an appropriate Assessment process to address, to the EPFI's satisfaction, the relevant environmental and social risks and scale of impacts of the proposed Project (which may include the illustrative list of issues found in Exhibit II). The Assessment Documentation should propose measures to minimise, mitigate, and where residual impacts remain, to compensate/ offset/ remedy for risks and impacts to Workers, Affected Communities, and the environment, in a manner relevant and appropriate to the nature and scale of the proposed Project The Assessment Documentation will be an adequate, accurate and objective evaluation and presentation of the environmental and social risks and impacts, whether prepared by the client, consultants or external experts. For	This document is the fourth deliverable (i.e., resubmitted DEIR) from the S&EIR process undertaken for the proposed Project. The impact assessment was undertaken during the impact assessment phase of the S&EIR process. The assessment comprehensively assessed the key environmental and social impacts and complied with the requirements of the South African EIA Regulations. In addition, an EMPr was compiled and is included in **Appendix J**.

Requirement		Project Specific Applicability
	Category A, and as appropriate, Category B Projects, the Assessment Documentation includes an Environmental and Social Impact Assessment (ESIA). One or more specialised studies may also need to be undertaken. For other Category B and potentially C Projects, a limited or focused environmental or social assessment may be appropriate, applying applicable risk management standards relevant to the risks or impacts identified during the categorisation process. The client is expected to include assessments of potential adverse Human Rights impacts and climate change risks as part of the ESIA or other Assessment, with these included in the Assessment Documentation.	
Principle 3: Applicable Environmental and Social Standards		
Overview	The Assessment process should, in the first instance, address compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues. The EPFI's due diligence will include, for all Category A and Category B Projects globally, review and confirmation by the EPFI of how the Project and transaction meet each of the Principles. For Projects located in Non-Designated Countries, the Assessment process evaluates compliance with the then applicable IFC PS and WBG EHS Guidelines. For Projects located in Designated Countries, compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues.	As South Africa has been identified as a non-designated country, the reference framework for environmental and social assessment is based on the IFC PS. In addition, this S&EIR process has been undertaken in accordance with NEMA (the host country's relevant legislation).
Principle 4: Environmental and Social Management System and Equator Principles Action Plan		
Overview	For all Category A and Category B Projects, the EPFI will require the client to develop or maintain an Environmental and Social Management System (ESMS). Further, an Environmental and Social Management Plan (ESMP) will be prepared by the client to address issues raised in the Assessment process and incorporate actions required to comply with the applicable standards. Where the applicable standards are not met to the EPFI's satisfaction, the client and the EPFI will agree on an Equator Principles Action Plan (EPAP). The EPAP is intended to outline gaps and commitments to	A formal project specific ESMS will be compiled in the event that the project is developed in the future. Management and monitoring plans outlined in the EMPr will serve as the basis for an ESMS for the proposed Project.

Requirement		Project Specific Applicability
	meet EPFI requirements in line with the applicable standards.	
Principle 5: Stakeholder Engagement		
Overview	EPFI will require the client to demonstrate effective Stakeholder Engagement as an ongoing process in a structured and culturally appropriate manner with Affected Communities Workers and, where relevant, Other Stakeholders. For Projects with potentially significant adverse impacts on Affected Communities, the client will conduct an Informed Consultation and Participation process. To accomplish this, the appropriate assessment documentation, or non-technical summaries thereof, will be made available to the public by the borrower for a reasonable minimum period in the relevant local language and in a culturally appropriate manner. The borrower will take account of and document the process and results of the consultation, including any actions agreed resulting from the consultation. Disclosure of environmental or social risks and adverse impacts should occur early in the Assessment process, in any event before the Project construction commences, and on an ongoing basis. All Projects affecting Indigenous Peoples will be subject to a process of Informed Consultation and Participation, and will need to comply with the rights and protections for Indigenous Peoples contained in relevant national law, including those laws implementing host country obligations under international law.	The S&EIR process included an extensive stakeholder engagement process which complies with the South African EIA Regulations. The process included consultations with local communities, nearby businesses, and a range of government sector stakeholders (state owned enterprises, national, provincial and local departments). The stakeholder engagement process solicits interest from potentially interested parties through the placement of site notices and newspaper advertisements as well as written and telephonic communication. A Stakeholder Engagement Plan will be developed and implemented as part of the ESMS (post-EIA phase) for the construction and operational phases of the project.
Principle 6: Grievance Mechanism		
Overview	For all Category A and, as appropriate, Category B Projects, the EPFI will require the client, as part of the ESMS, to establish effective grievance mechanisms which are designed for use by Affected Communities and Workers, as appropriate, to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance. The borrower will inform the Affected Communities and Workers about the grievance mechanism in the course of the stakeholder engagement process and ensure	The EMPr includes a Grievance Mechanism Process for Public Complaints and Issues. This procedure effectively allows for external communications with members of the public to be undertaken in a transparent and structured manner. A Grievance Mechanism will be developed and implemented as part of the ESMS (post-EIA phase) for the construction and operational phases of the project.

Requirement		Project Specific Applicability
	that the mechanism addresses concerns promptly and transparently, in a culturally appropriate manner, and is readily accessible, at no cost, and without retribution to the party that originates the issue or concern.	
Principle 7: Independent Review		
Overview	For all Category A and, as appropriate, Category B Projects, an Independent Environmental and Social Consultant, not directly associated with the client, will carry out an Independent Review of the Assessment Documentation including the ESMPs, the ESMS, and the Stakeholder Engagement process documentation in order to assist the EPFI's due diligence, and assess Equator Principles compliance.	This principle will only become applicable in the event that that the project is developed in the future.
Principle 9: Independent Monitoring and Reporting		
Overview	To assess Project compliance with the Equator Principles after Financial Close and over the life of the loan, the EPFI will require independent monitoring and reporting for all Category A, and as appropriate, Category B projects. Monitoring and reporting should be provided by an Independent Environmental and Social Consultant; alternatively, the EPFI will require that the client retain qualified and experienced external experts to verify its monitoring information, which will be shared with the EPFI in accordance with the frequency required.	This principle will only become applicable in the event that the project is developed in the future.

6.5 GENERIC EMPR RELEVANT TO AN APPLICATION FOR SUBSTATION AND OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE

NEMA requires that an EMPr be submitted where an EIA has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation. The content of an EMPr must either contain the information set out in Appendix 4 of the EIA Regulations, 2014, as amended, or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice, that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including, but not limited to, the applicant and the CA.

GN 435 of 22 March 2019 identified a generic EMPr relevant to applications for substations and overhead electricity transmission and distribution infrastructure which require authorisation in terms of Section 42(2) of NEMA. Applications for overhead electricity transmission and distribution

infrastructure that trigger Activity 11 of Listing Notice 1 or Activity 9 of Listing Notice 2 and any other listed or specified activities must use the generic EMPr.

The objective of the generic EMPr is "to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of overhead electricity transmission and distribution infrastructure. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature."

The generic EMPrs for Substations is included in the Site-Specific EMPr (**Appendix J**).

6.6 BIODIVERSITY MANAGEMENT PLAN (BMP) FOR VULTURES

To substantially reduce vulture mortalities caused by existing energy infrastructure and mitigate any loss to vultures from new energy infrastructure, several strategies and actions are typically outlined in conservation plans, such as the Biodiversity Management Plan (BMP) for Vultures in South Africa. Energy infrastructure, including powerlines, wind turbines, and solar farms, poses significant threats to vultures, primarily through collision, electrocution, and habitat disruption.

Key strategies that could be included to address these threats:

6.6.1.1 Powerline Modifications and Mitigation Measures:

- Bird-Friendly Powerline Design: Modify existing powerlines to make them more visible and less dangerous to vultures. This may involve using markers or insulation that help prevent birds from colliding with the wires or getting electrocuted on the poles.
- Undergrounding of Powerlines: Where feasible, the burial of powerlines can help reduce the risk of collisions, especially in critical vulture habitats.
- Risk Mapping and Identifying High-Risk Areas: Conduct studies to identify areas with higher vulture traffic or species-specific risk zones, particularly during foraging or migration periods. Powerlines could be rerouted or buried in such areas to reduce mortality risks.
- Monitoring and Reporting: Set up systems to regularly monitor the mortality rate due to powerline collisions and electrocution. Encourage reporting of dead or injured vultures to better track incidents.

6.6.1.2 Wind and Solar Energy Infrastructure:

- Site Assessment for New Developments: Before establishing new wind or solar farms, thorough environmental assessments should be carried out to identify if the site overlaps with important vulture habitats, migration corridors, or feeding grounds. Projects should be sited in areas that minimize the risks to vultures.
- Wind Turbine Design Adjustments: For existing wind farms, implementing bird-friendly turbine designs (such as placing turbines away from known vulture flight paths or using slower-moving blades) can significantly reduce collision risks.
- Smart Infrastructure Operation: Reduce turbine speeds during times of high vulture activity or in areas with frequent vulture movement. In some cases, wind farms can install technology that detects bird activity, allowing them to temporarily shut down turbines when vultures are nearby.

- Strategic Placement of Solar Farms: Avoid placing solar farms in regions that provide critical feeding or nesting sites for vultures. Land-use planning should consider their importance to local biodiversity.

6.6.1.3 Collaboration with Energy Sector Stakeholders:

- Partnerships with Energy Companies: Work closely with energy companies to promote the design and installation of bird-safe infrastructure. This includes sharing knowledge on vulture species' behaviours and flight paths to better inform infrastructure planning.
- Vulture-Friendly Guidelines and Best Practices: Develop industry guidelines that recommend vulture-friendly practices when building and operating energy infrastructure.
- Corporate Social Responsibility (CSR): Encourage energy companies to contribute to vulture conservation efforts, such as funding research or adopting mitigation measures at their sites.

6.6.1.4 Education and Capacity Building:

- Training for Energy Sector Workers: Energy companies, utility workers, and developers should be trained to identify vulture species and the risks they face. This would allow for early detection and mitigation of potential hazards related to infrastructure.
- Public Awareness Campaigns: Increase awareness among local communities and stakeholders about the risks posed by energy infrastructure to vultures and other wildlife. Public engagement can help in reducing unintentional harm (e.g., avoiding unregulated construction of infrastructure in vulture-rich areas).

6.6.1.5 Legislation and Policy Enforcement:

- Stronger Regulations and Standards: Government authorities can play a key role by implementing and enforcing regulations to ensure that all new energy infrastructure undergoes comprehensive environmental assessments that consider vulture populations.
- Incentives for Mitigation Measures: Provide incentives (e.g., tax breaks, funding) for companies that implement vulture-safe measures in their energy infrastructure projects.

6.6.1.6 Long-Term Monitoring and Adaptive Management:

- Continued Monitoring: Long-term monitoring of vulture populations, as well as energy infrastructure, should be conducted to assess the effectiveness of mitigation measures. This will help identify any new risks and allow for adaptive management strategies.
- Collaboration with Conservation Groups: Ongoing cooperation between government bodies, environmental NGOs, and researchers can help provide up-to-date data and innovative solutions for minimizing vulture mortalities.

By taking a proactive and collaborative approach, South Africa can significantly reduce the impact of energy infrastructure on vulture populations and ensure that new developments are designed with the protection of biodiversity in mind.

6.7 ADDITIONAL PERMITS AND AUTHORISATIONS

Table 6-5 outlines the additional permits and authorisations required for the proposed development, as well as the relevant Competent Authorities responsible.

Table 6-5 - Additional Permits and Authorisations required for the proposed development

Permits/Authorisation	Legislation	Relevant Authority/Company	Status
Water Use Licence / General Authorisation	National Water Act (Act No. 36 of 1998)	Department of Water and Sanitation	In Progress
Notification Of Intent To Develop (NID) Section 38 (1) and Section 38 (8)	National Heritage Resource Act (Act No. 25 of 1999)	South African Heritage Resources Authority (SAHRA)	In Progress
Obstacle Permit	Civil Aviation Act (Act 13 of 2009)	Air Traffic and Navigation Services / Civil Aviation Authority	Submitted; Conditional Approval will be required for the facility prior to construction.
Section 53 Consent	Minerals and petroleum Resources Development Act (No. 28 of 2002)	Department of Mineral Resources and Energy & Petroleum Agency SA	Submitted; Approval will be required prior to construction.
Square Kilometre Array (SKA) Project		South African Radio Astronomy Observatory (SARAO)	Submitted
Wayleave/No Objection	Electronic Communications Act (Act 36 of 2005)	Altech Netstar	Obtained
		Sentiv (Altron Nexus)	Obtained
		Herotel	Obtained
		Transnet Pipelines	Obtained
		SAPS	Obtained
		SAWS	Obtained
		SANDF	Obtained
		NTCSA	Obtained
		Telkom	Obtained
		Cell C	Obtained
		Vodacom	Obtained
		MTN	Submitted renewal – consultation ongoing
		Sentech	Obtained
		Neotel	Obtained

7 DESCRIPTION BASELINE ENVIRONMENTAL

The following chapter presents an overview of the biophysical and socio-economic environment in which the Project is located. It is important to gain an understanding of the Project area and its surroundings, as it will provide for a better understanding of the receiving environment in which the Project is being considered.

The description of the baseline environment is essential in that it represents the conditions of the environment before the construction of the Project (i.e. the current, or status quo, environment) against which environmental impacts of the Project can be assessed and future changes monitored.

The area has previously been studied to some extent and is recorded in various sources. Consequently, some components of the baseline have been generated based on literature review. However, where appropriate, baseline information has been supplemented or generated by specialists appointed to undertake baseline and impact assessments for the Project.

7.1 PHYSICAL ENVIRONMENT

7.1.1. SOIL, LANDUSE AND LAND CAPABILITY

The following is extracted from the Soil, Landuse and Land Capability Specialist Assessment report by Albie Götze and included as Appendix G.1.

The project area is situated in hilly terrain with broad foot slopes with grassland and woody vegetation, on hill slopes and along streams. The Suikerbosrand River drains the area from east to west. The findings of the desktop assessment are summarised in **Table 7-1** below.

Table 7-1 - Summary of the results of the desktop assessment

Main Aspect	Descriptor	Value / description
Climate	Mean Annual Rainfall (mm) (Schulze, 2009).	600 – 700
	Total annual evaporation (mm) (Schulze, 2009)	2000 - 2200
	Climate capability classification (out of 9) (DAFF, 2017)	05 (moderate) to 06 (moderate high)
	Köppen-Geiger Climate Zones (Beck et al, 2018)	BSh (Dry, semi-arid, hot); Cwa (Temperate, dry winter, hot summer).
Terrain	Terrain type	Open high hills or ridges; plains with open low hills or ridges
	Terrain morphological units	Crest, mid-slope, foot slope & valley bottom
	Slope classes (%)	wide range from 0 to >35%
	Altitude (m)	1500 - 1800
	Terrain capability classification (out of 8) (DAFF, 2017)	02 (low-very low) to 07 (High)
Soil	Geology	Klipriviersberg Group; Turffontein Subgroup; Johannesburg Subgroup; Jeppestown Subgroup.

Main Aspect	Descriptor	Value / description
	Land types (approximate % area covered)	Ba1, Ba29, Ba 30, Ib42, Ib43 & Ib44
	General description of soils	Red-yellow well drained massive or weakly structured soils, soils with a plinthic horizon; soils with a strong texture contrast between A and B-horizon; rocky areas.
	Dominant soil forms	Hutton, Vaalbos, Ermelo, Clovelly, Bainsvlei, Westleigh, Sepane, Valsrivier, Sterkspruit, Rensburg, Bonheim, Swartland, Glenrosa, Mispah.
	Soil capability classification (out of 9) (DAFF, 2017)	02 (low-very low) to 08 (High-very high)
	Water erosion susceptibility	04 (moderate-high) to 07 (Low)
	Wind erosion susceptibility	01 (Very high) to 06 (Moderate-low)
Land use	Agricultural land use in the surrounding area	Cultivation (rain-fed & irrigation), natural grazing (livestock & game)
	Agricultural land use on the site	Cultivation (rain-fed & irrigation), natural grazing (livestock & game)
	Irrigation suitability (out of 5)	01 (unsuitable) to 04 (good)
General	Long-term grazing capacity (ha per Large Stock Unit) (DAFF, 2018)	5 to 8
	Land capability classification (out of 15) (DAFF, 2017)	02 (Low) to 10 (Moderate-high)
	Within Protected Agricultural Area (PPA) (DALRRD, 2020 & PDALA, 2024)	Suikerbosrant RF PAA – 'C' (moderate) priority rating. Grootvlei-Balfour RF PAA– 'C' (moderate) priority rating.

7.1.1.1 Protected Agricultural Areas

The project area is situated in two Protected Agricultural Areas (PAA's) as defined by the Department of Agriculture, Land Reform and Rural Development (DALRRD, 2020) and recently published in the Preservation and Development of Agricultural Land Act (Act No. 39 of 2024) (PDALA, 2024). The relevant PAA's are the Suikerbosrant Rainfed (RF) PAA in the northern and western parts and the Grootvlei-Balfour RF PAA towards the south and east (**Figure 7-1**).

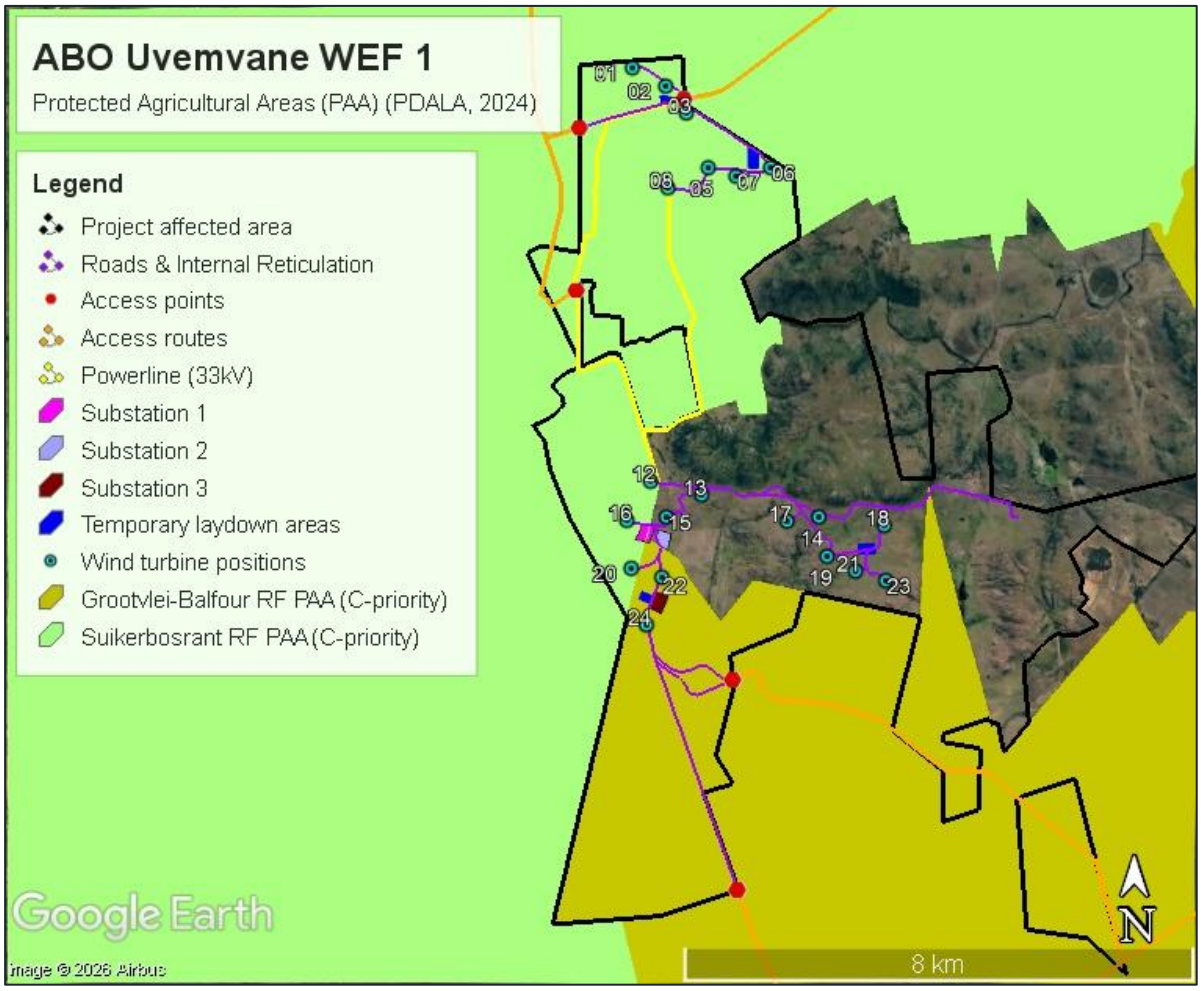


Figure 7-1 - Protected Agricultural Areas in relation to the project area and layout

The PDALA (2024) assigns Priority Ratings to PAAs which are based on a sliding scale from A onwards in terms of the priority of the area from a cultivation perspective. For Rainfed (RF) PAAs the Priority Ratings ranges from 'A' to 'F' with 'A' being the highest priority level and 'F' the lowest Priority Rating pertaining to the RF PAAs demarcation. For Irrigated (IR) PAAs the Priority Ratings ranges from 'A' to 'D' with 'A' again being the highest priority rating and 'D' the lowest Priority Rating pertaining to IR PAA. In future, Grazing PAAs will have priority ratings of 'A' to 'D'.

Both the Suikerbosrant and the Grootvlei-Balfour PAA's have a priority rating of 'C' (moderate priority) and therefore of national significance

7.1.1.2 Field crop boundaries

Figure 7-2 below presents the national data base of Field Crop Boundaries as published by the Crop Estimates Consortium (2023) in relation to the major planned development components of the project.

According to this data, 11 of the currently proposed WTG positions and associated infrastructure are placed directly in or partially within cultivated lands. The other 16 WTG sites are placed outside currently or previously cultivated lands.

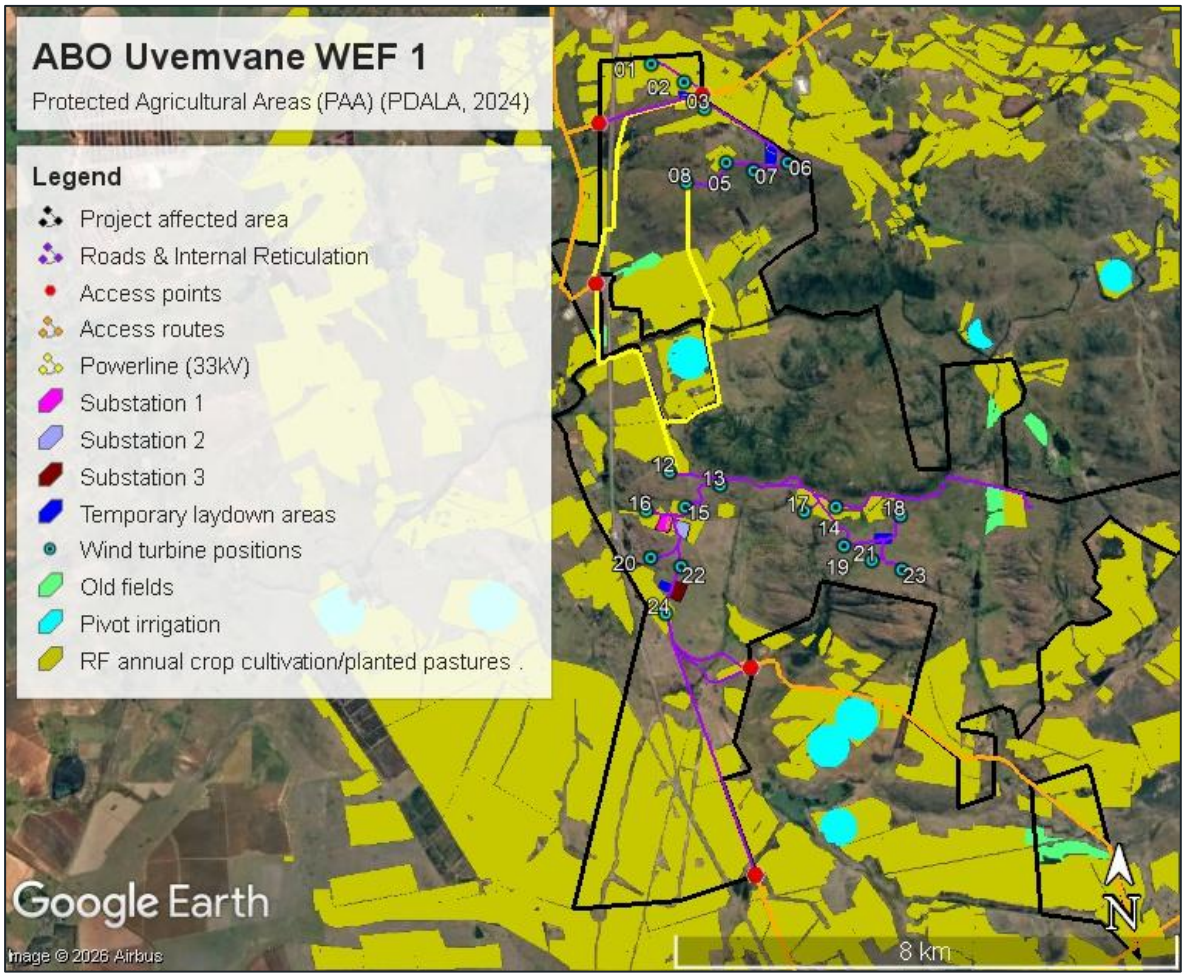


Figure 7-2 - Field Crop Boundaries associated with the project area and related infrastructure (Crop Estimates Consortium, 2023)

7.1.1.3 Field survey findings

Agricultural land uses

According to field survey findings, nine of the WTG positions fall directly or partially in cultivated lands (i.e. currently cultivated land, old fields, and planted pastures) and one is located within 50 m of a cultivated land. **Table 7-2** below summarizes the locations of the different WTG hardstands as well as the three alternative sites considered for the development of the EIH (EIH1 to EIH3) in terms of agricultural land uses. **Table 7-3** further below illustrates the project layout in relation to recorded cultivated land.

Table 7-2 - Summary of the proposed locations of WTG hardstands and alternative EIH sites with regards to areas of local agricultural land use

Verified agricultural land use	WTG's
Within annual, rainfed cultivated lands (currently cultivated).	01 & 02

Verified agricultural land use	WTG's
Partially within annual, rainfed cultivated lands (currently cultivated).	03
Within planted pastures.	EIH1 & EIH2
Within old fields (not cultivated in the last 5 years or more).	14, 15, 16, 17, 18 & 24
In natural veld but within 50 m of annual, rainfed cultivated lands, planted pastures or old fields.	05
Natural veld – grazing.	06, 07, 08, 12, 13, 19, 20, 21, 22, 23 & EIH3

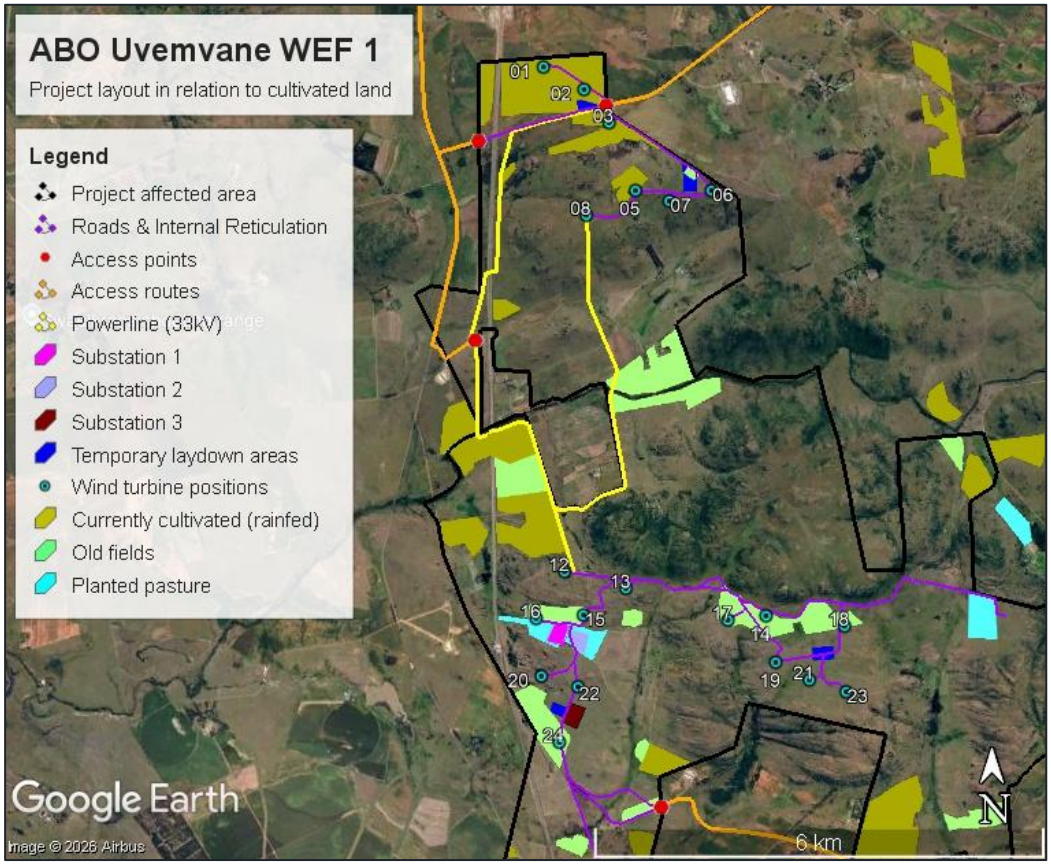


Figure 7-3 - Proposed project infrastructure in relation to recorded cultivated lands

In the project area, annual, rainfed cultivated lands (**Figure 7-4**) are used to produce maize and soya beans, while other areas have been cultivated as rainfed planted perennial grass pastures – mostly Eragrostis curvula (Weeping Love Grass / Oulands Gras) (**Figure 7-5**), which are mostly grazed as standing hay but also cut and baled for winter feed for local livestock. Old fields (areas where no cultivation has been recorded in the last five years and no pastures have been planted) (**Figure 7-6**) also occur and are grazed by livestock together with non-arable areas of natural vegetation (**Figure 7-7**).

The natural vegetation in the area, which includes a variety of habitats (mountain slopes, plains, drainage lines, etc.) and mostly occur on shallow, non-arable soils or low-lying areas associated with drainage lines and wetlands, are utilized for livestock grazing which includes cattle and sheep. The long-term grazing capacity according to DAFF (2018) is between 5 and 8 ha per Large Stock Unit (ha/LSU). This resource, however, has been overutilized in some areas where the estimated grazing capacity is lower due to a decline in ecological veld condition over time. The estimated actual grazing capacity for the project area is between 7 and 12 ha/LSU, which is still considered moderately high by DAFF (2018).

Figure 7-4 - A recently harvested crop of rainfed maize in the vicinity of the project area

Figure 7-5 - A planted pasture of perennial Eragrostis curvula in the vicinity of the project area

Figure 7-6 - An old field in the project area that has not been cultivated for more than 20 years

Figure 7-7 - Natural, non-arable, grazing veld in the project area

The land use in areas within the larger project area as well as adjacent land also includes pivot irrigated lands. However, none of the proposed WTG hardstands or other project infrastructure are proposed to be constructed in or close to such areas.

7.1.1.4 Soils

From the perspective of the assessment to which this report pertains, soil observations were focussed on the 10 WTG hardstand areas that fall directly or partially in or close to cultivated lands (Refer back to **Table 7-2**). Other WTG sites that don't fall in or near such areas were randomly assessed as well to verify pedological conditions. The crop production potential of all assessed areas was evaluated taking various relevant factors into consideration to determine if the land can sustainably produce

crops to support food security of the region. On a regional level, the main factor relied upon in this regard is climate capability and, on a landscape (local) level soil texture, effective soil depth (soil capability) and terrain slope (terrain capability) are most heavily relied upon for the assessment of land use potential for rainfed crop production. Practical considerations such as accessibility to agricultural machinery and implements are also considered where applicable.

Where WTG sites occur directly or partially in currently cultivated lands, consideration is given to production figures of the past season as well as for seasons of average, above average and below average rainfall. These figures were sourced from the relevant landowner/s in personal interviews during the site visit and presented further down below.

Based on the findings of the SSVR that preceded this report (Götze, 2024a & b), those WTG sites that occur in natural veld (areas of no current or historical cultivation), which were not included in this assessment, were assumed to have 'low' sensitivity in terms of annual, rainfed crop production. In this regard, it is assumed (with a high degree of certainty from a specialist viewpoint) that the most reliable indication of cropping potential or land capability is historical and current land use. The suitable versus the unsuitable soils have been identified over time through trial and error where the suitable soils are generally under active (annual) crop production and therefore have a realistic land capability of at least 8 (moderate) or more. Land that is not actively cultivated can reliably be considered to have limitations that make them unsuitable for annual, rainfed crop production with a resulting realistic land capability of less than 8 (moderate).

Pedological observations were conducted and classified according to the latest South African soil classification system (Soil Classification Working Group, 2018) for each relevant WTG hardstand and EIH alternative and presented in a summative table below (**Table 7-3**) and visually, with photographs of the terrain and dominant soil form(s) of each assessed WTG hardstand and EIH alternative, in Appendix A of the specialist report.

Table 7-3 - Results of soil and terrain investigations on each WTG hardstand planned for the project

WTG / EIH no.	Soil form	Soil depth (mm)			Clay %			Topography	Slope class (%)	Current land use	Latitude	Longitude
		A horizon	B/C horizon	Effective depth	A horizon	B/C horizon	Restrictive horizon					
1	Dresden	400		400	15	-	hard plinthite	mid-slope	5 - 10	Cultivated - rainfed	-26,594145	28,396199
	Dresden	400		400	15	-	hard plinthite	mid-slope	5 - 10	Cultivated - rainfed	-26,594782	28,396305
	Westleigh	350	1000	350	15	30	30	mid-slope	5 - 10	Cultivated - rainfed	-26,594780	28,395470
	Westleigh	250	1000	250	15	30	30	mid-slope	5 - 10	Cultivated - rainfed	-26,594118	28,395437
2	Dresden	350		350	15	-	hard plinthite	crest	0 - 5	Cultivated - rainfed	-26,597304	28,401703
	Lichtenburg	300	1400	1400	15	15	hard plinthite	mid-slope	5 - 10	Cultivated - rainfed	-26,596745	28,401675
	Dresden	350		350	15	-	hard plinthite	crest	5 - 10	Cultivated - rainfed	-26,596819	28,400904
	Lichtenburg	250	500	500	15	15	hard plinthite	crest	0 - 5	Cultivated - rainfed	-26,597839	28,401313
	Dresden	300		300		-	hard plinthite	crest	0 - 5	Cultivated - rainfed	-26,597461	28,400953
3	Sepane	300	650	650	10	35	35	crest	0 - 5	Cultivated - rainfed	-26,600864	28,404374
	Kroonstad	300	1300	1300	10	10	35	crest	0 - 5	Cultivated - rainfed	-26,601564	28,404479
	Kroonstad	400	600	600	10	10	35	crest	0 - 5	Cultivated - rainfed	-26,601117	28,405177
	Kroonstad	300	600	600	10	10	35	crest	0 - 5	Fall-out area	-26,600589	28,405029
5	Mispah	300		300	10	-	hard rock	mid-slope	10 - 15	Cultivated - rainfed	-26,608737	28,408227
	Hutton	400	1500	1500	10	15	n/a	mid-slope	10 - 15	Cultivated - rainfed	-26,608751	28,407501
	Mispah	100		100	10	-	hard rock	mid-slope	15 - 20	Natural veld	-26,609455	28,407779

WTG / EIH no.	Soil form	Soil depth (mm)			Clay %			Topography	Slope class (%)	Current land use	Latitude	Longitude
		A horizon	B/C horizon	Effective depth	A horizon	B/C horizon	Restrictive horizon					
	Mispah	200		200	10	-	hard rock	mid-slope	10 - 15	Natural veld	-26,609342	28,408411
14	Mispah	150		150	15	-	hard rock	mid-slope	5 - 10	Natural veld	-26,659218	28,426618
	Mispah	100		100	15	-	hard rock	mid-slope	10 - 15	Natural veld	-26,658997	28,425882
	Mispah	150		150	15	-	hard rock	mid-slope	5 - 10	Old field	-26,659823	28,426491
	Mispah	200		200	15	-	hard rock	mid-slope	5 - 10	Old field	-26,659679	28,425705
15	Mispah	200		200	10	-	hard rock	mid-slope	5 - 10	Natural veld	-26,659742	28,401719
	Vaalbos	350	1200	1200	10	10	hard rock	mid-slope	10 - 15	Old field	-26,660253	28,400813
	Mispah	350		350	10	-	hard rock	mid-slope	10 - 15	Natural veld	-26,660261	28,401544
	Vaalbos	350	700	700	10	10	hard rock	mid-slope	10 - 15	Old field	-26,659570	28,400938
16	Ermelo	400	1500	1500	10	10	n/a	valley bottom	5 - 10	Old field	-26,660598	28,395375
	Hutton	350	1500	1500	10	10	n/a	valley bottom	5 - 10	Old field	-26,659928	28,395377
	Hutton	350	1500	1500	10	10	n/a	valley bottom	10 - 15	Old field	-26,659844	28,394617
	Ermelo	350	1500	1500	10	10	n/a	valley bottom	5 - 10	Old field	-26,660539	28,394485
17	Mispah	250		250	10	-	hard rock	mid-slope	5 - 10	Old field	-26,660716	28,420076
	Carolina	250	550	550	10	10	hard rock	mid-slope	5 - 10	Old field	-26,660082	28,420292
	Carolina	350	750	750	10	10	hard rock	mid-slope	5 - 10	Old field	-26,660174	28,421071
	Carolina	400	700	700	10	10	hard rock	mid-slope	0 - 5	Old field	-26,660892	28,420903

WTG / EIH no.	Soil form	Soil depth (mm)			Clay %			Topography	Slope class (%)	Current land use	Latitude	Longitude
		A horizon	B/C horizon	Effective depth	A horizon	B/C horizon	Restrictive horizon					
18	Glenrosa	350		350	15	-	lithic	mid-slope	10 - 15	Old field	-26,661428	28,435646
	Glenrosa	300		300	15	-	lithic	mid-slope	10 - 15	Old field	-26,661329	28,436483
	Glenrosa	350		350	15	-	lithic	mid-slope	10 - 15	Old field	-26,660700	28,436183
	Glenrosa	350		350	15	-	lithic	mid-slope	10 - 15	Old field	-26,660841	28,435497
19	Mispah	350		350	15	-	hard rock	mid-slope	5 - 10	Natural veld	-26,665438	28,426827
	Mispah	300		300	15	-	hard rock	mid-slope	5 - 10	Natural veld	-26,665292	28,426966
24	Clovelly	300	650	650	10	10	lithic	mid-slope	5 - 10	Old field	-26,675666	28,397705
	Carolina	350	1100	1100	10	10	hard rock	mid-slope	5 - 10	Old field	-26,674864	28,397608
	Carolina	300	950	950	10	10	hard rock	mid-slope	5 - 10	Old field	-26,674851	28,398318
	Mispah	250		250	15	-	hard rock	mid-slope	5 - 10	Old field	-26,675594	28,398456
EIH1	Carolina	250	500	500	10	10	hard rock	mid-slope	15 - 20	Pasture - rainfed	-26,663132	28,397682
	Clovelly	300	1100	1100	10	10	lithic	mid-slope	10 - 15	Pasture - rainfed	-26,662926	28,396343
	Hutton	300	1500	1500	10	10	n/a	mid-slope	15 - 20	Pasture - rainfed	-26,662186	28,397488
	Hutton	350	1500	1500	10	10	n/a	mid-slope	5 - 10	Pasture - rainfed	-26,661622	28,398780
	Hutton	350	1500	1500	10	10	n/a	valley bottom	10 - 15	Pasture - rainfed	-26,660994	28,397291
EIH2	Glenrosa	400		400	10	-	lithic	mid-slope	10 - 15	Pasture - rainfed	-26,663318	28,399806
	Clovelly	300	650	650	10	10	lithic	mid-slope	5 - 10	Pasture - rainfed	-26,662163	28,400355

WTG / EIH no.	Soil form	Soil depth (mm)			Clay %			Topography	Slope class (%)	Current land use	Latitude	Longitude
		A horizon	B/C horizon	Effective depth	A horizon	B/C horizon	Restrictive horizon					
	Clovelly	250	550	550	10	10	lithic	mid-slope	5 - 10	Pasture - rainfed	-26,662627	28,401555
	Clovelly	250	600	600	10	10	lithic	mid-slope	10 - 15	Pasture - rainfed	-26,663107	28,400832
	Mispah	200		200	10	-	hard rock	mid-slope	10 - 15	Pasture - rainfed	-26,664234	28,401156
EIH3	Clovelly	350	650	650	10	10	lithic	mid-slope	10 - 15	Natural veld	-26,672713	28,398653
	Clovelly	350	600	600	10	10	lithic	mid-slope	10 - 15	Natural veld	-26,673386	28,400133
	Clovelly	300	700	700	10	10	lithic	mid-slope	10 - 15	Natural veld	-26,672027	28,399785
	Glenrosa	300		300	10	-	lithic	mid-slope	10 - 15	Natural veld	-26,671454	28,400952
	Clovelly	300	800	800	10	10	lithic	mid-slope	10 - 15	Natural veld	-26,670841	28,399579

7.1.1.5 Agricultural production potential of the project area

The assessment of the soil and agricultural production potential of the project area is based on information gained during the desktop assessment (summarized in **Table 7-1**) of the specialist report), as well as soil parameters of which information was gathered during the field assessments, which included:

- Topography (terrain unit).
- Terrain slope (%).
- Soil texture (i.e. clay %) of different soil horizons.
- Depth of different soil horizons.
- Effective soil depth.
- Notable impacts.
- Crop production figures for the last five years.
- Livestock stocking rates and grazing potential.

For ease of presentation and discussion WTG and EIH sites are grouped together under farm units (**Table 7-4)** belonging to different landowners, which in most instances represent more than one farm portion. The focus of interviews was primarily on cultivation and harvest records, livestock production figures, and labour related subjects.

Table 7-4 - Information on each farm unit that was assessed in this investigation

Farm Unit	Farm portion(s)	Interview conducted with	Interview date(s)	WTG / EIH no.
1	2 & 17 Lagerspoort 406	Landowner: Jaques Rosenthal Current renter: Stephan Potgieter Former renter: Mouton Kotze	02-Oct-25 28-Oct-25	1, 2, 3, 5, 6, 7 & 8
2	9 Malanskraal 407	Landowner: Anton Weststrate	02-Oct-25	13, 14, 15, 17, 18, 19, 21, 23 & EIH2
3	6 Malanskraal 407 2 Modderfontein 410	Landowner: Hendrik de Wet Farm manager: Mouton Kotze	28-Oct-25	12, 16, 20, 22, 24 EIH1 & EIH3

At the time of the site visit, personal interviews with the different landowners where WTG positions occur directly in cultivated lands, was prioritized. It is the specialist's opinion that enough regional and local data is available from other interviews to extrapolate livestock figures for those areas.

Further below, **Table 7-5** and **Table 7-6** presents crop and other agricultural production figures on a 5-year average per farm unit as listed above, while **Table 7-7** and **Table 7-8** presents information related to expected agricultural production losses per farming unit related to the occupation of the WTG hardstands of the project of different agricultural production areas.

All assessed WTG hardstands that fall in cultivated lands have a variety of soil limitations that cause the production potential of each 1 ha hardstand to be different from the average production that was obtained from landowner information. Where block-specific production figures for cultivated lands (such as detailed harvest maps) were not available, and to account for the fact that on ground level, the soils (and hence the land capability and production potential) of each WTG hardstand vary in a

complex pattern across the landscape, a basic 'soil limitation factor' was applied to the crop production potential of each WTG hardstand falling within cropland boundaries to gain a calculated production loss estimate in terms of the expected impact caused by the proposed development. For example, where it is the specialist's opinion that due to soil limitations that may cause diminished crops and where it is expected that only 75% of the average harvest production can be obtained, a soil limitation factor of 0.75 is applied to the long-term average. Conversely, if it is expected that the site on which a WTG hardstand is proposed may outperform the long-term average due to a lack of such limiting factors a 'soil limitation factor' of more than 1.0 is applied. For example, a factor of 1.25 is applied where a crop of 25% more than the long-term average is expected.

The production of livestock in the different farm units is also addressed **Table 7-5** and **Table 7-6**. The different land users stock their land at different stocking rates and use a variety of feeding regimes. Some make use of only natural grazing and others a combination of natural grazing (6 to 8 months – rainfall dependent), bales from perennial grass pastures (3 to 4 months), and the gleaning of cultivated lands after harvesting (2 to 3 months). Winter and summer licks are continuously set out as a rule by all farmers. Cattle is the only commercially farmed livestock in the project area although some farmers have small herds of sheep, mostly for personal use, of which the grazing utilization is deemed negligible on the broad scale.

Signs of overgrazing were observed on all farm units. The estimated ecological grazing capacity of all natural rangeland portions varies between 7 and 12 ha/LSU.

