

# **UMMBILA EMOYENI ONE ELECTRICAL GRID INFRASTRUCTURE**

## **Non-technical Summary**

DFFE Reference No.: 14/12/16/3/3/2/2162

## Introduction

Seriti Green Developments SA (Pty) Ltd will be developing the Ummbila Emoyeni Wind Energy Facility (WEF) and associated electrical grid infrastructure (EGI) on a site located ~6km south-east of Bethal and 1km east of Morgenzon, within the Mpumalanga Province. The project site is located across the Govan Mbeki, Lekwa, and Msukaligwa Local Municipalities within the Gert Sibande District (Figure 1). The project is planned as part of a larger cluster of renewable energy projects (to be known as the Ummbila Emoyeni Renewable Energy Farm), which include a 900MW WEF, to be developed in several phases, and a 100-150MW solar energy facility. The grid connection infrastructure for both facilities will include a 400/132kV Main Transmission Substation (MTS), to be located between the Camden and SOL Substations, which will be looped in and out of the existing Camden-Sol 400kV transmission line; on-site switching stations (132kV in capacity) at each renewable energy facility (Eskom Portion); 132kV power lines from the switching stations at each renewable energy facility to the new 400/132kV MTS; and a collector substation with 2 x 132kV bus bars and 4 x 132kV IPP feeder bays to the onsite IPP Substation.

## Environmental Impact Assessment Process

Separate Environmental Impact Assessment (EIA) processes were completed for the WEF, the solar energy facility and the EGI. All three of these have received environmental authorisation.

The full extent of the project site has been considered within the EIA process with the aim of determining the suitability from an environmental and social perspective and identifying areas that should be avoided in development planning. Within this identified project site, a development area and development footprints for the substations and corridors for the power lines have been defined for assessment. The project site is larger than the area required for the development of the EGI and therefore provides the opportunity for the optimal placement of infrastructure, ensuring avoidance of major identified environmental sensitivities or constraints identified through the EIA process.

The proposed 900MW WEF, 100-150MW solar energy facility, and EGI solution are collectively referred to as the Ummbila Emoyeni Renewable Energy Farm. The renewable energy facilities which the Ummbila Emoyeni EGI will support will be constructed as a separate stand-alone project and therefore, separate Scoping and Environmental Impact Assessment (S&EIA) processes will be undertaken for each facility.

The Ummbila Emoyeni Renewable Energy Farm is proposed in response to the identified objectives of national and provincial government and local and district municipalities to develop renewable energy facilities for power generation purposes. It is the developer's intention to bid the renewable energy facilities under the Department of Mineral Resources and Energy's (DMRE's) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme or a similar programme in the private off take market, with the aim of evacuating the generated power into the national grid. This will aid in the diversification and stabilisation of the country's electricity supply, in line with the objectives of the Integrated Resource Plan (IRP), with the Ummbila Emoyeni Renewable Energy Farm set to inject up to 1GW of electricity into the national grid (wind and solar generation). Similarly, the location of the new generation in the Mpumalanga Province is important in the context of the Just Energy Transition (JET). The Ummbila Emoyeni Projects will provide valuable jobs and socio-economic benefits that are required in an area where coal fired generation will be phased out over the next 10 years. This will be vitally important if the JET is to be successfully implemented and is a transition for everyone.

The EGI will include:

- A new 400/132 kV Main Transmission Substation (MTS), to be located adjacent to the Camden SOL Overhead Lines (OHLs).
- New collector stations (3): each will comprise several incoming 132 kV lines from each project switching station, feeder bays, 132kV bus bars and outgoing 132kV line to the MTS.
- Two 400kV loop-in loop-out OHLs to the existing Camden-Sol 400kV transmission line.
- On-site switching stations (132kV in capacity) at each renewable energy facility.

- 132kV power lines from the switching stations to the collector substations and ultimately to a new MTS.
- On-site IPP substations where the generated power will be transformed from 33 kV to 132 kV so that it can be evacuated to the Collector stations and MTS
- Access roads up to 12m wide.

The development of the EGI required the completion of an EIA to obtain **Environmental Authorisation (EA)** from the National Department of Forestry, Fisheries, and the Environment (DFFE), in consultation with the Provincial Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDL&EA)), in accordance with the requirements of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and Environmental Impact Assessment (EIA) Regulations (GNR 326), 2014, as amended.