Table 7-5 - Production area sizes of the different farm units directly related to the project development in the project area

FARM UNIT PRODUCTION AREAS				
Production type	**Farm unit**			**Total area**
	1	**2**	**3**	
Total cultivated land (ha)	152,4	4,6	540,6	697,6
Total pastures (ha)	0,0	20,4	25,1	45,5
Total grazing rangelands (ha)	530,6	714,2	605,9	1850,7
Total infrastructure and fall-out areas (ha)	8,0	4,2	31,3	43,5
Total extent (ha)	691,0	743,3	1202,9	2637,2

Table 7-6 - Production figures (5-year average) of the directly influenced farm units in the project area

ANNUAL PRODUCTION (5-year average)				
Product	**Farm unit**			**Averages**
	1	**2**	**3**	
Maize (t/ha)	7,5	0	5,9	4,5
Soya beans (t/ha)	1,6	0	2,2	1,3
250 kg grass bales (units/ha)	0	20	17	12,3

ANNUAL PRODUCTION (5-year average)				
Livestock - (weaned calf/ha)	0,2	0,35	0,28	0,3

Table 7-7 - Production areas in relation to WTG's and EIH alternatives in the project area

PRODUCTION AREAS RELATED TO WTG's AND EIH ALTERNATIVES				
Infrastructure	**Farm unit**			**Project area total (ha)**
	1	**2**	**3**	
WTG's (area = 1 ha ea.)				
WTG in cultivated land (ha)	3	0	0	3
WTG in planted pasture (ha)	0	0	0	0
WTG in old fields (ha)	0	3	2	5
WTG in natural grazing rangelands (ha)	4	5	3	12
Total WTG's	7	8	5	20
EIH's (area = 7 ha ea.)				
EIH in cultivated land (ha)	0	0	0	0
EIH in planted pasture (ha)	0	7	7	14
EIH in old fields (ha)	0	0	0	0
EIH in natural grazing rangelands (ha)	0	7	0	7
Total EIH alternatives	0	14	7	21
Total area WTG + EIH (ha)	**7**	**22**	**12**	**41**

The area potentially occupied by WTG hardstands is 20 ha and the area covered by one EIH is approximately 7 ha giving a total of 27 ha of land surface that will be permanently occupied by these WEF components. This equates to about 1.02 % of the total 2637 ha agricultural production area (**Table 7-8**) on which WTG and EIH sites are proposed. This percentage compares well to the total proposed permanent project footprint including all components and supporting infrastructure, which takes up about 1.12 % of the total affected area (67.2 ha of 6000 ha).

Other project infrastructure and affected land surfaces has low permanent surface coverage as access roads will be constructed along existing roads and tracks, and others such as the electrical connection network and temporary laydown areas are not expected to permanently affect large tracts of agricultural production land.

Table 7-8 - Expected agricultural production losses of the different farm units in relation to the areas occupied by WTG hardstands and one EIH in the project area

ESTIMATED ANNUAL PRODUCTION LOSSES (units per hectare)				
Agricultural Product	**Farm unit**			**Total loss**
	1	**2**	**3**	
Maize (t)	7,5	0	0	7,5
Soya beans (t)	1,6	0	0	1,6
250 kg grass bales (units)	0	51	60	111
Livestock - (weaned calves)	0,8	1,8	0,8	3,4

7.1.2. GEOLOGICAL CONTEXT

The following is extracted from the Geotechnical specialist assessment report by WSP Group Africa (Pty) Ltd and included as Appendix G.10.

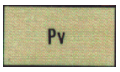
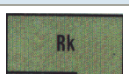
7.1.2.1 Geology

According to the published 1: 250 000 geological map, Sheet 2628 West Rand the site is underlain by rocks of the West Rand and Central Rand Group (Witwatersrand Supergroup), Kliprivier Group (Ventersdorp Supergroup) and Ecca Group (Transvaal Supergroup).

A number of faults characterise the site. The faults are trending in a north-west to south-east or north to south direction. In the Turffontein Subgroup, regional dip of the rocks is approximately 17°, 25°, 28° and 45°. The Kliprivier Group rocks dip in north easterly direction at approximately 50°. The rocks of the Johannesburg group dip at approximately 35° in a northerly direction

An excerpt from the geological sheet is given as **Figure 7-8** and the lithostratigraphy along with the map symbols is provided in **Table 7-9.**

Table 7-9 - Lithostratigraphy of the Area

Supergroup	Group	Subgroup	Formation	Description	Map Symbol
Quaternary Deposits				Alluvium	
Transvaal	Ecca		Vryheid	Sandstone, shale, coal beds	
Intrusive				Diabase	
Ventersdorp	Kliprivier			Basaltic lava, agglomerate, tuff	
Witwatersrand	Central Rand	Turffontein		Quartzite, conglomerate, sandy shale	
			Booysens	Shale	

Supergroup	Group	Subgroup	Formation	Description	Map Symbol
		Johannesburg		Quartzite and conglomerate	
	West Rand	Jeppestown		Quartzites with conglomerate layers	
			Roodepoort	Shale and quartzite	
			Crown	Amygdaloidal andesitic lava	
		Government	Florida Quartzite	Quartzite and basal conglomerate	
			Witpoortjie	Magnetic shale	
			Coronation Shale	Black strongly magnetic shale	

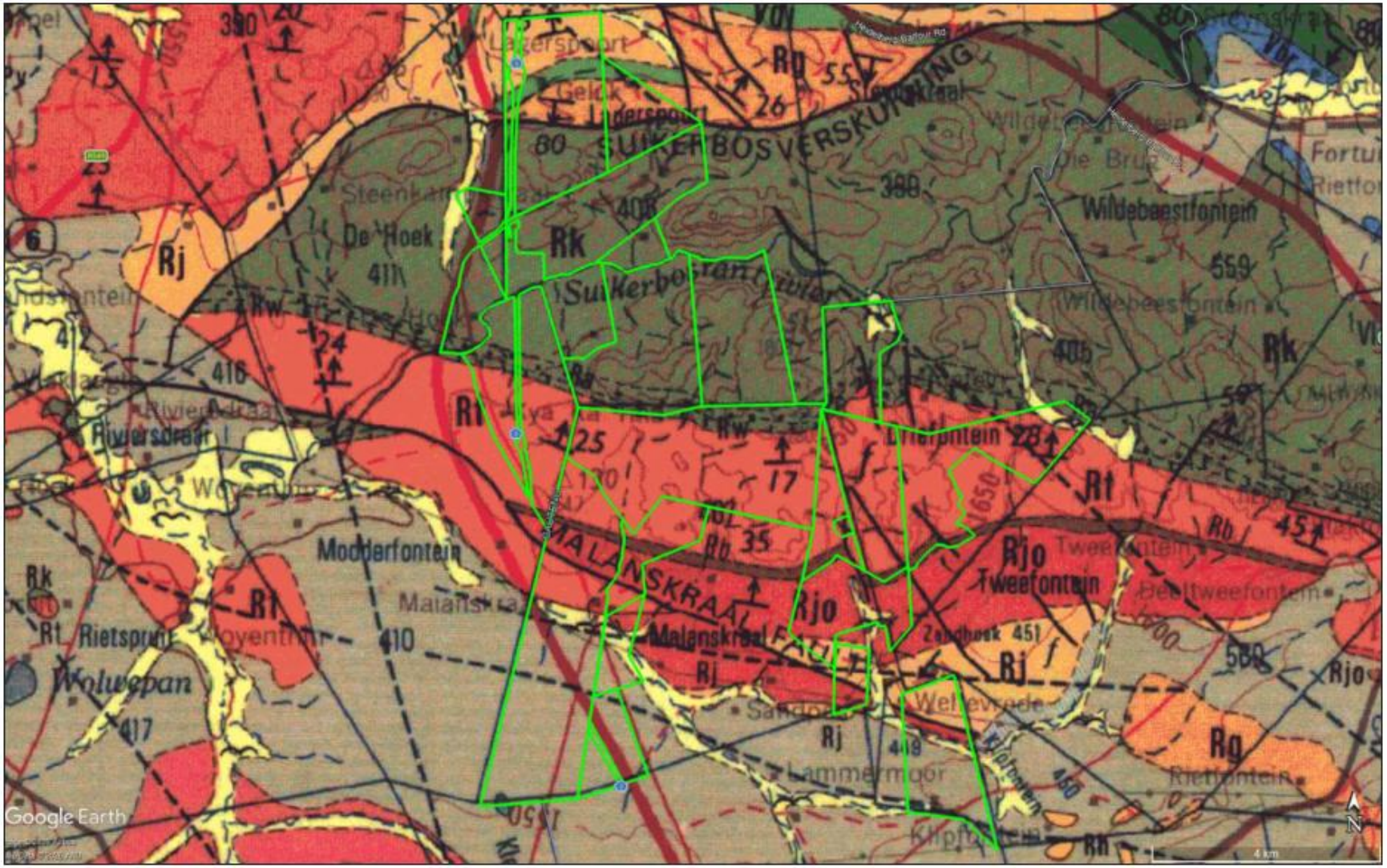


Figure 7-8 - Regional Geology of the Area

7.1.2.2 Site Reconnaissance

A site reconnaissance was carried out on the 13th of March 2025 during the summer season. The season over which the site visit was conducted does not affect the outcome of the assessment as the geotechnical impacts are more of a technical nature rather than environmental.

A total of twelve geological exposures, EXP1 to EXP12, were observed in various areas of the site and were profiled according to the current South African standards and guidelines (SANS 633). This was done to confirm or dispute the baseline geological information.

Access was not granted to the entire site. Some farmers did not grant access for the site reconnaissance, particularly in the northern and central section of the site.

The locations of the exposures are illustrated in **Figure 7-9.**The exposure profiles and photographs are presented in **Appendix G.10** in the specialist report.

A list and description of the exposures indicating the geology encountered on site is presented in **Table 7-10**.

The site reconnaissance confirmed that the central and northern sections of the site are underlain by the Witwatersrand Supergroup

The south-eastern and south-western section, underlain by the Vryheid Formation, is relatively flat and characterised by agricultural activities. No rock exposures were encountered.

Table 7-10 - Summary of Geological Exposures Encountered Across the Site

Exposure ID	Lat	Long	Rock Exposure Type
EXP1	26°39'31.72"S	28°28'26.93"E	Quartzite – medium hard rock
EXP2	26°39'40.85"S	28°28'7.00"E	Quartzite – medium hard to hard rock
EXP3	26°40'28.27"S	28°27'43.91"E	Quartzite – medium hard to hard rock
EXP4	26°39'19.47"S	28°23'56.40"E	Quartzite – medium hard to hard rock
EXP5	26°40'59.33"S	28°24'13.32"E	Quartzite – medium hard rock
EXP6	26°39'45.32"S	28°24'38.32"E	Conglomeritic Quartzite – medium hard rock
EXP 7	26°40'34.71"S	28°24'59.63"E	Quartzite – hard rock
EXP 8	26°40'0.99"S	28°25'5.08"E	Conglomeritic Quartzite – medium hard rock
EXP9	26°35'52.72"S	28°27'36.32"E	Basalt – soft to medium hard rock
EXP10	26°36'4.63"S	28°27'15.31"E	Quartzite – medium hard rock
EXP11	26°35'42.49"S	28°26'49.64"E	Basalt – soft to medium hard rock
EXP12	26°37'52.34"S	28°27'10.26"E	Basalt

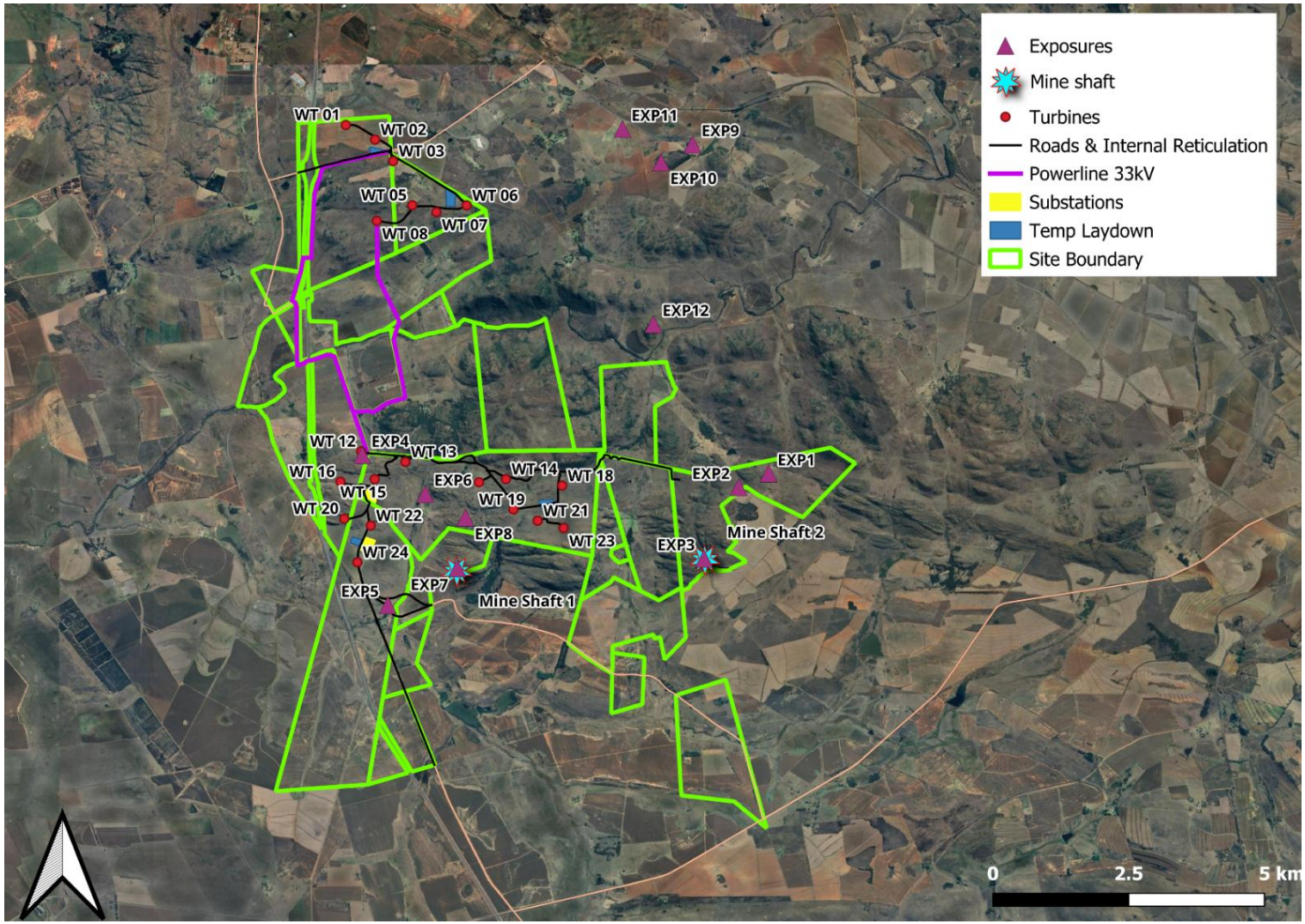


Figure 7-9 - Location of geological exposures on site

7.2 BIOLOGICAL ENVIRONMENT

7.2.1. TERRESTRIAL BIODIVERSITY

The following is extracted from the Terrestrial Biodiversity specialist assessment report compiled by HawkHead Consulting and included as Appendix G.2.

7.2.1.1 Regional vegetation characteristics

The Project area – referred to as the 'PAOI' - contains elements of both the Grassland and Savanna Biomes, and according to SANBI's regional mapping of South Africa's vegetation types (2018), is represented by four vegetation types, namely Soweto Highveld Grassland (Gm 8), Tsakane Clay Grassland (Gm 9), Andesite Mountain Bushveld (SVcb 11), and Gold Reef Mountain Bushveld (SVcb 9) (**Figure 7-10**). The general characteristics of the Grassland and Savanna Biomes, and the relevant regional vegetation types are discussed in more detail below:

Grasland biome

The PAOI is located in the Grassland Biome, which covers approximately 28% of South Africa and is the dominant biome of the central plateau and inland areas of the eastern subcontinent (SANBI, 2013). Grasslands are typically situated in moist, summer rainfall regions that experience between 400 mm and 2000 mm of rainfall per year. Vegetation consists of a dominant field-layer comprising grasses and herbaceous perennials, with little-to-no woody plants present.

South Africa's grassland ecosystems are parsed into five groups, with the PAOI located in the Mesic Highveld Grasslands group (SANBI, 2013). Mesic Highveld Grasslands occur at mid-altitudes and experience warm, wet summers (MAP 700-1200 mm) and cold winters. They are typically highly productive sourveld grasslands that are dominated by long-lived perennial grasses (SANBI, 2013).

Fire is common in Mesic Highveld Grasslands and maintains these ecosystems in a relatively treeless form (SANBI, 2013). Apart from their importance as rich stores of biodiversity, grasslands are critically important water production landscapes, constituting about half of South Africa's Strategic Water Source Areas (SANBI, 2013).

Savanna Biome

The savanna biome is the largest biome in South Africa, covering approximately 35% of the country's land surface (Scholes and Walker, 1993). Savannas are characterised by a dominant grass layer, over-topped by a discontinuous, yet distinct woody plant component. Primary determinants of savanna composition, structure and functioning are; fire, a distinct seasonal climate, substrate type, and browsing and grazing by large herbivores (Scholes and Walker, 1993).

Compositionally, Africa's savannas are distinguished as either fine-leafed savannas or broad-leafed savannas. The distribution of these forms is based primarily on soil fertility (Scholes and Walker, 1993); fine-leafed savannas occur on nutrient rich soils and are dominated by microphyllous woody species of the Fabaceae family (most commonly indigenous Acacia's). These savannas have a productive and diverse herbaceous layer that is dominated by grasses, and can support large populations of mammalian herbivores (Scholes and Walker, 1993). Conversely, broad-leafed savannas usually occur on nutrient poor soils and are dominated by macrophyllous woody species from the Combretaceae family (common genera: Combretum & Terminalia). Compared to fine-leafed

savannas, broad-leafed savannas are less productive and support a lower herbivore biomass (Scholes and Walker, 1993).

Regional vegetation types

- Soweto Highveld Grassland

Soweto Highveld Grassland extends in a broad band between Johannesburg and Ermelo in the north, and Perdekop and the Vaal River in the south (Mucina & Rutherford, 2011). Vegetation is characterised by short- to medium-high density tufted grassland, occurring on gently to moderately undulating plains (Mucina & Rutherford, 2011). Grasslands are typically dominated by *Themeda triandra*, along with several other co-dominant species. These grasslands are interrupted by small wetlands and rocky ridges and outcrops (Mucina & Rutherford, 2011).

In Mucina and Rutherford's (2011) regional vegetation type descriptions, important plant taxa are those species that have a high abundance, a frequent occurrence (not being particularly abundant), or are prominent in the landscape within a particular vegetation type. They recognise the following species as important taxa in Soweto Highveld Grassland vegetation type, amongst others:

Graminoids: *Themeda triandra, Andropogon appendiculatus, Brachiaria serrata, Cymbopogon pospischilii, Cynodon dactylon, Elionurus muticus, Eragrostis capensis, Eragrostis chloromelas, Eragrostis curvula, Eragrostis plana, Heteropogon contortus, Hyparrhenia hirta, Setaria sphacelata, Aristida junciformis, Aristida congesta, Aristida bipartita and Paspalum dilatatum.*

Herbs: *Hermannia depressa, Euryops gilfillanii, Geigeria aspera, Graderia subintegra, Haplocarpha scaposa, Helichrysum rugulosum, Helichrysum nudifolium, Lippia scaberrima, Senecio coronatus, Vernonia oligocephala and Wahlenbergia undulata.*

- Tsakane Clay Grassland

Tsakane Clay Grassland occurs in pockets along a narrow band from Soweto to Springs, towards Vereeniging and between Balfour and Standerton, in Gauteng and Mpumalanga Provinces (Mucina and Rutherford, 2011). The landscape is characterised by flat to slightly undulating grassy plains and low hills. Vegetation includes short dense grasslands, dominated by several highveld grass species and several forb species (Mucina and Rutherford, 2011).

Mucina & Rutherford (2011) list the following flora species as being important or characteristic taxa in Tsakane Clay Grassland:

Grasses: *Brachiaria serrata, Cynodon dactylon, Cynodon hirsutus, Digitaria ternata, Elionurus muticus, Eragrostis chloromelas, Eragrostis plana, Eragrostis racemosa, Heteropogon contorts, Hyparrhenia hirta, Seteria sphacelata, Themeda triandra, Andropogon schirensis, Cymbopogon caesius, Melinis nerviglumis and Seteria nigrirostris.*

Herbs: *Acanthospermum australe, Eriosema salignum, Euryops transvaalensis, Gerbera viridifolia, Helichrysum nudifolium, Helichrysum rugulosum, Hermannia depressa, Nidorella hottentotica, Senecio coronatus, Senecio inornatus, Hypoxis rigidula, Striga asiatica, Tephrosia capensis and Chaetacanthus setiger.*

- Andesite Mountain Bushveld

Andesite Mountain Bushveld is found across several separate occurrences in Gauteng, North-West, Mpumalanga and Free State Provinces. This vegetation type is characterised by medium-tall thorny

bushveld, with a well-developed grass layer on hillslopes and the valleys of undulating landscapes (Mucina and Rutherford, 2011).

Mucina & Rutherford (2011) list the following flora species as being important or characteristic taxa in Andesite Mountain Bushveld:

Trees and Tall Shrubs: *Dombeya rotundifolia, Celtis africana, Combretum molle, Diospyros lycioides subsp. lycioides, Gymnosporia polyacantha, Euclea crispa, Protea caffra, Searsia pyroides var. pyroides, Searsia rigida, Senegalia caffra, Vachellia karroo, Zanthoxylum capense and Ziziphus mucronata.*

Grasses: *Hyparrhenia hirta, Setaria sphacelata, Themeda triandra, Digitaria eriantha, Elionurus muticus, Eragrostis racemosa, Eragrostis superba, Panicum maximum, Cymbopogon pospischilii, Digitaria eriantha and Eragrostis curvula.*

Herbs: *Commelina africana, Vernonia natalensis, Vernonia oligocephala and Aloe greatheadii var. davyana.*

- Gold Reef Mountain Bushveld

Gold Reef Mountain Bushveld occurs along rocky west-east trending ridge and hill systems in the North-West, Gauteng, Free State and Mpumalanga Provinces (Mucina and Rutherford, 2011). Vegetation comprises a mixture of trees and grasses, with dense woody vegetation dominated by Senegalia caffra associated with south-facing slopes (Mucina and Rutherford, 2011).

Mucina & Rutherford (2011) list the following flora species as being important or characteristic taxa in Gold Reef Mountain Bushveld:

Trees and Tall Shrubs: *Dombeya rotundifolia, Celtis africana, Combretum molle, Englerophytum magalismontanum, Ochna pretoriensis, Gymnosporia buxifolia, Mystroxylon aethiopicum, Protea caffra, Searsia leptodictya, Vangueria infausta, Vangueria parvifolia, Canthium gilfillanii, Ehretia rigida, Grewia occidentalis, Senegalia caffra and Ziziphus mucronata.*

Low Shrubs: *Athrixia elata, Pearsonia cajanifolia, Searsia magalismontana subsp. magalismontana, Searsia rigida var. rigida and Ancylobothrys capensis.*

Grasses: *Loudetia simplex, Panicum natalense, Trachypogon spicatus, Alloteropsis semialata, Bewsia biflora, Digitaria tricholaenoides, Diheteropogon amplectens, Tristachya biseriata and Tristachya leucothrix.*

Herbs: *Helichrysum nudifolium, Helichrysum rugulosum, Pentanisia angustifolia, Senecio venosus, Xerophyte retinervis, Cheilanthes hirta, Hypoxis hemerocallidea and Pellaea calomelanos*

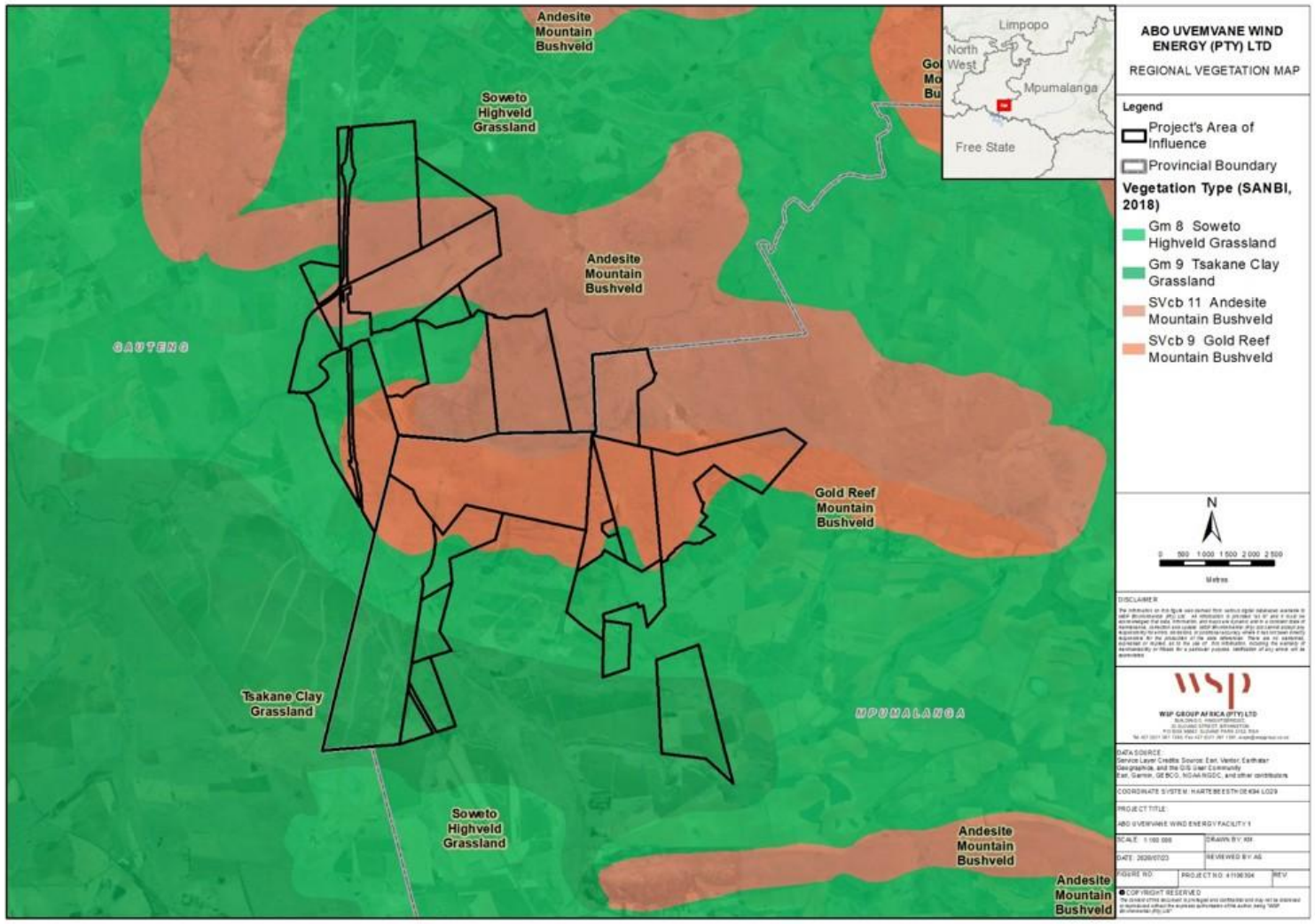


Figure 7-10 - PAOI in relation to the SANBI (2018) vegetation types

7.2.1.2 Regional Ecological Sensitivity and Conservation Setting

Nationally Threatened Ecosystems

According to the NEMBA Revised National List of Threatened Ecosystems (2022), Andesite Mountain Bushveld and Gold Reef Mountain Bushveld are not threatened. Soweto Highveld Grassland however, is listed as Vulnerable, while Tsakane Clay Grassland is listed as Endangered Both of these vegetation types have experienced large-scale habitat loss and modification due to cultivation, urbanisation, mining, dam building and road infrastructure. Considering the conservation status of Soweto Highveld Grassland and Tsakane Clay Grassland, any potential losses associated with the proposed Project are a concern. The remaining extent of Soweto Highveld Grassland and Tsakane Clay Grassland, as mapped by SANBI are shown in **Figure 7-11.**

The proposed Project layout has been intentionally configured to avoid placing infrastructure within natural habitat areas classified as Soweto Highveld Grassland and Tsakane Clay Grassland. While the layout generally avoids patches of Tsakane Clay Grassland, small portions of Soweto Highveld Grassland will still be affected in the PAOI.

Terrestrial Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)

Both the MBSP (2024) and the Gauteng C-plan (2024) recognise three primary categories of conservation land; protected areas, critical biodiversity areas (CBA) and ecological support areas (ESA). Land not designated under these three categories is essentially 'other natural areas' or 'modified habitats'. Definitions for each category are listed below:

- Protected Areas: Protected areas recognised in terms of the National Environmental Management Protected Areas Act, No. 57 of 2003, that are currently considered to meet biodiversity targets;
- Critical Biodiversity Area: Areas (outside of Protected Areas) that are required to meet provincial biodiversity targets for biodiversity pattern (species and ecosystems) and ecological processes. They should remain in a natural state and maintained in good ecological condition. Both the MBSP and the Gauteng C-plan recognise two CBA ranks, viz. CBA Irreplaceable and CBA Optimal under the MBSP, and CBA 1 and CBA 2 under the Gauteng C-Plan;
- Ecological Support Area: Play an important role in supporting the ecological functioning of critical biodiversity areas or for generating or delivering important ecosystem services. They support landscape connectivity and resilience to climate change adaptation. They need to be maintained in at least an ecologically functional state;
- Other Natural Areas: Often retain much of their natural character and may contribute significantly to maintenance of viable species populations and natural ecosystem functioning, and may provide important ecological infrastructure and ecosystem services. They are not, however, prioritized for immediate conservation action (under the MBSP); and
- Modified: Often referred to as transformed, these areas have lost a significant proportion (or all) of their natural biodiversity and in which ecological processes have broken down (in some cases irretrievably), as a result of biodiversity-incompatible land-use practices such as ploughing, hardening of surfaces, mining, cultivation and the construction of houses or other built infrastructure.

The spatial delineations of the MBSP and the Gauteng C-Plan in relation to the PAOI are shown in **Figure 7-12**. Field observations and aerial imagery indicate that certain CBA/ESA patches have been

disturbed by past/current cultivation and therefore do not comprise undisturbed natural habitat (these are shown in **Figure 7-13**).

The MBSP delineations indicate that portions of the east and centre of the PAOI are classified as CBA Irreplaceable, with smaller areas designated as CBA Optimal and ESAs. The remaining areas are categorized as “other natural areas” or “modified habitats.” The statuses of the MBSP CBA delineated habitat patches in the PAOI and surrounding landscape are predicated on a combination of the following attributes, as per data received from the Mpumalanga Parks and Tourism Agency (MPTA) (M. Lötter):

- Vegetation:
  - Andesite Mountain Bushveld;
  - Soweto Highveld Grassland;
  - Tsakane Clay Grassland;
  - Gold Reef Mountain Bushveld;
- Wetlands:
  - Central Bushveld Group One;
- Amphibians:
  - Giant Bullfrog (Pyxicephalus adspersus);
- Invertebrate:
  - Chrysoritis aureus buffer;
  - Chrysoritis aureus (GDARD model);
- Plants:
  - Brachycorythis conica subsp. transvaalensis;
- Process:
  - Escarpment south;
  - Climate change refugia;
  - Macro-corridor connecting to Gauteng CC corridor;
  - Critical linkages; and
  - Core corridor.

The Gauteng C-Plan delineations designate large areas of the Gauteng portion of the PAOI as ESAs with smaller areas designated as CBA 1 and CBA2. Triggering criteria for the Gauteng C-Plan designated CBAs include Red List plant, bird and invertebrate habitats, Orange List plant habitat, bioclimatic zones, priority quaternary catchments and primary vegetation.

The continued ecological functioning and integrity of CBAs is required to meet provincial conservation targets for biodiversity patterns (species and ecosystems) and ecological processes. Accordingly, activities that cause transformation (i.e., developmental activities) in CBAs should be avoided. Although most proposed Project infrastructure have been positioned, as far as possible, to avoid CBAs or align with existing disturbance footprints, portions of the proposed access road network traverse CBA patches and may result in losses and disturbances.

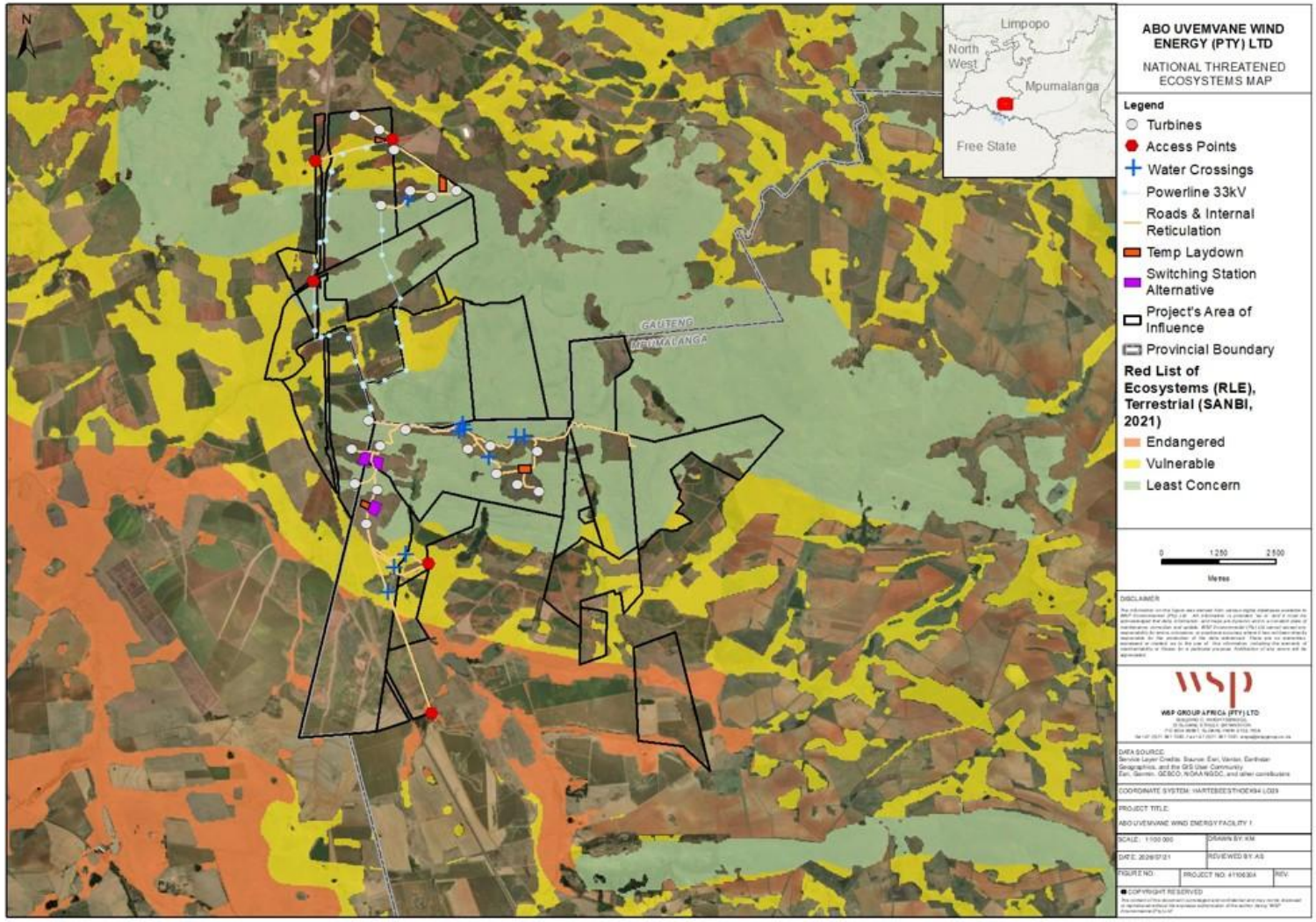


Figure 7-11 - PAOI in relation to the Red List of Ecosystems mapping data

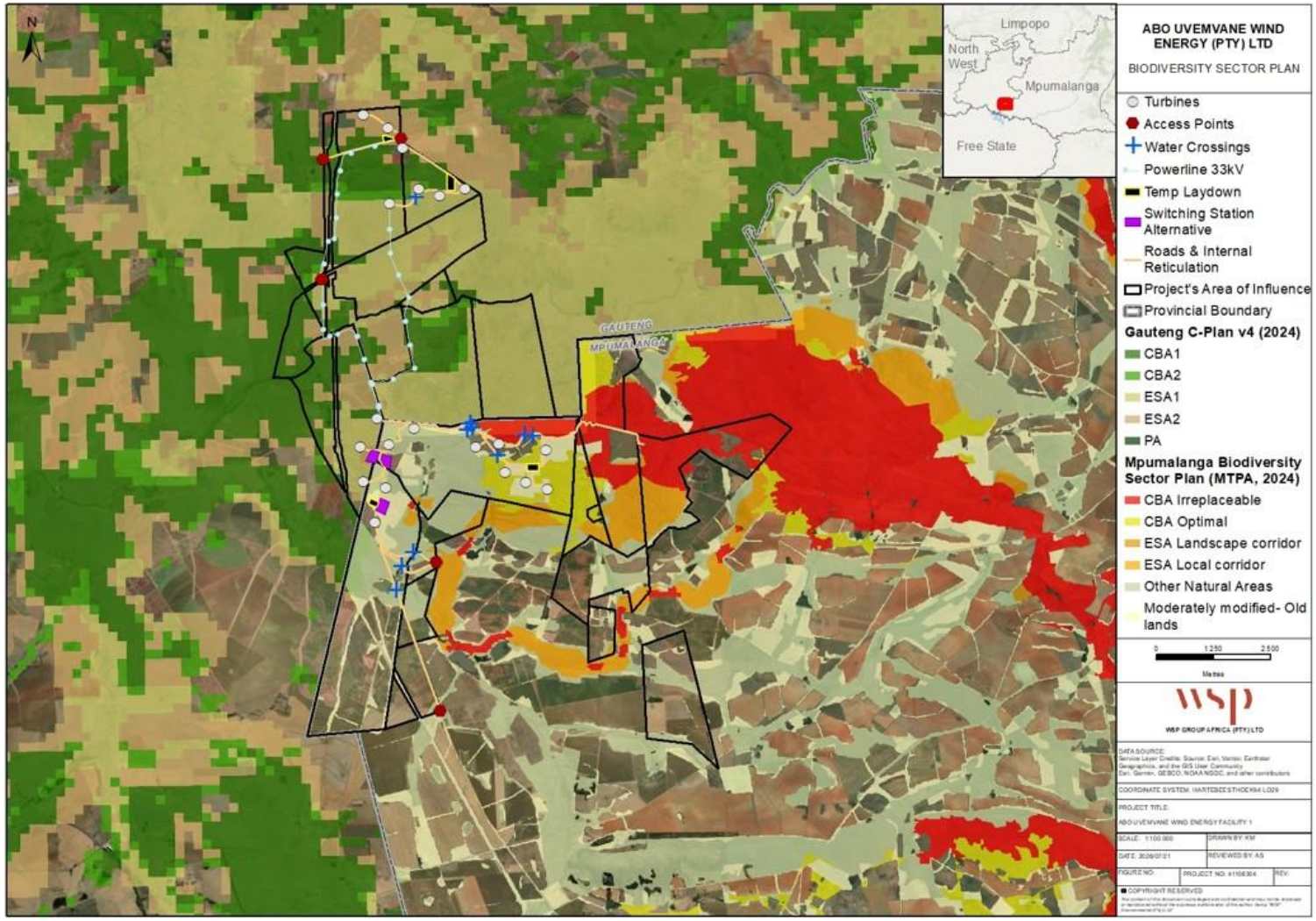


Figure 7-12 - PAOI in relation to mapped Protected Areas, CBAs and ESAs, as per the Gauteng C-Plan (2024) and the MBSP (2024)

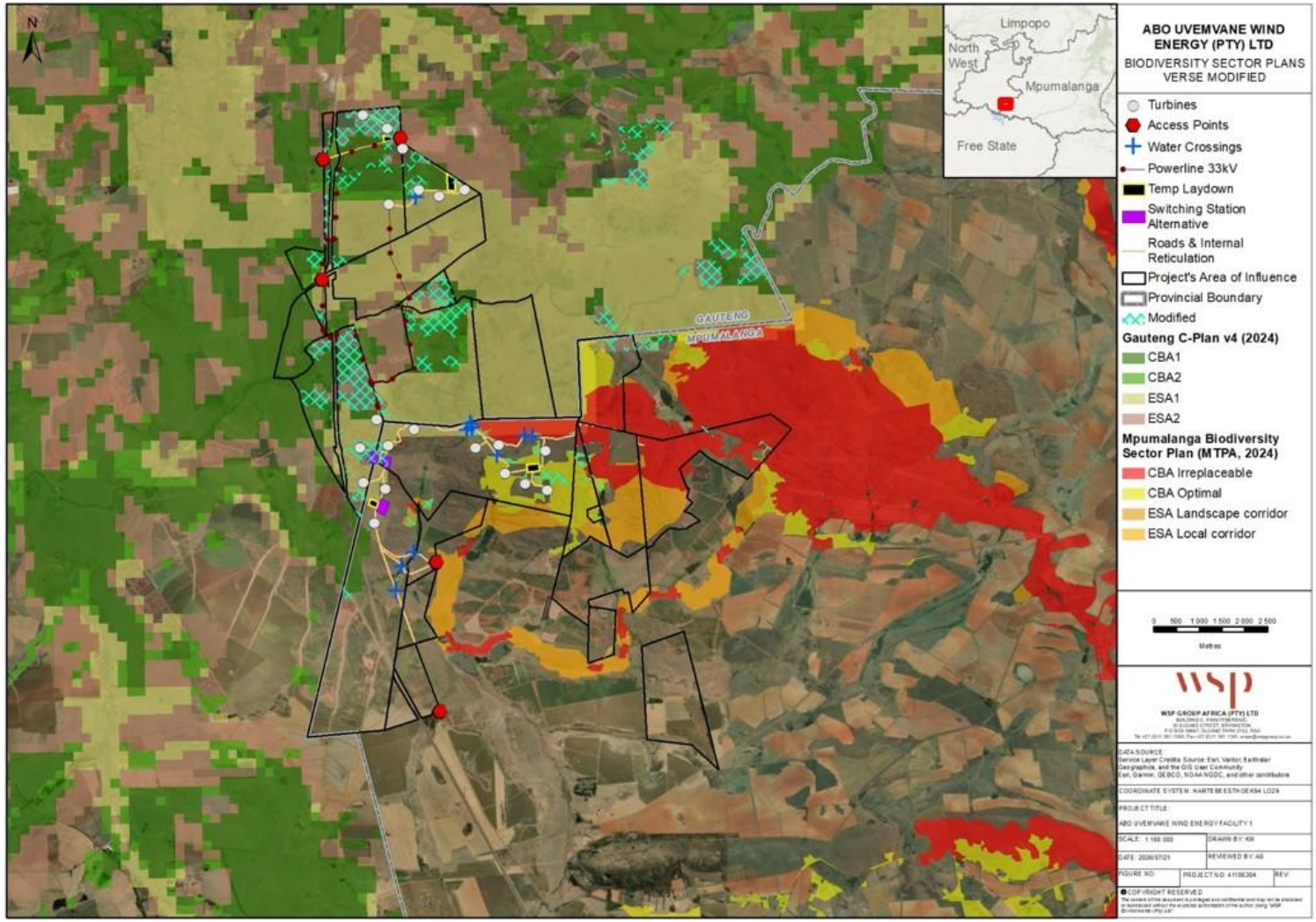


Figure 7-13 - CBAs and ESAs that have been disturbed by past/current cultivation activities

Strategic Water Source Areas

The PAOI is not located in a SWSA for groundwater or surface water (**Figure 7-14**). SWSAs were therefore not included as a receptor for the impact assessment or considered further in this report

Freshwater Ecosystem Priority Areas

Freshwater Ecosystem Priority Areas (FEPA) are rivers and wetlands required to meet biodiversity targets for freshwater ecosystems. Essentially, these areas were identified at a national level as priority areas for conserving freshwater ecosystems and supporting the sustainable use of water resources, as well as upstream catchment management areas (Driver, et al., 2012). FEPAs should be maintained in a natural/near natural condition, and anthropogenic activities in Upstream Management Areas should be carefully managed to prevent degradation of downstream FEPAs. The site does not lie within a National Freshwater Ecosystem Priority Area (FEPA) River Sub catchment (Belcher, 2026). The PAOI is located in a 'Migration Corridor', as per the mapping of FEPA shown in **Figure 7-15**.This corridor is mostly associated with the Suikersbosrand River, which runs through the centre of the PAOI.

Indigenous Forests

No indigenous forests are present in the PAOI. Indigenous forests were therefore not included as receptor for the impact assessment or considered further in this report.

Protected Areas and Conservation Areas

The PAOI is not located in a formal protected area (**Figure 7-16**). The nearest protected areas are Alice Glöckner Provincial Nature Reserve and Suikerbosrand Nature Reserve, both of which are managed by the Gauteng Provincial Government:

- Alice Glöckner Provincial Nature Reserve is 155.40 ha in extent and located approximately 3.2 km north-west of the PAOI; and
- Suikerbosrand Nature Reserve is about 11 333 ha in extent and located approximately 13 km north-west of the PAOI.

Amongst other biodiversity attributes, both nature reserves are recognised as butterfly hotspots, with *Aloeides dentatis dentatis, Chrysoritis aureus, Orachrysops mijburghi and Metisella meninx* listed as important species of conservation concern for these reserves (Henning et al., 2009).

Priority Focus Areas for Protected Area Expansion

Priority Focus Areas for protected area expansion are large, intact and unfragmented areas of high biodiversity importance, that are suitable for the creation/expansion of protected areas (Driver, et al., 2012). Land-use planning and decision making should avoid fragmenting Priority Focus Areas, to prevent such areas from being excluded from future protected area expansion. (Driver, et al., 2012).

According to the delineations of the National Protected Area Expansion Strategy (2018), large portions of the PAOI are mapped as Priority Focus Areas, as shown in **Figure 7-17.** These are mirrored across the portions of the PAOI that fall within Mpumalanga Province, according to the Mpumalanga's Protected Area Expansion Strategy – 20 Year Plan. Certain components of the proposed Project infrastructure fall within mapped Priority Focus Areas. Many of these components have, however, been located within patches of Secondary Grassland (old lands) rather than in areas

of intact natural habitat. This positioning reduces potential negative impacts on the ecological functioning of the affected and adjacent portions of the Priority Focus Area network.

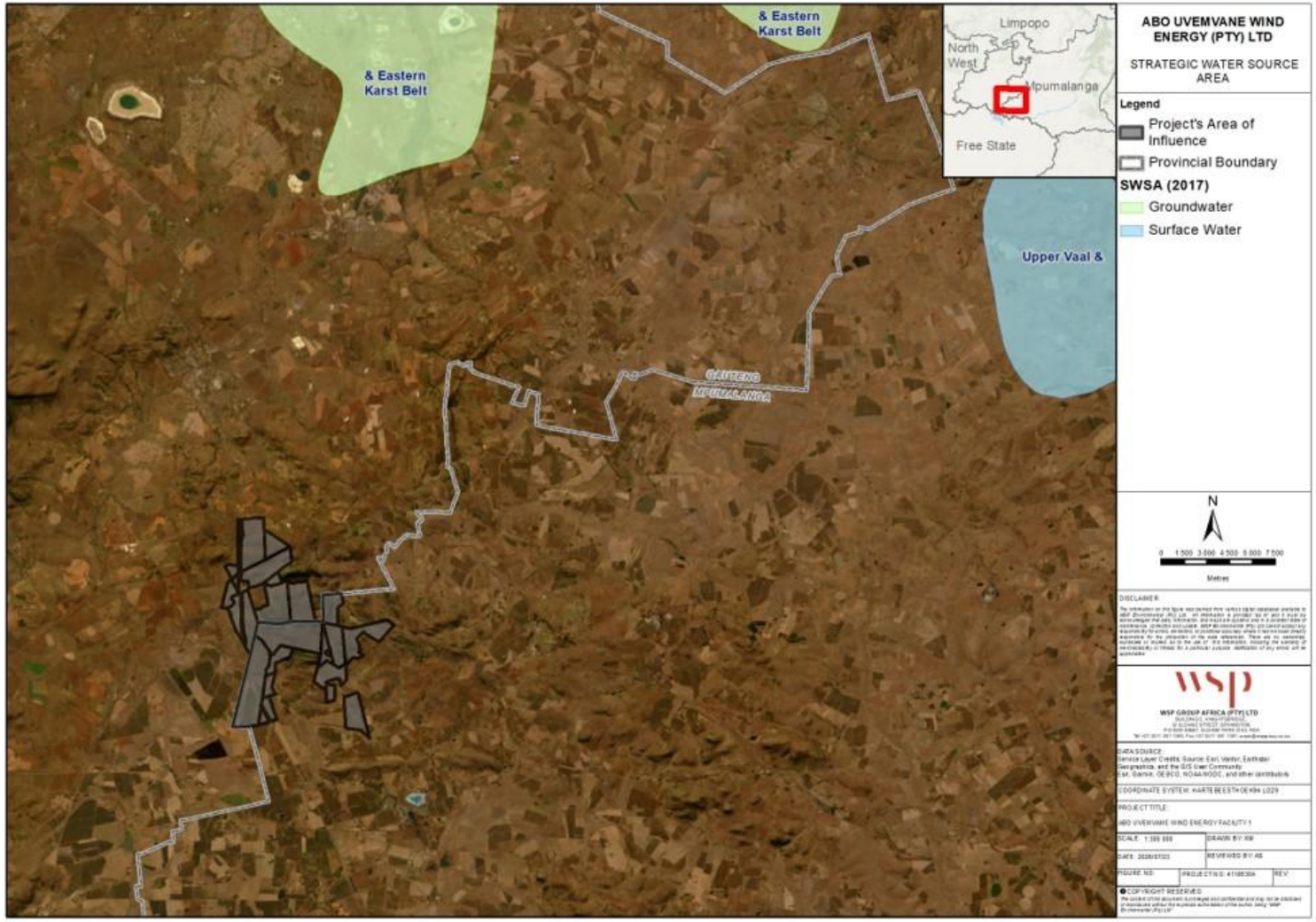


Figure 7-14 - PAOI in relation to mapped Strategic Water Source Areas

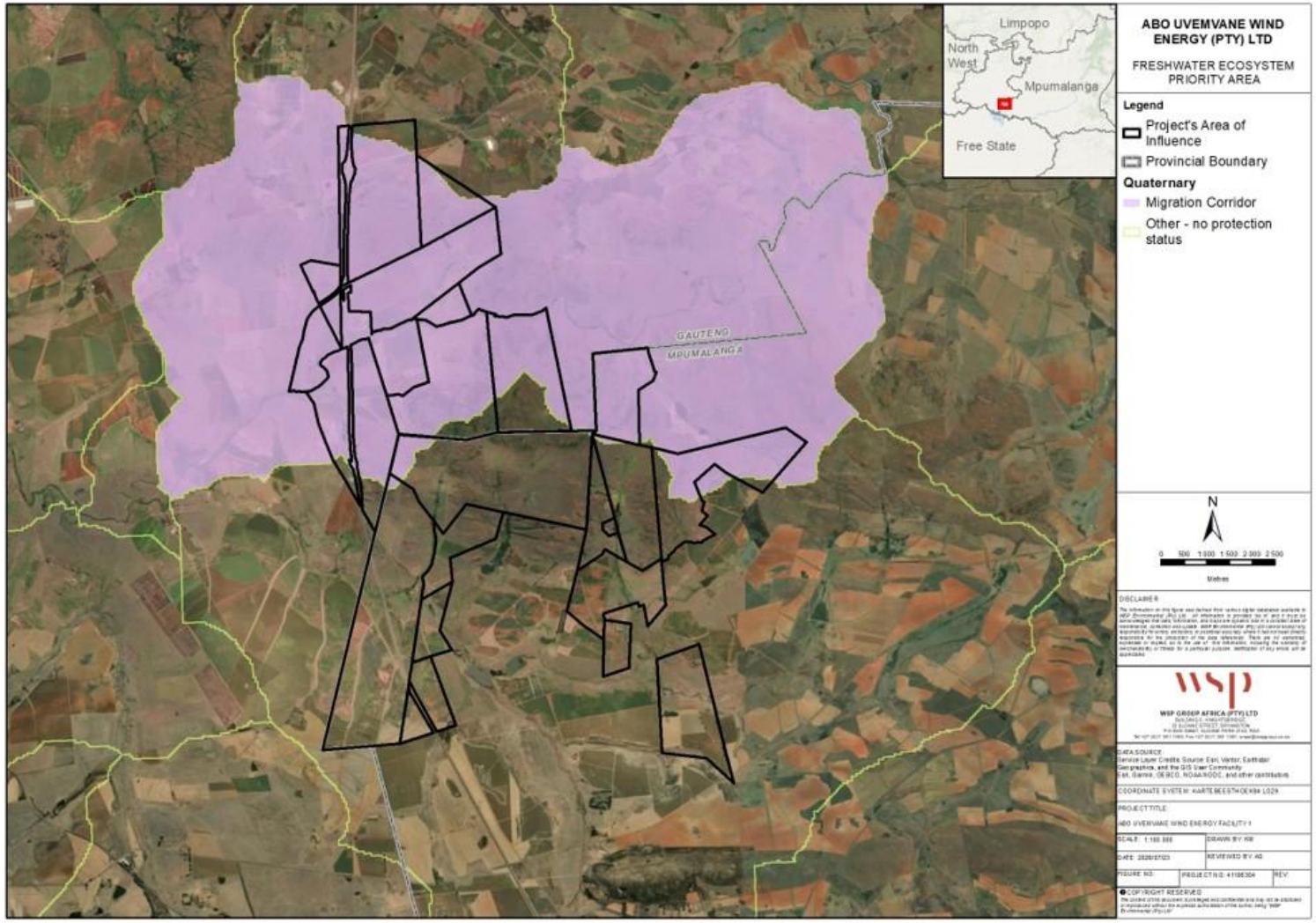


Figure 7-15 - PAOI in relation to recognised Freshwater Ecosystem Priority Area

Figure 7-16 - Protected areas and environments in the landscape surrounding the PAOI

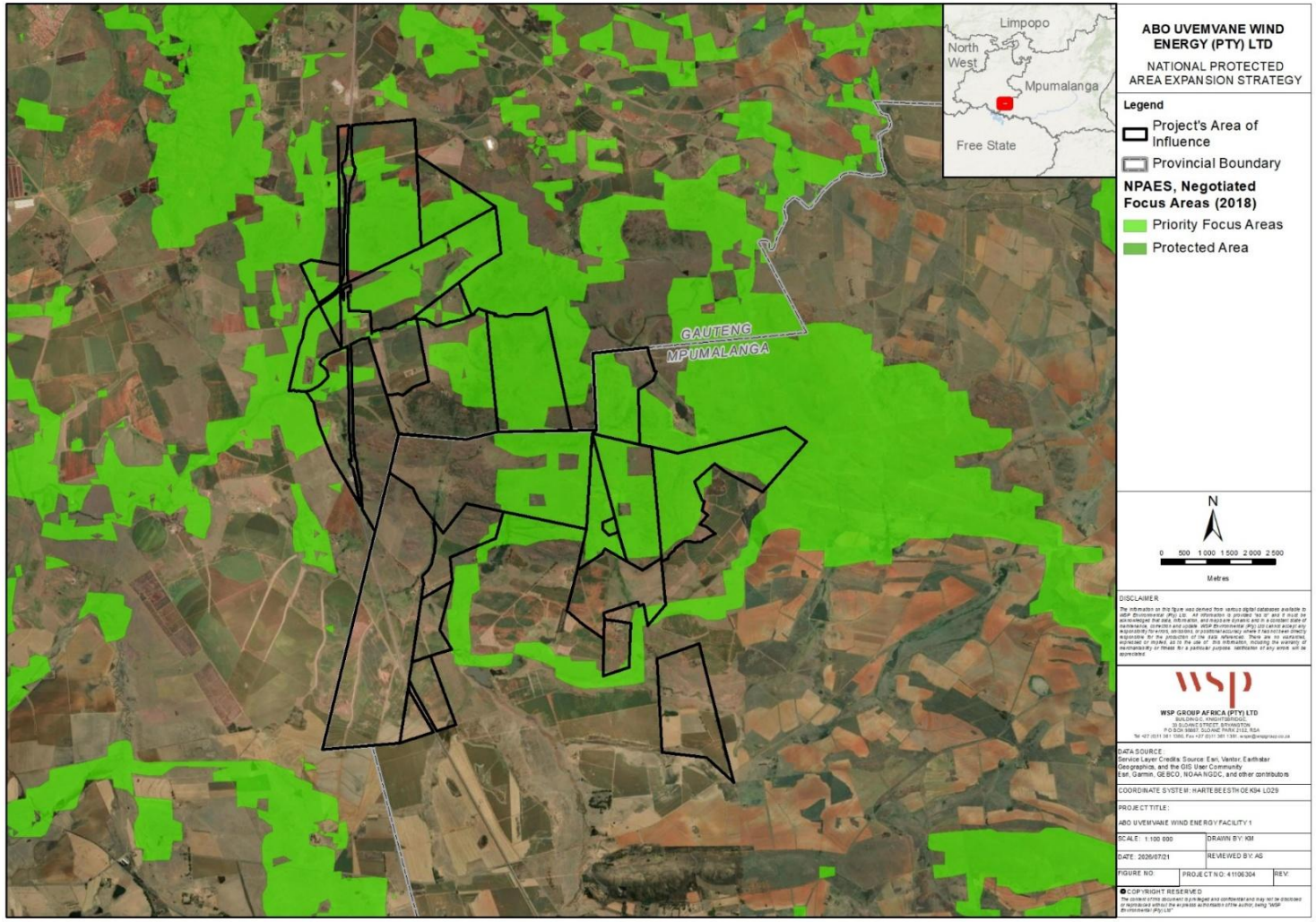


Figure 7-17 - PAOI in relation to provincial Priority Focus Area, as per the Mpumalanga Protected Areas Expansion Strategy – 20 Year Plan

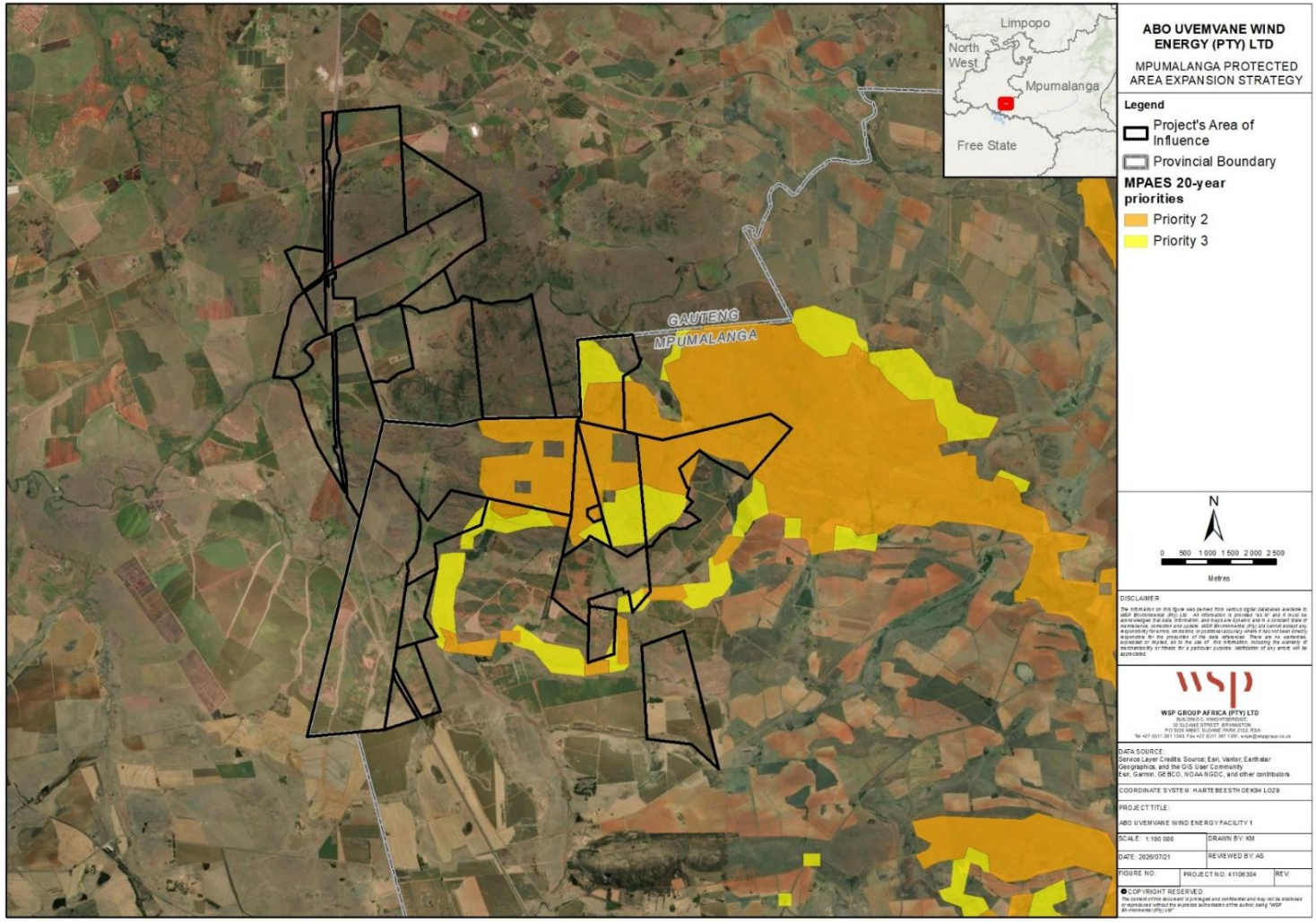


Figure 7-18 - PAOI in relation to provincial Priority Focus Area, as per the Mpumalanga Protected Areas Expansion Strategy – 20 Year Plan

Key Biodiversity Areas

Key Biodiversity Areas (KBA) are sites of global importance for species and their habitats (SANBI, 2024). They are identified by applying the Global Standard for the Identification of Key Biodiversity Areas that was developed by the International Union for the Conservation of Nature (IUCN) (SANBI, 2024). In total, 260 individual KBAs covering 356 000 km^2 have been identified in South Africa. These include South Africa's former network of Important Bird Areas (IBA) (SANBI, 2014).

The PAOI is not located in, or in close proximity to, a recognised KBA (Birdlife International, 2025). The closet KBAs are Suikerbosrand Nature Reserve (Site ID 100947), located to the north-east of the PAOI, and Devon Grasslands (Site ID 100757), which is located to the east (**Figure 7-19**).

Climate Change Corridor Network

The Mpumalanga Climate Change Corridor Network shows a Climate Change Focal (Refugia) Area along the Gauteng-Mpumalanga border within the PAOI. Large areas in the west of PAOI are also designated as Critical Link Corridors, with smaller sections identified as Core Corridors and Supporting Corridors (**Figure 7-19**). These corridors are recognized at a provincial level as crucial connections between identified Refugia, allowing species and ecosystems to move and adapt to climate change. Large-scale modification of these corridors through infrastructure development will compromise their compatibility with respects to climate change adaptation. It must be noted that the delineations of the Mpumalanga Climate Change Corridor Network are limited to Mpumalanga Province (**Figure 7-20**), and do not extend into adjacent areas of Gauteng Province.

Intact Grassland Patches

At a provincial level, MTPA has delineated a network of large 'Intact Grasslands'. These are grassland patches that are typically large (>100 ha) and well-connected across the landscape and have been identified by the provincial authorities through modelling as important for maintaining connectivity in support of inter alia, species populations, ecological processes and climate change adaption. No intact grasslands are located in or intersect the PAOI, as per the mapping of Mpumalanga Province's network of large intact and connected grassland patches (**Figure 7-21**).

Rocky Ridges

Ridge ecosystems are recognised as important biodiversity features, harbouring diverse flora and fauna communities, including several species of conservation concern. They also play an important role in many ecological (dispersal) and hydrological (water recharge) processes (refer to Section10 of the specialist report for additional discussion on the ecological importance of ridges). Ridges in Gauteng Province have been mapped and classified based on their degree of transformation (refer to **Table 7-11**) illustrates the ridge classifications within the PAOI, and shows various areas designated as Class 1 ridges. As far as possible, rocky ridges were avoided through careful placement of infrastructure to prevent disturbance to these important landforms. In instances where complete avoidance was not possible, infrastructure has typically been positioned along the outer edge of the delineated ridge, often within the mapped buffer zone, rather than within the core rocky feature itself. Disturbances should also be restricted to the absolute minimum required for construction and the turbine footprints should be orientated as much as possible within the designated buffer zones. This will reduce potential impacts and helps maintain the integrity of the ridge system as far as practicable.

Table 7-11 – Gauteng Ridge Classification

Class	Description
Class 1 Ridges	5% or less of the area has been transformed by human activity. Comprises approximately 58% of Gauteng's ridges.
Class 2 Ridges	More than 5% but less than 35% of the ridge has been transformed by human activity. Comprises approximately 23% of Gauteng's ridges.
Class 3 Ridges	Ridges that have been transformed by 35% or more, but less than 65% as a result of human activity. Comprises approximately 8% of Gauteng's ridges.
Class 4 Ridges	Ridges that have been transformed by 65% or more as a result of human activity. Comprises approximately 11% of Gauteng's ridges.

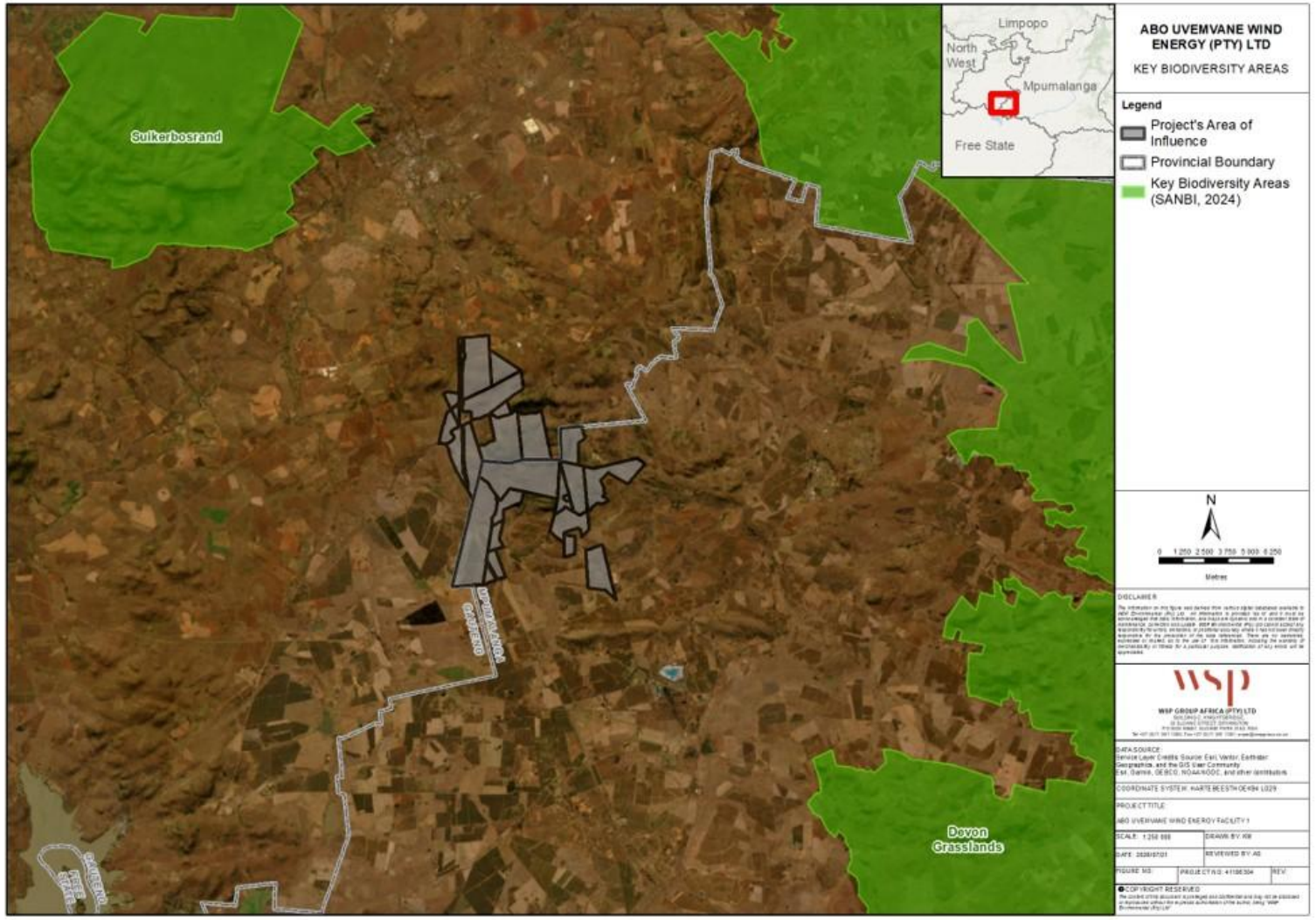


Figure 7-19 - The PAOI and Key Biodiversity Areas

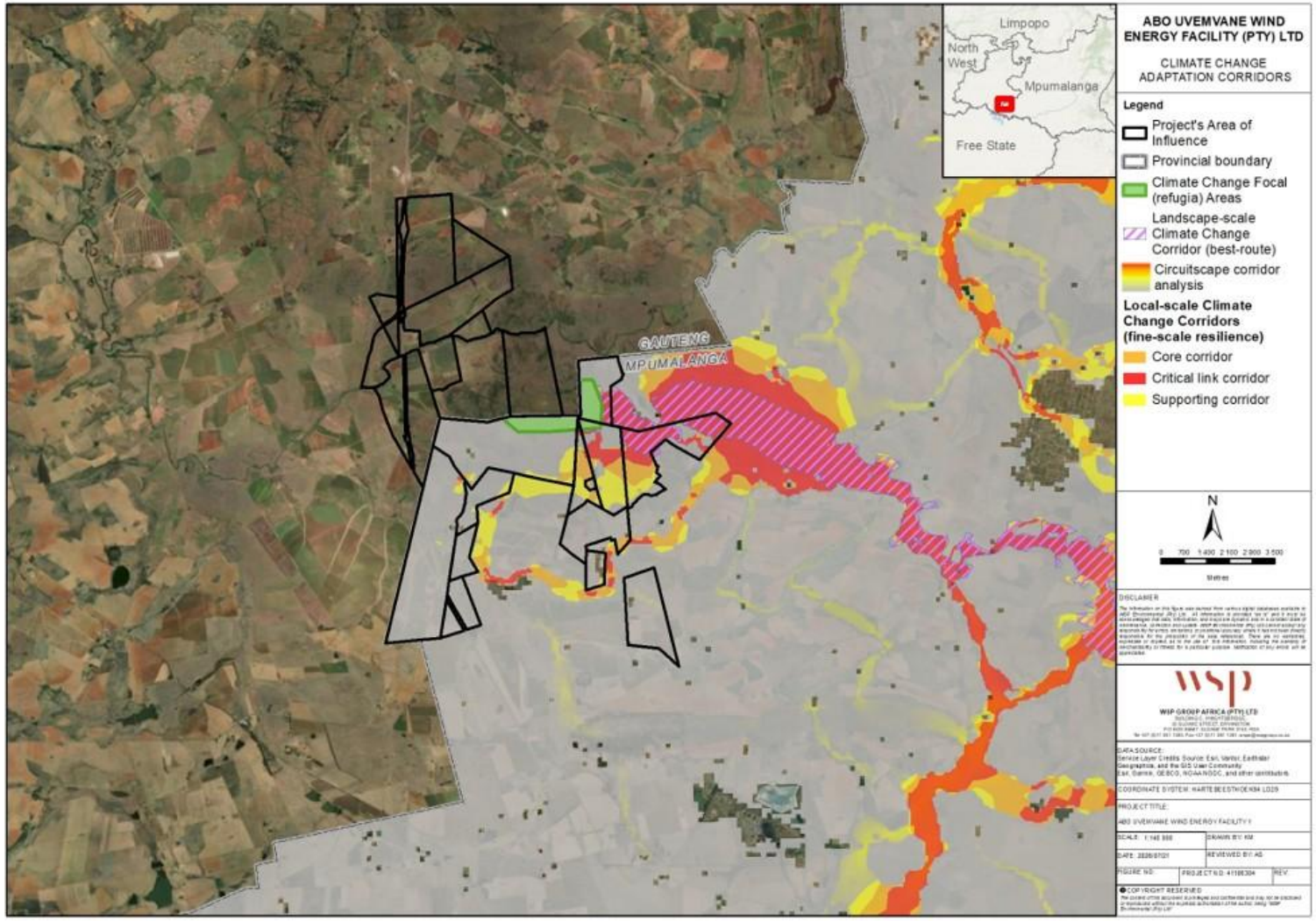


Figure 7-20 - Mpumalanga's Climate Change Corridor Network and the PAOI

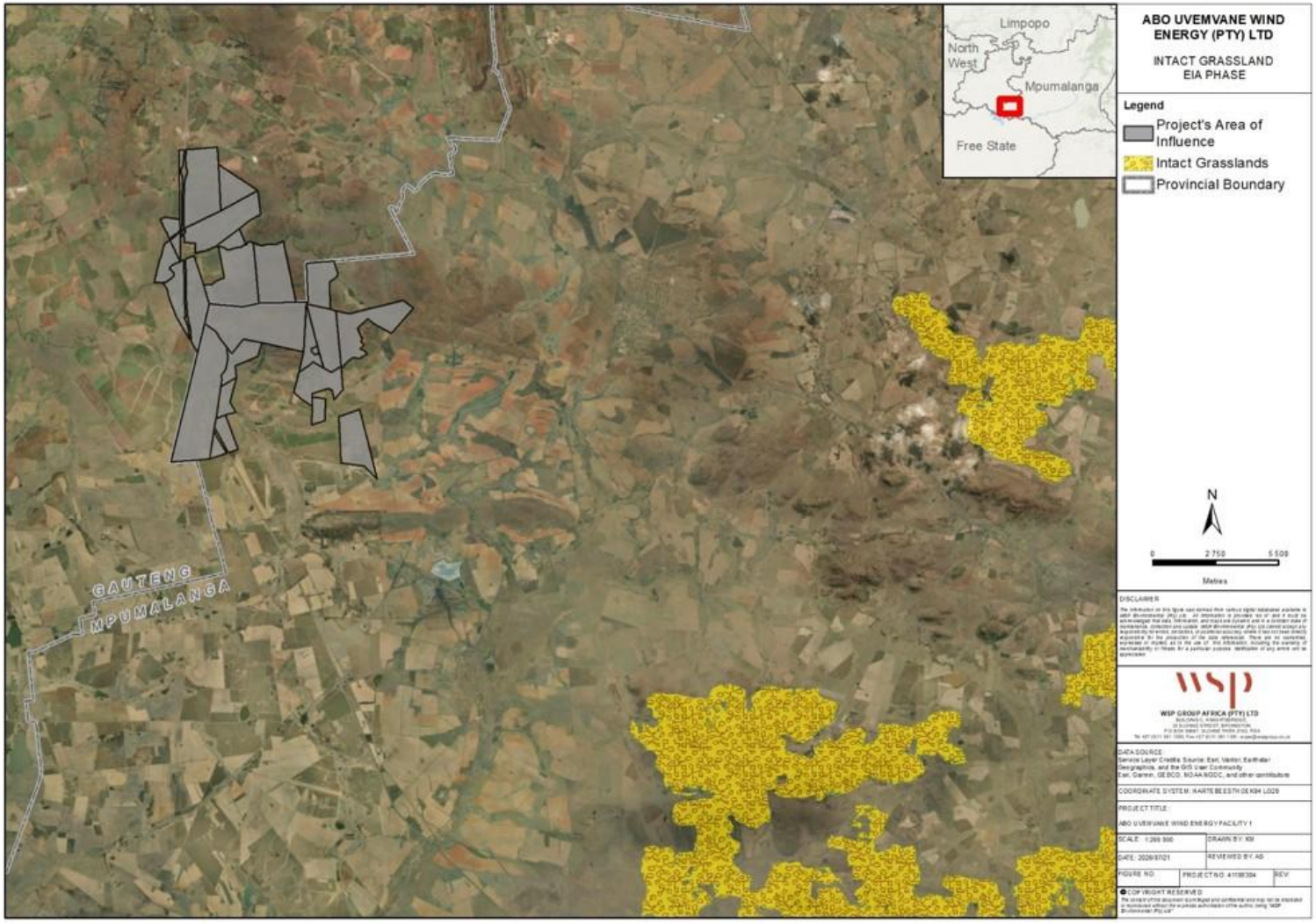


Figure 7-21 - Intact Grasslands in the landscape surrounding the PAOI

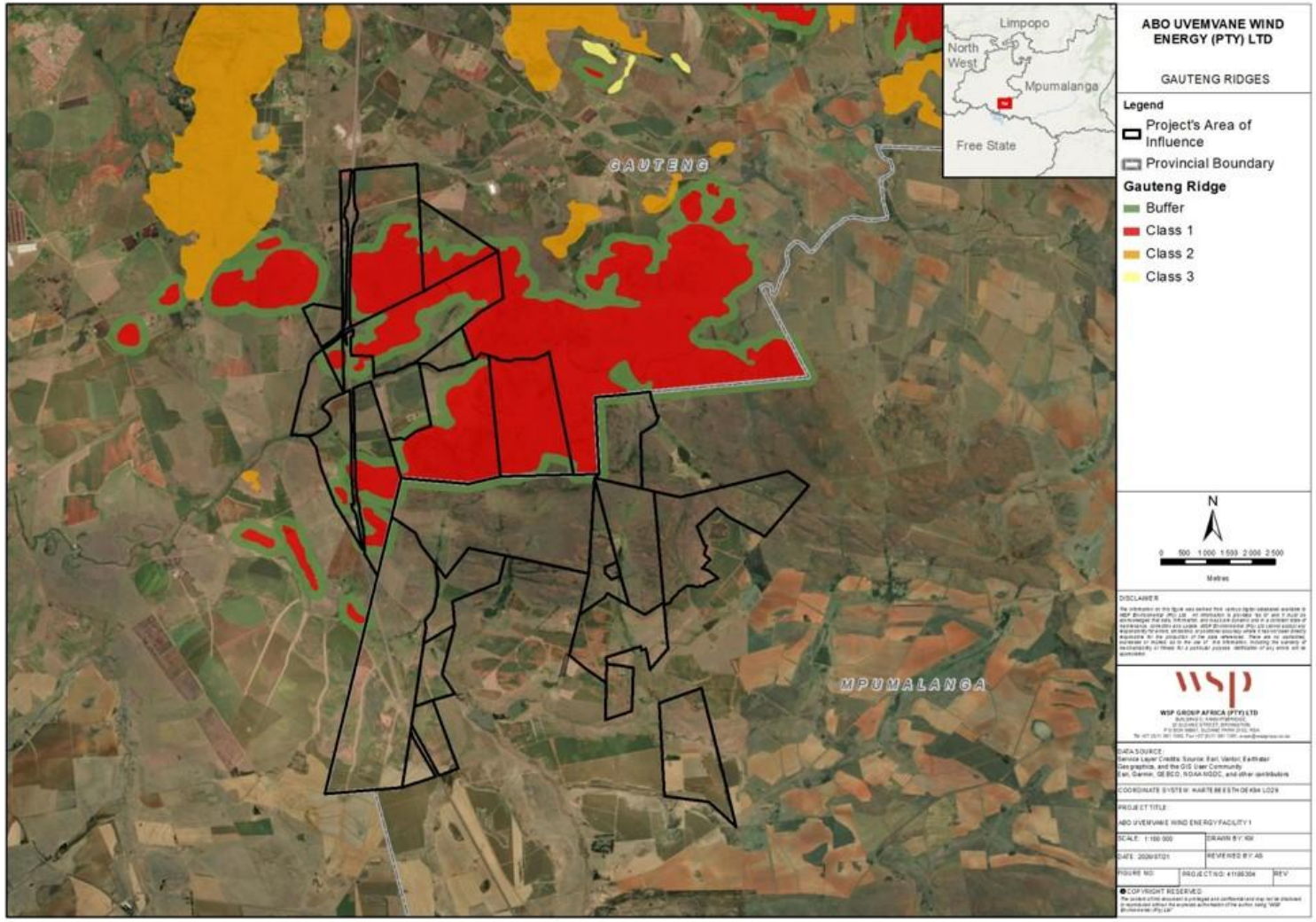


Figure 7-22 - Gauteng Rocky Ridge classification and the PAOI

7.2.1.3 Landscape Context and Existing Impacts on Terrestrial Biodiversity

The following notes summarise the general landscape context and exiting/current impacts observed in the PAOI during the field programme:

- The PAOI is large and encompasses a series of rocky ridges and hills, bisected by the Suikerbosrand River and numerous small water courses and streams;
- Most of the land in the centre of the PAOI remains natural and under wildlife or livestock management, with isolated cultivated fields also present. Cultivated fields are more prevalent along the flat and open periphery of the PAOI;
- Stands of alien invasive trees including *Acacia dealbata, Acacia mearnsii, Eucalyptus camaldulensis and Populus x canescens* are present in the PAOI, but are not currently abundant or widespread;
- Game/livestock fences typically delineate farm boundaries and numerous internal fences further partition farms into smaller game or grazing camps. The PAOI is also fragmentated by many farm roads/tracks, as well as larger district and national roads, such as the N3 Highway, which bisects the PAOI along its western boundary; and
- Agricultural land uses (i.e., crop production and livestock farming) dominate most of the land surrounding the PAOI, and accordingly large areas are modified by cultivated fields.

7.2.1.4 Habitat units in the PAOI

Seven habitat units were identified in the PAOI during the field survey. These include four (4) natural habitats and three modified habitats:

- Natural Habitats
  - Mountain Bushveld;
  - Rocky Shrubland and Grassland;
  - Watercourses (Rivers and Wetlands);
  - Natural Dry Grassland;
- Modified Habitats
  - Secondary Grassland;
  - Alien Tree Stands; and
  - Cultivated Fields.

These habitat units are described, with accompanying photographs, in **Section 7.2.2.2** through to **Section 7.2.2.8** of the Terrestrial Biodiversity Impact Assessment Report included as **Appendix G.2** habitat unit map for the PAOI is shown in **Figure 7-23**.

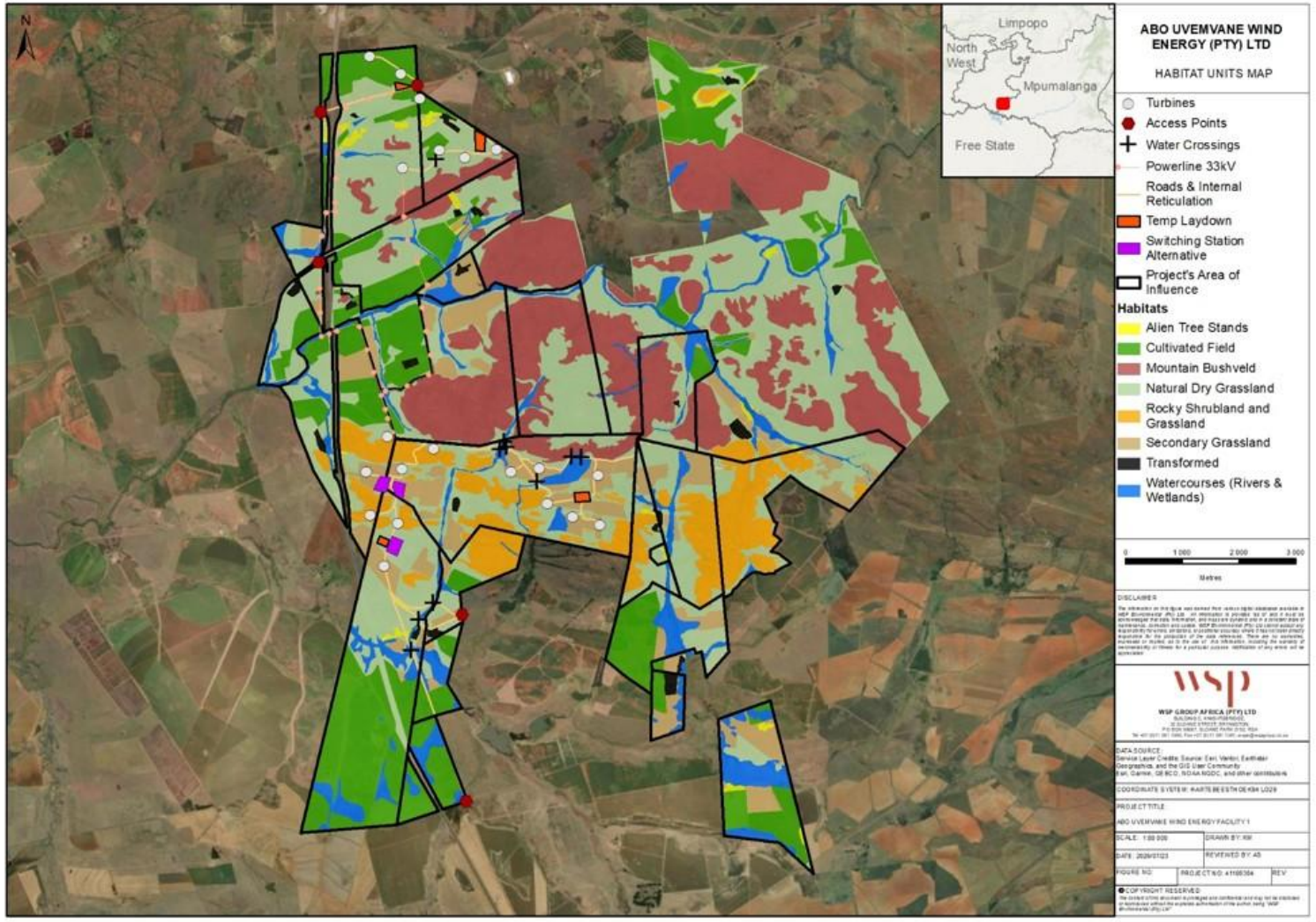


Figure 7-23 - Habitat unit map of the PAOI

7.2.1.5 Flora species of conservation concern

The following notes summarise the key findings of the Plant Species Specialist Assessment with respects to flora SCC and protected species occurring and potentially occurring in the PAOI:

- No flora SCC were recorded in the PAOI during the field programme. However, habitat suitability assessments indicate that several SCC may be present; and
- Several flora species recorded in the PAOI during the field programme are listed as Protected on the Mpumalanga Nature Conservation Act (Act No. 10 of 1998) and/or Gauteng's Nature Conservation Ordinance 12 of 1983 (as amended).

For additional information refer to the Plant Species Specialist Assessment report. Attached as **Appendix G.12**.

7.2.1.6 Fauna species of conservation concern

The following notes summarise the key findings of the Animal Species Specialist Assessment with respects to fauna SCC occurring and potentially occurring in the PAOI:

- During the 2024 and 2025 field programme, six free-roaming mammal SCC were confirmed in the PAOI, namely:
  - Mountain Reedbuck (*Redunca fulvorufula fulvorufula*) – Endangered;
  - Serval (*Leptailurus serval*) - Near Threatened;
  - Cape Clawless Otter (*Aonyx capensis*) - Near Threatened;
  - Vlei Rat (*Otomys cf. auratus*) - Near Threatened;
  - Grey Rhebok (*Pelea capreolus*) - Near Threatened;
  - Southern African Hedgehog (*Atelerix frontalis*) - Near Threatened;
- An additional two actively-managed/farmed mammal SCC were also recorded in the PAOI, viz. Sable Antelope (*Hippotragus niger niger*) - Vulnerable and Roan Antelope (*Hippotragus equinus*) – Vulnerable. Both antelope species are extralimital within the PAOI. They would therefore not currently be included in national Red List conservation assessments, as their conservation value would be regarded as 'uncertain'; and
- The PAOI comprises large areas of diverse natural habitat, and habitat suitability assessments indicate that several other fauna SCC are likely to be present.

For additional information on the observed mammal SCC, refer to the Animal Species Specialist Assessment report attached as **Appendix G.13**.

7.2.1.7 General sensitivity and site ecological importance

To assess the general ecological sensitivity of the PAOI with respects to terrestrial biodiversity, regional- and local factors were considered:

- Biodiversity Significance: Large sections of the PAOI are designated as Critical Biodiversity Areas (CBAs) under both the MBSP (2022) and the Gauteng C-Plan (Version 4). Several biodiversity attributes contribute to these designations including inter alia, the confirmed/potential presence of flora and fauna SCC, primary habitat, threatened ecosystems, and various essential ecological processes. CBAs are important for achieving provincial biodiversity targets;
- Threatened Ecosystems: Soweto Highveld Grassland (VU) and Tsakane Clay Grassland (EN) characterise portions of grassland in the north and south of the PAOI. At a national-level, both

vegetation types have experienced large-scale habitat loss and modification due to various anthropogenic activities, and both are thus listed as threatened vegetation types;

- Other ecological features: Rivers and Wetlands - the Suikerbosrand River runs through the centre of the PAOI, while numerous other smaller streams and wetlands are also present. Watercourses and wetlands are crucial for regional hydrology and biodiversity conservation, with several flora and fauna SCC known, or likely to be present, in these habitats in the PAOI. Ridges - ridges are recognised as important biodiversity features, harbouring diverse flora and fauna communities, including several SCC. They also play an important role in many ecological (dispersal) and hydrological (water recharge) processes.

Based on these considerations, the findings of this specialist study confirm the DFFE screening tool rating of '**Very High'** sensitivity for patches of natural habitat in the PAOI.

The site-specific ecological importance (SEI) of identified habitat units in the PAOI were further assessed using the SANBI (2026) protocol (refer to **Section 3.4** and Appendix B for the methodology on the specialist report attached as **Appendix G.2**). The results of the assessment are presented in **Table 7-12** and shown in **Table 7-24**.