Savannah Environmental was appointed as the Independent Environmental Assessment Practitioner (EAP) in accordance with NEMA and Regulations 21 to 24 of the 2014 EIA Regulations (GNR 326) to undertake the required S&EIA in support of the application for Environmental Authorisation (EA) and the public participation process for the project, in order to identify and assess all potential environmental impacts associated with the proposed EGI and recommend appropriate mitigation measures in an Environmental Management Programme (EMPr).

The EIA process was completed in two stages:

- The **Scoping Phase** included the identification and description of potential impacts associated with the proposed project through a desktop study and consultation with interested and affected parties and key stakeholders. This phase considered the broader project area in order to identify and delineate any environmental fatal flaws, no-go or sensitive areas, as well as project alternatives in order to determine which should be assessed in more detail in the EIA Phase. Following the public review period of the Scoping Report, this phase culminated in the submission of a final Scoping Report and Plan of Study for the EIA Phase to the competent authority for acceptance and approval to continue with the EIA Phase of the process.
- The **EIA Phase** involved a detailed assessment of potentially significant positive and negative impacts (direct, indirect, and cumulative) identified in the Scoping Phase. This phase considered a proposed development footprint and includes detailed specialist investigations (including field surveys), consideration of feasible alternatives and public consultation. Recommendations of practical and achievable mitigation and management measures are included in an Environmental Management Programme (EMPr) considering all phases of the project. Following the public review period of the EIA Report and EMPr, this phase culminated in the submission of a Final EIA Report and EMPr to the competent authority for review and decision-making.

The EIA Report, together with the specialist studies, provided a detailed assessment of the potential impacts that may result from the development of the Ummbila Emoyeni EGI. No environmental fatal flaws or unacceptable impacts were identified in the detailed specialist studies conducted, provided that the recommended mitigation measures are implemented. These measures include, amongst others, the avoidance of sensitive features within the development footprint and the undertaking of the construction and operational bird and bat monitoring, as specified by the specialists.

The potential environmental impacts associated with the Ummbila Emoyeni EGI assessed through the EIA process include:

- Impacts on terrestrial ecology (flora and fauna).
- Impacts on freshwater ecology.
- Impacts on avifauna.
- Impacts on bats.
- Impacts on soils and agricultural potential.
- Impacts on heritage resources, including archaeology, palaeontology and the cultural landscape.
- Visual impacts on the area imposed by the components of the grid connection infrastructure.
- Positive and negative social impacts.
- Traffic impacts.

The development footprint, as assessed in the EIA Report is presented in **Figure 2**.