Table 7-12 - Site Ecological Importance of habitat unit in the PAOI

Habitat Unit	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Mountain Bushveld	HIGH: Confirmed or highly likely occurrence of CR, EN, VU species (= Mountain Reedbuck, EN & several NT species).	HIGH: Large intact area for any conservation status ecosystem types. Good habitat connectivity with potentially functional ecological corridors. Only minor current negative ecological impacts with limited signs of major past disturbance and good rehabilitation potential.	HIGH	MEDIUM: Habitat that can recover slowly (~ more than 10 years) to restore >75% of the original species composition and functionality of the receptor functionality	HIGH
Rocky Shrubland and Grassland	HIGH: Confirmed or highly likely occurrence of CR, EN, VU species (= Mountain Reedbuck, EN & several NT species).	HIGH: Large intact area for any conservation status ecosystem types. Good habitat connectivity with potentially functional ecological corridors. Only minor current negative ecological impacts with limited signs of major past disturbance and good rehabilitation potential.	HIGH	MEDIUM: Habitat that can recover slowly (~ more than 10 years) to restore >75% of the original species composition and functionality of the receptor functionality	HIGH
Watercourses (Rivers and Wetlands)	HIGH: Confirmed or highly likely occurrence of CR, EN, VU species. Small area of natural habitat of EN or VU ecosystem type (=several NT species; Soweto Highveld Grassland, VU & Tsakane Clay, EN).	HIGH: Large intact area for any conservation status ecosystem types. Good habitat connectivity with potentially functional ecological corridors. Only minor current negative ecological impacts with limited signs of major past disturbance and good rehabilitation potential.	HIGH	MEDIUM: Habitat that can recover slowly (~ more than 10 years) to restore >75% of the original species composition and functionality of the receptor functionality	HIGH

Habitat Unit	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Natural Dry Grassland	HIGH: Confirmed or highly likely occurrence of CR, EN, VU species. Small area of natural habitat of EN or VU ecosystem type (= Mountain Reedbuck, EN; several NT species; Soweto Highveld Grassland, VU & Tsakane Clay, EN).	HIGH: Large intact area for any conservation status ecosystem types. Good habitat connectivity with potentially functional ecological corridors. Only minor current negative ecological impacts with limited signs of major past disturbance and good rehabilitation potential.	HIGH	MEDIUM: Habitat that can recover slowly (~ more than 10 years) to restore >75% of the original species composition and functionality of the receptor functionality	HIGH
Secondary Grassland	LOW: No confirmed populations of SCC. < 50% of receptor contains natural habitat.	LOW: Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network. BUT, Several major past and current impacts (=ploughing).	LOW	MEDIUM: Habitat that can recover slowly to restore >75% of the original species composition and functionality.	LOW
Alien Tree Plantations	VERY LOW: No confirmed or highly likely populations of SCC or range-restricted species. No natural habitat remaining.	VERY LOW: Several major current negative ecological impacts.	VERY LOW	VERY HIGH: Habitat that can recover rapidly to restore >75% of the original species composition and functionality.	VERY LOW
Cultivated Fields	VERY LOW: No confirmed or highly likely populations of SCC or range-restricted species. No natural habitat remaining.	VERY LOW: Several major current negative ecological impacts.	VERY LOW	VERY HIGH: Habitat that can recover rapidly to restore >75% of the original species composition and functionality.	VERY LOW

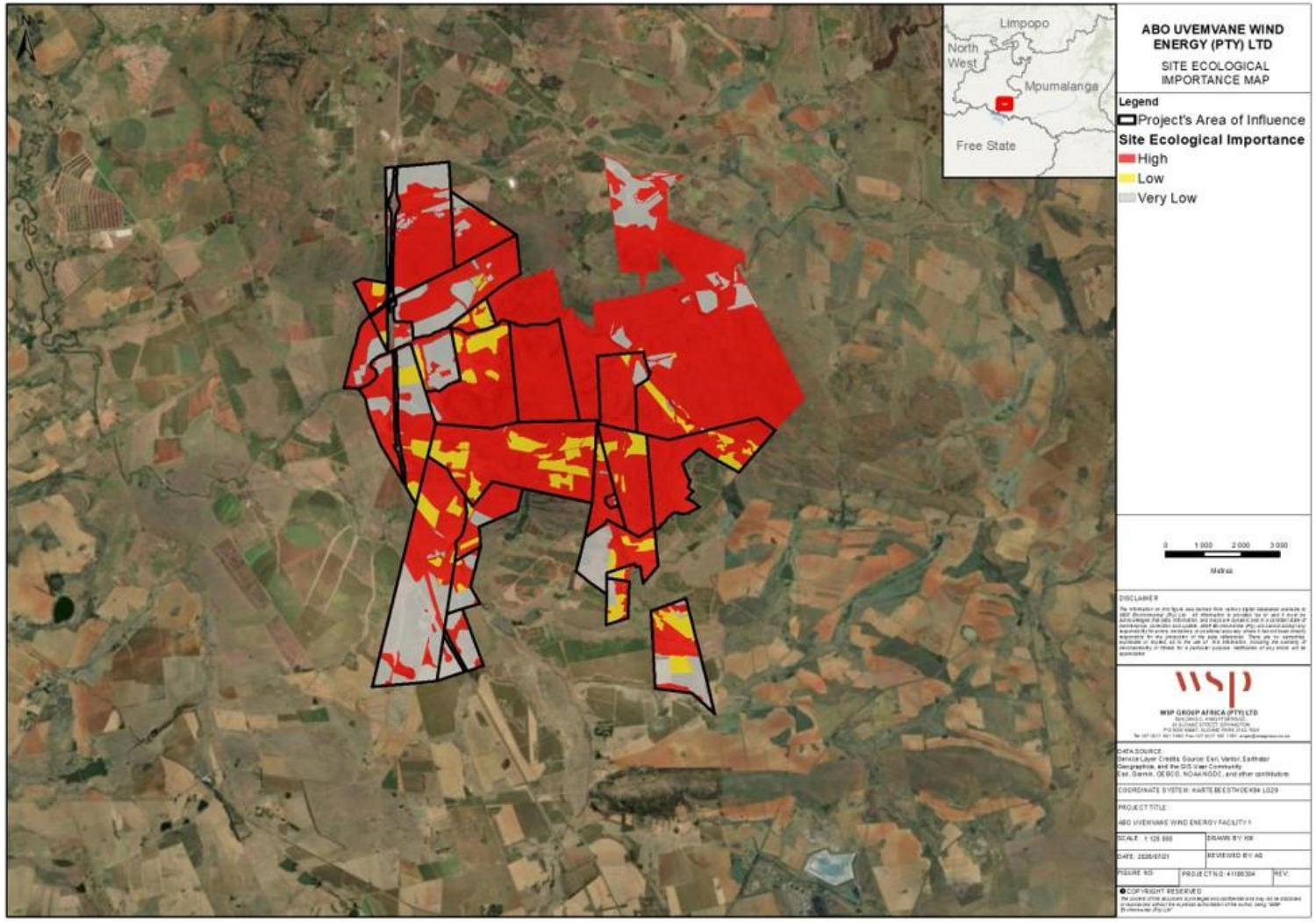


Figure 7-24 - Site Ecological Importance of the PAOI

7.2.2. PLANT SPECIES

The following is extracted from the Plant Species Assessment compiled by Hawkhead Consulting and included as Appendix G.12.

7.2.2.1 Habitat units

- Seven habitat units were identified within the PAOI. Their characteristics and biodiversity sensitivities are described in **Section 7.1.1.4 Habitat units in the PAOI** (Terrestrial Biodiversity). Flora findings are discussed below in the context of these habitat units
- These habitat units are described, with accompanying photographs, in the Sections below. A habitat unit map for the PAOI is shown in **Figure 7-23**.

7.2.2.2 Mountain Bushveld

Mountain Bushveld is a variable habitat unit, that dominates the taller rocky hills and mountains in the north of the PAOI. Vegetation structure ranges from low open bushveld to low- and short closed bushveld depending on slope position, as per Edwards (1983) structural classification, and this generally grades into the Natural Dry Grassland habitat unit.

The woody component is dominated by broad-leafed species. The herbaceous layer is moderately- to well-developed, except in very rocky sites, and in most areas is grass dominated, although forbs are common to locally abundant (**Figure 7-25** and **Figure 7-26**).

Dominant woody species generally include *Diospyros lycioides, Searsia leptodictya and Searsia pyroides, with several other taxa also common or diagnostic, such as Aloe marlothii, Cussonia paniculata, Dombeya rotundifolia, Euclea crispa, Gymnosporia buxifolia, Lippia javanica, Rhoicissus tridentata, Vangueria parvifolia and Ziziphus mucronata*.

Species commonly recorded in the herbaceous layer of areas of Mountain Bushveld include grasses, such as *Brachiaria serrata, Eragrostis chloromelas, Eragrostis curvula, Hyparrhenia hirta, Melinis nerviglumis, Setaria sphacelata, Themeda triandra and Tristachya leucothrix, and various forbs including inter alia; Acalypha angustata, Berkheya setifera, Commelina africana var. barberae, Hilliardiella oligocephala, Hypoxis acuminata, Ipomoea ommaneyi, Pentanisia angustifolia and Pseudopegolettia tenella*. For a list of flora species recorded in this habitat unit during the field survey refer to Appendix C of the specialist report.

Figure 7-25 - Typical Mountain Bushveld

Figure 7-26 - Typical Mountain Bushveld

Sensitivity Aspects

- The Mountain Bushveld that characterises the rocky hills and mountains in the PAOI is a natural habitat unit;
- These areas provide important habitat for a variety of flora and fauna, and at both local- and regional scales they increase habitat heterogeneity and play a vital role as landscape corridors and refugia;
- No flora SCC were recorded in this habitat unit; however, habitat suitability assessments suggest that several flora SCC may be present; and
- Areas of Mountain Bushveld in the PAOI are therefore considered to have floristic importance and sensitivity.

7.2.2.3 Rocky Shrubland and Grassland

Rocky Shrubland and Grassland characterises the low, but very rocky hills and ridges in the southern portion of the PAOI. Vegetation structure is variable and ranges from low closed grassland to low- to high open shrubland (sensu. Edwards, 1983). Woody vegetation is dominated by broad-leafed species and the herbaceous layer is poor- to moderately developed and generally grass dominated (**Figure 7-27** and **Figure 7-28).**

Dominant woody species include Protea *caffra, Searsia magalismontana and Vangueria parvifolia. Other common woody taxa include Ancylobothrys capensis, Brachylaena rotundata, Clutia pulchella, Cussonia paniculata, Englerophytum magalismontanum, Lopholaena coriifolia and Mundulea sericea*.

Common graminoids species recorded include *Cyperus rupestris, Eragrostis chloromelas, Eragrostis curvula, Eragrostis trichophora, Melinis nerviglumis, Loudetia simplex, Microchloa caffra and Tristachya leucothrix, while common forbs include inter alia; Cleome maculata, Commelina africana var. barberae, Helichrysum lepidissimum, Hilliardiella aristata, Hypoxis acuminata, Indigofera melanadenia, Phymaspermum athanasioides and Tritonia nelsonii*. For a list of flora species recorded in this habitat unit during the field survey refer to Appendix C of the study.

Sensitivity Aspects

Rocky Shrubland and Grassland shares many of the same sensitivity features as Mountain Bushveld:

- Rocky Shrubland and Grassland in the PAOI is a natural habitat unit;
- These areas provide important habitat for a variety of flora and fauna, and at both local- and regional scales, they increase habitat heterogeneity and play a vital role as landscape corridors and refugia;
- No flora SCC were recorded in this habitat unit; however, habitat suitability assessments suggest that several flora SCC may be present; and
- Areas of Rocky Shrubland and Grasslands in the PAOI are therefore considered to have floristic importance and sensitivity.

Figure 7-27 - Typical area of Rocky Shrubland and Grassland

Figure 7-28 - Area of Rocky Shrubland and Grassland dominated by Protea caffra trees

7.2.2.4 Watercourses (Rivers and Wetlands)

This is a variable habitat unit that is associated with the drainage features in the PAOI, including large watercourses, such as the Suikerbosrand River, as well as smaller drainage lines and wetland systems.

Vegetation structure along larger rivers and streams ranges from low- to short open bushveld, with certain areas characterised by low- to short closed bushveld (**Figure 7-29**) In more typical wetland areas, vegetation structure is typically characterised by low- to tall closed grassland **(Figure 7-30**) (sensu. Edwards, 1983).

Common woody species generally recorded along rivers and streams include a mixture of *Celtis africana, Diospyros lycioides, Leucosidea sericea, Salix mucronata, Searsia leptodictya, Searsia pyroides* and the alien trees *Gleditsia triacanthos, Salix babylonica* and *Sesbania punicea*. Some notable variations include dense, closed-canopy stands of *Olea europaea* that characterise certain mountain valley streams, and thickets dominated by *Leucosidea sericea* that characterise overgrazed river and drainage line portions.

Common flora species recorded include grasses and sedges such as *Andropogon appendiculatus, Digitaria eriantha, Cyperus congesta, Eleocharis limosa, Eragrostis curvula, Eragrostis gummiflua, Eragrostis plana, Kyllinga erecta, Panicum maximum, Panicum schinzii, Paspalum distichum, Paspalum dilatatum*, Scirpoides burkei, Setaria sphacelata and Themeda triandra.* The tall reed *Phragmites australis*, as well as the bulrush *Typha capensis* are also present in certain areas. Common forbs recorded in this habitat unit include inter alia; *Berkheya bipinnatifida, Berkheya radula, Berkheya speciosa, Bidens pilosa*, Centella asiatica, Cleome maculata, Commelina africana, Chironia palustris, Monopsis decipiens and Senecio inornatus* (*denotes alien species). For a list of flora species recorded in this habitat unit during the field survey refer to Appendix C of the specialist assessment report.

Sensitivity Aspects

- Watercourse habitats play a crucial role in maintaining terrestrial biodiversity, ecological processes and the hydrological functioning (e.g., filtration and flood attenuation) of the landscape.
- These habitats significantly increase landscape-scale habitat connectivity and thus provide important ecological corridors.

- No flora SCC were recorded in this habitat unit; however, habitat suitability assessments suggest that several flora SCC may be present;
- Watercourse habitats in the PAOI are therefore considered to have floristic importance and sensitivity.

Figure 7-29 - The Suikerbosrand River, flanked by both woody and herbaceous flora species

Figure 7-30 - Valley-bottom wetland, with an artificial farm dam

Figure 7-31 - Mountain valley, characterised by closed-canopy woodland dominated by Olea europaea

Figure 7-32 - Drainage line encroached by Leucosidea sericea thickets

7.2.2.5 Natural Dry Grassland

Natural Dry Grasslands occur throughout the PAOI, where they typically grade into areas of Mountain Bushveld or Rocky Shrubland and Grassland. Structurally, vegetation comprises low closed grassland, as per Edwards (1983).

Generally, this habitat unit is species rich and considered a primary vegetation community. Compositionally, vegetation is dominated by grasses, although forbs and some woody species are present and can be locally abundant **Figure 7-33** and **Figure 7-34.**

Common grass species recorded in areas of natural grassland include *Brachiaria serrata, Cymbopogon caesius, Cymbopogon pospischilii, Eragrostis chloromelas, Eragrostis curvula, Harpochloa falx, Hyparrhenia hirta, Melinis nerviglumis, Setaria sphacelata, Themeda triandra and*

Tristachya leucothrix. In overgrazed or trampled areas of this habitat unit, the species composition is similar to areas of Secondary Grassland and characterised by a prevalence of *Eragrostis* species.

Commonly recorded forbs include *Acalypha angustata, Berkheya setifera, Cleome maculata, Cyanotis speciosa, Hermannia depressa, Hilliardiella aristata, Hilliardiella oligocephala, Hypoxis acuminata, Ipomoea ommaneyi, Ledebouria luteola, Senecio inornatus, Senecio oxyriifolius and Scabiosa columbaria.*

Woody species generally occur as scattered individual- or small aggregations of medium-sized trees and shrubs. Common species include *Cussonia paniculata, Diospyros lycioides, Euclea crispa, Leucosidea sericea, Osteospermum moniliferum, Protea caffra and Seriphium plumosum*. The dwarf shrubs *Elephantorrhiza elephantina, Searsia discolor and Ziziphus zeyheriana* were also frequently recorded. For a list of flora species recorded in this habitat unit during the field survey refer to Appendix C of the specialist report.

Sensitivity Aspects

- Natural Dry Grassland in the PAOI is a natural habitat unit;
- These areas provide important habitat for a variety of flora and fauna, and also act as important ecological corridors, increasing local habitat connectivity and facilitating various ecological processes such as, inter alia, flora and fauna movement and dispersal;
- No flora SCC were recorded in this habitat unit; however, habitat suitability assessments suggest that several flora SCC may be present; and
- Natural Grasslands in the PAOI are therefore considered to have floristic importance and sensitivity.

Figure 7-33 - Typical example of Natural Dry Grassland in the PAOI

Figure 7-34 - Forb dominated area of Natural Dry Grassland

7.2.2.6 Secondary Grassland

Secondary Grasslands characterise former cultivated fields (‘old lands’) that have been left fallow, and over several years, have regenerated into a recovering (secondary) grassland community.

In line with Edwards (1983), vegetation structure is low closed grassland. Compositionally, Secondary Grasslands exhibit lower diversity compared to areas of Natural Dry Grassland, and are typically dominated by a small number of grass species – mostly *Eragrostis species, such as Eragrostis chloromelas, Eragrostis curvula and Eragrostis trichophora* (shown in **Figure 7-35**). The tall, robust

thatching grasses *Hyparrhenia hirta* also prevalent in certain areas of Secondary Grassland (**Figure 7-36).**

Other recorded grasses include *Cynodon dactylon, Digitaria eriantha, Eragrostis gummiflua, Eragrostis racemosa, Melinis nerviglumis, Pogonarthria squarrosa, Setaria sphacelata, Themeda triandra and Tristachya leucothrix.*

Few forbs are present in areas of this habitat unit, and include, inter alia; *Cleome monophylla, Commelina africana, Cyanotis speciosa, Gomphrena celosioides*, Helichrysum callicomum, Helichrysum nudifolium var. nudifolium, Hilliardiella oligocephala, Ipomoea ommaneyi and Solanum elaeagnifolium*.*

Woody species occurs as scattered individual small shrubs, and typically *include Diospyros lycioides, Elephantorrhiza elephantina, Searsia rigida* and *Seriphium plumosum*. For a list of flora species recorded in this habitat unit during the field survey refer to Appendix C of the specialist assessment report.

Sensitivity Aspects

- Secondary Grassland is a modified habitat unit;
- These areas have been stable for a long period, and as a result retain some of the functional attributes of natural grasslands;
- No flora SCC were recorded in this habitat unit. Considering their disturbed nature, it is considered unlikely that any flora SCC are present; and
- Accordingly, these Secondary Grasslands in the PAOI have low floristic importance or sensitivity.

Figure 7-35 - Eragrostis dominated Secondary Grassland I.

Figure 7-36 - Hyparrhenia hirta dominated Secondary Grassland

7.2.2.7 Alien Tree Stands

Alien tree stands are present in the PAOI. These generally occur as small, localised single-species stands. Structurally, they are defined as closed woodland, as per Edwards (1983). Dominant tree species dominating these stands in the PAOI include *Acacia mearnsii*, *Eucalyptus* species and *Populus x canescens* (**Figure 7-37** and **Figure 7-38).** Little to no indigenous vegetation is present in well-established alien tree stands.

Sensitivity Aspects

- Alien tree stands are considered modified habitat;

- No flora SCC were recorded in this habitat unit, and none are likely to be present; and
- Accordingly, Alien Tree Stands have no floristic importance or sensitivity.

Figure 7-37 - Small stand/windrow of Eucalyptus camaldulensis trees I

Figure 7-38 - Stand of Populus x canescens trees encroaching in a wetland in the PAOI I

7.2.2.8 Cultivated Fields

Several cultivated fields, including both pivot-irrigated and dry-land crop fields, are present across the PAOI. Most occur on the flatter edges of the PAOI, although there are a small number of fields in low-lying areas within the interior of the PAOI.

This habitat unit includes both actively/currently used cultivated fields that are regularly disturbed and denuded of indigenous vegetation (**Figure 7-39**), and well as fallow fields that have not been ploughed/cultivated in the recent past, but still remain either unvegetated or dominated by a combination of alien and indigenous ruderal plants and weeds.

Sensitivity Aspects

- Cultivated fields are considered a modified habitat Unit;
- They have been, or are currently, subject to regular and intense anthropogenic disturbance. When not dominated by a monoculture of crop species, these areas are typically colonised by several alien weeds, including some declared AIS;
- No flora SCC were recorded in this habitat unit and none are considered likely to be present; and
- Accordingly, Cultivated Fields have no floristic importance or sensitivity.

Figure 7-39 - Recently ploughed cultivated field

7.2.2.9 Floristics Analysis

Flora Species of Conservation Concern

Based on reviewed literature and data sources, up to 14 flora species that potentially occur in the PAOI are listed as SCC on the Red List of South Africa Plants. These taxa are listed in **Table 7-13** along with the conservation statuses, habitat preferences and a probability of occurrence, based on the findings of habitat suitability assessments. Twelve of the 14 taxa are summer flowering species.

No flora SCC were recorded in the PAOI during the field programme. However, considering the size and availability and diversity of natural habitat in the PAOI, habitat suitability assessments indicate that it is possible that several species SCC may be present across the broader PAOI.

Several taxa highlighted by the DFFE Screening Tool as potentially sensitive features for the PAOI for example favour open, undulating grassland habitats, often associated with exposed rocky outcrops. These include *Khadia beswickii, Delosperma macellum*, Sensitive Species 691, and *Brachycorythis conica subsp. transvaalensis*. Other taxa, such as Sensitive Species 1252 and Sensitive Species 1248, are more closely associated with wooded or bushland habitats. Both open grassland and more closed wooded habitats are present in the PAOI, and it is therefore possible/probable that some of these flora SCC may occur in undisturbed portions of natural habitat in the broader PAOI. Conversely, Prunus africana is typically associated with more well-developed forest habitat, which is not present in the PAOI. It is therefore considered unlikely that this species is present. In **Table 7-13**, it provides species-specific accounts for these taxa, as well as other SCC that potentially occur in the PAOI based on reviewed literature and datasets.

It is noted that most proposed Project infrastructure has been strategically located in areas that have already been disturbed by human activities, including historic and current cultivation, while most of proposed access road have been aligned with existing farm roads and vehicle tracks. It is therefore considered unlikely that flora SCC are present where infrastructure is proposed.

Nationally and Provincially Protected Species

Several flora species recorded in the PAOI during the field programme are listed as Protected on the Mpumalanga Nature Conservation Act (Act No. 10 of 1998) and/or Gauteng's Nature Conservation Ordinance 12 of 1983 (as amended).

These are listed in **Table 7-14**, along with other provincially Protected flora species that potentially occur in the PAOI based on reviewed literature and datasets. No flora species listed on the NEMBA ToPS List (2007) are likely to occur in the PAOI. **Figure 7-40** to **Figure 7-43** show images of select Protected flora species taken in the PAOI during the field programme.

Table 7-13 - National Red List flora species that potentially occur in the PAOI

Family	Scientific Name#	National Red List Status	Flowering Time	Habitat Preferences	Probability of Occurrence in the PAOI
Aizoaceae	*Delosperma leendertziae*	Near Threatened	August-March	Has an EOO of 8658 km2 and an AOO of 4-13 km2. Known from 10 locations, where it favours steep south-facing quartzite slopes in mountain grassland (Victor and Pfab, 2005c). iNaturalist records indicate that this species has been recorded at Suikerbosrand Nature Reserve.	Possible – suitable habitat present in the PAOI.
Aizoaceae	*Delosperma macellum*	Endangered	November-April	Known from only two locations, with a total population estimated at 68 mature individuals (Victor and Pfab, 2005b). The occupied area of this species is 101 km2 (SANBI, 2026). Occurs in open areas, near trees and favours loose gravel habitats (Victor and Pfab, 2005b).	Possible – suitable habitat present in the PAOI.
Aizoaceae	*Khadia beswickii*	Vulnerable	July-April	Species has an EOO of only 475 km2 and an AOO of 3-7 km2 (Victor and Pfab, 2005a). SANBI (2026) indicate the occupied area of this species is 1439.33 km2. It is known from only ten locations, mostly across Gauteng Province, but also scattered sites in Mpumalanga. iNaturalist records indicate that this species has been recorded at two sites close to the POAI in 2023; approximately 6.6 km north-east and 2 km north-west of the PAOI. Favours open shallow soils, over rocks in grassland (Victor and Pfab, 2005a).	Probable – suitable habitat present in the PAOI, but unlikely to be present in disturbed areas.
Aizoaceae	*Lithops lesliei subsp. lesliei*	Vulnerable	March-June	Rocky habitats in arid grassland (Mtshali, et al., 2023). The occupied area of this species according to SANBI (2026) is 2620.67 km2.	Probable – suitable habitat present in the PAOI, but unlikely to be

Family	Scientific Name#	National Red List Status	Flowering Time	Habitat Preferences	Probability of Occurrence in the PAOI
				iNaturalist records indicate that this species has been recorded in 2015 at sites approximately 5 km and 6.5 km to the north and west of the PAOI, respectively.	present in disturbed areas.
Asteraceae	*Cineraria longipes*	Vulnerable	March-May	Known from six subpopulations, with an AOO estimated at 5-14 km2 (Pfab and Victor, 2005a). The occupied area of this species is 138.62 km2 by SANBI (2026). Occurs on south-facing slopes of basalt hills, where it favours grassland habitats, where it grows amongst rocks and seepage lines (Pfab and Victor, 2005a). iNaturalist records indicate that this species has been recorded at Suikerbosrand Nature Reserve.	Possible – suitable habitat present in the PAOI.
Brassicaceae	*Cleome conrathii*	Near Threatened	March-May December-January	Occurs in grassland or deciduous woodland, where it favours stony quartzite slopes, with red sandy soils (Pfab, et al., 2005)	Probable – suitable habitat present in the PAOI, but unlikely to be present in disturbed areas.
Crassulaceae	*Adromischus umbraticola subsp. umbraticola*	Near Threatened	September-January	Species has an EOO of 14 600 km2 and is known from 14 locations. Grows in rock crevices on south-facing slope ridges. (Helme and Raimondo, 2006). iNaturalist records indicate that this species has been recorded at a site to the north-west of the PAOI.	Probable – suitable habitat present and previously recorded in close proximity to the PAOI.
Orchidaceae	*Brachycorythis conica subsp. transvaalensis*	Critically Endangered	January-March	Three small subpopulations of this species remain in Mpumalanga, all with populations of <10 individual plants (Van Staden et al., 2015). One other subpopulation is known in	Possible – suitable habitat present in the PAOI.

Family	Scientific Name#	National Red List Status	Flowering Time	Habitat Preferences	Probability of Occurrence in the PAOI
				Gauteng and numbers about 117 plants (Van Staden et al., 2015). This species has an occupied area estimated at 1194.27 km2 (SANBI, 2026). Favours short open grassland and wooded grassland, on sandy gravel overlying dolomite and occasionally quartzite. Occurs at an altitude of between 1000-1705 m (Van Staden et al., 2015).	
Orchidaceae	*Eulophia coddii*	Vulnerable	December	A range-restricted species, with an EOO of 7000-9000 km2 Pfab and Victor, 2005b). The occupied area of this species is 110.89 km2 (SANBI, 2026). Known from five locations, with an estimated population size of 240-1000 individuals (Pfab and Victor, 2005b). Occurs in bushveld and grassland, where it prefers sandstone-derived soils on steep slopes (Pfab and Victor, 2005b). iNaturalist records indicate that this species has been recorded in and around Suikerbosrand Nature Reserve in 2019-2022.	Probable – suitable habitat present in the PAOI, but unlikely to be present in disturbed areas.
Orchidaceae	*Habenaria barbertoni*	Near Threatened	February to March	Favours rocky hillsides in Acacia savanna, at altitudes between 1000 -1500 m (Victor, et al., 2005). iNaturalist records indicate that this species has been recorded at a site to the north of the PAOI.	Unlikely – no suitable habitat in the PAOI.
Rosaceae	*Prunus africana*	Vulnerable	December - June	Forest species, favouring inter alia, inland mistbelt and Afromontane forests up to 2100 m. Population estimated at 10 000 mature trees (Williams et al., 2008). The occupied area of this species is 1116.73 km2 according to SANBI (2026).	Unlikely – limited to no suitable habitat.

Family	Scientific Name#	National Red List Status	Flowering Time	Habitat Preferences	Probability of Occurrence in the PAOI
-	*Sensitive species 1248*	Vulnerable	September - April	Found in open woodland and steep rocky hills in shady situations at low- and medium altitudes. No EOO for this species is listed. The occupied area of this species is estimated at 9013.20 km2 (SANBI, 2026).	Possible – suitable habitat present.
-	*Sensitive species 1252*	Vulnerable	October - January	Moist bushveld habitats, including wooded mountain kloofs. The occupied area of this species is 4592.18 km2 (SANBI, 2026).	Possible – suitable habitat present.
-	*Sensitive species 691*	Vulnerable	February - March	EOO is between 455 and 11 158 km2, and thought to occur at less than 10 locations. The occupied area of this species is estimated at 6903.43 km2 (SANBI, 2026). Prefers moist areas in undulating grassland. iNaturalist records indicate that this species has been recorded at a site to the north-west of the PAOI.	Possible – suitable habitat present.

Table 7-14 - Provincially Protected flora species observed or potentially occurring in the PAOI

Family	Species Name	Gauteng Protected Status (1983)	Mpumalanga Protected Status (1998)	Field Programme Record
Agapanthaceae	*Agapanthus campanulatus*	Protected	-	
Amaryllidaceae	*Boophone disticha*	-	Protected	Confirmed
Amaryllidaceae	*Crinum bulbispermum*	Protected	Protected	Confirmed
Amaryllidaceae	*Crinum graminicola*	Protected	Protected	Confirmed
Amaryllidaceae	*Haemanthus humilis*	Protected	Protected	
Amaryllidaceae	*Haemanthus montanus*	Protected	Protected	
Amaryllidaceae	*Nerine krigei*	Protected	-	
Amaryllidaceae	*Scadoxus multiflorus*	Protected	Protected	
Anacampserotaceae	*Anacampseros subnuda*	-	-	
Apocynaceae	*Ceropegia rendallii*	Protected	Protected	
Apocynaceae	*Stapelia leendertziae*	Protected	-	
Araceae	*Zantedeschia albomaculata subsp. albomaculata*	Protected	Protected	
Aquifoliaceae	*Ilex mitis var. mitis*	-	-	
Araliaceae	*Cussonia paniculata*	Protected	-	Confirmed
Asphodelaceae	*Aloe bergeriana*	Protected	Protected	
Asphodelaceae	*Aloe davyana*	-	Protected	Confirmed
Asphodelaceae	*Aloe marlothii*	-	Protected	Confirmed
Asphodelaceae	*Aloe subspicata*	Protected	Protected	
Asphodelaceae	*Aloe transvaalensis*	Protected	Protected	
Asphodelaceae	*Aloe verecunda*	Protected	Protected	Confirmed
Asphodelaceae	*Kniphofia porphyrantha*	Protected	Protected	
Hypoxidaceae	*Hypoxis hemerocallidea*	-	Protected	Confirmed
Iridaceae	*Babiana bainesii*	Protected	-	
Iridaceae	*Gladiolus crassifolius*	Protected	Protected	
Iridaceae	*Gladiolus elliotii*	Protected	Protected	
Iridaceae	*Gladiolus longicollis subsp. platypetalus*	Protected	Protected	
Iridaceae	*Gladiolus papilio*	Protected	Protected	
Iridaceae	*Gladiolus permeabilis subsp. edulis*	Protected	Protected	
Iridaceae	*Gladiolus sericeovillosus subsp. calvatus*	Protected	Protected	

Family	Species Name	Gauteng Protected Status (1983)	Mpumalanga Protected Status (1998)	Field Programme Record
Iridaceae	*Gladiolus sericeovillosus subsp. sericeovillosus*	Protected	Protected	
Iridaceae	*Gladiolus dalenii*	Protected	Protected	Confirmed
Iridaceae	*Gladiolus permeabilis subsp. edulis*	Protected	Protected	Confirmed
Orchidaceae	*Bonatea antennifera*	Protected	Protected	
Orchidaceae	*Brownleea parviflora*	Protected	Protected	
Orchidaceae	*Disa aconitoides subsp. aconitoides*	Protected	Protected	
Orchidaceae	*Eulophia hians var. nutans*	Protected	Protected	
Orchidaceae	*Eulophia ovalis var. bainesii*	Protected	Protected	
Orchidaceae	*Eulophia tuberculata*	Protected	Protected	
Orchidaceae	*Habenaria falcicornis subsp. caffra*	Protected	Protected	
Orchidaceae	*Habenaria filicornis*	Protected	Protected	
Orchidaceae	*Habenaria galpinii*	Protected	Protected	
Orchidaceae	*Habenaria pseudociliosa*	Protected	Protected	
Orchidaceae	*Orthochilus leontoglossus*	Protected	Protected	
Orchidaceae	*Orthochilus welwitschii*	Protected	Protected	
Orchidaceae	*Pterygodium dracomontanum*	Protected	Protected	
Orchidaceae	*Satyrium parviflorum*	Protected	Protected	
Proteaceae	*Protea caffra*	Protected	Protected	Confirmed
Proteaceae	*Protea roupelliae subsp. roupelliae*	Protected	Protected	
Source: List based on data from BODATSA and field observations.				

Figure 7-40 - Boophone disticha

Figure 7-41 - Protea caffra

Figure 7-42 - Aloe verecunda

Figure 7-43 - Crinum graminicola

7.2.2.10 Declared Alien Invasive Species

Based on the findings of the field survey, 17 NEMBA declared alien invasive plant species were recorded in the PAOI. These are listed **Table 7-15** along with their growth form and NEMBA Category.

Table 7-15 - NEMBA Declared alien invasive species recorded during the PAOI

Scientific Name	Common Name	Growth Form	NEMBA Category
Acacia dealbata	Silver Wattle	Tree	2
Acacia mearnsii	Black Wattle	Tree	2
Cereus jamacaru	Queen of the Night	Succulent Tree	1b
Cirsium vulgare	Spear Thistle	Herbaceous forb	1b
Cuscuta campestris	Common Dodder	Parasite	1b
Datura stramonium	Large Thorn Apple	Herbaceous forb	1b
Eucalyptus camaldulensis	Gum	Tree	2
Gleditsia triacanthos	Honey Locust	Tree	1b
Melia azedarach	Syringa	Tree	1b
Opuntia ficus-indica	Sweet Prickly Pear	Succulent Tree	1b
Pennisetum clandestinum	Kikuyu	Graminoid	1b
Populus x canescens	Gray Polar	Tree	2
Pyracantha angustifolia	Yellow Firethorn	Tree	1b
Sesbania punicea	Red Sesbania	Tree	1b
Solanum elaeagnifolium	Potato Creeper	Herbaceous forb	1b
Verbena bonariensis	Wild Verbena	Herbaceous forb	1b
Xanthium spinosum	Spiny Cocklebur	Herbaceous forb	1b
Xanthium strumarium	Large Cocklebur	Herbaceous forb	1b

7.2.2.11 Flora of Medicinal Value

Twenty-nine flora species recorded in the PAOI have recognised medicinal value. These are listed in **Table 7-16** accompanied by a description of their purported use, as per Van Wyk *et al.*, (2009).

Table 7-16 - Flora species recorded in the RSA that have recognised medicinal value

Scientific Name Nationally Threatened Ecosystems	Medicinal Use*
Afroaster serrulatus	Used to treat headaches.
Artemisia afra	Treats several ailments, such as coughs, colds, fever and influenza.
Asparagus species	Used in the treatment of tuberculosis, kidney ailments and rheumatism.
Athrixia elata	Used as a remedy for coughs and as a purgative.
Boophone disticha	Bulbs scales are used to treat boils and septic wounds, as well as alleviate pains.
Centella asiatica	Used to treat a variety of infirmities including leprosy, wounds, cancer, fever and syphilis.
Crinum bulbispermum	Treats colds and scrofula.
Datura stramonium	Relieves asthma and acts to reduce pain. Weak infusions are used as an aphrodisiac.
Dombeya rotundifolia	Used to treat ulcers, diarrhoea, haemorrhoids and other stomach afflictions.
Elephantorrhiza elephantina	Used to treat diarrhoea, haemorrhoids, dysentery, perforated ulcers and as an emetic. .
Gomphocarpus fruticosus	Ground leaves are used as snuff, and to treat headaches, tuberculosis and as an emetic.
Helichrysum species	Treats a variety of afflictions, including coughs, colds, fever, headaches and infections.
Heteromorpha arborescens	Various plant parts are used as a remedy for tuberculosis, abdominal pains, colic, headaches, fever, asthma and coughs.
Hilliardiella species	Infusions taken to treat stomach ailments, rheumatism, dysentery and diabetes.
Hypoxis species	Infusions of the corm are used to treat dizziness, bladder disorders and insanity.
Lippia javanica	Used to treat coughs, colds, influenza, measles, stomach problems and headaches.
Mentha longifolia	Treats various respiratory ailments including coughs, colds and asthma.
Olea europaea	Used as a hypotensive to lower blood pressure and enhance renal function.
Pelargonium luridum	Taken orally to treat diarrhoea and dysentery.
Pellaea calomelanos	Used to treat boils and abscesses and for internal parasites
Pentanisia angustifolia	Decoctions are used to treat burns, swellings, sore joints and rheumatism.
Protea caffra	Bark is used to treat bleeding stomach ulcers and diarrhoea.

Scientific Name Nationally Threatened Ecosystems	Medicinal Use*
Rhoicissus tridentata	Roots and tubers used to treat stomach ailments, kidney and bladder issues, and dysmenorrhoea.
Salix mucronata	Willow tips are used to treat rheumatism and fever.
Scabiosa columbaria	Used to treat colic and heartburn.
Typha capensis	Decoctions used to treat venereal disease, as well as diarrhoea, dysentery and enhance male libido.
Vachellia karroo	Barks and leaves used to treat diarrhoea and dysentery. Gum, barks and leaves also used to treat colds and oral thrush.
Zanthoxylum capense	Treats flatulent colic, stomach ache and fever.
Ziziphus mucronata	Bark and leaves are used as an expectorant in coughs and chest ailments, while roots extracts are used to treat diarrhoea and dysentery.
**Medicinal use, as per Van Wyk, et al. (2009).*	

7.2.2.12 Key Ecological Attributes and Processes

Landscape-scale ecological attributes, habitat connectivity, ecological corridors, refugia and ecological processes are described in **Section 7.2.1.1**.

7.2.2.13 General Sensitivity and Analysis of Site Ecological Importance

The DFFE National Web Based Screening Tool rated the Plant Species Theme for the PAOI as 'Medium' sensitivity, based on the possible presence of several flora SCC (listed in Section 1.4 of the specialist report). The findings of this specialist study confirm this sensitivity rating, with habitat suitability assessments indicating that several flora SCC, including those highlighted by the screening tool, may occur in the PAOI (refer to **Table 7-13**).

The site-specific ecological importance (SEI) of identified habitat units in the PAOI were assessed for flora using the SANBI (2026) protocol. The results of the assessment for flora are presented in **Table 7-12. Figure 7-23** shows a map of the SEI ratings for habitat units in the PAOI.

7.2.3. ANIMAL SPECIES

The following is extracted from the Animal Species Assessment report compiled by Hawkhead Consulting and included as Appendix G.13.

7.2.3.1 Mammals

Mammal Species Richness and Habitat Availability

Forty-three mammal species were recorded in the PAOI during the field programme. These are listed in **Table 7-18** with **Figure 7-45** to **Figure 7-59** showing select photographs of mammals taken in the PAOI during field work.

Certain farms in the PAOI are managed as game/wildlife farms, and accordingly, twelve of the recorded mammals are actively managed taxa (i.e., species that form part of managed or farmed

populations), of which some are extralimital[14]. Actively managed taxa include one megafauna[15] - the Giraffe (*Giraffa camelopardalis giraffa*), and several large- and medium-sized ungulates, such as Sable Antelope (*Hippotragus niger niger*), Black Wildebeest (*Connochaetes gnou*), Plains Zebra (*Equus quagga*), Impala (*Aepyceros melampus*) and Springbok (*Antidorcas marsupialis*).

The remaining 31 mammals are free-roaming taxa (i.e., part of self-sustaining, natural populations that are able to move freely across the landscape). These range from large- to small-sized antelope (e.g., Greater Kudu Tragelaphus strepsiceros and Steenbok Raphicerus campestris), to carnivores such as the Black-backed Jackal (*Canis mesomelas*) and Serval (*Leptailurus serval*), and finally through to small rodents like the Xeric Four-stripped Mouse (*Rhabdomys* species) and the Vlei Rat (*Otomys cf. auratus*).

The sighting of a single Large Grey Mongoose (*Herpestes ichneumon*) during the wet season survey is of interest. The PAOI lies beyond this species' previously documented distribution range (Do Linh San et al., 2025). However, recent observations from Gauteng and western Mpumalanga indicate that the Large Grey Mongoose's range may be broader than previously understood (Do Linh San *et al*., 2025), or possibly undergoing expansion (see Swanepoel et al., 2018).

The PAOI is characterised by large areas of suitable and heterogeneous natural habitat, supported by high levels of landscape connectivity. This, in conjunction with the prevalence of conservation-orientated game farming and the expected low levels of illegal hunting, suggests that it is likely that several additional mammal species may be present in the PAOI. Indeed, according to the distribution range maps presented in Stuart & Stuart (2007) and EWT & SANBI, (2025), up to 84 mammal species are known from the region, and of these, mammalMAP records indicate that 48 mammal species have previously been documented in the 2628CD QDS (listed in Appendix C of the specialist assessment report).

Table 7-17 – Indigenous mammal species recorded in the PAOI

Family	Scientific Name	Common Name	Field Programme	
			Dry Season Survey	Wet Season Survey
Bovidae	*Aepyceros melampus*#	Impala	x	x
Bovidae	*Alcelaphus buselaphus caama*#	Red Hartebeest	x	x
Bovidae	*Antidorcas marsupialis*#	Springbok	x	x
Bovidae	*Connochaetes gnou*#	Black Wildebeest	x	x
Bovidae	*Connochaetes taurinus*#	Blue Wildebeest		x
Bovidae	*Hippotragus equinus*#	Roan Antelope	x	

[14] An introduced species, that occurs outside its historical distribution range.
[15] Terrestrial mammal species weighing more than one tonne (*sensu*. Owen-Smith, 1992).

Family	Scientific Name	Common Name	Field Programme	
			Dry Season Survey	Wet Season Survey
Bovidae	*Hippotragus niger niger*#	Sable Antelope	x	x
Bovidae	*Kobus ellipsiprymnus ellipsiprymnus*#	Waterbuck	x	x
Bovidae	*Pelea capreolus*	Grey Rhebok	x*	
Bovidae	*Raphicerus campestris*	Steenbok	x	x
Bovidae	*Redunca fulvorufula fulvorufula*	Mountain Reedbuck	x	x
Bovidae	*Sylvicapra grimmia*	Common Duiker	x	x
Bovidae	*Taurotragus oryx*#	Eland	x	x
Bovidae	*Tragelaphus angasii*#	Nyala	x	
Bovidae	*Tragelaphus strepsiceros*	Greater Kudu	x	x
Canidae	*Canis mesomelas*	Black-backed Jackal	x	x
Canidae	*Otocyon megalotis*	Bat-eared Fox	x*	
Cercopithecidae	*Papio ursinus*	Chacma Baboon	x*	
Equidae	*Equus quagga*#	Plains Zebra	x	x
Erinaceidae	*Atelerix frontalis*	South African Hedgehog	x*	
Felidae	*Leptailurus serval*	Serval	x	
Felidae	*Caracal caracal*	Caracal	x*	
Giraffidae	*Giraffa camelopardalis giraffa*#	Giraffe	x	x
Herpestidae	*Atilax paludinosus*	Water Mongoose	x	x
Herpestidae	*Cynictis penicillata*	Yellow Mongoose	x	
Herpestidae	*Herpestes sanguineus*	Slender Mongoose	x	
Herpestidae	*Herpestes ichneumon*	Large Grey Mongoose		x
Herpestidae	*Suricata suricatta*	Suricate	x	
Hyaenidae	*Parahyaena brunnea*	Brown Hyaena	x*	
Hystricidae	*Hystrix africaeaustralis*	Cape Porcupine	x	x
Leporidae	*Lepus saxatilis*	Scrub Hare	x	
Leporidae	*Pronolagus randensis*	Jameson's Red Rock Rabbit	x	x
Macroscelididae	*Elephantus myurus*	Eastern Rock Sengi	x	x

Family	Scientific Name	Common Name	Field Programme	
			Dry Season Survey	Wet Season Survey
Muridae	*Otomys* cf. *auratus*[%]	Vlei Rat	x	
Muridae	*Mastomys* sp.	Multi-mammate Mouse	x	
Muridae	*Rhabdomys* sp.	Xeric Four-stripped Mouse	x	
Mustelidae	*Aonyx capensis*	Cape Clawless Otter	x	
Oryceropodidae	*Orycteropus afer*	Aardvark	x	
Procaviidae	*Procavia capensis*	Rocky Hyrax	x	
Sciuridae	*Xerus inauris*	Ground Squirrel	x	x
Suidae	*Phacochoerus africanus*	Warthog	x	x
Suidae	*Potamochoerus larvatus*	Bushpig	x	
Viverridae	*Genetta maculata*	Large-spotted Genet	x	x
[#]Actively managed taxon.				
*Based on anecdotal evidence obtained from farmers D. Van Niekerk and K. Saayman.				
[%]Species can only be positively identified to species-level based on skull measurements.				

Figure 7-44 - Mountain Reedbuck (Redunca fulvorufula fulvorufula) – Endangered

Figure 7-45 - Hartebeest (Alcelaphus buselaphus caama)

Figure 7-46 - Sable Antelope (*Hippotragus niger niger*) - Vulnerable

Figure 7-47 - Giraffe (*Giraffa camelopardalis giraffa*)

Figure 7-48 - Serval (*Leptailurus serval*) – Near Threatened

Figure 7-49 - Black-backed Jackal (*Canis mesomelas*)

Figure 7-50 - Slender Mongoose (*Herpestes sanguineus*)

Figure 7-51 - Water Mongoose (*Atilax paludinosus*)

Figure 7-52 - Large-spotted Genet (*Genetta maculata*)

Figure 7-53 - Porcupine (*Hystrix africaeaustralis*)

Figure 7-54 - Warthog (Phacochoerus africanus

Figure 7-55 - Bushpig (Potamochoerus larvatus)

Figure 7-56 - Xeric Four-stripped Mouse (Rhabdomys species

Figure 7-57 - Vlei Rat (Otomys cf. auratus) – Near Threatened

Figure 7-58 - Eastern Rock Sengi (*Elephantus myurus*)

Figure 7-59 - Rock Hyrax (*Procavia capensis)*

Mammal species of conservation

Six free-roaming mammal species recorded in the PAOI during the field programme are listed as species of conservation concern on the regional mammal Red List (EWT & SANBI, 2025), namely Mountain Reedbuck (*Redunca fulvorufula fulvorufula*), Grey Rhebok (Pelea capreolus), Serval, Southern African Hedgehog (*Atelerix frontalis*), Cape Clawless Otter (*Aonyx capensis*) and the Vlei Rat.

Two other recorded Red List species, namely Sable Antelope and Roan Antelope (*Hippotragus equinus*) are extralimital, and part of actively managed populations. Extralimital subpopulations of threatened species are currently not included in Red List conservation assessments, as per the International Union for the Conservation of Nature (IUCN) standards, and therefore they are considered of 'uncertain' conservation value.

The DFFE national web-based screening tool listed three mammal species as potentially sensitive features for the PAOI, namely the Maquassie Musk Shrew (*Crocidura maquassiensis*), Spotted-necked Otter (*Hydrictis maculicollis*), Oribi (*Ourebia ourebi ourebi*).

Reviewed literature and datasets further indicates that an additional seven mammal species that occur or potentially occur in the PAOI, are listed as SCC on the regional Red List. These are listed in **Table 7-18** along with their conservation statuses, habitat preferences and a 'probability of occurrence' determined through field observations and/or habitat suitability assessments.

Mountain Reedbuck

The Mountain Reedbuck is listed as Endangered on the regional Red List (Patel, et al., 2025). This medium-sized grazing antelope favours rolling grassy hillsides and mountain slopes above 1 500 m (Estes, 1991). Mountain Reedbuck are territorial and gregarious, and found in small herds ranging from 3 to 6 individuals (Estes, 1991). In 2016, the regional population of Mountain Reedbuck was estimated at 10 217–13 669 mature individuals. However, protected area monitoring data indicate a substantial decline of approximately 77% between 2008 and 2023 (Patel, et al., 2025). SANBI (2026) indicate that the area of occupancy of this species is 622.77 km2. Small herds (3-4 individuals) of Mountain Reedbuck were observed on several occasions in the PAOI, while one individual was recorded on a camera trap. Within the PAOI, this species is likely to be largely confined to the high-

lying Mountain Bushveld and Rocky Shrubland and Grassland habitat units, with dispersal across the intervening grassland matrix. Given the abundance of suitable habitat on-site, the Mountain Reedbuck population in the PAOI is likely to be stable and possibly a source population within a local metapopulation dynamic.

Grey Rhebok

Grey Rhebok (Near Threatened) are medium-sized, territorial browsing antelope. They are gregarious, living in herds comprising one adult male and 1 to 15 females and young (Estes, 1991). They favour sourveld grassland and scrubland in hills and mountainous areas (Estes, 1991). The regional population size of Grey Rhebok is thought to be about 10 000 individuals, with an estimated density in protected areas of 0.5 to 1.7 individuals per km2 (Taylor et al., 2025). Grey Rhebok was recorded in PAOI based on an anecdotal account from a local farmer. Important habitat for this species is also likely to centre on the Mountain Bushveld and Rocky Shrubland and Grassland habitat units. Considering the abundance of suitable habitat on-site, the Grey Rhebok population is likely to be a stable.

Serval

The Serval (Near Threatened) is a small feline predator. They are solitary and territorial, and favour wetland, tall grassland and well-watered savanna habitats (Estes, 1991). Population densities range from 0.1 to 1.5 individuals per km2, with a regional population estimated at 10 264 ±812 individuals (Power & da Silva, 2025). This species is frequently found in farmland and mining/industrial land, provided sufficient suitable habitat is present and levels of persecution remain low (Power & da Silva, 2025). The highest known Serval densities (between 76.20 - 101.21 animals per 100 km2). Serval were recorded on two camera traps in the PAOI and all areas of natural habitat in the PAOI are likely to constitute suitable habitat for this species. Given the abundance of habitat, the Serval population in the PAOI is likely to be a stable, source population.

Southern African Hedgehog

The Southern African Hedgehog is listed as Near Threatened on the regional Red List. This nocturnal species occurs in savanna and grassland habitat and is known to occur in residential gardens (Smith & da Silva, 2025). It generally prefers areas of dense vegetation and rocky outcrops (Smith &da Silva, 2025). The regional population of Southern African Hedgehog is not known; however, it is reported that the number of sightings has reduced over the last 10—20 years (Smith & da Silva, 2025). The EOO of Southern African Hedgehog is estimated at 748 169 km2, which represents a 5% reduction since 1980 (Smith & da Silva, 2025). Southern African Hedgehog was recorded in PAOI based on an anecdotal account from a local farmer. All areas of natural habitat in the PAOI will likely constitute suitable habitat for this species. It is considered probable that the on-site Southern African Hedgehog is a stable.

Cape Clawless Otter

Cape Clawless Otter is listed as Near Threatened on the regional Red List (Power, et al., 2025). This species has a fairly widespread, but patchy distribution. Population estimates range from 21 500 to 30 276 animals, with mature individuals numbering between 16 552-19 377 (Power, et al., 2025). The Cape-clawless Otter is an aquatic species that is rarely found far from permanent water (Power, et al., 2025). It favours riverine habitats, characterised by large rocks, dense vegetation and large areas of long grass (Power, et al., 2025). Cape-clawless Otter scat was observed along the Suikerbosrand

River in the PAOI. Considering the length of river habitat through the centre of the PAOI, and the presence of numerous farm dams, the Cape-clawless Otter population in the PAOI is likely to be stable and will be a source population.

Vlei Rat

The Vlei Rat is listed as Near Threatened on the regional Red List. This species occurs in mesic grassland and wetland habitats, where it favours dense vegetation in close proximity to water (Taylor & a Silva, 2025). Its distribution extends across most of eastern South Africa (Taylor & a Silva, 2025). No population size estimates are available however, population models indicate a continued decline in population size due to direct loss of habitat (e.g., from agriculture), reduction in habitat suitability from overgrazing and projected decrease in AOO due to climate change (Taylor & a Silva, 2025). During the dry season field survey, a single Vlei Rat was caught in a Sherman trap in dense vegetation along the Suikerbosrand River. Considering the length of river and adjacent grassland habitat through the centre of the PAOI, the Vlei Rat population in the PAOI is likely to be fairly large, stable and a source population.

Sable Antelope

The Sable Antelope is a large antelope that is listed as Vulnerable on the regional Red List (Muller, et al., 2025a). This species occurs at low densities relative to other antelope species, with an estimated regional population size of between 409-1 346 mature individuals (Muller, et al., 2025a). Sable occur in savanna woodland, with their historical distribution range extending across the Lowveld of eastern Mpumalanga, northern Limpopo Province, and west into the North-West Province (Muller, et al., 2025a). The herd in the PAOI is therefore extralimital, and part of an actively managed/farmed population.

Roan Antelope

The Roan Antelope is a large antelope that is listed as Vulnerable on the regional Red List (Muller, *et al*., 2025b). This species favours savanna woodland and grassland (Muller, et al., 2025b). Current population estimates suggest that there are 333 individuals in formally protected areas across the Roan's historic distribution range, which extends from Limpopo Province across to the North-West, Northern Cape and Free State provinces (Muller, *et al.*, 2025b). Roan in the PAOI are extralimital, and form part of actively managed/farmed populations.

Spotted-necked Otter

Spotted-necked Otter is listed as Vulnerable on the regional Red List. This species has a widespread distribution, but is restricted to areas of permanent, large open-water bodies (Power & Nicholson, 2025). The estimated range of Spotted-necked Otter totals 31 407 km of river, resulting in an estimated population size (taking into account both undisturbed and disturbed river habitats), of 17 117 individuals (Power & Nicholson, 2025). SANBI (2026) indicate that the area of occupancy of this species 12.30 km2. Spotted-necked Otter was not recorded during the field programme; however, large open water pools are present along numerous reaches of the Suikerbosrand River and several large farms dam are present in the PAOI. There is thus ample suitable habitat for Spotted-necked Otter, and it is probable that this species is present.

Maquassie Musk Shrew

Maquassie Musk Shrew (Vulnerable) is a rare shrew species. The EOO is estimated at 284 735 km2; however, it is thought to be patchily distributed and, based on its preference for wetland habitats, its

AOO is inferred at between 40 496 to 47 246 km2 and 1 790-2 089 km2 (based on a 500 and 32 m buffer around wetland habitat, respectively) (Russo & da Silva, 2025). SANBI (2026) document the area of occupancy at 0.72 km2. The population size of Maquassie Musk Shrew is estimated at 179 000 individuals. This species appears to favour moist grassland habitats in savanna and grassland ecosystems (Russo & da Silva, 2025). Although some suitable habitat is present for Maquassie Musk Shrew, there are no post-2000 records of this species this species in either Gauteng or Mpumalanga Provinces. It is therefore unlikely that Maquassie Musk Shrew is present in the PAOI.

Oribi

The Oribi (Endangered) is a medium-sized, territorial grazing antelope. They live in monogamous pairs, with a tendency to polygyny (Estes, 1991). They have a widespread, but patchy distribution across their range, and their regional population is facing increasing fragmentation. Oribi densities vary considerably depending on habitat suitability, but in areas where this species is uncommon, its density ranges from 0.1 to 0.4 animals per km2 (Schrader & da Silva, 2025). The minimum estimated population size of Oribi in South Africa is 3 098 individuals, with approximately 274 occurring on private land in Mpumalanga (Schrader & da Silva, 2025). The area of occupancy of Oribi is estimated at 160.25 km2 (SANBI, 2026). Oribi favour short open grassland and floodplains, with patches of taller grass (Schrader & da Silva, 2025). Suitable habitat is present for Oribi in the PAOI. However, none of the famers/game farmers interviewed during the field programme indicated that they were aware of the presence of Oribi in the area. It is therefore unlikely that Oribi occurs in the PAOI.

Table 7-18 - Mammal species of conservation concern occurring or potentially occurring in the PAOI

Family	Scientific Name	Common Name	Regional Red List Status (2025)	NEMBA ToPS List (2007)	Gauteng Protected Status (1983)	Mpumalanga Protected Status (1998)	Habitat Preferences*	Probability of Occurrence
Bovidae	*Hippotragus equinus*	Roan Antelope	Vulnerable	Vulnerable	Protected	Protected	Savanna woodland and grasslands.	Confirmed#
Bovidae	*Hippotragus niger niger*	Sable Antelope	Vulnerable	-	Protected	-	Savanna woodland.	Confirmed #
Bovidae	*Ourebia ourebi ourebi*	Oribi	Endangered	Endangered	Protected	Protected	Short open grassland, with patches of taller grass.	Unlikely – Suitable habitat present, but species has not been recorded in the region.
Bovidae	*Pelea capreolus*	Grey Rhebok	Near Threatened	-	Protected	Protected	Sourveld grassland and scrubland in hills and mountainous areas.	Confirmed (anecdotal)
Bovidae	*Redunca fulvorufula fulvorufula*	Mountain Reedbuck	Endangered	-	Protected	Protected	Rolling grassy hillsides and mountain slopes.	Confirmed
Chrysochloridae	*Amblysomus septentrionalis*	Highveld Golden Mole	Near Threatened	-	-	-	Sandy soils in grassland areas.	Possible - Suitable habitat present.
Chrysochloridae	*Chrysospalax villosus*	Rough-haired Golden Mole	Vulnerable	Critically Endangered	-	-	Sandy soils in grassland areas.	Possible - Suitable habitat present.
Erinaceidae	*Atelerix frontalis*	South African Hedgehog	Near Threatened	Protected	Protected	Protected	Range of habitats, including grassland and savanna.	Confirmed (anecdotal)

Family	Scientific Name	Common Name	Regional Red List Status (2025)	NEMBA ToPS List (2007)	Gauteng Protected Status (1983)	Mpumalanga Protected Status (1998)	Habitat Preferences*	Probability of Occurrence
Felidae	*Felis nigripes*	Black-footed Cat	Vulnerable	Protected		-	Open short grass areas in savanna and grassland habitats.	Possible - Suitable habitat present.
Felidae	*Leptailurus serval*	Serval	Near Threatened	Protected	-	-	Wetland, tall grassland and well-watered savanna habitats.	Confirmed
Felidae	*Panthera pardus*	Leopard	Vulnerable	Vulnerable	-	-	Wide range of habitats, including grassland and savanna.	Possible - Suitable habitat present.
Hyaenidae	*Parahyaena brunnea*	Brown Hyaena	Near Threatened	Protected	Protected	Protected	Savanna and grassland habitats.	Confirmed (anecdotal)
Muridae	*Otomys auratus*	Vlei Rat	Near Threatened	-	-	-	Moist grassland and wetland habitats.	Confirmed
Muridae	*Mystromys albicaudatus*	White-tailed Rat	Vulnerable	-	-	-	Grassland habitats.	Possible - Suitable habitat present.
Mustelidae	*Aonyx capensis*	Cape Clawless Otter	Near Threatened	Protected	Protected	Protected	Riparian habitats, with permanent water.	Confirmed
Mustelidae	*Hydrictis maculicollis*	Spotted-necked Otter	Vulnerable	Protected	Protected	Protected	Riparian habitats, favouring large, open water bodies.	Probable - Suitable habitat present
Soricidae	*Crocidura maquassiensis*	Maquassie Musk Shrew	Vulnerable	-	-	-	Little is known of habitat preferences. Thought to favour rocky or montane grasslands.	Unlikely - Suitable habitat present, but no post-2000 records of this species in this area of Gauteng and

Family	Scientific Name	Common Name	Regional Red List Status (2025)	NEMBA ToPS List (2007)	Gauteng Protected Status (1983)	Mpumalanga Protected Status (1998)	Habitat Preferences*	Probability of Occurrence
								Mpumalanga Provinces.
Soricidae	*Crocidura mariquensis*	Swamp Musk Shrew	Near Threatened	-	-	-	Reedbeds, wetlands and thick moist grassland in riverine habitats.	Probable - Suitable habitat present
**Habitat preferences as per Skinner and Smithers (1990), Stuart and Stuart (2007) and EWT & SANBI, (2025).*								
#Actively managed and extralimital taxon.								

7.2.3.2 Herpetofauna

Herpetofauna Richness and Habitat Availability

Six reptile species were documented for the PAOI **Table 7-19.** Five species were recorded based on anecdotal evidence from local farmers, and one species, namely the Water Monitor (*Varanus niloticus*) (**Figure 7-60**), was observed on-site during the field programme. Three amphibian species were also recorded during a night-time survey in the PAOI. These are also listed in **Table 7-19**.

The PAOI is characterised by a variety of habitats that will support a diversity of herpetofauna. These range from rocky hillsides and ridges, open grassland and savanna, through to closed riparian woodland and scrub. Variable aquatic habitats are also present, such as large rivers, small streams wetlands and farm dams. It is thus anticipated that the PAOI has a rich herpetofauna assemblage.

The distribution maps presented in Bates et al., (2014), indicate that up to 56 reptile species are known from the region in which the PAOI is located. Of these, ReptileMAP records indicate that 29 species have previously been recorded in the 2628CB QDS (Fitzpatrick Institute of African Ornithology, 2023). Similarly, the distribution maps in Du Preez and Carruthers (2009) indicate that 21 amphibian species have ranges that overlap with the PAOI, and this is corroborated by FrogMAP records, which list 13 taxa for 2628CB QDS.

Table 7-19 - Reptile and amphibian species recorded in the PAOI during the field programme

Family	Scientific Name	Common Name	Field Programme*
Reptile			
Agamidae	Agama atra	Southern Rock Agama	Anecdotal
Elapidae	Hemachatus heamachatus	Rinkhals	Anecdotal
Lamprophiidae	Pseudaspis cana	Mole snake	Anecdotal
Pelomedusidae	Pelomedusa subrufa	Marsh Terrapin	Anecdotal
Varanidae	Varanus niloticus	Water Monitor	Visual observation
Viperidae	Bitis arietans	Puffadder	Anecdotal
Amphibians			
Ranidae	Amieta dealandii	Common River Frog	Visual observation
Hyperoliidae	Kassina senegalensis	Bubbling Kassina	Audio
Bufonidae	Sclerophrys gutturalis	Guttural Toad	Audio
*Anecdotal evidence from farmers D. Van Niekerk and Kobus Saayman.			

Figure 7-60 - Water Monitor (Varanus niloticus) photographed in the PAOI

Figure 7-61 - Common River Frog (Amieta dealandii) caught in the PAOI

Herpetofauna Species of Conservation Concern

One reptile SCC potentially occurs in the PAOI, namely Giant Dragon Lizard (*Smaug giganteus*). In addition, the Giant Bullfrog (*Pyxicephalus adspersus*), which is listed as protected on the NEMBA Tops List (2007). These are listed in **Table 7-20** along with their conservation status, habitat preferences and a probability of occurrence.

It noted that according to both the (Gauteng) Nature Conservation Ordinance (12 of 1983) and the Mpumalanga Nature Conservation Act (Act No. 10 of 1998) all species of reptiles, excluding the monitors (e.g., Varanus niloticus) and all snakes, are considered 'protected'

Table 7-20 - Reptile species of conservation concern potentially occurring in the PAOI

Family	Scientific Name	Common Name	National Red List Status	NEMBA ToPS List (2007)	Gauteng Protected Status (1983)	Mpumalanga Protected Status (1998)	Habitat Preferences*	Probability of Occurrence
Reptiles								
Cordylidae	*Smaug giganteus*	Giant Dragon Lizard	Vulnerable	Endangered	Protected	Protected	Highveld grasslands, often dominated by Themeda triandra.	Unlikely - Suitable habitat present, but species has not been previously recorded in the region.
Amphibians								
Pyxicephalidae	*Pyxicephalus adspersus*	Giant Bullfrog	Least Concern	Protected	Protected	Protected	Shallow pans, wetlands and seasonally rained-filled depressions in savanna and grasslands. iNaturalist records indicate that this species has been recorded in the broader Heidelberg region as recently as 2025.	Possible - Suitable habitat present.
*Habitat preferences as per Branch (1998) and Bates *et al*., (2014).								

7.2.3.3 Key Ecological Attributes and Processes

Key ecological attributes, habitat connectivity, ecological corridors, refugia and landscape-scale ecological processes are discussed in Section 7.2.1.1 Regional vegetation characteristics (Terrestrial Biodiversity) and are not repeated here. The findings are equally applicable to fauna species occurring within the PAOI.

7.2.3.4 General Sensitivity and Analysis of Site Ecological Importance

The DFFE National Web Based Screening Tool rated the Animal Species Theme for the PAOI as 'High' sensitivity, based on the confirmed or likely, modelled presence of several fauna SCC (listed in Section 1.4 of the specialist report).

- During the field programme, six free-roaming mammal SCC were confirmed in the PAOI, namely Mountain Reedbuck (Endangered), Serval (Near Threatened), Cape Clawless Otter (Near Threatened), Grey Rhebok (Near Threatened), Southern African Hedgehog (Near Threatened), and the Vlei Rat (Near Threatened); and
- Habitat suitability assessments also indicate that several other fauna SCC are likely to be present in the PAOI.

The findings of this study therefore confirm the 'High' sensitivity rating for patches of undisturbed natural habitat in the PAOI. For modified habitat, such as cultivated fields, it is considered 'Low'

The site-specific ecological importance (SEI) of identified habitat units in the PAOI were assessed using the SANBI (2020) protocol (refer to Section 3.4 and Appendix B for the methodology). The results of the assessment are presented in **Table 7-11** and shown in **Figure 7-22.**

7.2.4. AQUATIC BIODIVERSITY

The following is extracted from the Aquatic Biodiversity Impact Assessment compiled by BlueScience (Pty) Ltd and included as Appendix G.3.

The site is situated within the Savanna Biome, characterized by low hills and valleys interspersed with tributaries and wetland areas of the Suikerbosrant/Blesbokspruit River System (**Figure 7-63**). The primary drainage direction is towards the west where the Suikerbosrant River drains into the Vaal River. The Blesbokspruit River originates in Benoni to the east of Johannesburg and flows in a southerly direction past Nigel and Heidelberg to join the Suikerbosrant River to the west of the site. The Suikerbosrant River arises near Leandra and Impumelo to the northeast of the site and flows for approximately 70 to its confluence with the Blesbokspruit River and then another 35km south-westward to its confluence with the Vaal River.

The area normally receives about 678mm of rain per year, mostly during summer. Typically, very little to no rain falls between May and September and the highest rainfall (112mm) occurs in January (**Figure 7-62**). As a result of the very low rainfall in winter, the smaller watercourses at the site are, under natural conditions, seasonally flowing rivers.

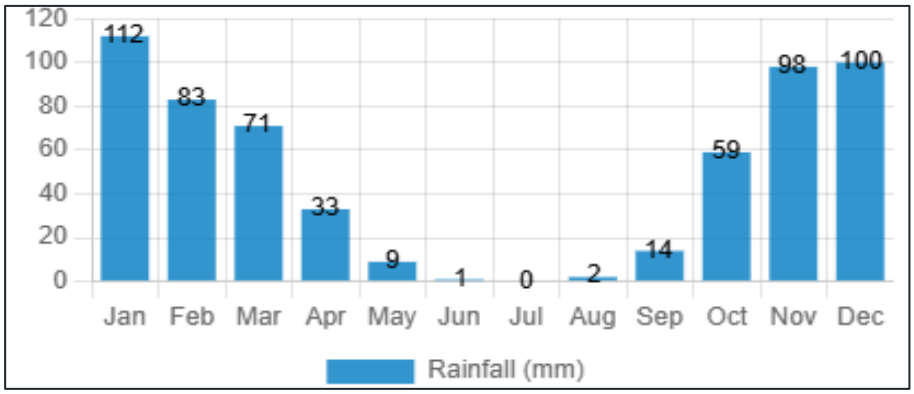


Figure 7-62 - Average monthly rainfall for the area (SA Atlas of Climatology and Agrohydrology, R.E. Schulze, 2009 – obtained from CapeFarmMapper, 2022)

As mentioned, the area does not lie in a strategic water source area for ground or surface water. A minor fractured aquifer occurs within the wider area, with the water table typically occurring at depths of about 10 m below ground level with a yield of between 0.5 and 2 litres a second. The surface and groundwater quality tend to be very good, with natural electrical conductivity concentrations of less than 70 mS/m. The recharge of the aquifer is good and estimated to be about 45 mm/a. The aquifer has a medium to high susceptibility and vulnerability to contamination.

The natural vegetation of the study area is mapped as comprising Andesite and Gold Reef Mountain Bushveld on the higher-lying northeastern portion of the site while Soweto Highveld and Tsakane Clay Grasslands occur on the lower-lying southern and western extents. The bushveld vegetation types are still largely intact and well protected that they are of Least Concern conservation status while the grassland vegetation is more impacted and impacted by cultivation and urban sprawl such that they are considered to be Endangered vegetation types. The typical land cover comprises a mix of open natural bushveld, grassland, wetlands and cultivated areas. Several dams have been constructed in the watercourses within the project area of influence. A vegetation assessment has been undertaken for the site and more detail on the terrestrial vegetation cover is included in that specialist assessment

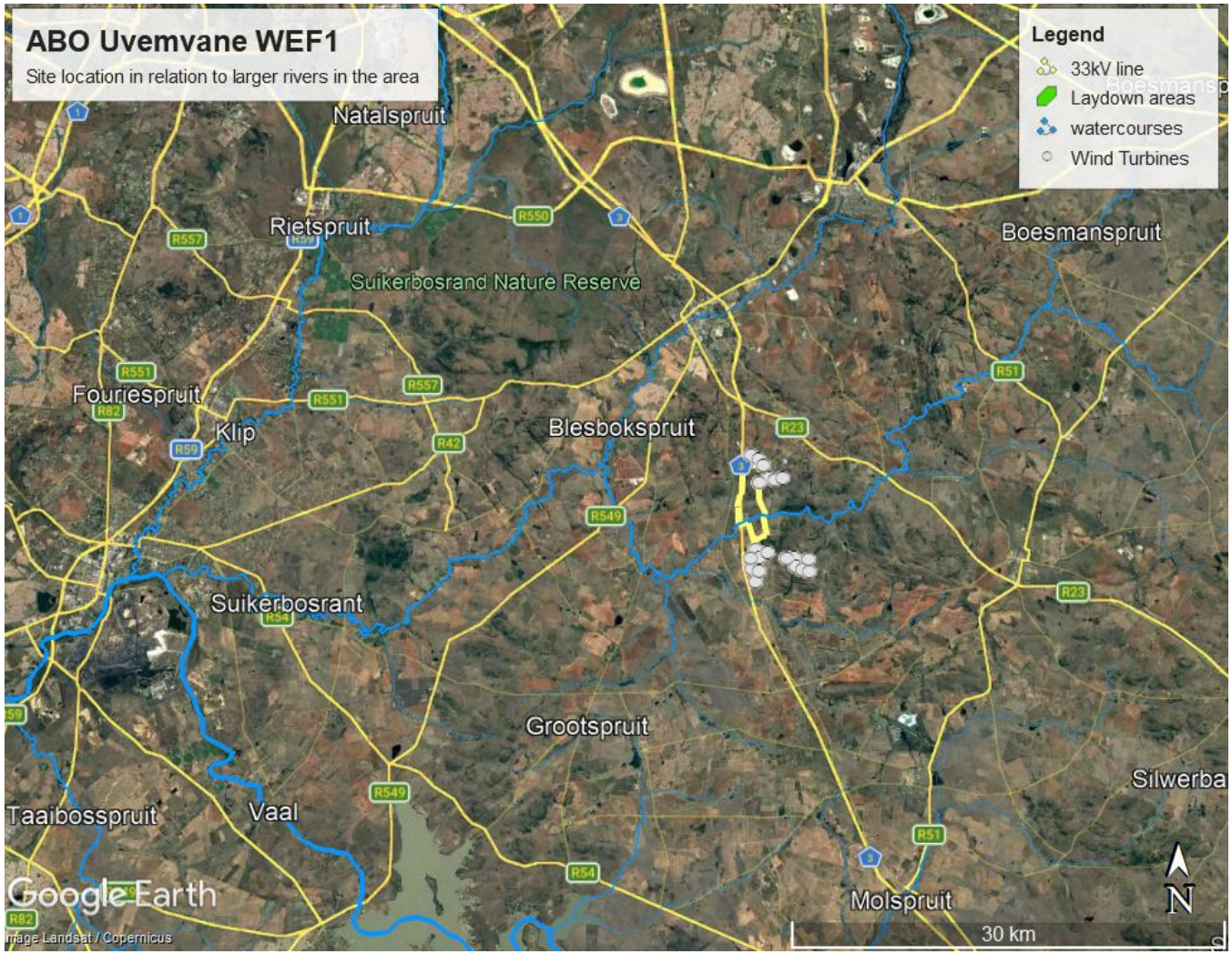


Figure 7-63 - Rivers map for study site (red polygon represents the study boundaries, shown in Google Earth

7.2.4.1 Aquatic Biota

Amphibian species occurring in the wider area are the Giant African bullfrog (*Pyxicephalus adspersus*), African red toad (*Schimsmaderma carens*), Raucous toad (*Sclerophrys capensis*), guttural toad (*Sclerophrys gutturalis*), striped stream frog (*Strongylopus fasciatus*), common river frog (*Amietia delalandii*), Senegal running frog (*Kassina senegalensis*), Bowettger's dainty frog (*Cacosterum boettgeri*), and the African clawed frog or platanna (*Xenoplus laevis*). Nearly all the amphibian species are listed by the International Union for the Conservation of Nature as being of Least concern. Many of the amphibians are widespread and found in many different habitats, including grasslands, shrublands, wetlands and artificial environments and breeds in temporary and permanent sources of water. Platannas are aquatic amphibians and only leave the water when they need to migrate to new water bodies during droughts or because of other disturbances. The Giant African bullfrog (although listed as Least Concern) is of concern due to its declining population associated with loss of habitat.

Table 7-21 - Native fish species recorded in the Suikerbosrand River

Taxon	Endemism	Cons. Status (Global)
Labeobarbus aeneus (Burchell, 1822)	Unknown	Least Concern
Labeobarbus marequensis (Smith, 1841)	Unknown	Least Concern
Labeo capensis (Smith, 1841)	Unknown	Least Concern
Labeo umbratus (Smith, 1841)	Unknown	Least Concern
Enteromius paludinosus (Peters, 1852)	Widespread	Least Concern
Labeobarbus aeneus (Burchell, 1822)	Unknown	Least Concern
Pseudocrenilabrus philander (Weber, 1897)	Unknown	Least Concern
Tilapia sparrmanii (Smith, 1840)	Unknown	Least Concern

Source: Freshwater Biodiversity Information system

7.2.4.2 Conservation value of Aquatic Features

Three sets of conservation mapping at a national, provincial and local scale are of relevance to the identification of aquatic features of ecological and biodiversity conservation importance. These are the National Freshwater Ecosystem Priority Areas (NFEPA) map, the National Wetland Map version 5 (NWMv5), and the provincial Conservation Plans for Gauteng and Mpumalanga.

National FEPAs are intended to provide strategic spatial priorities for conserving South Africa's freshwater ecosystems and supporting the sustainable use of water resources. FEPAs were determined through a process of systematic biodiversity planning and were identified using a range of criteria for serving ecosystems and associated biodiversity of rivers, wetlands and estuaries. The river and wetland FEPAs are required to be maintained in a largely natural ecological state, while Fish Support Areas should not be allowed to degrade from their existing ecological condition. In terms of

Freshwater Ecosystem Biodiversity Areas mapped within the study area, the site does not lie within a FEPA River Sub-catchment (**Figure 7-64**).

Some mapped FEPA wetland areas occur within or adjacent to the site and are mostly associated with dams. The only natural wetlands are in the southwestern extent of the site, which are depression wetlands (**Figure 7-65).**

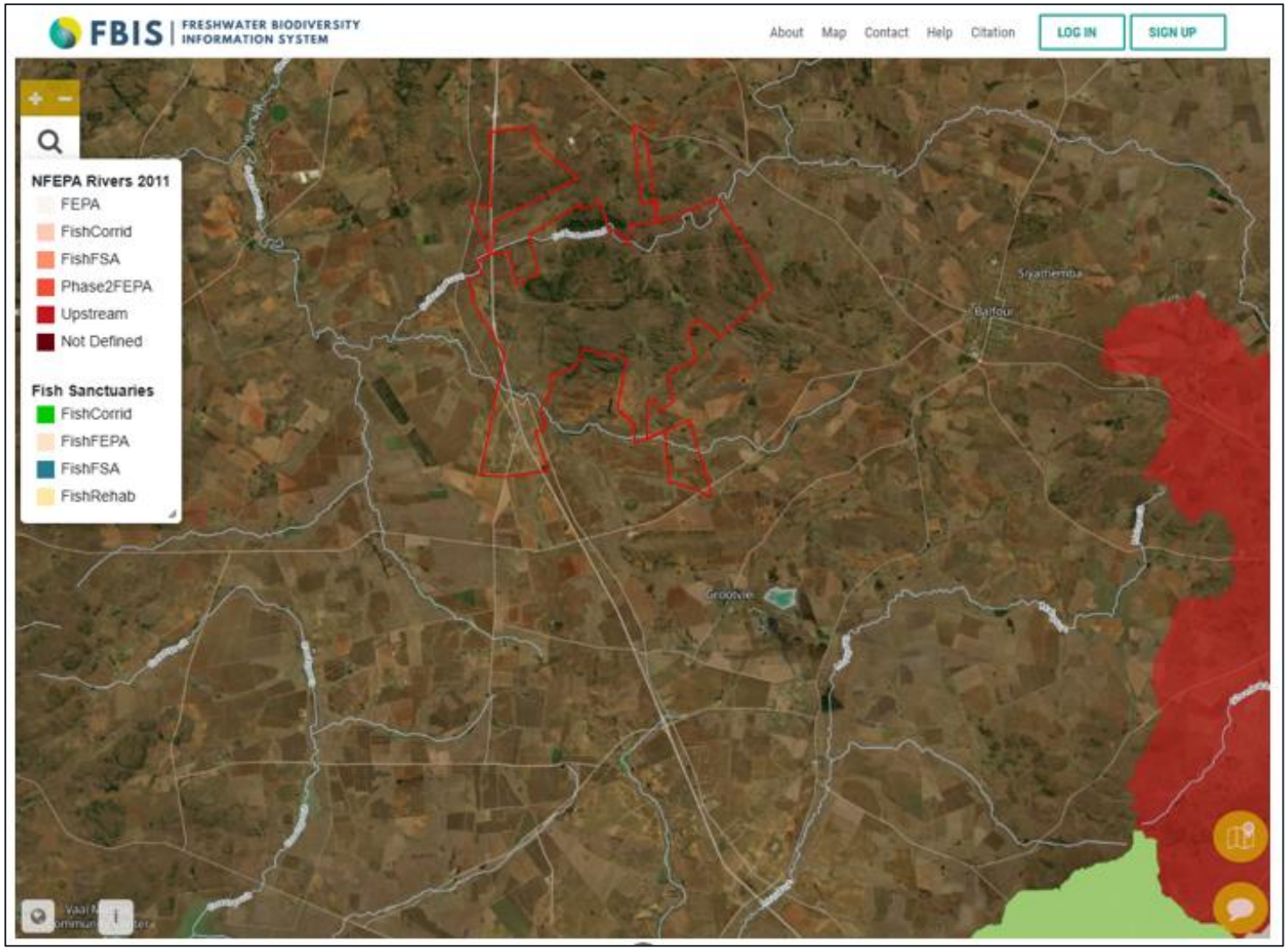


Figure 7-64 - National Freshwater Ecosystem Priority Areas for the proposed development area (FBIS, 2025)

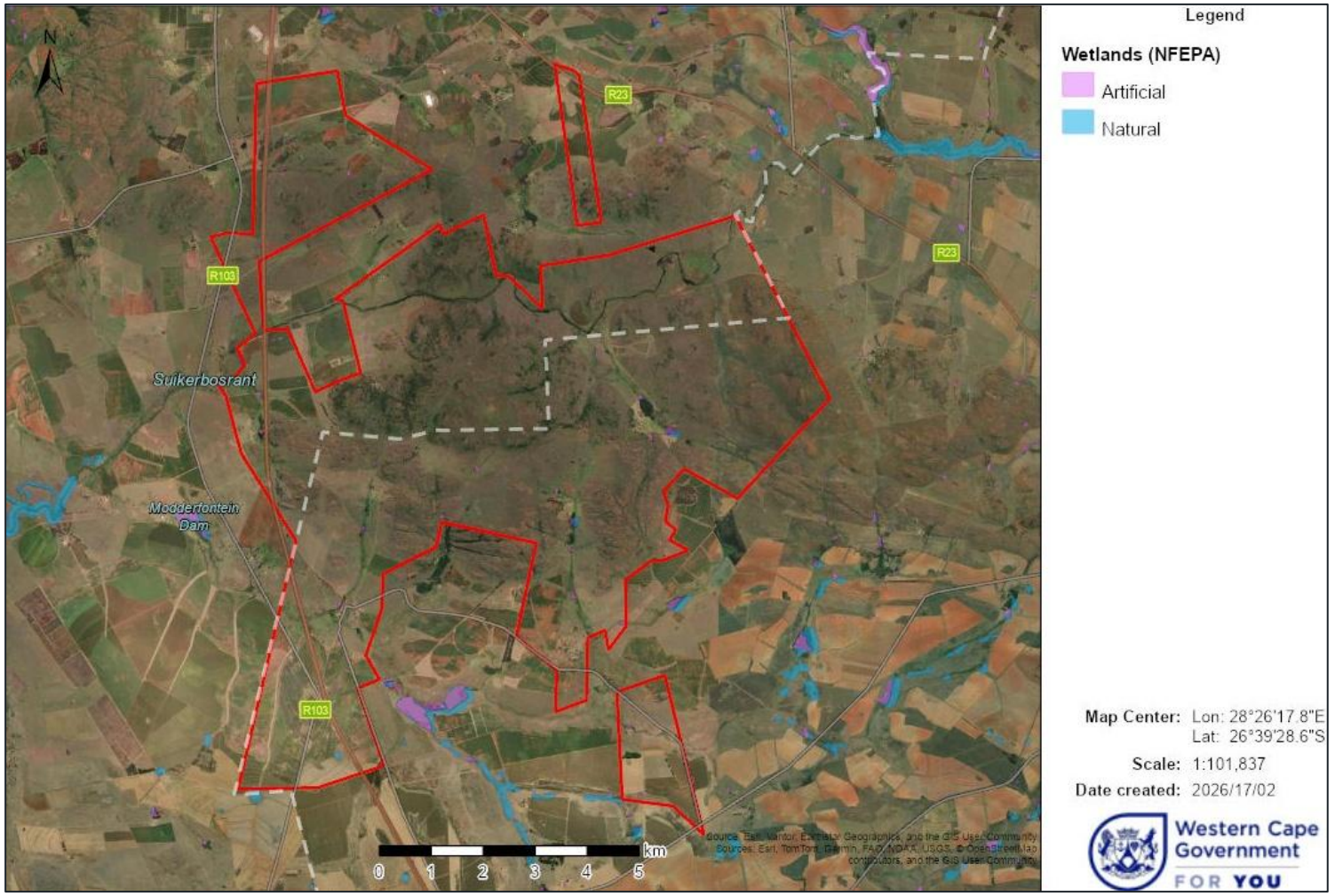


Figure 7-65 - National Freshwater Ecosystem Priority Areas map for the study site where the red polygon indicates the site boundaries (CapeFarmMapper, 2026)

In the NWM5, there are several wetland features mapped within and adjacent to the site which are listed below and shown in **Figure 7-66**:

- Riverine wetland (light blue/white areas in (**Figure 7-66**) associated with the Suikerbosrant River that drains through the northern portion of the site;
- Unchanneled valley bottom wetland (light green area) associated with a minor tributary of the Suikerbosrant River that drains into the river from the north; and
- Seeps (upper reaches – orange areas), channelled valley bottom (middle reaches – blue areas) and floodplain (lower reaches – dark green areas) wetland areas associated with tributaries of the Suikerbosrant River that drain into the river from the south.

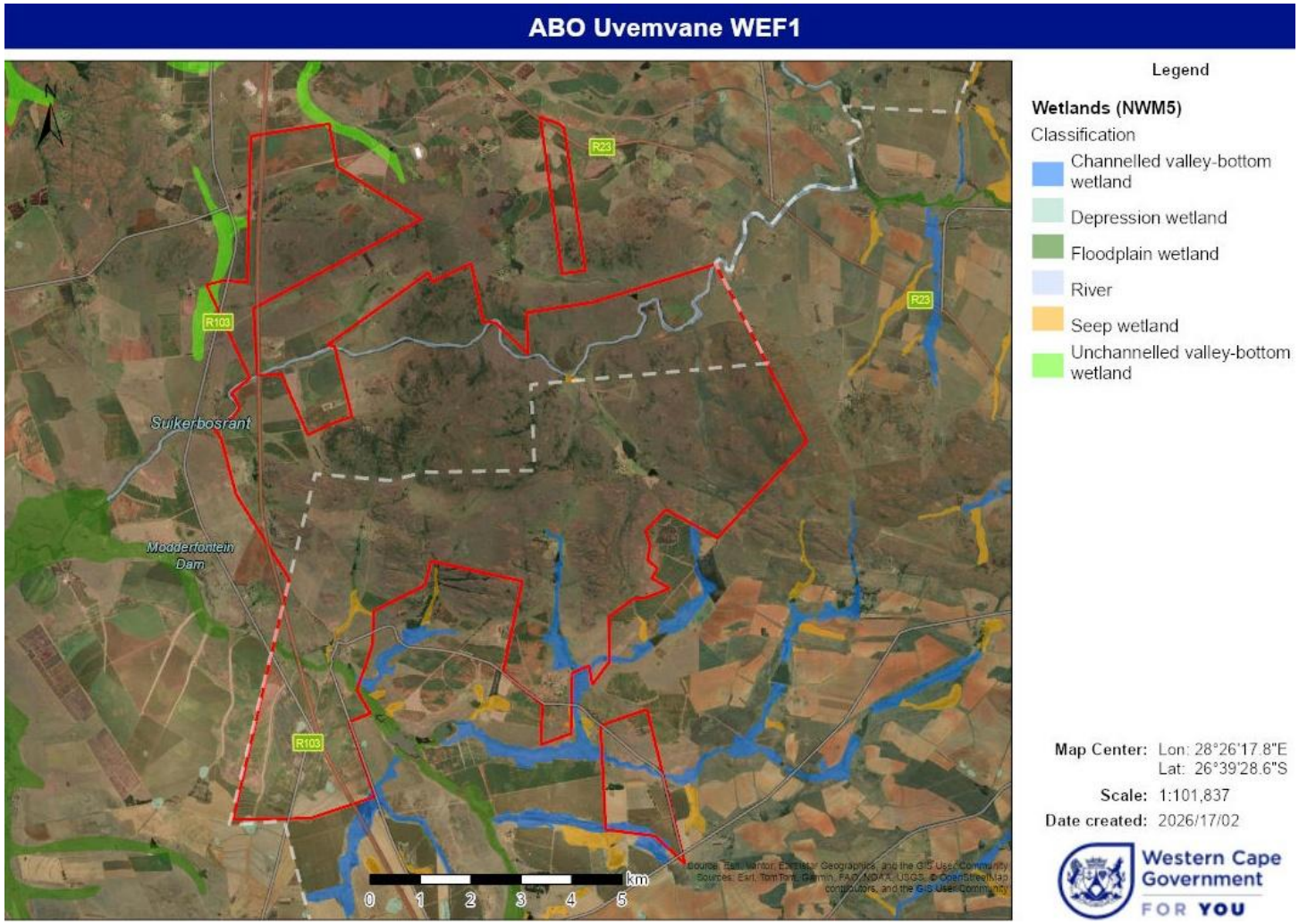


Figure 7-66 - National Wetland map for the study site where the red polygon indicates the study boundaries (CapeFarmMapper, 2027)

In the Mpumalanga Biodiversity Sector Plan, the FEPA wetland mapping has been applied to the aquatic features within the area, with the natural FEPA wetlands mapped as aquatic Ecological Support Areas. The surrounding terrestrial areas comprise a mix of transformed and natural areas.

The 2024 Gauteng CBA Map is only applicable to the northern portion of the site (**Figure 7-69, top**). The mapping reflects mostly the terrestrial biodiversity planning and comprises terrestrial Critical Biodiversity Areas and Ecological Support Areas that are not aligned with aquatic habitats.

The latest Mpumalanga Biodiversity Sector Plan (MBSP 2023 -shown in **Figure 7-69, bottom**) encompasses the 2014 Highveld wetlands mapping (**Figure 7-70**) is similar to the NWM5 mapping showing the wider seep, valley bottom and floodplain wetlands along the watercourses. This mapping is thus also similar to the aquatic biodiversity sensitivity mapping as per the DFFE Screening Tool. Within the site there are only some smaller ESA wetlands with the more important CBA wetlands occurring to the south of the site. These wetlands are not essential for meeting targets, but that play an important role in supporting the functioning of the CBAs wetland which deliver important ecosystem services.