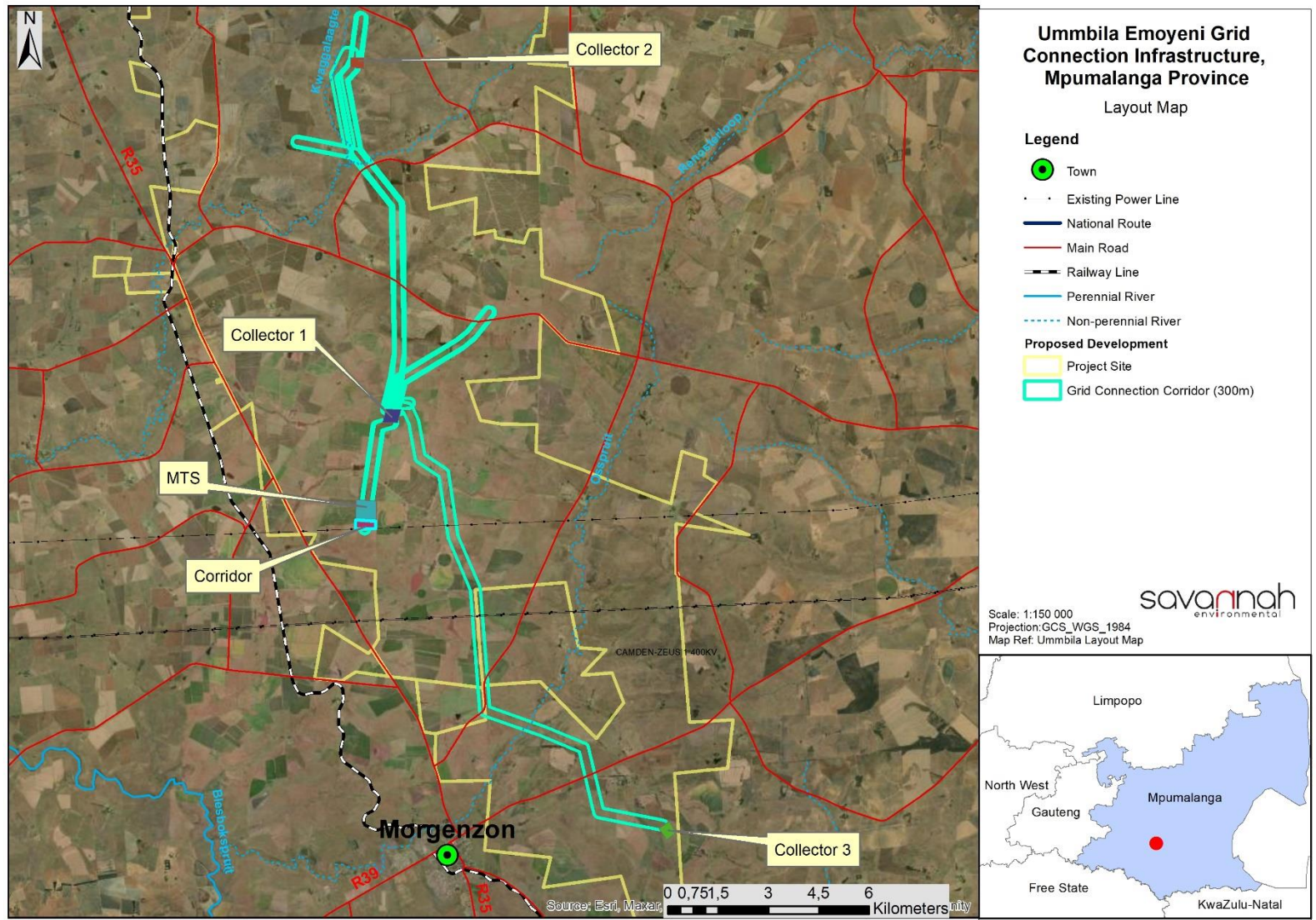


Figure 2: The development footprint of the Umbila Emoyeni EGI, as assessed within the EIA Report

## Impacts on Terrestrial Ecology (including flora and fauna)

From a botanical and ecological perspective, it was found that the study area is mostly comprised of either Moderate (799.58 ha; 45%) or Low (620.56 ha; 35%) sensitivity. Various “Very High” sensitivity areas also occur throughout the study area (comprising features such as wetlands, ephemeral rivers and streams, seepages, and other drainage lines). Furthermore, various CBA and ESA areas occur throughout the study area. Development is highly discouraged within the areas classified as CBA Irreplaceable Areas and development within CBA Optimal Areas should be avoided as far as possible.

A total of 198 plant species were found within the study area, which consisted of 158 native, 0 Red List, 6 protected, 0 Mpumalanga endemic, 39 alien, and 11 NEM:BA listed invasive species.

A total of 32 mammal species, 6 amphibians and 10 reptile species were recorded within the projects site. No amphibian or reptile SCC were recorded within the project site; however, 4 mammal SCC were recorded within the project site namely; Serval (Near Threatened), Brown hyena (Near Threatened); Vlei rat (Near Threatened), Cape clawless otter (Near Threatened) and South African hedgehog (Near Threatened). It was determined that the development will not detrimentally impact these populations/individual SCC.

During this assessment it was determined that the study area contains numerous habitat variations, and include Drainage, Fallow Land, Natural Clay, Natural Dolerite, Natural Loam Soil, Natural Rock Turf, Natural Sandstone, and Disturbed areas. Each of these areas (excluding disturbed areas) have certain unique species, with drainage areas having the highest number (i.e., many of its species are not shared with the other habitats). Development should therefore not proceed within drainage areas, which are all classified as “Very High” sensitivity. Natural rock turf and natural clay areas had the lowest number of species that occurred only in those types, and development should therefore aim to occur within these habitat types, since this would minimize the loss of unique biodiversity.

Furthermore, the only substation infrastructure that will directly impact drainage/wetland areas is Collector Substation 3 as a small portion a seepage wetland is located within the footprint of this substation. It is recommended that this substation’s footprint is adjusted in order to avoid any direct impacts on this seepage wetlands. All other substation infrastructure will avoid any direct impact on wetland features. Furthermore, no wetland/drainage features are located within the 400 kV LILO corridor.

There are no impacts associated with the proposed EGI development that cannot be mitigated to a low level. Its local environmental impact can be reduced to an acceptable magnitude. Likewise, the contribution of the proposed EGI to the cumulative impact in the area would be low and is acceptable. As such, there are no fatal flaws associated with the development and no terrestrial ecological considerations that should prevent it from proceeding. Therefore, it is the opinion of the specialists that the development may be authorised within the specified area, subject to the implementation of the recommended mitigation measures.

## Impacts on Freshwater Ecology

All endorheic wetland features, wetland features that are not directly connected to the larger extensive wetland network or that have been fractured/isolated through agricultural practices are classified as High Sensitive. Even though these wetland features do not provide functions and services to the extent of the more connected and larger wetland features, these wetlands still provide some functions and services. Furthermore, most of these wetland features are fairly small and any direct impacts on these wetland habitats may have a significant impact on the drivers of these wetland features as well as the associated biodiversity. Another feature of these wetlands is the fact that, even though small in size, they are located within relatively small catchment areas, thus these wetlands’ percentage coverage in relationship to their catchments are fairly significant, making these wetland features vulnerable to catchment disturbances.

The following buffer areas are recommended and should be implemented for maintaining the freshwater resource features REC (Recommended Ecological Category) allowing the persistence of the current present ecological status as well as their functions and services.

- A wetland buffer area of 11m from the outer edge of wetland features are recommended and should be implemented for maintaining the freshwater resource features REC (Recommended Ecological Category) allowing the persistence of the current present ecological status as well as their functions and services.
- All freshwater features with their buffer areas have been classified as either Very High- or High sensitive and should be regarded as “No-Go” areas apart from the following activities and infrastructure which may be allowed (although restricted to an absolute minimum footprint):
  - only activities relating to the route access and cabling:
    - the use/upgrade of existing roads and watercourse crossings are the preferred options;
    - Where no suitable existing roads and watercourse crossings exist, the construction of new access roads and watercourse crossings can be allowed, however this should be deemed as a last resort.
    - All underground cabling should be laid either within access roads or next to access roads (as close as possible).

With mitigation measures in place, impacts on the integrity and functioning of freshwater resource features can be potentially reduced to sufficiently low levels. This would be best achieved by incorporating the recommended management & mitigation measures into an Environmental Management Programme (EMPr) for the site, together with appropriate rehabilitation guidelines and ecological monitoring recommendations.

Based on the outcomes of this study it is the specialist’s considered opinion that the proposed project detailed in this report could be authorised from a freshwater resource perspective.

Since there are watercourses present within the development area of the Ummbila Emoyeni Solar Energy Facility as identified in the Freshwater Impact Assessment Report, and since water may be abstracted from boreholes for use during the construction and operational phases, a water use authorisation for the project will be required from the DWS for water uses identified in Section 21(a), Section 21(c) and 21(i) of the National Water Act (Act 36 of 1998).

## Impacts on Avifauna

Pre-construction bird monitoring was undertaken over a period of 12 months within the project area. The pre-construction bird monitoring included the identification of twelve vantage points, five drive transects, and 15 walk transects of 500m in length across the project site. A total of 102 species (5 805 birds) were recorded during the walk transects conducted across the full pre-construction bird monitoring period.

A total of 26 target species were recorded during vantage point monitoring over the pre-construction monitoring period. A total of 72 observations of 18 target species (comprising 235 birds) were recorded during 703.12km of drive transect observations.

The following sensitivities were identified from an avifaunal perspective:

- Wetlands - Very High Avifaunal Site Ecological Importance
- Natural Grasslands – High Avifaunal Site Ecological Importance
- Agricultural/cultivated fields – Very Low Avifaunal Site Ecological Importance

The primary threat to these species is likely to rather be associated with the risk of collision fatalities, therefore areas and flights that appeared to represent preferred foraging or movement corridors for avifaunal SCCs were considered to have high avifaunal sensitivity. Species utilising the highly modified agricultural areas are likely resilient to disturbance and ongoing activity, including habitat modification. These areas are of low avifaunal sensitivity and are the preferred areas for development activities as well as permanent and temporary structures such as site buildings and lay-down areas. However, species utilising these areas, such as Southern Bald Ibis, remain at risk to collision when commuting to and from foraging areas.