Of most importance in all of the above-mentioned conservation mapping, from an aquatic perspective are the features included in the NWM5 mapping which have been carried through to the DFFE Screening Tool mapping for aquatic biodiversity sensitivity as being of Very high sensitivity. The NWM 6 (beta) is unchanged from the NWM5 for the wetland features mapped within the project area of influence

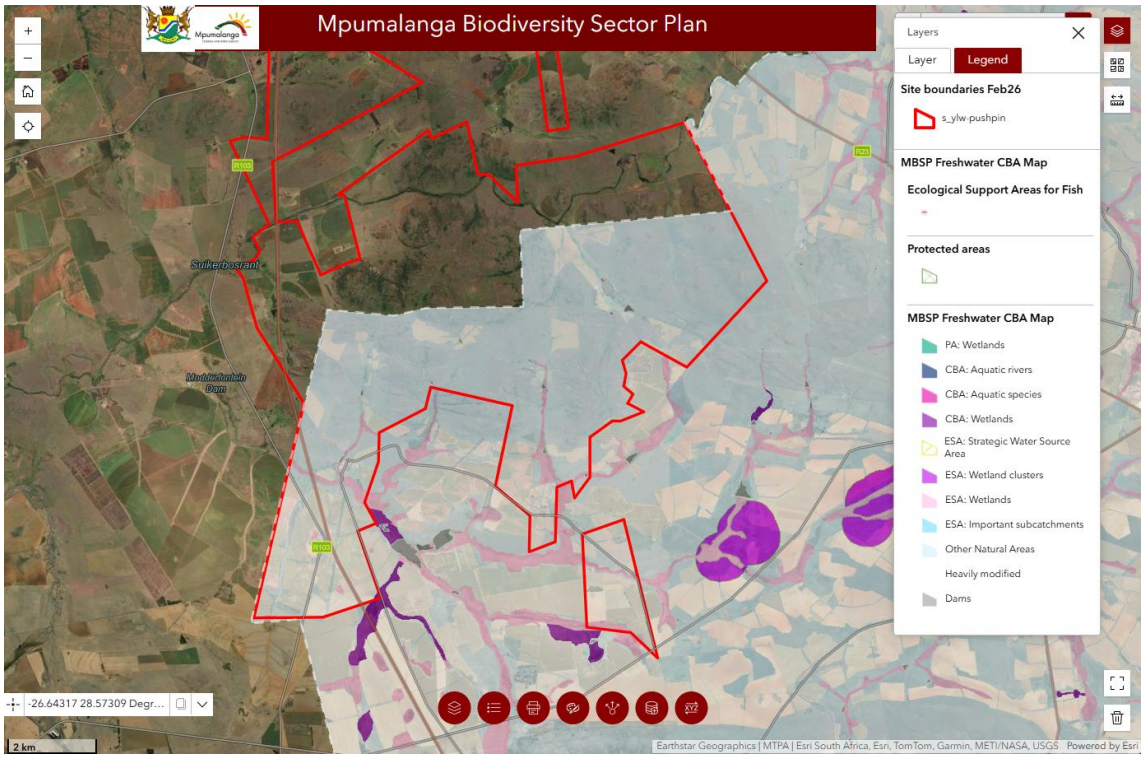


Figure 7-67 - Provincial Biodiversity and Conservation Plans for the study site, where the top image is for the 2024 Gauteng CBA Map (sourced from SANBI BiodiversityGIS, 2026) and the lower image is of the 2023 Mpumalanga Biodiversity Sector Plan (sourced from MBSP, 2025)

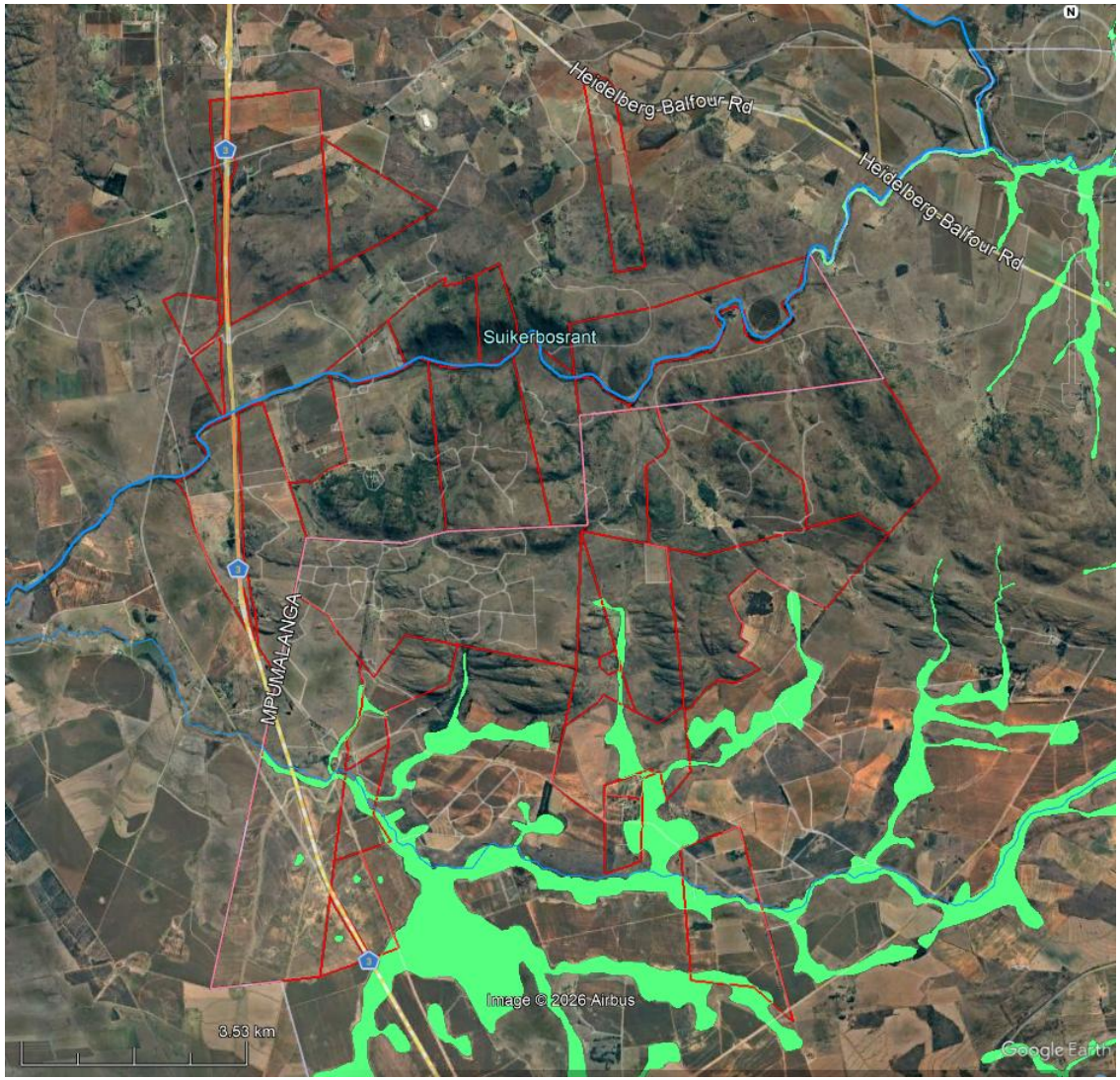


Figure 7-68 - 2014 Mpumalanga Highveld Wetland mapping for the project area, overlain in Google Earth

7.2.4.3 Site verification outcomes

The aquatic features occurring within the site are the Suikerbosrant tributary of the Vaal River and its associated tributaries and wetland areas. These watercourses range from being largely natural on the higher-lying areas of the site to being moderately to largely modified ecological condition in their middle and lower reaches. The watercourses have moderate ecological importance but are of high sensitivity. They provide corridors for the movement of water and biota through the site and are particularly sensitive to flow, water quality and habitat modification due to the associated wetland habitat along many of the watercourses

Dominant plant species in the bushveld and grassland areas include common buffalo thorn (*Ziziphus mucronata*), current-rhus (*Searsia pyroides*), ribbed kunirhus (*Searsia pallens*), ouhout (*Leucosidea sericea*), African boxwood *(Myrsine africana*), gwarrie (*Euclea crispa*), shiny leaf (*Rhamnus prinoides*), mountain cabbagetree (*Cussonia paniculata*), grassveld bitterbush (*Selago densiflora*), and natal grass (*Melinis repens*). Within the wetter areas, Orange River swamplily (*Crinum bulbospermum*), pennywort (*Centella asiatica*), arum lilies (*Zantedeschia albomaculata*), sedges such as Cyperus congestus, common reeds (*Phragmites australis*) and bulrushes (*Typha capensis*) occur. Invasive alien plants occur in the disturbed areas such as silver wattle (Acacia dealbata), prickly pear (Opuntia ficus-indica) and pampas grass (*Cortaderia selloana*).

Figure 7-69 - Views of Suikerbosrant River upstream (top) and downstream (bottom) of the site

Figure 7-70 - Views of some of the tributaries of the Suikerbosrant River within the site

All of the streams within the study area are non-perennial lower foothill streams, with the exception of the Suikerbosrant River which is perennial. The watercourses drain from the higher-lying hills within the centre of the site, either northwards towards the Suikerbosrant River or towards the south and into an unnamed tributary of the river. On the hillslopes the watercourses are largely natural, becoming increasingly disturbed in their lower reaches where they drain through farmlands and both the terrestrial and aquatic vegetation has been modified. From the Site Characterisation assessments, the geomorphological and physical characteristics of the watercourses can be classified as shown in **Table 7-22.**

Table 7-22 - Geomorphological and physical features

River	Suikerbosrant River	Unnamed tributaries
Geomorph Zone	Lower foothill zone	Upper to Lower foothill zones
Lateral mobility	Relatively unconfined	Confined in places due to topography, becoming unconfined
Channel pattern	Single/multiple thread, moderate/low sinuosity	Single thread with relatively low sinuosity
Channel modification	High modification (irrigated, cultivated areas)	Little modification of upper reaches, becoming increasingly modified
Hydrological type	Perennial	Seasonal
Ecoregion	Highveld	
DWS catchment	C21B and C21C (Upper Vaal River System)	
Vegetation type	Andesite Mountain Bushveld on high-lying areas, Soweto Highveld Grassland on low-lying areas	
Rainfall region	Summer	

The evaluation of Index of Habitat Integrity (IHI) provides a measure of the degree to which a river has been modified from its natural state. The methodology involves a qualitative assessment of the number and severity of anthropogenic perturbations on a river and the damage they potentially inflict upon the system. These disturbances include both abiotic and biotic factors, which are regarded as the primary causes of degradation of a river. The severity of each impact is ranked using a scale from 0 (no impact) to 25 (critical impact). The IHI assessment contains an evaluation of the impacts of two components of the rivers, the riparian zone and the instream habitat. The watercourses within the study area are still in a moderately to largely modified ecological condition, with a modification of the habitat occurring because of the surrounding farming activities.

Table 7-23 - Index of Habitat integrity assessment results and criteria assessed of watercourse

Instream Criteria	Suikerbosrant	Tributaries	Riparian Zone Criteria	Suikerbosrant	Tributaries
Water abstraction	14	9	Water abstraction	12	7
Flow modification	12	7	Inundation	7	5
Bed modification	9	7	Flow modification	10	6
Channel modification	7	6	Water quality	8	6
Water quality	9	6	Indigenous vegetation removal	10	9
Inundation	7	5	Exotic veg encroachment	8	7
Exotic macrophytes	7	6	Bank erosion	8	6
Exotic fauna	6	5	Channel modification	7	6
Solid waste disposal	7	4			
Category	C/D	C	Category	C/D	C

The wetland areas within the wider study area can be classified as either valley bottom, seep or depression wetlands. The wetland features within the study area have the characteristics described in **Table 7-24**.

Table 7-24 - Classification of wetland areas within the wider study area

Name	Valley bottom wetlands	Seeps	Depression wetlands
System	Inland		
Ecoregion	Highveld		
Landscape setting	On the valley floor along watercourse	On hillslopes adjacent to watercourse	Isolated depressions on a plain
Longitudinal zonation	Lower foothill	Foothills	Not applicable
Drainage	Drainage in and out associated with watercourse	Groundwater inflow and outflow to watercourse	Inflow from surrounding runoff; no outflow
Seasonality	Seasonal	Mostly seasonal	Naturally seasonal
Anthropogenic influence	Moderate levels of modification (irrigated, cultivated areas)		
Geology and soils	Kliprivierberg Group basalt that form shallow, rocky, clayey soils of mainly Mispah and Glenrosa soil forms.		
Vegetation	Andesite Mountain Bushveld on higher-lying areas and Soweto Highveld Grassland on lower-lying areas		

Salinity	Fresh

The Present Ecological Status (PES) Method (DWAF 2005) was used to establish the integrity of the wetlands in the project area of influence and was based on the modified Habitat Integrity approach developed by Kleynhans (DWAF, 1999; Dickens et al, 2003). **Table 7-25** shows the criteria and results from the assessment of the habitat integrity of the wetlands. These criteria were selected based on the assumption that anthropogenic modification of the criteria can generally be regarded as the primary causes of the ecological integrity of a wetland.

Table 7-25 - Habitat integrity assessment criteria for palustrine wetlands (Dickens *et al*,2003)

Criteria	Valley bottom wetlands	Seeps	Depression wetlands
Hydrologic			
Flow Modification	3.2	3.8	1.5
Permanent Inundation	3.5	4.0	1.0
Water Quality			
Water Quality Modification	2.5	4.0	2.0
Sediment Load Modification	2.0	3.7	1.5
Hydraulic/Geomorphic			
Canalisation	3.0	3.8	1.5
Topographic Alteration	2.8	4.5	1.0
Biota			
Terrestrial Encroachment	2.5	3.2	1.0
Indigenous Veg Removal	2.0	3.0	1.0
Invasive Plant Encroachment	2.5	3.5	2.0
Alien Fauna	2.5	3.5	2.0
Over utilisation	2.5	3.8	1.0
Category	C	B	E

The wetlands in the project area of influence are subjected to physical habitat modification as well as flow and water quality modification because of the surrounding farming activities. In terms of the current ecological state of the wetlands, the seeps are the least impacted and in a largely natural ecological state, the valley bottom wetlands are slightly more impacted (moderately modified) while the depression wetlands are seriously modified with most of their natural habitat and functionality lost.

The Ecological Importance and Sensitivity (EIS) assessment for both watercourses and wetlands consider several biotic and habitat determinants surmised to indicate either importance or sensitivity. In addition, the assessment of wetland areas includes an assessment of the ecosystem services supplied by the wetland areas (divided into Hydrological Functional Importance and Direct Human Benefits). The results of the EIS assessment for the watercourses are provided in **Table 7-26** and for the wetlands in **Table 7-27**.

Table 7-26 - Results of the EIS assessment for the watercourses

Biotic Determinants	Suikerbosrant	Tributaries
Rare and endangered biota	2	2
Unique biota	2	1
Intolerant biota	2.5	2.5
Species/taxon richness	2	1.5
Aquatic Habitat Determinants		
Diversity of aquatic habitat types or features	3	2.5
Refuge value of habitat type	2.5	2
Sensitivity of habitat to flow changes	2.5	2.5
Sensitivity of flow related water quality changes	2.5	2.5
Migration route/corridor for instream and riparian biota	3	1.5
National parks, wilderness areas, Nature Reserves, Natural Heritage sites, Natural areas,	1	1
EIS CATEGORY	High	High/Moderate

Table 7-27 - Results of the EIS assessment for the wetlands

EIS for the Valley Bottom wetlands			
Ecological Importance	Score	Ecological Importance	Score
Biodiversity support	2.0	Flood attenuation	2.8
Presence of Red Data species	2.5	Streamflow regulation	2.7
Populations of unique species	1.5	Sediment trapping	2.7
Migration/breeding/feeding sites	2.0	Phosphate assimilation	2.5
Landscape scale	1.6	Nitrate assimilation	2.7
Protection status of the wetland	2.0	Toxicant assimilation	1.5
Protection status of the vegetation type	1.0	Erosion control	2.8
Regional context of the ecological integrity	2.0	Carbon storage	1.8
Size and rarity of the wetland type/s present	1.5	Hydrological/Functional Importance	2.38
Diversity of habitat types	1.5	Water for human use	2.5
Sensitivity of the wetland	2.5	Harvestable resources	1.5
Sensitivity to changes in floods	2.5	Cultivated foods	1.5
Sensitivity to changes in low flows/dry season	2.5	Cultural heritage	1.5
Sensitivity to changes in water quality	2.5	Tourism and recreation	1.5
		Education and research	1.5
Ecological Importance & Sensitivity	2.5	Importance of Direct Human Benefits	1.67

EIS for the Valley Bottom wetlands			
OVERALL IMPORTANCE: VALLEY BOTTOM WETLANDS		**MODERATE**	
EIS for the Seeps			
Ecological Importance	Score	Ecological Importance	Score
Biodiversity support	1.67	Flood attenuation	2.5
Presence of Red Data species	1.5	Streamflow regulation	3.0
Populations of unique species	1.5	Sediment trapping	2.0
Migration/breeding/feeding sites	2.0	Phosphate assimilation	2.5
Landscape scale	1.72	Nitrate assimilation	2.5
Protection status of the wetland	2.0	Toxicant assimilation	1.5
Protection status of the vegetation type	1.0	Erosion control	2.5
Regional context of the ecological integrity	2.0	Carbon storage	1.5
Size and rarity of the wetland type/s present	1.8	Hydrological/Functional Importance	2.25
Diversity of habitat types	1.8	Water for human use	2.5
Sensitivity of the wetland	2.5	Harvestable resources	1.3
Sensitivity to changes in floods	1.5	Cultivated foods	1.0
Sensitivity to changes in low flows/dry season	2.5	Cultural heritage	1.0
Sensitivity to changes in water quality	2.5	Tourism and recreation	1.0
		Education and research	1.0
Ecological Importance & Sensitivity	2.5	Importance of Direct Human Benefits	1.25
OVERALL IMPORTANCE: SEEPS		**MODERATE**	
EIS for the Depressions			
Ecological Importance	Depress	Ecological Importance	Depress
Biodiversity support	1	Flood attenuation	1
Presence of Red Data species	1	Streamflow regulation	0
Populations of unique species	1	Sediment trapping	0
Migration/breeding/feeding sites	1	Phosphate assimilation	0
Landscape scale	0.2	Nitrate assimilation	0
Protection status of the wetland	0	Toxicant assimilation	0
Protection status of the vegetation type	1	Erosion control	0
Regional context of the ecological integrity	0	Carbon storage	0
Size and rarity of the wetland type/s present	0	Hydrological/Functional Importance	1.3

EIS for the Valley Bottom wetlands			
Diversity of habitat types	0	Water for human use	0
Sensitivity of the wetland	1	Harvestable resources	0
Sensitivity to changes in floods	1	Cultivated foods	0
Sensitivity to changes in low flows/dry season	1	Cultural heritage	0
Sensitivity to changes in water quality	1	Tourism and recreation	0
		Education and research	0
Ecological Importance & Sensitivity	1.00	Importance of Direct Human Benefits	0
OVERALL IMPORTANCE: DEPRESSIONS		**LOW**	

The watercourses with their associated seep and valley bottom wetlands are of moderate to high ecological importance and sensitivity, while the very degraded depression wetlands are of low ecological importance and sensitivity.

A buffer of 50m is recommended for the watercourses while the associated wetland habitats should be protected by a 100m buffer. Services could be placed through these aquatic habitats and buffer areas but must be kept to a minimum and adequately mitigated.

The findings of this assessment thus largely agree with the DFFE screening tool for aquatic biodiversity sensitivity mapping in that most of the site is of low aquatic sensitivity. The watercourses are however considered to be of high sensitivity and should be avoided by the proposed WEF facilities, as recommended above.

If the above-recommended buffers and the proposed mitigation measures in the impact assessment are implemented, the risk to the aquatic ecosystems is likely to be low such that the General Authorisations for Section 21(c) and (i) water uses under the National Water Act (Act 36 of 1998) would apply.

The following table summarises the findings of the site verification assessment in terms of aquatic ecosystem sensitivity:

Sensitivity Theme: Aquatic		
Screening Tool Site Sensitivity	Specialist Site Sensitivity	Reasons why the Screening Tool Sensitivity is disputed / confirmed
Most of the site comprises low Aquatic Biodiversity Sensitivity in terms of the DFFE screening tool mapping with the watercourses and wetlands within the site being of very high sensitivity. The site does not lie within a National FEPA River Sub catchment or a SWSA. The wetlands are mapped in the National Wetland Map5 and the 2014 Mpumalanga Highveld Wetlands Map.	Low for the widespread area and High to moderate for the watercourses and wetlands within the site. A medium sensitivity has been applied to the adjacent buffers.	The Screening Tool indicated the site to be in an area mapped as being of Low Aquatic Biodiversity Sensitivity but with the aquatic features mapped as very high sensitivity. This assessment found the watercourses and wetlands on the site to be of high sensitivity. Buffer zones of 50m on either side of the watercourses and 100m from the wetlands are deemed sufficient to protect these aquatic ecosystems from any impact arising from the proposed WEF.

7.2.5. AVIFAUNA

The following is extracted from the Avifaunal assessment report compiled by Holland and Associates Environmental Consultants and included as Appendix G.5.

7.2.5.1 The Regional Context

The closest Important Bird Areas (IBAs) which are also Key Biodiversity Areas (KBAs) are the Devon Grasslands, located approximately 10 km east of the PAOI, the Suikerbosrand Nature Reserve, located approximately 4 km north-west of the PAOI and Blesbokspruit wetland, located approximately 17 km north of the PAOI and is a IBA and not a KBA (Key Biodiversity Areas Partnership, 2024; Marnewick, *et al*., 2015).

7.2.5.2 The Project Area of Influence (PAOI)/ the Local Context

The study area does not contain any formal protected areas (SAPAD, 2026) nor conservation areas (SACAD, 2026). Several smaller protected areas surround the PAOI these include, the Suikerbosrand Nature Reserve, located approximately 4 km north-west of the PAOI, the Devon Protected Area, located approximately 10 km east of the PAOI, Valdaam Nature Reserve located 15.65 km south of the PAOI, Daisy Private Nature Reserve located 5 km north of the PAOI, Marievale Nature Reserve located approximately 18 km north of the PAOI, Voortrekker Private Nature Reserve located approximately 15 km north-east of the PAOI and Nicolaas Private Nature Reserve located approximately 20 km north-east of the PAOI.

According to the Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2024) the study area consists entirely of Tsakane Clay Grassland (Endangered), Soweto Highveld Grassland (Vulnerable), Gold Reef Mountain Bushveld (Least Concern) and Andesite Mountain Bushveld (Least Concern).

7.2.5.3 Avifaunal Habitats

Ridges and rocky outcrops

The PAOI contains hills, koppies, ridges and rocky outcrops that provide habitat for a variety of specialised raptor species such as eagles, kestrels and falcons that use them for foraging, nesting and roosting. Verreaux's Eagle (Vulnerable) which was recorded within the PAOI during pre-construction monitoring favours rocky outcrops, koppies, hills, and mountains wherever their main prey item, the rock hyrax, occurs. Lanner Falcon (Near threatened), also recorded within the PAOI, tends to favour cliffs as nesting and roosting sites, however they do use alternative structures such as trees, pylons and buildings.

Cultivated Land

A large portion of the PAOI consists of cultivated land which a variety of birds may be attracted to for food, shelter and nesting habitat. These include francolins, spurfowl, geese, cranes and larks. A variety of larks who may utilise cultivated fields were recorded in high abundance in the study site. These include Eastern Clapper Lark, Red-capped Lark and Rufous-naped Lark. Lanner Falcon (Near threatened) also tends to favour rocky outcrops surrounded by grassland and agricultural land for nesting. There is evidence which suggests that Lanner Falcon strongly benefits from agricultural land (Sarà, 2014) most likely due to the resulting high density of rodents which occur during the peak crop harvest periods.

Grassland habitat

This is a relatively uniform habitat in terms of plant species composition and abundance and is dominated by grasses with a few scattered woody species. This type of habitat is favoured by the recorded large terrestrial SCC species: Lanner Falcon (Vulnerable), Southern Bald Ibis (Vulnerable), Blue Korhaan (Near threatened), Northern Black Korhaan, Secretarybird (Endangered) as well as Lanner Falcon (Vulnerable). A variety of passerines such as larks, pipits and cisticolas also depend on grasslands. Due to the large extent of grassland habitat, the density of avian species is typically low.

Drainage lines and watercourses

Drainage lines and watercourses are characterised by taller riparian vegetation with small trees and generally support a higher avifaunal abundance and diversity than the surrounding areas. The SCC listed above for karoo scrub habitat may also occur here occasionally, but this habitat is more likely to be frequented by smaller passerine species. Endemic and near-endemic species recorded in the PAOI that prefer this habitat include Bar-throated Apalis, Chinspot Batis, Southern Boubou, African Paradise Flycatcher, Brown-hooded Kingfisher, African Goshawk, Cape Robin-chat, Arrow-marked Babbler, Black-collared Barbet, Long-billed Crombec, African Olive Pigeon, Lesser Swamp-warbler, Little Rush-warbler, Black Crake and African Rail.

Rivers, wetlands and artificial waterpoints

The PAOI includes several natural and artificial NFEPA surface waterpoints that can attract a variety of water-associated birds including the recorded SCC Secretarybird (Endangered), which prefers to nest and roost near waterbodies for foraging and breeding. This habitat is most frequently utilised by weavers, doves, sparrows, bishops ducks, teals, grebes, shovelers, wagtails, stilts, lapwings, plovers, coots, doves and martins which typically favour waterbodies for foraging and breeding. Therefore, an area of 100 m of artificial open water bodies is considered to be of high avifaunal sensitivity. The artificial waterpoints in the PAOI are, however, not considered to be irreplaceable, and any man-made open water structures could be removed or covered, which would lower the sensitivity.

Alien trees and pylons

The PAOI contains several stands of alien trees as well as electricity pylons that provide suitable roosting and nesting substrate for a variety of avian species, including raptors such as Common Buzzard, Cape Eagle Owl, Barn Owl, Jackal Buzzard, Spotted Eagle Owl, Booted Eagle, Black-chested Snake Eagle, Martial Eagle (Endangered) and Verreaux's Eagle (Vulnerable), otherwise unavailable in the area.

7.2.5.4 Site Ecological Importance

The calculation of the Site Ecological Importance is presented in **Table 7-28 .** Six avifaunal habitat types were identified within the PAOI: ridges, hill and rocky outcrops, cultivated land, grassland, drainage lines and watercourses, rivers, wetlands and artificial waterpoints, and alien trees and man-made structures (pylons, buildings).

The Conservation Importance (CI) for ridges, hills and rocky outcrops, grasslands and drainage lines and watercourses, was determined as medium due to more than 50% of the receptor containing natural habitat with potential to support SCC. Dams and alien trees, and man-made structures were rated as low CI as no confirmed or highly likely populations of SCC occurring, and <50% of the receptor containing natural habitat that can support SCC. Cultivated land, farm dams and alien trees

and man-made structures were rated as low CI as no confirmed or highly likely populations of SCC occur there, and the receptor contains <50% natural habitat that can support SCC.

The Functional Integrity of ridges, hills and rocky outcrops, grassland, and drainage lines and watercourse has been rated as high as >20 ha of area is intact. It was rated as very high for cultivated land as this habitat is largely intact and its ability to maintain its structure and function. Farm dams and alien trees and man-made structures were rated as low due to their small size.

The Receptor Resilience of ridges, hills and rocky outcrops, grassland and, drainage line and watercourses and alien trees and man-made structures was rated as medium as a recovery to restore >75% of functionality is assumed to be slow, but possible with rehabilitation, over more than 10 years. For cultivated fields and farm dams, the receptor resilience was determined as very high.

The resulting Site Ecological Importance (SEI) rating was determined as medium for ridges, hills and rocky outcrops, grassland and drainage lines and watercourses, which means with minimisation and restoration mitigation development activities with medium impact are acceptable if followed by appropriate restoration activities. The SEI for alien trees was determined as low, and the SEI for cultivated land and farm dams was determined as very low.

Table 7-28 – Calculation of Site Ecological Importance

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor resilience	Site Ecological Importance
Ridges, hills and rocky outcrops	Medium	High	Medium	Medium	Medium
Cultivated land	Low	Very high	Medium	Very high	Very low
Grassland	Medium	High	Medium	Medium	Medium
Drainage lines & watercourses	Medium	High	Medium	Medium	Medium
Farm dams	Low	Low	Low	Very high	Very low
Alien trees & man-made structures	Low	Low	Low	Medium	Low

The combined SEI is the highest rating, i.e., medium for the proposed development as a whole, which means with minimisation and restoration mitigation development activities with medium impact are acceptable if followed by appropriate restoration activities (SANBI, 2020).

7.2.5.5 Avifauna of the Project Area of Influence

SABAP2 has recorded a total of 265 species in the PAOI, of which 177 were recorded as present on the WEF site (Annexure B). Of those recorded on the WEF site, 18 are endemic or near endemic, 18 are regional Red List species (Lee et al., 2025) and 26 are priority species for wind energy developments (Retief, et al., 2014). The 26 observed priority species recorded included two species listed as Endangered (Secretarybird and Black Stork), four species listed as Vulnerable (Verreaux's Eagle, Red-footed Falcon, African Marsh Harrier and Yellow-billed Stork) and twelve species listed as

Near Threatened (African Darter, White-backed Duck, Yellow-billed Duck, Great Egret, Lanner Falcon, Greater Flamingo, Hamerkop, Southern Bald Ibis, Black-winged Kite, Melodious Lark, Kittlitz's Plover and Red-billed Teal). Priority species were recorded with an average passage rate of 0.606 priority species flights per hour and an average passage rate of 0.544 priority species flights per hour passing through risk height. The highest IKA across all walked transects on the WEF site was recorded for WT7 where over 400 birds per kilometre sampled were recorded and where a total of 60 species were recorded, the most abundant of these were Red-billed Quelea and Cape Weaver.

7.2.5.6 Results of the Additional 2026 Winter Nest Survey

A known Verreaux's Eagle nest (NE1) was visited in the vicinity of the Helderberg Kloof Estate, approximately 12.5 km north-west of the WEF site. A single adult bird was found sitting on the nest built on a telecommunication tower, presumably incubating (**Table 7-29**).

An area close to Alpha Base, a historical military base north-west of the site, was also searched for a known Verreaux's Eagle nest (NE2, location obtained from Hawkwatch International). The nest was not visible from accessible roads, and the status of the nest could not be determined.

A series of ridges with alien trees in the Klipfontein area, north-east of the study area, was searched for a historical vulture roost (ROOST1). A Secretarybird was observed perched on the same tree on three separate occasions, and also foraging in a field nearby on one occasion, in the western side of the study area, but no nest was found. A known Black Sparrowhawk nest (NE4) was visited in the centre of the study site and found to be inactive. No flamingos were observed in any of the wetlands during this survey.

Table 7-29 - Winter 2026 Survey Results

Nest	Species	Status
NE1	Verreaux's Eagle	Active nest
NE2	Verreaux's Eagle	Undetermined
ROOST1	Vulture Roost	Inactive
NE3	Secretarybird	Active roost
NE4	Black Sparrowhawk	Inactive

A total of 84 avian species, including 11 Priority Species, were recorded during the 5-day winter survey. Black-winged Kite was the most frequently recorded Priority Species, with 13 incidental records (**Table 7-30**).

Table 7-30 - Winter 2026 Survey Incidental Records

Common Name	Red List Status (Regional)	Red List Status (Global)	WEF Score	Number of Records	Total Individuals
African Harrier-Hawk			190	2	2
Yellow-billed Duck	NT	LC	N/A	3	4
Black Sparrowhawk			170	3	3

Common Name	Red List Status (Regional)	Red List Status (Global)	WEF Score	Number of Records	Total Individuals
Secretarybird	VU	EN	320	4	4
African Darter	NT	LC	N/A	5	5
Black-winged Kite	NT	LC	175	13	14
Grey-winged Francolin			190	1	1
White Stork			220	1	7
Lanner Falcon	NT	LC	300	1	1
African Fish Eagle			290	1	1
Verreaux's Eagle	VU	LC	360	2	2

7.2.5.7 Avifaunal Constraints

Avifaunal constraints were identified based on the results of pre-application monitoring (Annexure B) and nest surveys and were provided as shapefiles to the Applicant to inform the design of the project layout. Refer to Annexure B Section 5.5 of the study for a discussion on how buffer sizes were derived. An avifaunal constraints map (Figure 2) was developed which considers the following features:

- NFEPA rivers by 200 m
- NFEPA wetlands by 100 m
- Critical Biodiversity Areas (CBAs)
- Nests and roosts
- Woodland areas
- Areas of high flight activity including rocky ridges, scarps and steep slopes

Turbines are not supported within river and wetland buffers, but minimised linear infrastructure such as powerlines or roads may be acceptable with mitigations.

Large areas of the site fall within areas mapped as irreplaceable and important CBAs. It is generally recommended to avoid all CBAs by development planning as far as possible and to exclude the irreplaceable CBAs from the proposed development footprint.

Due to the presence of Verreaux's Eagle in the area, development on steep slopes (> 1:4) and on scarps, ridges and rocky outcrops is not recommended. These areas must be avoided by development as far as possible. Some very minimised turbine placement may be found acceptable with additional mitigation measures in place.

Woodland areas are used for nesting and roosting, and development should avoid these areas as much as possible.

All constraints are complied with in the proposed optimised EIA layout (Figure 2, **Table 7-31**), which avoids all no blade areas.

Table 7-31 - Winter 2026 Survey Incidental Records

Constraint area	Constraint	Proposed layout compliance
Within 200 m of NFEPA Rivers and Wetlands (artificial and natural)	No turbines are supported. Some minimised infrastructure such as roads and overhead powerlines may be acceptable if unavoidable, with pylons placed as far as possible on the outside of the buffers and mitigations such as bird flight diverters installed along the entire line.	Full. No turbines are proposed within these areas. Minimised infrastructure as proposed is acceptable with mitigations.
Within Critical Biodiversity Areas	Should be avoided by development, as far as possible. Minimised unavoidable linear activities may be acceptable with mitigation.	Full. No turbine positions are proposed within CBAs. Minimised proposed linear infrastructure is acceptable with mitigations.
Wooded areas	Should be avoided by development, as far as possible. Minimised unavoidable linear activities may be acceptable with mitigation.	Full. No turbines are proposed within these areas. Minimised infrastructure as proposed is acceptable with mitigations.
Areas of identified higher flight activity by priority species	Should be avoided by turbine placement and overhead powerlines as far as possible. Minimised development may be acceptable with mitigation.	Full. No turbines are proposed within areas identified as high flight risk areas. A small section of one blade area protrudes slightly into this area which is acceptable. Minimised proposed linear infrastructure is acceptable with mitigations.

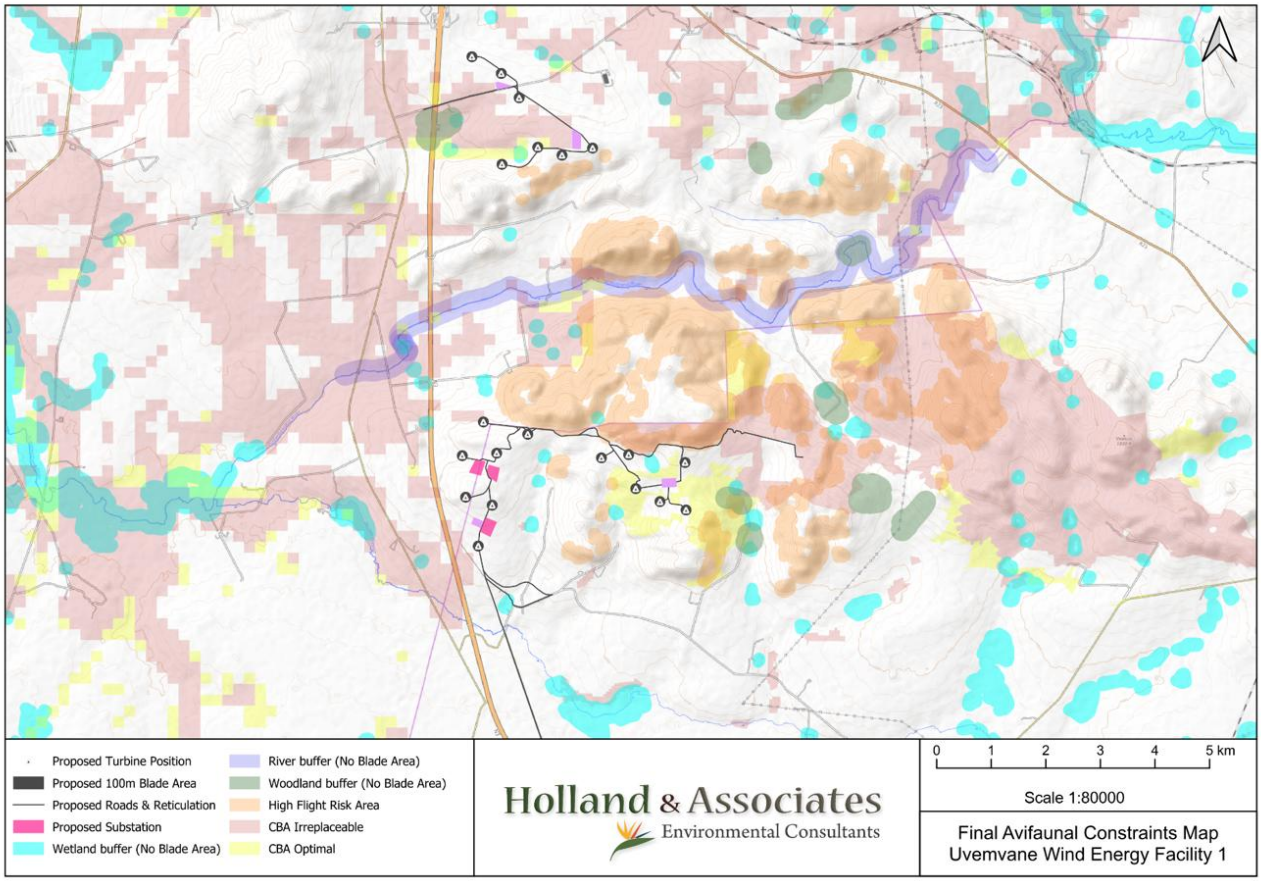


Figure 7-71 - Avifaunal Constraints Map

7.2.5.8 Collision Risk Modelling

Table 7-32 below presents quantitative collision risk fatality estimates calculated according to Band (2024). Gross collisions per year indicate the theoretical unmitigated collision risk without birds actively avoiding any turbines. Net collisions incorporate the species-specific avoidance rates as per (Band, 2024). The final mitigated residual risk assumes the avoidance of high-risk flight areas, as per the proposed layout, and the implementation of blade patterning, achieves an efficiency of 72% for the proposed 20 turbines.

Table 7-32 - Collisions Risk Model (Band, 2024) Results

Species	Flights at Risk Height	Time at Risk (s)	Gross Collisions/yr	Net Collisions/yr	Mitigated Risk (-72%) / yr
Black-winged Kite	43	44,100	7.684	0.384	0.1075
Verreaux's Eagle	24	27,348	5.718	0.114	0.0319
Common Buzzard	24	4,631	0.807	0.016	0.0045
Greater Flamingo	13	2,691	0.703	0.014	0.0039

Species	Flights at Risk Height	Time at Risk (s)	Gross Collisions/yr	Net Collisions/yr	Mitigated Risk (-72%) / yr
Black Sparrowhawk	10	1,294	0.271	0.014	0.0038
Red-footed Falcon	6	9,085	1.583	0.079	0.0222
Lanner Falcon	6	1,111	0.290	0.006	0.0016
Jackal Buzzard	6	1,091	0.228	0.005	0.0013

The Collision Risk Model predicts that for the proposed turbine layout, which avoids high flight risk areas, and with blade patterning applied across all turbines, over the 20-year operational lifetime of the facility, less than one fatality per priority species will occur, with the exception of Black-winged Kite (Least Concern), with an estimated fatality of 2.15 birds over 20 years.

Specifically, the model predicts 0.64 Verreaux's Eagle fatalities, 0.44 Red-footed Falcon, and less than 0.1 individuals for Common Buzzard (0.09), Greater Flamingo (0.078), Black Sparrowhawk (0.078), Lanner Falcon (0.034), and Jackal Buzzard (0.028), over a 20-year period. These numbers are well below the PBR value, assuming that the facility must achieve less than 0.1 of the calculated PBR. Therefore, according to the Collision Risk Model (Band 2024), the proposed WEF is unlikely to result in unacceptable impacts on avifauna.

However, confidence in these numbers is relatively low due to the high number of assumptions and estimates required and the lack of local, peer-reviewed, species-specific data to validate the applied model. The true collision risk may be higher than predicted and could require adaptive mitigation measures, such as Shut-Down-on-Demand, to be deemed necessary based on actual post-construction fatality data. Post-construction monitoring throughout the lifetime of the facility must therefore be implemented, with fatality thresholds as per the Post-construction Monitoring Plan (Appendix E of the study).

7.2.6. BUTTERFLY HABITAT ASSESSMENT

The following is extracted from the Invertebrates assessment report compiled by Bathusi Environmental Consulting CC and included as Appendix G.14.

7.2.6.1 Recorded and documented butterfly diversity

Table 7-33 indicates the anticipated butterfly diversity of the study area, including species that were recorded during the survey period and threatened species (red text) that are considered likely inhabitants of the project area, based on a review of habitat diversity and status. Annotated photographs of some species and habitat characteristics within the study area are provided in Section 10.3 of the study.

Table 7-33 - Butterfly diversity of the study area and species

Families, Subfamilies and Species	English Names	Conservation Status (Global status unless otherwise stated)
FAMILY: PAPILIONIDAE	**SWALLOWTAIL FAMILY**	
SUBFAMILY: PAPILIONINAE	**Swallowtails and swordtails subfamily**	

Families, Subfamilies and Species	English Names	Conservation Status (Global status unless otherwise stated)
Papilio demodocus demodocus Esper, [1798]	Citrus Swallowtail	LC
FAMILY: HESPERIIDAE	**SKIPPERS**	
SUBFAMILY: COELIADINAE	**POLICEMEN**	
Coeliades forestan forestan (Stoll, [1782])	Striped Policeman	LC
Coeliades Pisistratus (Fabricius, 1793)	Two-pip Policeman	LC
SUBFAMILY: HESPERIINAE	**RANGERS AND SWIFTS**	
Gegenes letterstedti (Wallengren, 1857)	Brown Dodger	LC
Gegenes pumilio gambica (Mabille, 1878)	African Dark Dodger	LC
Kedestes lepenula (Wallengren, 1857)	Sun-burst Ranger	LC
Pelopidas mathias (Fabricius, 1798)	Black-banded Swift	LC
Tsitana tsita (Trimen, 1870)	Dismal Sylph	LC
SUBFAMILY: HETEROPTERINAE	**SYLPHS**	
Metisella meninx (Trimen, 1873)	Marsh Sylph	Near Threatened (Rare: Habitat specialist)
SUBFAMILY: PYRGINAE	**SANDMEN AND ELFINS**	
Agyllia asterodia (Trimen, 1864)	Star Sandman	LC
Eretis umbra umbra (Trimen, 1862)	Shadow Elf	LC
Ernsta colotes transvaaliae (Trimen, 1889)	Eastern Bushveld Sandman	LC
Gomalia elma elma (Trimen, 1862)	Green Marbled-Sandman	LC
Spialia ferax (Wallengren, 1863)	Striped Sandman	LC
Spialia mafa mafa (Trimen, 1870)	Speckled Sandman	LC
Spialia spio (Linnaeus, 1764)	White-spot Sandman	LC
FAMILY: PIERIDAE	**WHITES, YELLOWS, VAGRANTS AND TIPS**	
SUBFAMILY: COLIADINAE	**YELLOWS AND CLOUDED YELLOWS**	
Catopsilia florella (Fabricius, 1775)	African Migrant	LC
Colias electo electo (Linnaeus, 1763)	African Clouded Yellow	LC
Eurema brigitta brigitta (Stoll, [1780])	Broad-bordered Grass Yellow	LC
SUBFAMILY: PIERINAE	**WHITES AND TIPS SUBFAMILY**	
Belenois aurota (Fabricius, 1793)	Pioneer Caper White/Brown-veined White	LC
Belenois creona severina (Stoll, 1781)	Southern African Caper White	LC
Colotis annae annae (Wallengren, 1857)	Scartlet Tip	LC
Colotis antevippe gavisa (Wallengren, 1857)	Southern Red Tip	LC

Families, Subfamilies and Species	English Names	Conservation Status (Global status unless otherwise stated)
Colotis euippe omphale (Godart, [1819])	Southern Round-winged Orange Tip	LC
Colotis evagore Antigone (Boisduval, 1836)	African Small Orange Tip	LC
Colotis evenina evenina (Wallengren, 1857)	African Orange Tip	LC
Mylothris agathina agathina (Cramer, [1779])	Eastern Dotted Border	LC
Mylothris rueppellii haemus (Trimen, 1879)	Southern Twin Dotted Border	LC
Pinacopteryx eriphia eriphia (Godart, [1819])	Zebra White	LC
Pontia helice (Linnaeus, 1764)	African Meadow White	LC
Teracolus subfasciatus (Swainson, [1883])	Lemon Traveller	LC
FAMILY: NYMPHALIDAE	**BRUSH-FOOTED BUTTERFLIES**	
SUBFAMILY: BIBLIDINAE	**BYBLIA SUBFAMILY**	
Byblia anvatara acheloia /(Wallengren, 1857)	Eastern Plain Joker	LC
Byblia ilithyia (Drury, 1773)	Spotted Joker	LC
SUBFAMILY: CHARAXINAE	**CHARAXES SUBFAMILY**	
Charaxes saturnus saturnus Butler, 1866	Painted Emperor/Foxy Charaxes	LC
SUBFAMILY DANAINAE	MONARCH SUBFAMILY	
Danaus chrysippus (Linnaeus, 1758)	Plain Tiger/African Monarch	LC
SUBFAMILY: HELICONIINAE	**ACRAEA SUBFAMILY**	
Acraea horta (Linneaus, 1764)	Garden Acraea	LC
Acraea neobule Doubleday, 1847	Wandering Acraea	LC
Phalanta phalantha aethiopica (Rothschild & Jordan, 1903)	African Leopard	LC
Stephenia natalica (Boisduval, 1847)	Black-based Acraea	LC
Telchinia rahira rahira (Boisduval, 1833)	Marsh Amber	LC
Telchinia serena (Fabricius, 1775)	Dancing Amber	LC
SUBFAMILY: NYMPHALINAE	PANSY SUBFAMILY	
Catacroptera cloanthe cloanthe (Stoll, 1781)	Pirate	LC
Hypolimnas misippus (Linnaeus, 1764)	Mimic Diadem	LC
Junonia hierta cebrene Trimen, 1870	African Yellow Pansy	LC
Junonia oenone oenone (Linneaus, 1758)	Blue-spot Pansy	LC
Junonia orithya madagascariensis Guenée, 1865	African Blue Pansy	LC
Precis archesia archesia (Cramer, [1779])	Garden Commodore	LC

Families, Subfamilies and Species	English Names	Conservation Status (Global status unless otherwise stated)
Precis octavia sesamus Trimen, 1883	Southern Gaudy Commodore	LC
Vanessa cardui (Linnaeus, 1758)	Painted Lady	LC
SUBFAMILY: SATYRINAE	**BROWNS SUBFAMILY**	
Stygionympha wichgrafi wichgrafi Van Son, 1955	Rocky Hillside Brown	LC
FAMILY: LYCAENIDAE	**BLUES AND COPPERS**	
SUBFAMILY: APHNAEINAE	**OPALS, RUSSETS AND SCARLETS**	
Aloeides henningi Tite & Dickson, 1973	Hillside Russet	LC
Chrysoritis aureus (van Son, 1966)	Heidelberg Golden Opal	Threatened: Endangered
Cigaritis ella (Hewitson, [1865])	Hilltop Silverline	LC
Cigaritis mozambica (Bertoloni, 1850)	Marmalade Silverline	LC
Cigaritis natalensis (Westwood, 1852)	Glitter Silverline	LC
SUBFAMILY: LYCAENINAE	**SORREL-COPPERS**	
Lafron clarki Clark & Dickson, 1971	Eastern Sorrel Copper	LC
SUBFAMILY: POLYOMMATINAE	**BLUES AND HAIRTAILS**	
Actizera lucida (Trimen, 1883)	Rayed Blue	LC
Anthene amarah amarah (Guérin-Méneville, 1849)	Black-striped Hairtail	LC
Anthene definita definite (Butler, 1899)	Grey Hairtail	LC
Azanus jesous (Guérin-Méneville, 1849)	Topaz Babul Blue	LC
Azanus moriqua (Wallengren, 1857)	Black-bordered Babul Blue	LC
Azanus ubaldus (Stoll, 1782)	Velvet-spotted Babul Blue	LC
Cacyreus marshalli Butler, 1898	Geranium Bronze	LC
Cacyreus virilis Stempffer, 1936	Mocker Bronze	LC
Cupidopsis cissus cissus (Godart, 1824)	Meadow Blue	LC
Cupidopsis jobates jobates (Hopffer, 1855)	Tailed Meadow Blue	LC
Eicochrysops messapus mahallakoaena (Wallengren, 1857)	Pink Cupreous Ash Blue	LC
Freyeria trochylus (Freyer, [1843])	Brown Grass Jewel	LC
Lampides boeticus (Linneaus, 1767)	Pea Blue	LC
Lepidochrysops patricia (Trimen, 1887)	Patrician Nimble Blue	LC
Lepidochrysops plebeia plebeian (Butler, 1898)	Twin-spot Nimble Blue	LC
Leptomyrina henningi henningi Dickson, 1976	Plain Black-eye	LC

Families, Subfamilies and Species	English Names	Conservation Status (Global status unless otherwise stated)
Leptotes brevidentatus (Tite, 1958)	Short-toothed Zebra Blue	LC
Leptotes pirithous pirithous (Linnaeus, 1767)	Common Zebra Blue	LC
Tarucus sybaris sybaris (Hopffer, 1855)	Dotted Pierrot	LC
Tuxentius melaena melaena (Trimen, 1887)	Black Pie	LC
Uranothauma nubifer nubifer (Trimen, 1895)	Black Heart	LC
Zintha hintza hintza (Trimen, 1864)	Blue Pied Pierrot	LC
Zizeeria knysna knysna (Trimen, 1862)	Sooty Grass Blue	LC
Zizula hylax (Fabricius, 1775)	Tiny Grass Blue	LC
SUBFAMILY: THECLINAE	**HAIRSTREAKS**	
Capys disjunctus disjunctus Trimen, 1895	Russet Protea	LC
Deudorix antalus (Hopffer, 1855)	Brown Playboy	LC

7.2.6.2 Butterfly Species of Conservation Priority Relevant to the Project

Studies about the vegetation and preferred habitat of threatened butterfly species in South Africa indicate that ecosystems with a unique combination of features are often selected by localised threatened butterfly species (Deutschländer and Bredenkamp 1999; Edge 2005; Terblanche, Morgenthal & Cilliers 2003; Lubke, Hoare, Victor & Ketelaar 2003; Edge, Cilliers & Terblanche, 2008). Threatened butterfly species in South Africa are therefore regarded as effective and accurate bioindicators of rare ecosystems.