The Avifauna Impact Assessment identified that all impacts associated with the development of the Ummbila Emoyeni EGI will be of low, medium and high significance before mitigation, and can be mitigated to an acceptable level of impact (i.e., medium and low significance, depending on the impact being considered). The implementation of additional mitigation measures such as implementation of bird flappers in areas of elevated recorded passage rates will be highly effective at reducing the likelihood of collisions as large flocks of birds are easily detected.

Based on the screening study, reconnaissance study and results of the pre-application avifaunal monitoring programme conducted for the Ummbila Emoyeni Renewable Energy Farm and associated infrastructure (including cumulative impacts), it is the avifaunal specialist's informed opinion that the proposed development will not have a significant negative impact on the viability or persistence of avifaunal populations (particularly avifaunal SCCs) in the area following the implementation of mitigation measures. The proposed positions of the EGI provided in the layout are acceptable. It is the specialist's opinion that the proposed development can be approved from an avifaunal perspective and that the layout is acceptable.

## Impacts on Bats

Pre-construction bat monitoring was undertaken over a period of 12 months for the project site in accordance with the best practice guidelines. The monitoring was designed to monitor bat activity across the area for the Ummbila Emoyeni EGI.

Bat roosting sites in the project site are relatively limited and unlikely to support large congregations of bats, with no underground sites (e.g., caves, mines, sinkholes) present. The closest known major bat roost is approximately 75km north of the project site. Although occasional ridges and rocky outcrops are features of the landscape, none are present in the project site. Bats are likely to roost in buildings associated with farmsteads within and bordering the project site, especially Cape Serotine and Egyptian Free-tailed Bat. The building inspections on site did not reveal any roosting bats but evidence (e.g., fur-oil-stained exit/entry points) suggests that bats are using these features. Trees growing at these farmsteads and elsewhere on site where they form clumps could also provide roosting spaces for bats.

Sensitive features within the project site at which bat foraging activity may be concentrated include farm buildings (and within built up areas for some species) where they would forage for insects attracted to lighting, dams and wetland areas, within and along the edge of woodland/tree patches, and over cultivated areas (refer to **Table 1**).

**Table 1:** Features used to assign spatial risk categories in the project site for bats

Risk Level		
Low	Medium	No-Go
Heavily modified land	CBA Optimal	Farm Dams
Moderately modified land	ESA Landscape corridor	Wetlands
	ESA Local corridor	Trees
	Other Natural Areas	Buildings
		Rivers/Streams
		Wetlands
		CBA Irreplaceable Areas

Grid connection infrastructure impacts bats directly because bats collide with the power lines, and indirectly through the modification of habitats, including disturbance or destruction of roosting, foraging and commuting spaces. The potential impacts to bats as a result of construction and operation activities include the following:

- Modification of bat foraging/commuting habitat.
- Destruction of/Disturbance to bat roosts.
- Bat mortality.
- Disturbance to bats.

Based on the bat activity recorded at the site proposed for the Ummbila Emoyeni EGI, the significance ratings for the majority of the impacts to bats posed by the development are predicted to be low and medium significance before mitigation. After mitigation, all impacts are predicted to be low. Based on the opportunity for reduction of the impacts through appropriate mitigation measures and appropriate micro-siting of infrastructure to avoid areas of sensitivity from a medium significance to a low, acceptable significance, no fatal flaws are expected to occur. Provided these mitigation measures are adhered to, it is the specialist's opinion that the project assessed can be approved.



## Impacts on Soils and Agricultural Potential

Four main sensitive soil forms were identified within the project site, namely the Vaalbos, Avalon, Ermelo and Tukulu soil forms. The land capability sensitivity (DAFF, 2017) indicates a range of sensitivities expected throughout the project site, which predominantly covers “Low” to “Moderate” sensitivities. Smaller patches are characterised by sensitivities up to “Moderately High”. Furthermore, various crop field boundaries were identified by means of the DFFE Screening Tool (2022), which are predominantly characterised by “High” sensitivities with one area being classified as “Very High” sensitivity.

The specialist has recommended that such high potential crop fields be avoided by throughout the life of the operation. If avoidance is not feasible, stakeholder engagement must be undertaken to compensate landowners for high crop field land use areas where necessary. In a case where relocating the project infrastructure is not feasible, the developer should engage with the owners of the crop fields for an appropriate compensation.