Species presented in **Table 7-34** to **Table 7-36** were considered because they were highlighted by the Screening Tool, recorded during the assessment, identified from credible regional records, or considered potentially suitable based on habitat requirements. The expected presence or absence (Likelihood of Occurrence) of these threatened butterfly species, as well as other butterfly species of conservation priority that are not currently included in threatened categories, are also indicated in **Table 7-34** to **Table 7-36**.

Table 7-34 - Least Concern butterfly species of the Mpumalanga Province and Gauteng Province combined, but flagged as Rare or Critically Rare by Mecenero et al. (2020)*

Species	Threatened Status	Recorded (survey)	Residential status at the site (LoO)**
Aloeides barberae Barberton Russet	Endangered	No	Highly unlikely
Aloeides dentatis dentatis Toothed Russet	Endangered	No	Could exist at some areas but were not observed during the surveys. Basic observations are recommended as part of biodiversity monitoring programme (if deemed necessary).
Aloeides nubilus	Endangered	No	Highly unlikely

Species	Threatened Status	Recorded (survey)	Residential status at the site (LoO)**
Cloud Russet			
Aloeides rossouwi Stoffberg Russet	Critically Endangered	No	Unlikely
Chrysoritis aureus Heidelberg Golden Opal/Heidelberg Copper	Endangered	No	The Environmental Screening Report indicates a 'Medium Sensitivity' for this species in the study area (thus suggesting that the species is considered a potential inhabitant of the area). MTPA observation records, which were not available at the time of this report, further indicate the known presence of the species at specific localities across the project area. Findings of this assessment support these initial sensitivity indications with specific parts identified as potentially highly suitable for this species. As a precautionary measure these parts have been categorised as highly sensitive and have been excluded from the development during the scoping phase of the project. MTPA locality will be incorporated in the final report. Basic monitoring surveys will be recommended as part of the biodiversity monitoring programme, with any observations or potential impacts assessed and addressed as they arise.
Chrysoritis phosphor borealis Scarce Scarlet Opal	Endangered	No	Highly unlikely
Dingana clarki amissivallis Verloren Vallei Bronze Speckled Widow	Vulnerable	No	Highly unlikely
Dingana fraterna Stoffberg Widow	Critically Endangered	No	Highly unlikely
Lepidochrysops irvingi Sabie Nimble Blue	Vulnerable	No	Highly unlikely
Lepidochrysops jefferyi Purple-brown Nimble Blue	Critically Endangered	No	Highly unlikely
Lepidochrysops praeterita Highveld Nimble Blue	Endangered	No	Unlikely
Lepidochrysops swanepoeli Barberton Nimble Blue	Critically Endangered	No	Highly unlikely
Orachrysops mijburghi Heilbron Indigo Blue	Endangered	No	No individuals of this species were observed during the brief surveys. Considering the nature and status of wetland habitat in the study area, it is considered an unlikely

Species	Threatened Status	Recorded (survey)	Residential status at the site (LoO)**
			inhabitant of certain areas. The potential presence of Orachrysops mijburghi can however not be excluded entirely; avoidance of wetland habitat is strongly recommended and will mitigate against significant impacts on this species. Basic observations are recommended as part of biodiversity monitoring programme.
Orachrysops violescens Violescent Indigo Blue	Endangered	No	Highly unlikely

Table 7-35 - Near Threatened butterfly species of the Mpumalanga Province and Gauteng Province combined (Mecenero et al. 2020)*

Species	Threatened Status	Recorded (survey)	Status at the site (LoO)**
Dingana alaedeus Wakkerstroom Widow	Near Threatened	No	Highly unlikely
Metisella meninx Marsh Sylph	Near Threatened	No	Considered a likely inhabitant of some wetland and riparian zones. Avoidance of wetland habitat is strongly recommended and will mitigate against significant impacts on this species. Basic observations will be recommended as part of biodiversity monitoring programme.

Table 7-36 - Least Concern butterfly species of the Mpumalanga Province and Gauteng Province combined, but flagged as Rare or Critically Rare by Mecenero et al. (2020)*

Species	Threatened Status	Recorded (survey)	Status at the site (LoO)**
Eriboea marieps (= Charaxes marieps) Marieps Black Prince	Least Concern: Rare, Restricted range	No	Highly unlikely
Lepidochrysops procera Potchefstroom Blue/Grassland Nimble Blue	Least Concern: Rare, Habitat specialist	No	Unlikely
Orachrysops warreni Verloren Vallei Indigo Blue	Least Concern: Extremely Rare	No	Highly unlikely

Considering that the occurrence of threatened butterfly species in the project area is restricted to highly specific habitat types, the implementation of avoidance strategies and micro-siting of development components (as per the latest layout iteration) has achieved significant mitigation of potential and likely impacts. Considering the latest layout, the proposed development is unlikely to cause significant threats to any threatened butterfly species or populations and habitat associated with these species. While minor infringements into High Sensitivity areas are noted according to the latest layout (refer Section 11.4), the application of the recommended mitigation approach, which also

includes final walkthrough of site footprints and micro-siting recommendations, will ameliorate impact significance to acceptable levels.

7.2.6.3 Butterfly Habitat Sensitivity

The estimated butterfly ecological sensitivity for the study area is illustrated in **Figure 7-72**, and is categorised as follows:

- Very High butterfly habitat sensitivity:

Very High Sensitivity is indicated for any area where a Threatened butterfly species has been recorded or considered highly likely to be present as habitat at these sites is highly suited for the existence of a population of these threatened species. Specifically, Chrysoritis aureus (Heidelberg Golden Opal/Heidelberg Copper) is considered a species of interest in specific parts of the wider region; these parts of the landscape should be protected. According to the latest project layout, none of these areas will be directly affected by the proposed development. These parts of the wider landscape generally relate to certain sections of the high mountainous parts of the Mountain Bushveld habitat type.

- High butterfly habitat sensitivity:

High Sensitivity areas include parts of the landscape where the Threatened butterfly might not necessarily occur, but a conspicuous/high diversity of other butterflies is present. These areas also refer to habitat types that are considered moderately suitable for priority species, e.g., watercourses, rocky ridges, and areas that act as migration corridors for butterflies. It is worth noting that some/limited developments, e.g., inserting a wind turbine, in High Sensitivity areas are still possible under controlled and specific conditions; careful development and implementation of effective mitigation and conservation measures, as well as the implementation of effective mitigation and conservation principles could even contribute to the safeguarding ecosystems with high butterfly habitat sensitivity. High sensitivity areas generally relate to untransformed and natural habitat types of the landscape, including the following broad-scale habitat types:

- Mountain bushveld;
- Natural grassland (high integrity portions);
- Rocky shrubland; and
- Watercourses and Wetlands.

- Medium butterfly habitat sensitivity:

Medium Sensitivity areas conform to those parts where butterfly diversity is not conspicuously high, and these parts of the project area is not considered to represent a significant migration or movement corridor for butterfly species based on available information. Despite some modification of the predominant vegetation (e.g., resulting from high and persistent grazing pressure and associated deterioration patterns), extensive parts of the project area are nonetheless considered relatively natural and do not exhibit the high transformation levels associated with cultivated or fallow agricultural fields. Medium sensitivity areas generally relate to the Natural grassland broad-scale habitat, specifically parts where lower integrity or status have been recorded.

- Low butterfly habitat sensitivity:

Low Sensitivity areas represent modified or extensively degraded areas. Butterfly abundance in these areas is often conspicuously poor or generally contain high numbers of ubiquitous and widespread butterfly species that have the ability to utilise 'poor' floral types (e.g., exotic and invasive species) as host plants for caterpillars. For example, butterfly abundance and diversity are typically very poor in areas where plantations of Eucalyptus trees dominate, exhibiting characteristics of Low Sensitivity. Low sensitivity areas generally relate to parts of the landscape that exhibit moderate to severe levels of disturbance, including:

- Alien tree stands;
- Cultivated fields; and
- Transformed areas.

Table 7-37 - Habitat types of the project area in relation to the ascribed sensitivity

Habitat type	Ecological condition	Butterfly value	Sensitivity
Mountain bushveld	Natural	High	High
Natural grassland	Natural	High	Medium–High
Rocky shrubland	Natural	High	High
Secondary grassland	Modified	Moderate	Medium
Cultivated fields	Transformed	Low	Low
Wetlands	Natural/mesic	High	High

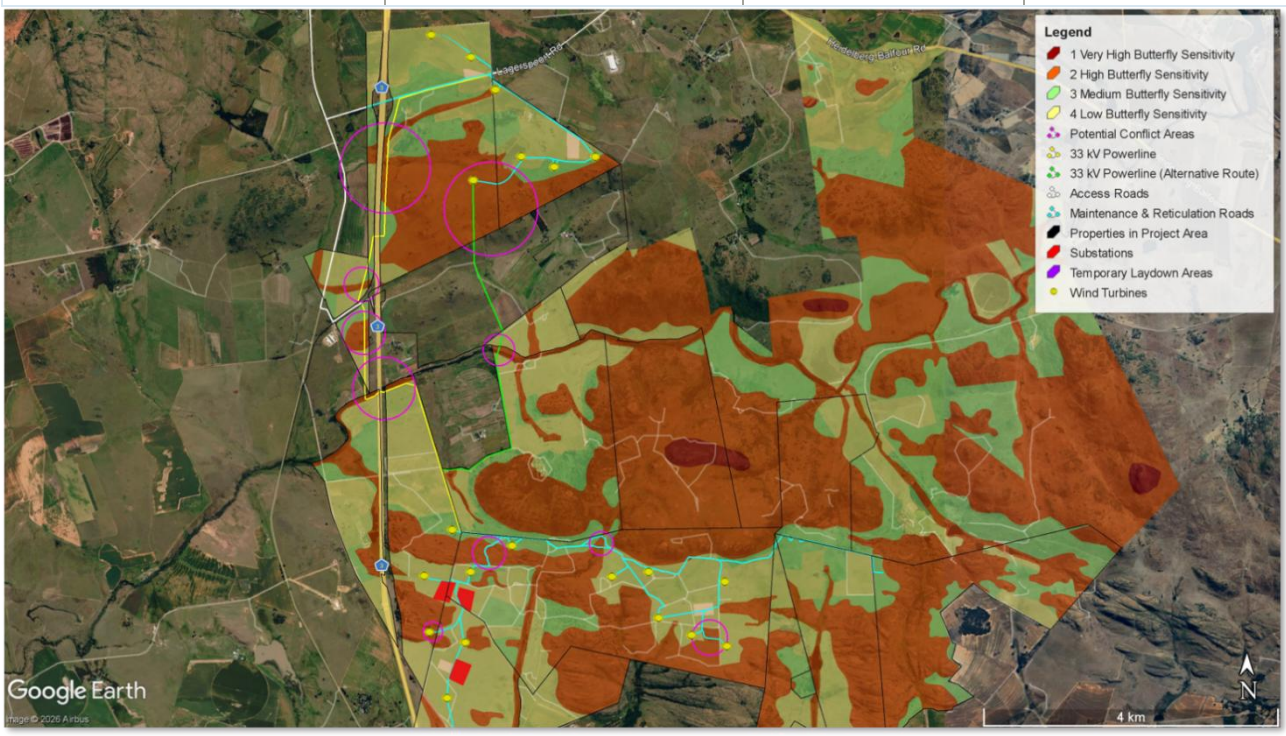


Figure 7-72 - Habitat sensitivity for butterfly species within the study area in relation to the project components and layout, with an indication of potential conflict areas

7.2.7. BATS

The following is extracted from the Bats Assessment report compiled by Volant Environmental and is included as Appendix G.6.

7.2.7.1 Potential Species Present in the Area

A desktop study which included the environmental reports for wind energy facilities (and other developments) in the region data from the African Chiropteran Report (ACR, 2022) and Bats of Southern and Central Africa (Monadjem *et al*., 2020) revealed that 20 species could potentially be found in the area (**Table 7-38**). The ACR database was used to plot species that have been captured or recorded near the POAI. The specialist used a radius of 100 km as bats are known to travel vast distances and this provides a broader context to ensure that species that may migrate across the PAOI are included. Only four species have been captured or collected within 50 km from the proposed WEF, *Laephotis capensis*, *Tadarida aegyptiaca*, *Myotis welwitchii* and *Chaerephon pumilus* (**Figure 7-73,** ACR, 2021). More species have been captured within 100 km of the PAOI, including *Myotis tricolor, Rhinolophus simulator* and *Rhinolophus capensis*. Probability of occurrence is based on the distribution ranges of the species and habitat and roosting requirements along with specialist knowledge and experience. The distribution ranges of all species have been drawn from the ACR database (2022).

Table 7-38 - List of species with possible occurrence around the proposed WEF site

Species name	Common name	Conservation Status IUCN/ SA Red List	Foraging habits	Roosts	Probability occurrence	Risk of Impact
Cistugidae						
Cistugo - lesueur	Lesueur's hairy bat	LC/NT	Clutter-edge forager	Rock crevices	Low	High
Emballonuridae						
Taphozous-mauritianus	Mauritian tomb bat	LC/LC	Open-air forager	Open-air forager	High	High
Hipposideridae						
Hipposideros caffer -	Sundevall's leafnosed bat	LC/LC	Clutter forager	Cave and hollow dependent	Low	Low
Miniopteridae						
Miniopterus-natalensis	Natal long-fingered bat	LC/LC	Clutter-edge forager	Caves	High	High
Molossidae						

Species name	Common name	Conservation Status IUCN/ SA Red List	Foraging habits	Roosts	Probability occurrence	Risk of Impact
Mops-midas	Angolan free-tailed bat	LC/LC	Open-air forager	Roosts in any suitable crevice and in the roofs of buildings and houses	High	High
Tadarida-aegyptiaca	Egyptian free tailed bat	LC/LC	Open-air forager	Caves, rock crevices, under exfoliating rocks, hollow trees, behind the bark of dead trees and buildings	High	High
Nycteridae						
Nycteris - thebaica	Egyptian slit faced bat	LC/LC	Clutter forager	Caves, culverts, and trunks of large trees	Medium	Low
Pteropodidae						
Epomophors-crypturus	Peters's epauletted fruit bat	LC/LC	Clutter forager	In valleys and lowlying areas where large fruiting trees are present.	Medium	High
Epomophors -wahlbergi	Wahlberg's Epauletted Fruit bat	LC/LC	Clutter forager	Roosts in dense foliage of large, leafy trees	Medium	High
Rousettus - aegyptiacus	Egyptian rousette	LC/LC	Clutter forager	Caves	Low	High
Rhinolophidae						
Rhinolophus-clivosus	Geoffroy's horseshoe bat	LC/LC	Clutter forager	Caves and mines	Medium	Low
Rhinolophus-darlingi	Darling's horseshoe bat	LC/LC	Clutter forager	Caves and mines	Medium	Low
Rhinolophus -denti	Dent's horseshoe bat	LC/NT	Clutter forager	Caves and mines	Medium	Low
Rhinolophus-simulator	Bushveld horseshoe bat	LC/LC	Clutter forager	Caves and mines	Medium	Low
Rhinonycteridae						

Species name	Common name	Conservation Status IUCN/ SA Red List	Foraging habits	Roosts	Probability occurrence	Risk of Impact
Cloeotis-percivali	Percival's short-eared trident bat	LC/EN	Clutter forager	Cave and hollow dependent	Low	Low
Vespertilionidae						
Eptesicus-hottentotus	Long-tailed serotine	LC/LC	Clutter-edge forager	Caves and rock crevices	High	Medium
Laephotis-capensis	Cape serotine	LC/LC	Clutter-edge forager	Under the bark of trees, foliage, and buildings	High	High
Myotis-tricolor	Temminck's myotis	LC/LC	Clutter-edge forager	Caves	Medium	Medium
Pipistrellus - hesperidus	Dusky pipistrelle	LC/LC	Clutter-edge forager	Wooded areas in trees as well as cracks in rocks	High	Medium
Scotophilus-dinganii	Scotophilus dinganii	LC/LC	Clutter forager	Roosts mainly in holes in trees and roofs of houses	High	Medium

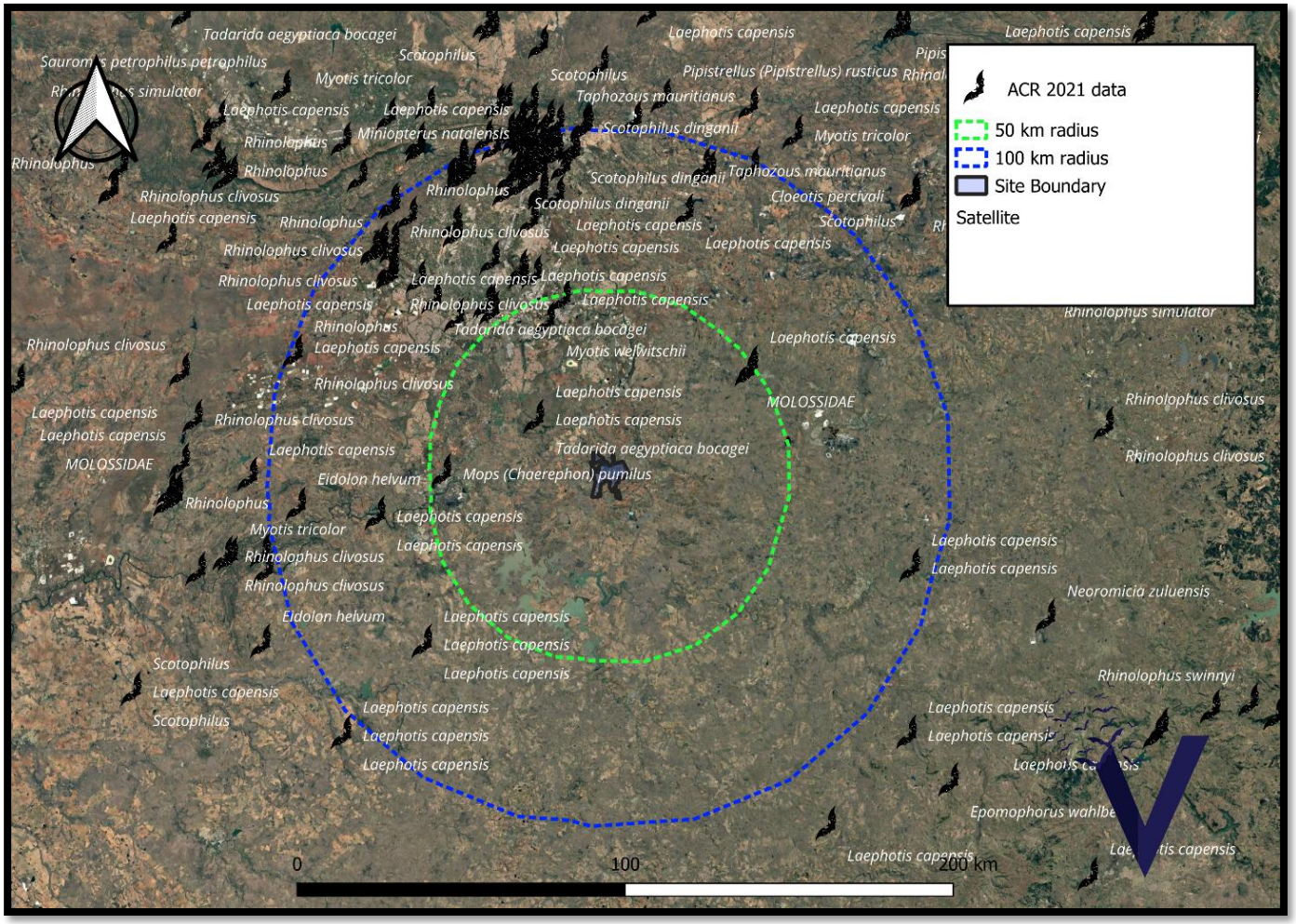


Figure 7-73 - Bats captured or collected near the Project Area of Influence

7.2.7.2 Protected areas

A search was conducted to identify any protected areas present within 100 km of the proposed WEF project area using the South African Protected Area Data (SAPAD 2025 Q3). The identified public/privately owned protected areas are illustrated on the figure below (**Figure 7-74).** The reserves consist of privately as well as publicly owned land used for wildlife conservation as well as specific livestock farming. These sites are all registered designated protected areas (SAPAD 2025 Q3).

In addition to protected areas present around the proposed WEF site, a search for cave roosts was conducted. Locations of historical caves are fairly well known, but as not all the records are publicly available, it does impose risks of these sites being missed. Both summer and winter roost inspections have been performed during the assessment. Due to the geological makeup of complex dolomite structures found in and around the Gauteng region, cave structures are easily formed. A few known caves found within the 50 Km and 100 Km radius are well known (e.g. Nash's Cave, Bat's Cave, Bakwena/Irene Cave, Skurweberg Caves, Gladysvale Mine, American Cave, Monument Cave, Fountains Cave, Scramblers, Sterkfontein, Gladysvale Mine, Kromdraai Mine, Minaar's Cave, Wondercave, Silwer Myn, Grobler's Cave, Porcupine Cave, Mamelodi Cave, Groenkloof, Swartkop cave). Most of the abovementioned caves are found North of the PAOI and should not affect the proposed development as the SABPG only require a 20 km search radius. Results obtained in this study will provide information

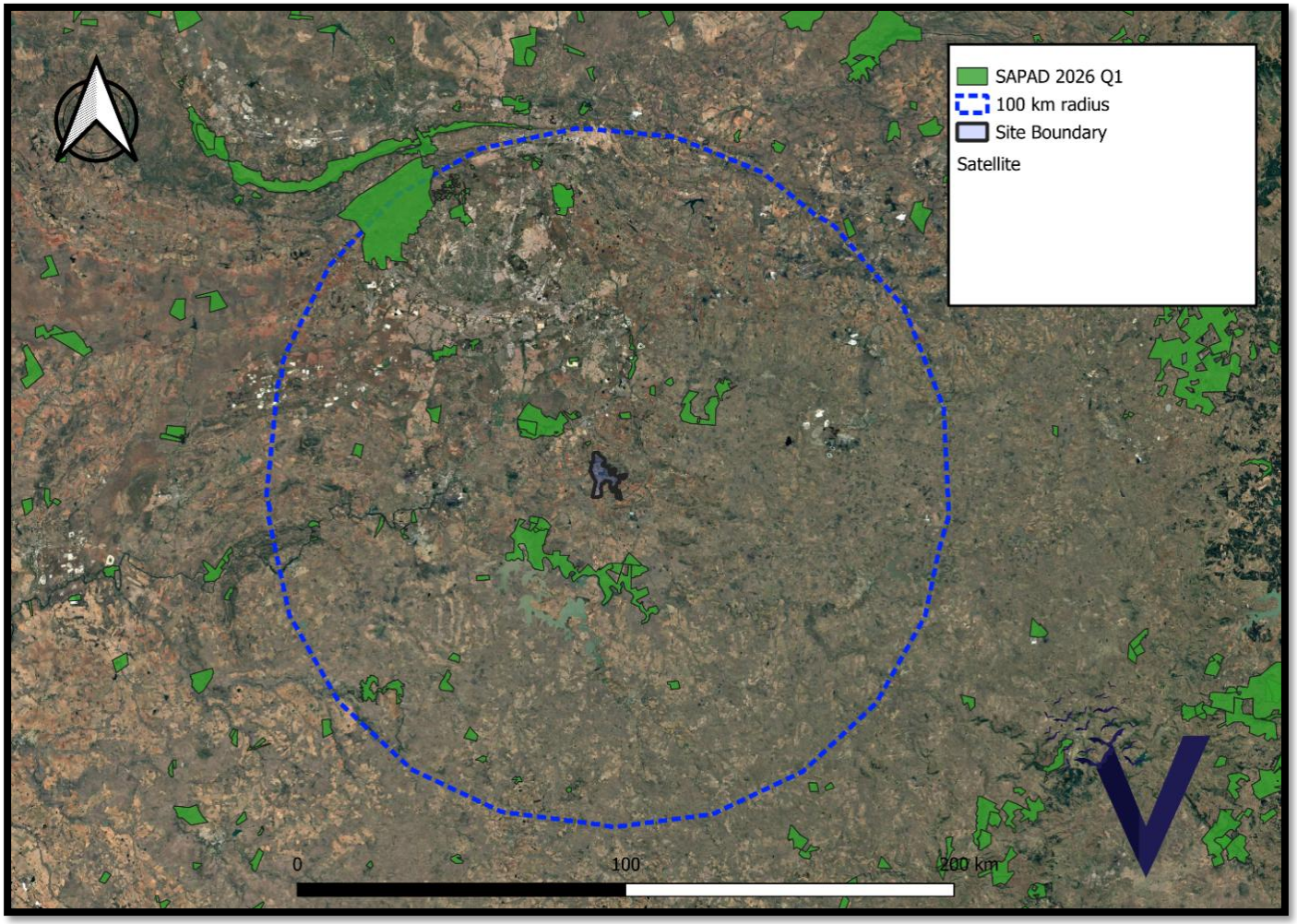


Figure 7-74 - Location of protected areas near the Project Area of Influence

7.2.7.3 Passive monitoring

Five bat species were recorded across the monitoring period between 26 August 2024 and 3 September 2025 (**Table 7-39**). This included 264 691 bat calls recorded over a period of 20 572,57 hours at a median of 0,99 bat passes per hour. Of the species recorded *L. capensis* was the most abundant followed by *T. aegyptiaca*.

Table 7-39 - Bat species detected across the Project Area of Influence with their Impact Risk and abundance (BP/H)

Species name	Common name	Conservation Status IUCN/ SA Red List	Foraging habits	Roosts	Risk of Impact	Median number of bat passes per hour
Molossidae						
Tadarida aegyptiaca	Egyptian free tailed bat	LC/LC	Open-air forager	Caves, rock crevices, under exfoliating rocks, hollow trees, behind the bark of dead trees and buildings	High	3,40
Miniopteridae						
Miniopterus natalensis	Natal long-fingered bat	LC/NT	Clutter-edge forager	Caves	High	0,00
Vespertilionidae						
Laephotis capensis	Cape serotine	LC/LC	Clutter-edge forager	Under the bark of trees, foliage, and buildings	High	16,76
Pipistrellus hesperidus	Dusky pipistrelle	LC/LC	Clutter-edge forager	Wooded areas in trees as well as cracks in rocks	Medium	0,07
Scotophilus dinganii	Yellow bellied house bat	LC/LC	Clutter-edge forager	Under the bark of trees, foliage, and buildings	Medium	1,34

Bat passes per species

Bat activity within the Project Area of Influence was dominated by *Laephotis capensis* and *Tadarida aegyptiaca*, with activity patterns indicating seasonal and nocturnal variation. Most species exhibited peak activity during the early evening (18:00 to 21:00), corresponding with emergence from roosts and the commencement of foraging and drinking activities. Activity generally declined throughout the night, with very limited activity recorded after 05:00. A slight increase in L. capensis activity before dawn suggests movements back to roost sites.

Seasonal trends showed increased bat activity during the summer months, particularly between September 2024 and January 2025, with activity peaking during December 2024. Activity declined

markedly during the winter months, with some periods recording little to no bat activity, before increasing again from August 2025. These patterns are likely influenced by climatic conditions, breeding cycles, and seasonal habitat use.

Scotophilus dinganii, Miniopterus natalensis, and *Pipistrellus hesperidus w*ere recorded at relatively low but consistent levels throughout the survey period. The very low activity levels of M. natalensis suggest that the species does not maintain a nearby roost or regularly migrate through the area, instead using the site only occasionally for foraging.

Bat Passes per Bat Detector

Acoustic monitoring was undertaken across five detector locations within the PAOI. Although equipment issues resulted in data loss during the first two months of monitoring and temporary microphone failures at two detector locations, more than 80% of the monitoring data was successfully collected. A total of 264,691 bat calls were recorded during the survey period, with activity levels indicating an overall medium bat fatality risk for the PAOI. Bat activity at ground level was substantially higher than at turbine height, suggesting that most activity occurs closer to the ground and associated habitat features.

Bat activity was unevenly distributed across the study area, with the detector positioned adjacent to the river (UVE-01) recording significantly higher activity levels than all other monitoring stations (see **Table 7-40).** The riverine habitat accounted for the majority of recorded bat calls, indicating that watercourses and associated vegetation represent important foraging and commuting habitat for bats. The availability of open water, increased insect abundance and the likely presence of nearby roost sites are considered key factors contributing to the elevated activity levels recorded in this area.

Temporal patterns showed that bat activity peaked during the early evening hours following emergence from roosts and declined steadily throughout the night. Seasonal trends indicated the highest levels of activity during spring and summer, particularly at the riverine detector, while activity decreased substantially during winter.

Table 7-40 - Bat detectors deployed across the Project Area of Influence with the relative abundance recorded at each

Detector	Height	Habitat	Number of bat calls recorded	Median bat passes per hour
UVE-01	10 m	River	228 225	16,76
UVE-02	10 m	Grassland near ridges	18 078	1,80
UVE-03	10 m	High grassland	10 862	0,95
UVE-04	70 m	High grassland	3 766	0,42
UVE-05	120 m	High grassland	3 760	0,00

Bat passes at height

Bat activity was substantially higher at ground level than at elevated monitoring heights, indicating that bats primarily forage and commute close to the ground. Activity at turbine height was generally low and was only recorded in notable numbers at 70 m during November and December 2024 and again during August and September 2025.

7.2.7.4 Sensitive bat areas

Several potential bat sensitive areas, including water sources and potential foraging areas, are outlined below. Based on data obtained from bat detectors and during driven transects water sources, including rivers, open water and wetlands are highly sensitive. The ridges and vegetated areas will be used by bats for roosts and foraging and should be seen as highly sensitive. A 200 m buffer was implemented around sites that are considered to be of High Sensitivity to bats as required by MacEwan (2022).

Water bodies

All bat species are dependent on sources of open water and will visit at least one of these sites once per night. This includes pools in streams, lakes, ponds, slow-flowing streams, rivers and artificial bodies of water with similar properties such as farm dams, cattle troughs, swimming pools (Korine et al, 2016). Some evidence also showed calm water sources tends to attract more bats as the water surface provides a less cluttered acoustic signal return being advantages to bats hunting behavior (Von Frenckell *et al*, 1978). Based on the South Africa Best Practice Guidelines for Bats at Wind Energy Facilities (SABPG, MacEwan et al 2020) a 200 m buffer is required around all areas that are seen as Medium Sensitivity areas for bats, and this includes all sources of open water (**Figure 7-75)**

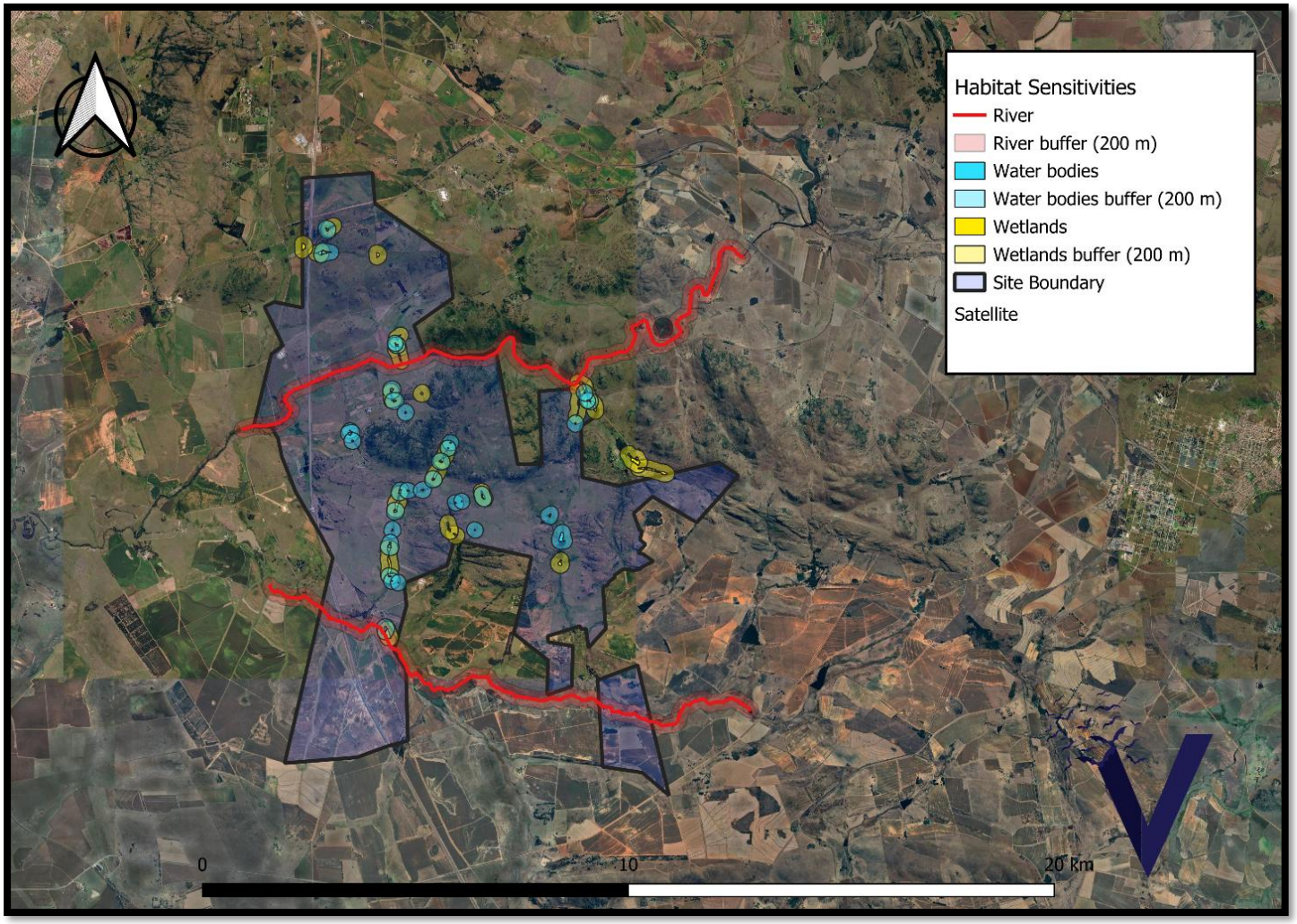


Figure 7-75 - Locations of sources of water sources that are classified as sensitive to bats with required 200 m buffer applied

Ridges

Some species of bats, including T. aegyptiaca, roost in rock crevices, and these areas may act as potential roosts. All ridges and rocky outcrops were visited during the spring survey (November) to determine if bats are roosting in the rock crevices. It appears as if bats do use ridges as flyways, classifying these as Medium Sensitive and a 200 m buffer will be needed (**Figure 7-76**).

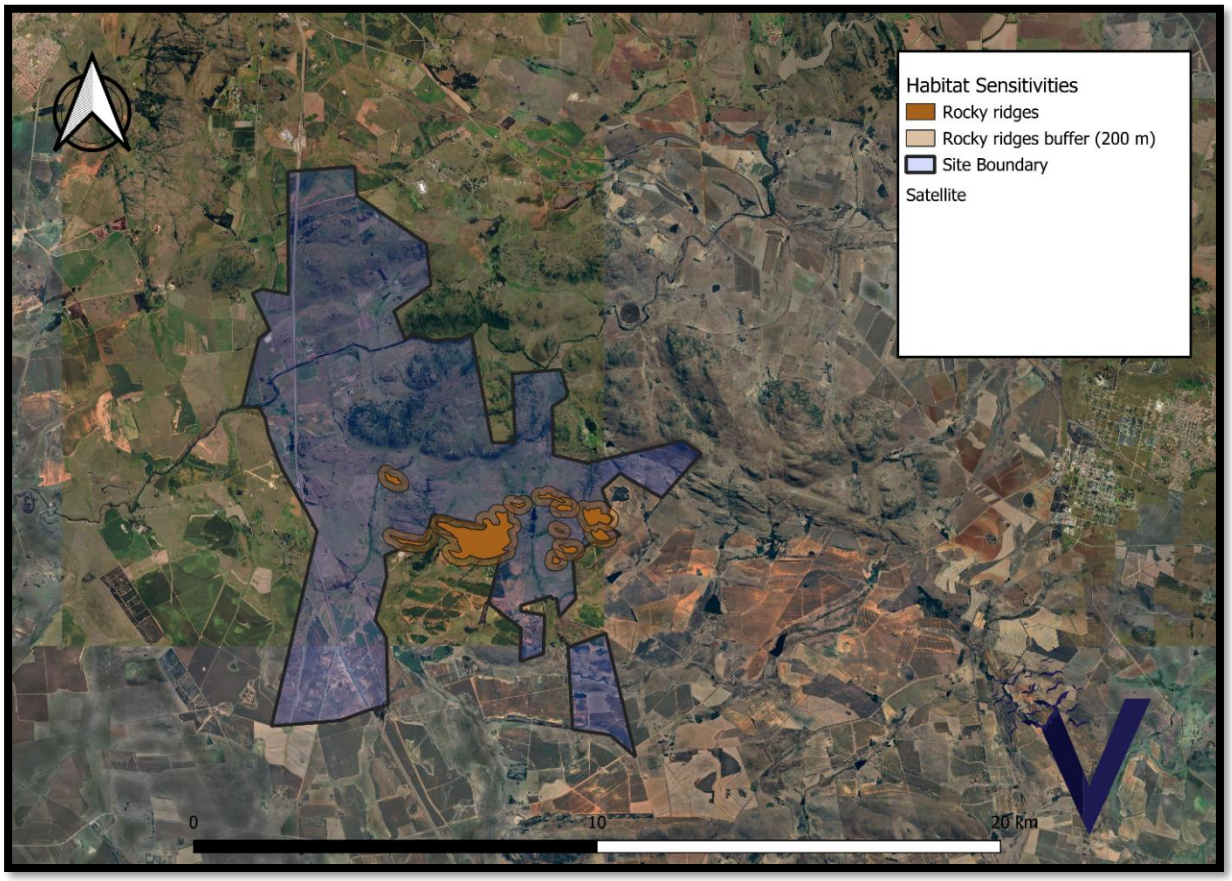


Figure 7-76 - Ridges located across the Project Area of Influence including required buffers

Wooded Areas

Bats use dense patches of trees as both foraging and roosting locations, and has been deemed to be of Medium sensitivity to bats. As such a 200 m buffer will be required (**Figure 7-77**).

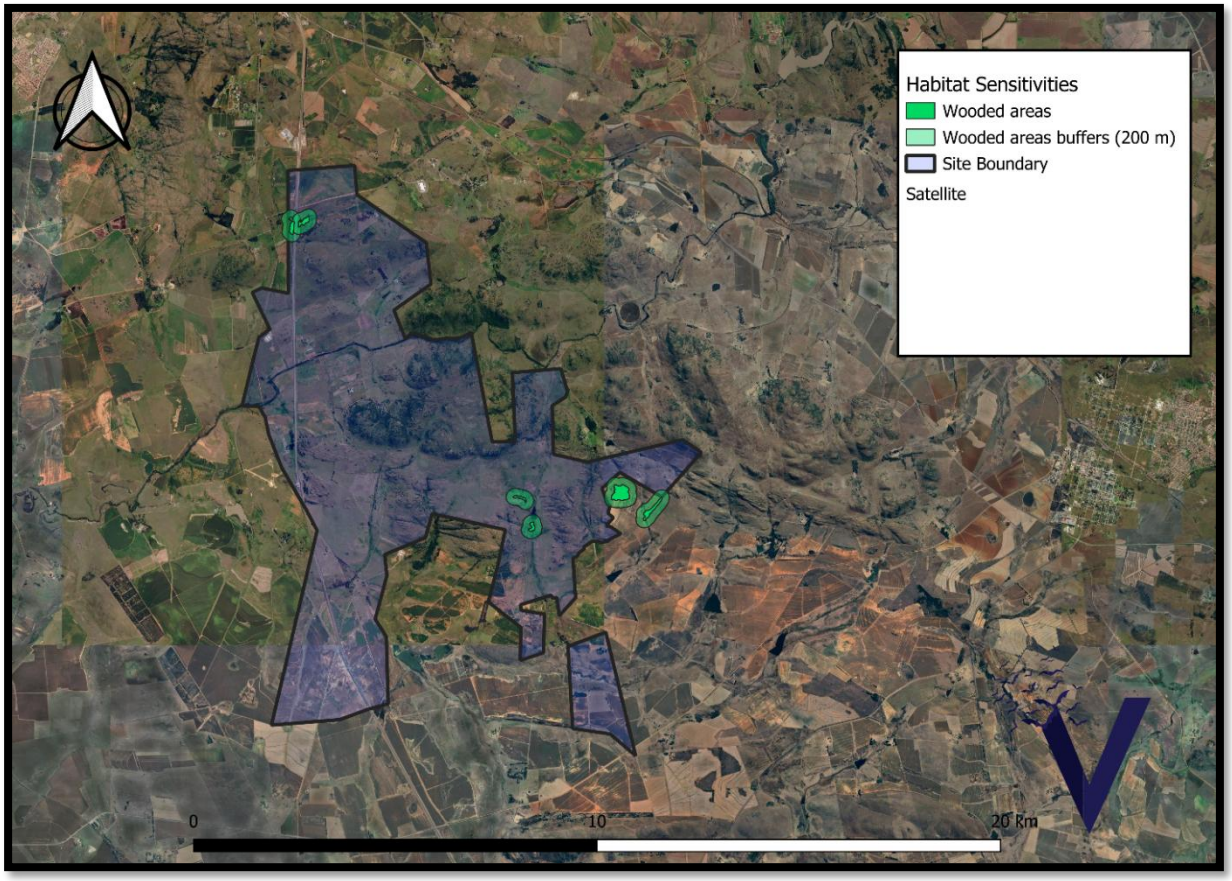


Figure 7-77 - Wooded areas located on the Project Area of Influence including required buffers

7.2.7.5 Bat buffers

Water bodies, rivers, wetlands, ridges and wooded areas must be given 200 m buffers as they are seen as areas that are of Medium Sensitivity to bats, and No-Go buffers have been applied around all confirmed roosts which are considered as High sensitivity features (**Figure 7-78**). Roosts found have been classified as small and large roosts and will require a 1 km and 2.5 km buffer respectively. The mine shaft has been given a No-Go buffer of 500 m, but the shaft must be inspected continuously throughout the construction and pre-construction phase to ensure that it is not used by other species of bats in the future. As the guidelines regarding the buffer sizes and shapes are stringent and well defined, it is important that all applied buffers be respected and followed when considering final facility layout. No part of the wind turbine, including the blade tips must encroach into these buffer zones. The buffers zones can be measured on a map during the preparation of report sensitivity maps or on the ground. The applied buffer zones are measured from the ground all the way to the full length of the turbine sweep and it includes all parts of the turbine, tower and rotor sweep.

For other associated WEF developments, such as buildings, sub-stations, roads and powerlines, developers must:

- For roads: A 200 m minimum buffer applies to bat roosts, and disturbances to foraging areas by roads must be considered in the assessment.

- For power lines: A 500 m powerline buffer applies to bat roosts. Powerlines can cross bat important foraging areas area, as long as all the other water use license mitigation measures are in place in the case of wetlands and rivers.

For buildings and sub-station infrastructure: A 500 m minimum buffer applies to bat roosts, and disturbances to foraging areas by roads must be considered in the assessment. Light pollution and noise from such buildings must also be considered in the assessment

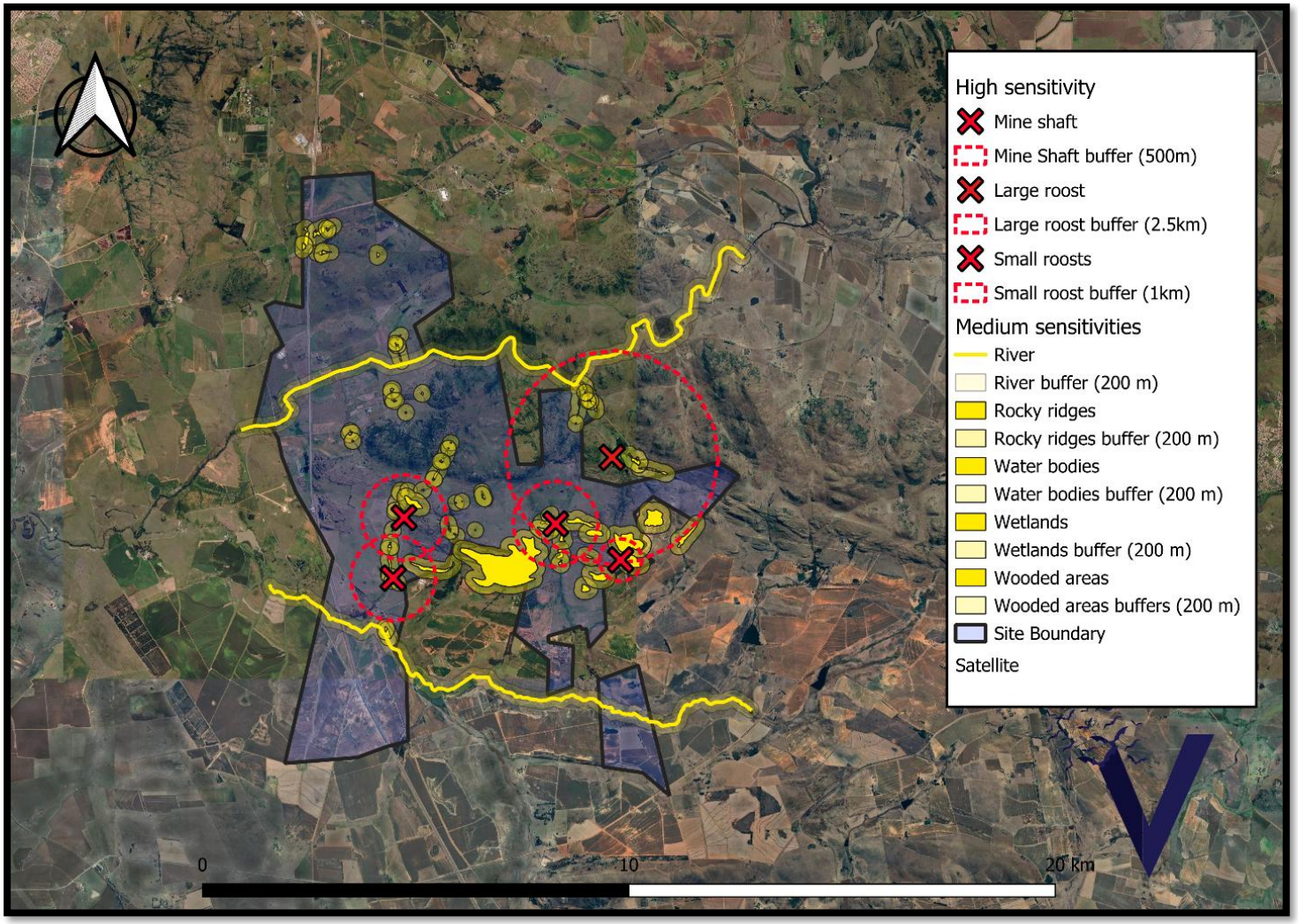


Figure 7-78 - Buffers for bat sensitive areas

7.3 SOCIAL AND ECONOMIC ENVIRONMENT

The social baseline describes the social profile of the project-affected area based on desktop research. The regional, district and local context describe the geographical setting of the project. The demography of the project-affected area is provided and its leadership structures.

7.3.1. Archaeological and Cultural Heritage

The following is extracted from the Heritage Impact assessment compiled by Cedar Tower Services (Pty) Ltd and is included as Appendix G.4.

7.3.1.1 Background

The proposed project is located area is between Balfour in the Mpumalanga province and Heidelberg in Gauteng province. According to Raper et al (2018) in the Dictionary of Southern African Place Names, Balfour was "*established on the farms Vlakfontein No. 101 and No. 108 which belonged to Frederick Stuart McHattie, and named McHattiesburg after him in 1897. Proclaimed on 16 February 1898, it was renamed Balfour on 15 February 1905, after Arthur James Balfour, Prime Minister of Great Britain, 1902-1905, who visited South Africa in that year.*" Balfour's economy is mainly gold mining and maize farming.

Heidelberg was laid out on the farm Langlaagte and attained municipal status in 1903 (Raper, 2018). Heidelberg was founded in 1862 when H.J. Uckerman established a trading post at the foot of the Suikerboschrand. The town was planned in 1865, named after Uckerman's university in Germany. It was a key junction for wagon trails connecting settlements across the Transvaal. With the completion of the railway to Natal in 1895, Heidelberg became a hub for both rail and road transport. The station was later restored and now serves as the Heidelberg Motor Museum. During the Witwatersrand gold rush, the town thrived, with 18 hotels, though its boom has since passed. A monument commemorates P. Kruger, M. Pretorius, and P. Joubert for their role in the Boer struggle. Heidelberg briefly served as the provincial capital for the Boer government during the Anglo-Boer War (Pistorius, 2003, SAHRIS ID 5053). During the Second Anglo-Boer War, the British constructed a concentration camp.

7.3.1.2 Built Environment and cultural landscapes

The landscape in which the proposed development is located is mountainous with the Suikerbosrandrivier running through the middle. There are several farm werfs located within the proposed development area. Some of these have associated historical cemeteries indicated on the first edition 1:50 000 topo map (**Figure 7-85**). Although the N3 has diverged from historical routes, the R23 still follows along a historical route that might be impacted by the proposed development (**Figure 7-81).** These werfs and associated structures are older than 60 years, based on the First Edition 1:50 000 Topo Map, and further assessment is required to mitigate impact.

According to Doucakis (2021), one of the farms, Laagerspoort (also known as Lagerspoort) used to be known as Onderstepoort. This was the location of Voortrekker Hendrik Potgieter's lager during the three day campaign (28-30 November 1837). Further details of this conflict is found in Fourie (2016), "*A commando of 330 Voortrekkers and a small group of Barolong under the command of Andries Hendrik Potgieter and Piet Uys attacked the Khumalo Ndebele of Mzilikazi in the vicinity of the Marico River. Of interest for this study is that they departed Lagerspoort near present-day Heidelberg and travelled via the present-day farm of Deelkraal … to the Matabele settlements near the Marico River. During the attack some 500 Matabele were killed and 3000 cows taken by the Voortrekker commando.*

On their way back, the cows were divided amongst the members of the commando on the property today known as Deelkraal (Bergh, 1999).” The exact location of the lager could not be confirmed, but Doucakis quotes Reverend N. Roberts “ Lat. 26 . 37’ 30” S. & Long. 28 . 25’E. on the farm LAGERSPOORT 310 [406 IR], situated at the foot of a steep and high mountain, on the right [north] bank of the Sugar Bush River where it emerges from the hills to the North-East of the Heidelberg-Villiers Road. From information gathered on the spot it appears that the lager [sic] stood close to the house now occupied by Mr. van Breda.”

Most of the nearby sites from SAHRIS are structures associated with the development of railway lines. They have been identified and recorded as part of a project called Footsteps Along the Tracks (FAT). This includes the site identification, documentation and assessment of extant built structures, originally constructed by the Netherlands South African Railway Company (Nederlandsche Zuid-Afrikaansche Spoorwegmaatschappij - NZASM). Although these sites have been graded as having very high levels of regional significance on SAHRIS (Grade II), none of these sites have been formally protected through the publication of a gazette notice in terms of section 27 of the NHRA. Furthermore, the actual cultural value of these sites is likely to be of high or moderate local significance (Grade IIIA or IIIB). Due to the location of these structures being located outside of the area proposed for development, no impact to these resources is anticipated from this proposed development.

Table 7-41 - NZASM’s FAT project’s findings of structures in the vicinity of the project

SAHRIS ID Line Name Site Name	Statement Of Significance	Grade Images
105330 NZASM_SEL_076 Suikerbosrand cutting	Cutting; On the original trajectory, now defunct. This structure, being part of the larger NZASM endeavour, falls under the generic NZASM statement of significance, but specifically is also a good extant example of its type. Its importance lies in its associations with South Africa's community, heritage, and is considered uncommon, rare and endangered; it has the potential to yield information for understanding; as an object it demonstrates principal characteristics; has particular aesthetic characteristics; demonstrates a high degree of technical achievement; has strong and special associations with both historic and contemporaneous communities; has a special association with the life and work of an important organisation and its associated persons; and is significant in revealing labour practices of the time; all as they relate to the culture of South Africa and her international cultural historic affiliates. The NZASM South-Eastern Line cutting at the Suikerbosrand River has served local farmers and fishermen alike since the line trajectory was relocated.	Grade II
105331	Bridge; On the original trajectory, now defunct.	Grade II

SAHRIS ID Line Name Site Name	Statement Of Significance	Grade Images
NZASM_SEL_077 Suikerbosrand bridge	This structure, being part of the larger NZASM endeavour, falls under the generic NZASM statement of significance, but specifically is also a good extant example of its type. Its importance lies in its associations with South Africa's community, heritage, and is considered uncommon, rare and endangered; it has the potential to yield information for understanding; as an object it demonstrates principal characteristics; has particular aesthetic characteristics; demonstrates a high degree of technical achievement; has strong and special associations with both historic and contemporaneous communities; has a special association with the life and work of an important organisation and its associated persons; and is significant in revealing labour practices of the time; all as they relate to the culture of South Africa and her international cultural historic affiliates.	
105332 NZASM_SEL_078 Kraal Station	Station; Associated with other remaining built structures along the original trajectory and at the Kraal precinct; Important built residue, still in use. Should any development occur, cognisance should be given to their heritage importance. This structure, being part of the larger NZASM endeavour, falls under the generic NZASM statement of significance, but specifically is also a good extant example of its type. Its importance lies in its associations with South Africa's community, heritage, and is considered uncommon, rare and endangered; it has the potential to yield information for understanding; as an object it demonstrates principal characteristics; has particular aesthetic characteristics; demonstrates a high degree of technical achievement; has strong and special associations with both historic and contemporaneous communities; has a special association with the life and work of an important organisation and its associated persons; and is significant in revealing labour practices of the time; all as they relate to the culture of South Africa and her international cultural historic affiliates. It is a scarce and authentic example of its type.	Grade II
105333	Water tank stand; Associated with other remaining built structures along the original trajectory and at the Kraal precinct; Important built residue, still in use.	Grade II

SAHRIS ID Line Name Site Name	Statement Of Significance	Grade Images
NZASM_SEL_079 Kraal Station Water tank	Should any development occur, cognisance should be given to their heritage importance. This structure, being part of the larger NZASM endeavour, falls under the generic NZASM statement of significance, but specifically is also a good extant example of its type. Its importance lies in its associations with South Africa's community, heritage, and is considered uncommon, rare and endangered; it has the potential to yield information for understanding; as an object it demonstrates principal characteristics; has particular aesthetic characteristics; demonstrates a high degree of technical achievement; has strong and special associations with both historic and contemporaneous communities; has a special association with the life and work of an important organisation and its associated persons; and is significant in revealing labour practices of the time; all as they relate to the culture of South Africa and her international cultural historic affiliates. It is a scarce example of imported prefabricated cast iron water tanks installed by the NZASM.	

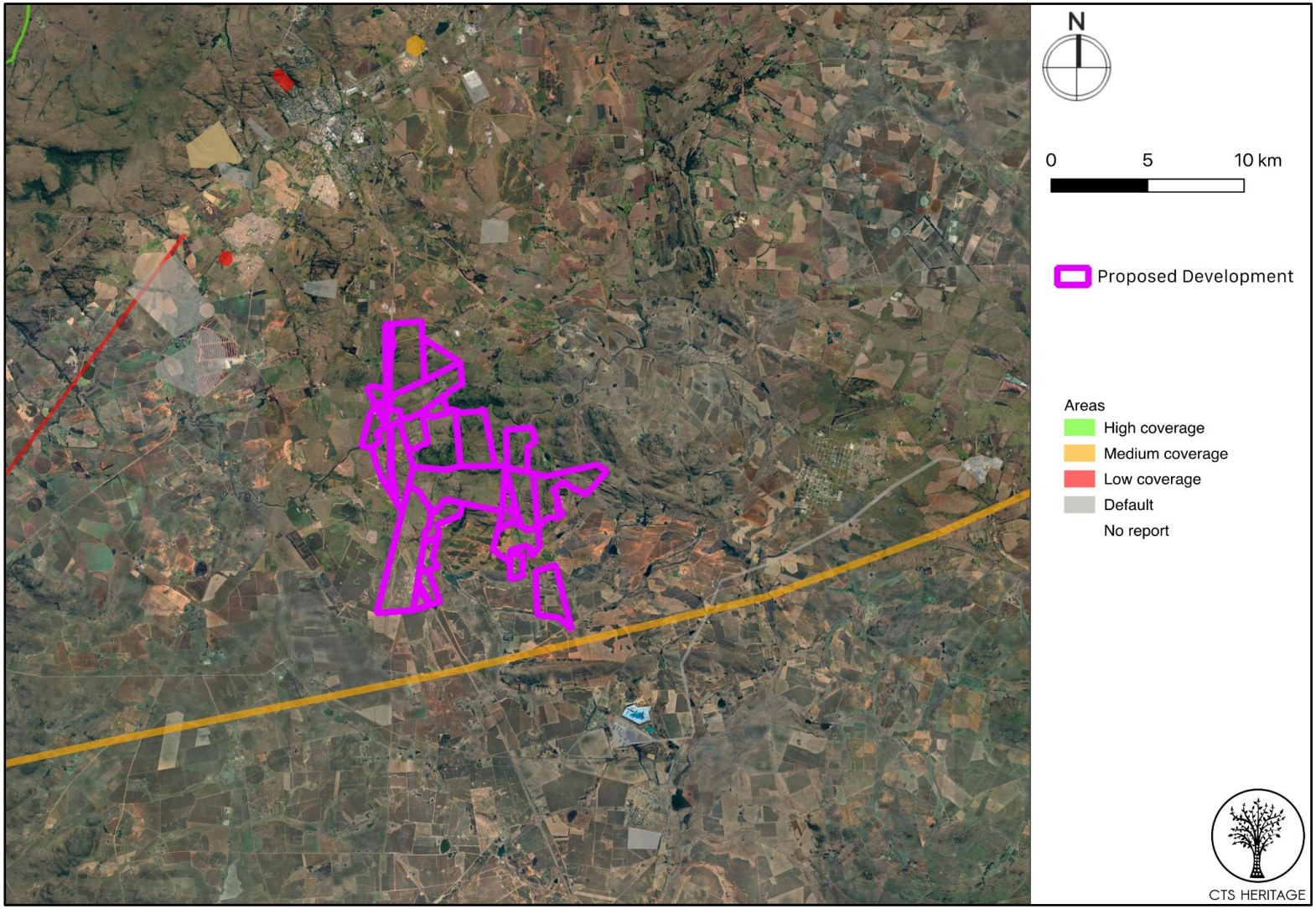


Figure 7-79 - Spatialisation of heritage assessments conducted in proximity to the proposed development

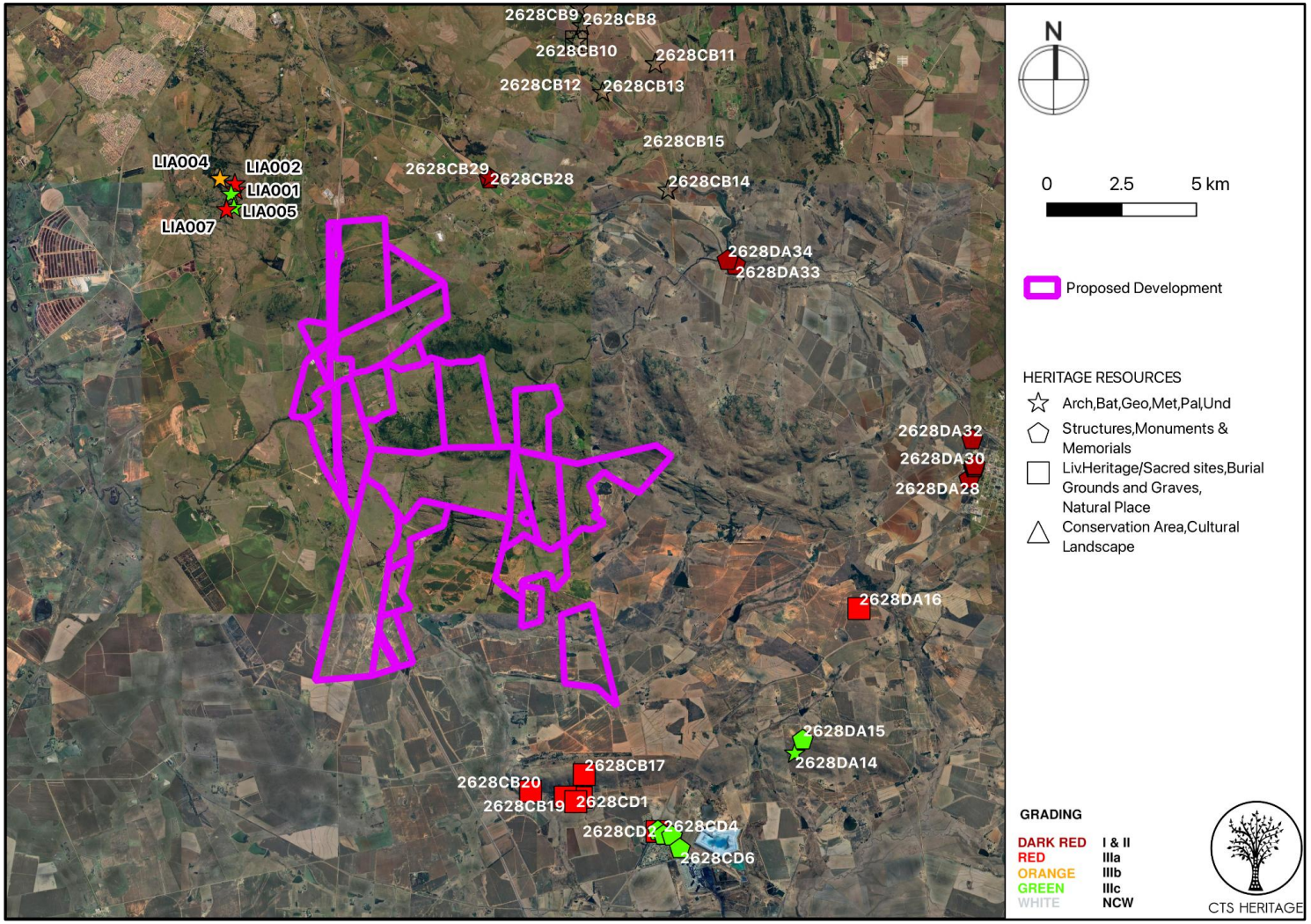


Figure 7-80 - Heritage Resources Map. Heritage Resources previously identified in proximity to the study area, with SAHRIS Inv. Nos indicated.

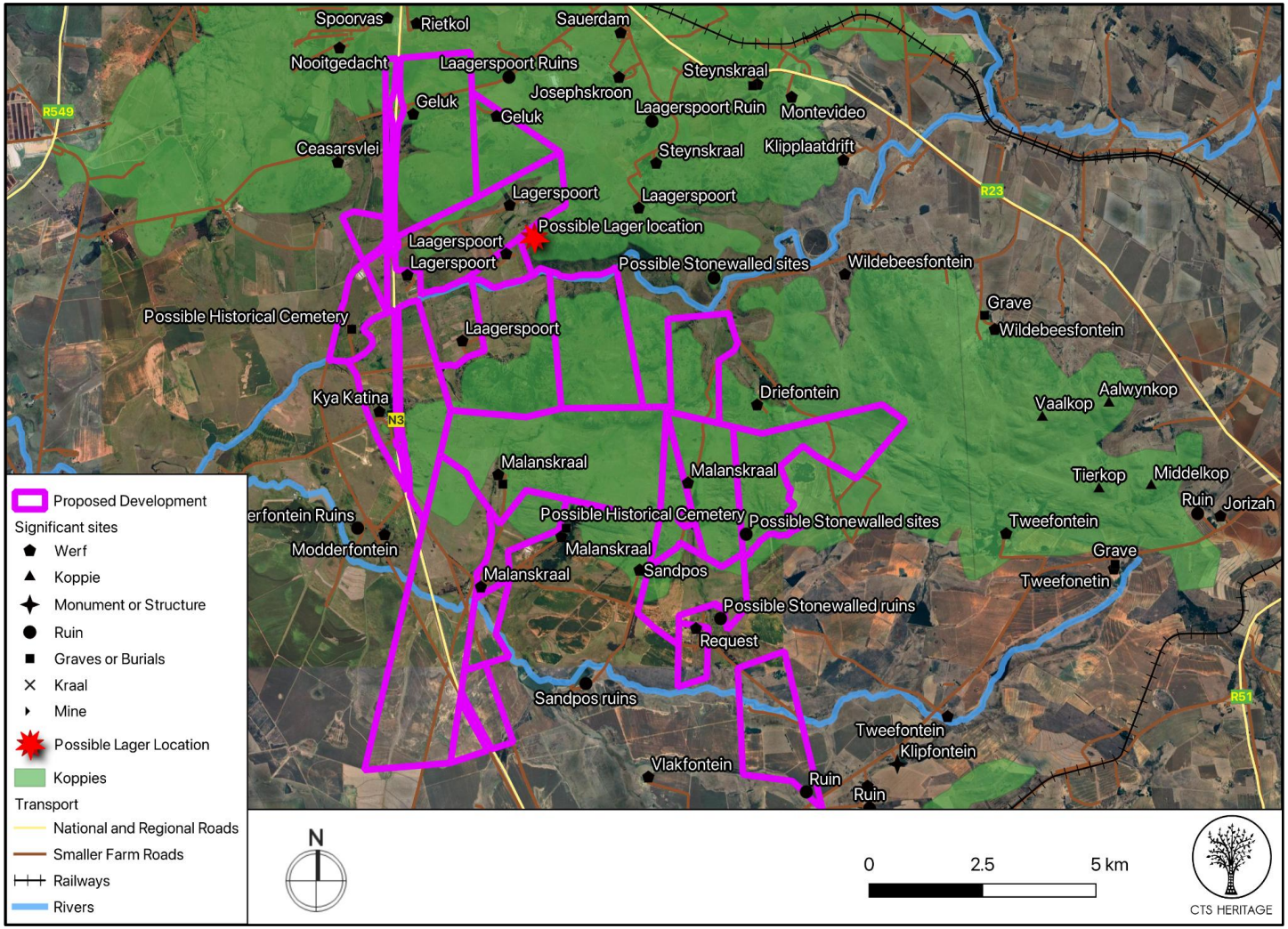


Figure 7-81 - Cultural Landscape Map. Map indicating sensitive receptors near the proposed development, extracted from the Topo 1:50 000 map

7.3.1.3 Archaeology

Very few archaeological impact studies have been conducted in the vicinity. Despite this, and the extensive agricultural transformation of the area, some archaeological sites spanning the Earlier, Middle and Later Stone Age have been found in the region. According to Pistorius (2003, SAHRIS ID 5053), the earliest remains in the area are stone-walled settlements built by Late Iron Age Sotho people, found primarily in the Suikerbosrand Nature Reserve. These sites were occupied from the 17th or 18th century well into the 19th century.

As noted by Coetzee (2015), "*The Late Iron Age (LIA) settlements are characterised by stone-walled enclosures situated on defensive hilltops c. AD 1640 - AD 1830). This occupation phase has been linked to the arrival of ancestral Northern Sotho, Tswana and Ndebele (Nguni–speakers) in the northern regions of South Africa with associated sites dating between the sixteenth and seventeenth centuries AD. The terminal LIA is represented by late 18th/early 19th century settlements with multichrome Moloko pottery commonly attributed to the Sotho-Tswana. These settlements can in many instances be correlated with oral traditions on population movements during which African farming communities sought refuge in mountainous regions during the processes of disruption in the northern interior of South Africa, resulting from the so-called difaqane (or mfecane).*"

In 2003, Pistorius (SAHRIS NID 5053) identified seven Late Iron Age Sites located on the lower foot slope of a mountain, approximately 4 km west of the proposed development (**Figure 7-80**). Site LIA001 is located at the base of a mountain and consists of a circular outer wall with inner enclosures, likely used for housing and livestock. It dates from the late 18th to early 19th century and is in excellent condition. Site LIA002, situated northwest of LIA001, is larger but shares a similar structure. A more recent brick building, now largely demolished, was built within the site. Though part of the archaeological surface was disturbed by this construction, much of the site remains intact. Site LIA003 is small, likely a single enclosure for small livestock, and is in pristine condition, dating to the same period as LIA001 and LIA002. Site LIA004, once a large settlement near an Eskom structure, was mostly destroyed by a bulldozer. It may have been the main village of the area, also dating to the late 18th to early 19th century. Site LIA005 consists of a single stone wall, possibly a retaining wall or part of a larger site that was destroyed. It dates from the Late Iron Age, with a nearby brick-paved area of a later date. Site LIA006, west of LIA005, has been mostly destroyed by a bulldozer, leaving little information about its structure. Site LIA007, located further west, has low outer walls and central enclosures. Its features are not well defined, and it also dates from the Late Iron Age. It appears, based on satellite imagery, that there are several possible stonewalled sites located in the proposed area for development

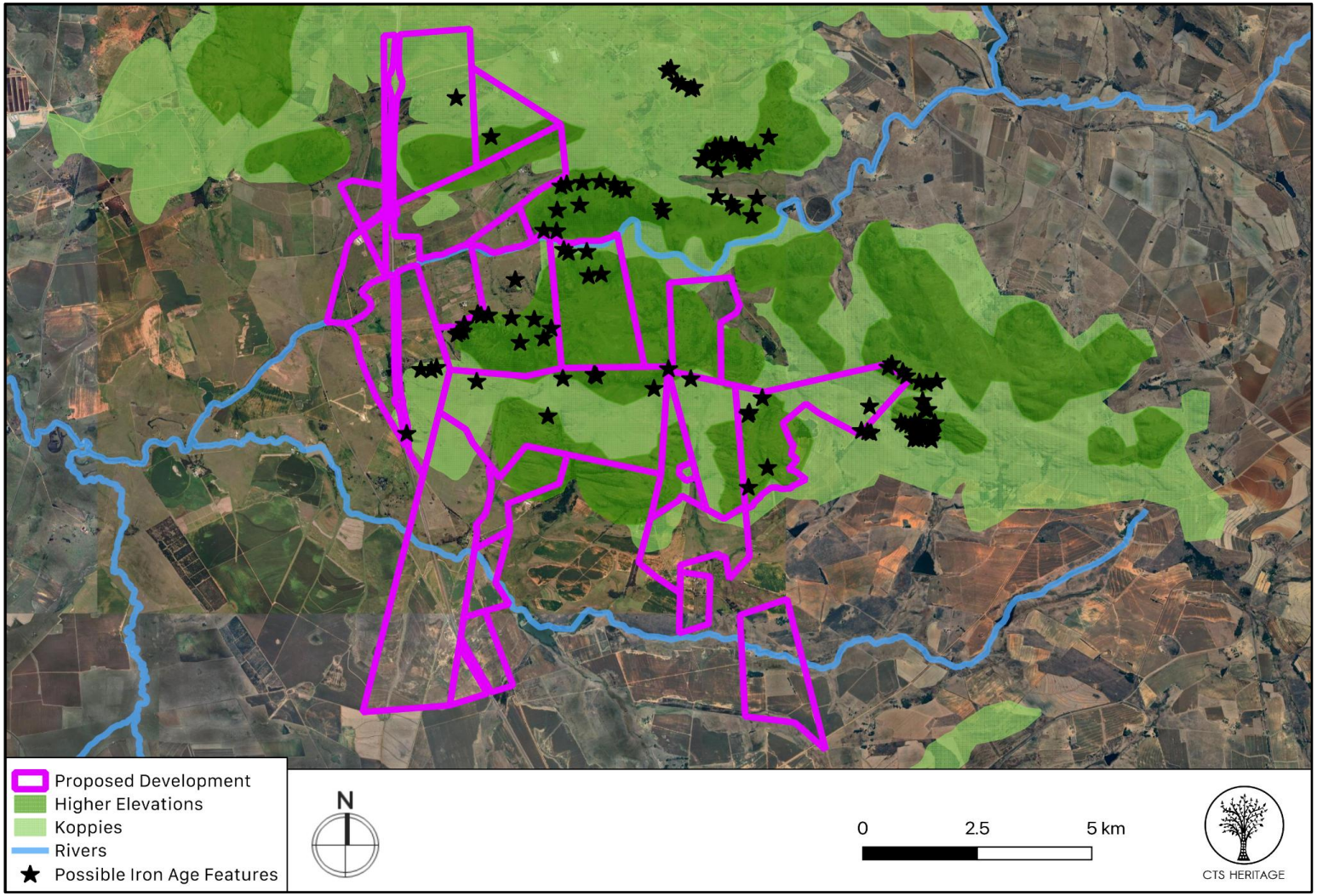


Figure 7-82 - Cultural Landscape Map. Map indicating possible stonewalled ruins inside the proposed development, extracted from the historic aerial photography

Figure 7-83 - Cultural Landscape Map. Map indicating possible stonewalled ruins inside the proposed development, extracted from the Topo 1:50 000 map

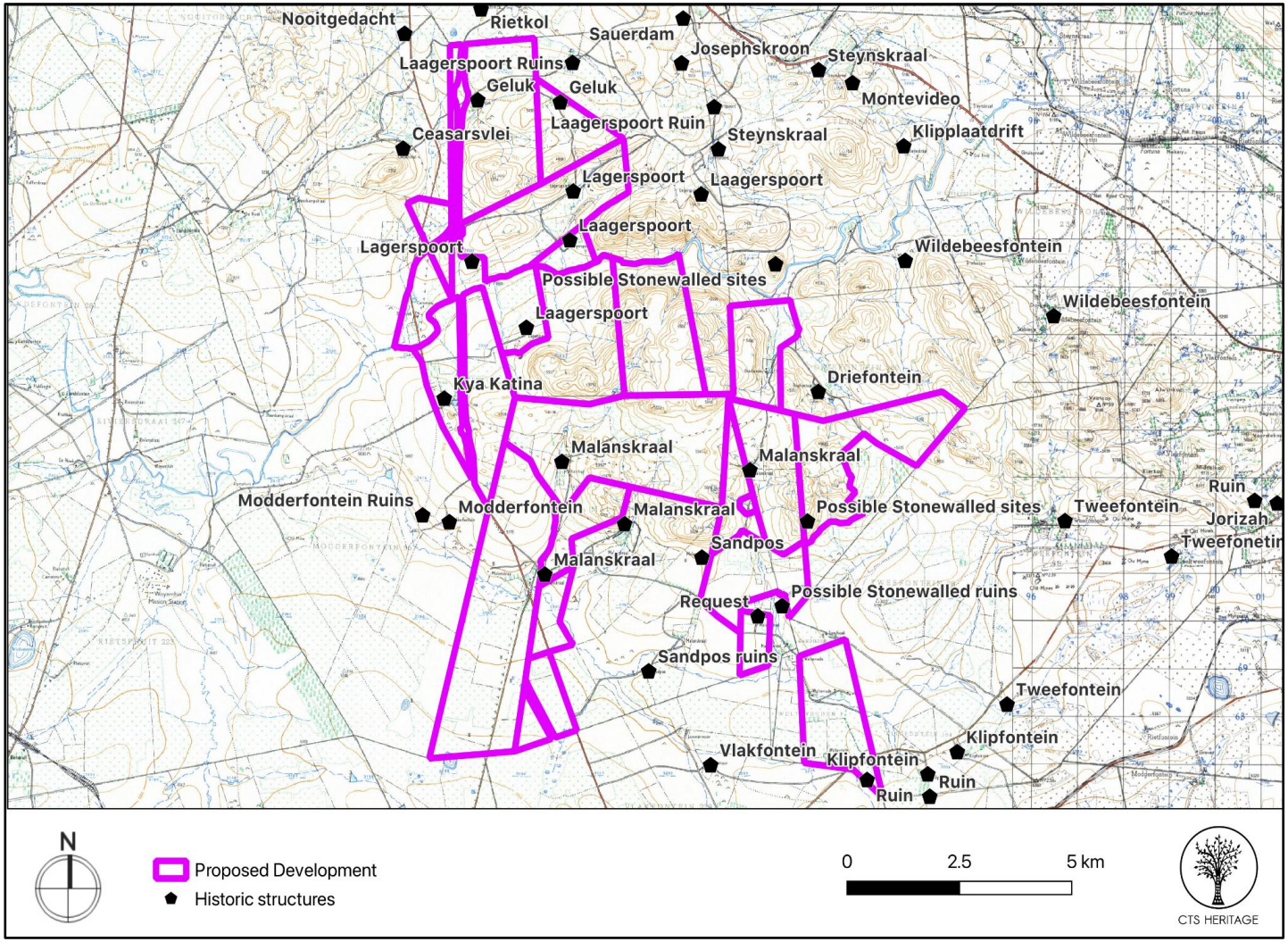


Figure 7-84 - First Edition Topo Map. First Edition Topo Map indicating historical farm werfs that still exist

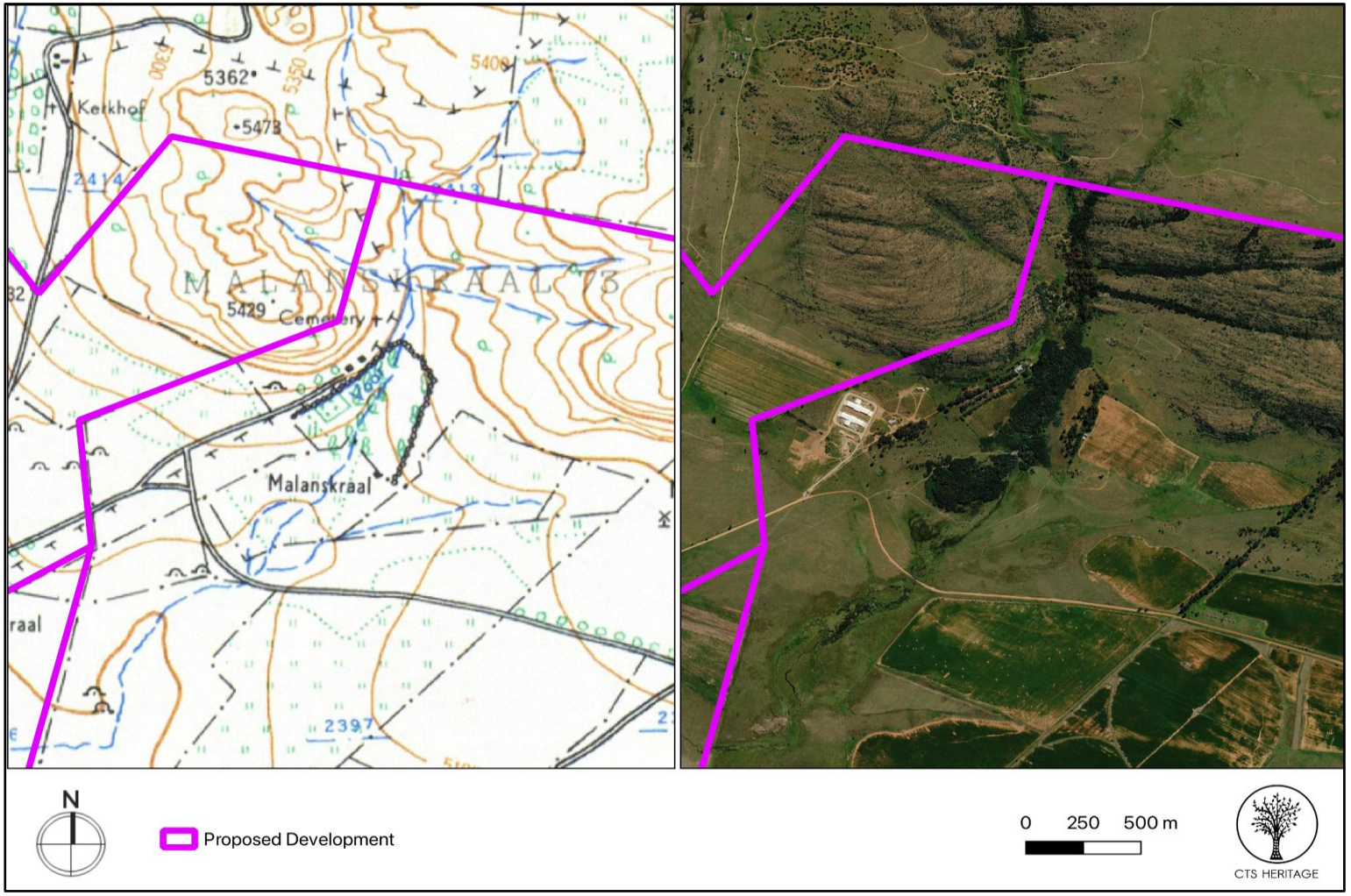


Figure 7-85 - First Edition Topo Inset Map A. First Edition Topo Map indicating historical Malanskraal farm werf that still exists, and has an associated historical cemetery

7.3.1.4 Palaeontology

According to the SAHRIS Palaeosensitivity Map, the proposed development is mostly underlain by sediments of Low palaeontological sensitivity, with some small areas underlain with Moderate to Very High fossil sensitivity (**Figure 7-86**). According to the extract from the Council of GeoScience Map CGS 2628 East Rand Geology Map the development area is underlain by sediments from Pv: Vryheid Formation in the Ecca Group, Ra: Alberton, and Rw: Westonaria, both in the Rk: Klipriviersberg Group, Rb: Booysens, Rjo: Johannesburg, and Rt: Turffontein Formations in the Central Rand Group, Rg: Government, and Rj: Jeppestown Formations in the West Rand Group, Q-a: Quaternary Alluvium and V-di: Diabase (**Figure 7-87**).

Most of the proposed development is underlain by the Klipriviersberg Group (Rk), and the Turffontein Formation (Rt) in the Central Rand Group. According to the Palaeotechnic report of Gauteng (Groenewald and Groenewald, 2014), the Klipriviersberg Group, which also contains the Ra: Alberton, and Rw: Westonaria Formations, has Low palaeontological sensitivity, with no fossils recorded. Turffontein Formation (Rt) in the Central Rand Group falls in the Witwatersrand Supergroup Which, according to the SAHRIS Fossil Heritage Browser, has Insignificant or Zero palaeontological sensitivity.

Other underlying sediments with Insignificant/ Zero palaeontological sensitivity, belong to the Witwatersrand SuperGroup: Rb: Booysens, and Rjo: Johannesburg Formations in the Central Rand Group, Rg: Government, and Rj: Jeppestown Formations in the West Rand Group.

The sediments marked as having Moderate sensitivity on the SAHRIS Palaeosensitivity Map, are Quaternary Alluvium. Groenewald and Groenewald (2014) note that "*Superficial deposits of Quaternary and Tertiary age can contain important fossils. Most notable are fossils associated with, for example, the Tswaing Impact Crater north of Pretoria (Johnson et al, 2006). The superficial deposits are allocated a moderate palaeontological sensitivity due to the fact that many fossiliferous rocks might be covered in a thin layer of soil, where fossils are only found where the topsoil has been removed by erosion.*" The Alluvial deposits, however, have Low palaeontological sensitivity, being "*Recent sandy and clayey deposits along water courses" These sediments are known to contain a "wide range of fossils possible, including mammalian bones and teeth, tortoise remains, ostrich egg etc*."

The Vryheid Formation in the Ecca Group is the formation that has Very High palaeontological sensitivity. These deltaic sandstones, shales and coals, with minor conglomerates date to the Early to Middle Permian. It is known for its rich assemblages of plant fossils (Glossopteris Flora), including tree trunks, stumps and roots, palynomorphs, rare insects, conchostracans, and low diversity trace fossil assemblages. There are very rich and historically important plant fossil collections from the Vryheid Formation at Vereeniging. In a desktop PIA by Groenewald located approximately 15 km southeast of the proposed development (2014, SAHRIS NID 164647) the following was noted regarding the Vryheid Formation: "*The Vryheid Formation is well-known for the occurrence of coal beds that resulted from the accumulation of plant material over long periods of time. Plant fossils described by Bamford (2011) from the Vryheid Formation are; Azaniodendron fertile, Cyclodendron leslii, Sphenophyllum hammanskraalensis, Annularia sp., Raniganjia sp., Asterotheca spp., Liknopetalon enigmata, Glossopteris > 20 species, Hirsutum 4 spp., Scutum 4 spp., Ottokaria 3 spp., Estcourtia sp., Arberia 4 spp., Lidgetonnia sp., Noeggerathiopsis sp. And Podocarpidites sp*.

According to Bamford (2011), little data has been published on these potentially fossiliferous deposits. Good fossil material is likely around the coal mines and yet in other areas the exposures may be too poor to be of interest. When they do occur fossil plants are usually abundant and it would not be feasible to preserve and maintain all the sites. In the interests of heritage and science, however, such sites should be well recorded, sampled and the fossils kept in a suitable institution.

Although no vertebrate fossils have been recorded from the Vryheid Formation, invertebrate trace fossils have been described in some detail by Mason and Christie (1986). It should be noted, however, that the aquatic reptile, Mesosaurus, which is the earliest known reptile from the Karoo Basin, as well as fish (Palaeoniscus capensis), have been recorded in equivalent aged strata in the Whitehill Formation in the southern part of the basin (MacRae, 1999). Indications are that the Whitehill Formation in the main basin might be correlated with the mid-Vryheid Formation. If this assumption proves correct, there is a possibility that Mesosaurus could be found in the Vryheid Formation.

The late Carboniferous to early Jurassic Karoo Supergroup of South Africa includes economically important coal deposits within the Vryheid Formation. The Karoo sediments are almost entirely lacking in body fossils but ichnofossils (trace fossils) are locally abundant. Modern sedimentological and ichnofaunal studies suggest that the north-eastern part of the Karoo basin was marine. In KwaZulu-Natal a shallow basin margin accommodated a prograding fluviodeltaic complex forming a broad sandy platform on which coal-bearing sediments were deposited. Ichnofossils include U-burrows (formerly Corophioides) which are assigned to ichnogenus Diplocraterion (Mason and Christie, 1986)....

The Permian aged Vryheid Formation contains significant fossils of plants belonging to the Glossopteris assemblage. It is therefore likely that fossils will be present in all outcrops on the sites of the development."

All of the proposed new infrastructure is located within areas of low and zero palaeontological sensitivity.