The Soils and Agricultural Potential Impact Assessment identified that all impacts associated with the development of the Ummbila Emoyeni EGI will be of low significance before mitigation, and can be mitigated to an impact level of low significance. It is the specialist’s opinion that the proposed development will have an overall low residual impact on the agricultural production ability of the land.

## Impacts on Heritage Resources (archaeology, palaeontology and cultural landscape)

The proposed development will not have a substantial negative impact on the archaeological heritage resources identified within the proposed development area for the grid connection infrastructure. No Stone Age or Iron age archaeology was identified during the field assessment. Some historical ruins and kraals of contextual historic significance, graded IIIC, were identified; however, none of these are likely to be impacted as per the layout provided and assessed.

A number of burial grounds and/or graves were identified during the field assessment (Grade IIIA) and some of these fall within areas likely to be impacted as per the proposed layout. A 50m no-go buffer has been recommended around these burial grounds. The burial ground recorded as Observation 008 is located away from any proposed infrastructure and is therefore unlikely to be impacted by the development. However, it is still recommended that a no-development area of 50m be implemented around this site to ensure that no impact takes place.

No palaeontological no-go areas have been identified within the project areas. With the exception of one fossil site of low scientific value, none of the recorded fossil sites overlaps directly with, or lies close to (< 20 m) the proposed infrastructure and no modification of the layouts through micro-siting is proposed here on palaeontological grounds.

Impacts on archaeological and palaeontological heritage are expected to be of medium and high significance pre-mitigation and can be reduced to low significance post-mitigation.

Based on the outcomes of the Heritage Impact Assessment, it is not anticipated that the proposed development of the grid connection infrastructure will negatively impact on significant heritage resources on condition the recommended mitigation measures are adhered to.

## Visual Impacts

The following sensitivities were identified from a visual perspective:

- Highly sensitive areas include:
  - Areas immediately surrounding settlement and homesteads development of which is likely to significantly change the character of views for residents. A 1000m buffer is proposed which should be sufficient to ensure that development does not totally dominate views. It is possible that receptors (owners /residents) have no concern regarding the development of these areas, in which case the sensitivity rating will reduce.
  - Areas on and immediately beside ridgelines as the development of these areas is likely to be more visible to surrounding areas including protected areas. A 1000m buffer is proposed; and Corridors beside the main roads that could be affected including the N17, the R35, and the R39. This is deemed sensitive because

development in this corridor is likely to be highly obvious to people travelling along the roads the proposed 500m corridor should be sufficient to ensure that development does not totally dominate views.

- Medium sensitivity areas include:
  - Watercourses and a buffer of 250m either side of watercourses. These areas are proposed in order to protect these natural features within the proposed focus area.
- Low sensitivity areas include:
  - Valley side slopes the development of which is likely to make the project least obvious from surrounding areas. The fact that development may be focused on areas with relatively low sensitivity does not preclude the necessity for mitigation.

The elements associated with the proposed grid connection are to a degree subject to the locations of the proposed renewable energy projects. A key consideration is the location of the proposed MTS relative to the renewable energy projects and the connection point on the existing 400kV overhead power line. The closer that it is located to the connection point the shorter the necessary additional 400kV loop in / loop out overhead power line is likely to be. Whilst this could mean that necessary overhead power line connections between the renewable energy projects and the MTS may be longer, these are likely to be lower power lines with significantly lower impacts.

At this early stage therefore a key consideration from minimising landscape and visual impacts is to locate the MTS as close to the existing 400kV overhead power line as possible as this is likely to minimise the extent of largest elements associated with the proposed grid connection that are likely to result in the largest impacts. It will also ensure that the impacts associated with these elements are most likely to impact areas that are currently affected by views of the existing 400kV overhead power line which is likely to help safeguard other areas of the landscape that are currently unaffected.

If the necessary overhead power lines and MTS were to be located in a manner that prevented them being visible to stakeholders, the entire focus area would be indicated as being highly sensitive. This wouldn't provide guidance of any value. It also needs to be borne in mind that the overhead power lines and the MTS are likely to be visible to differing extents and distances.

The proposed project will generally result in landscape and visual impacts of low to medium significance, depending on the distance from the grid connection infrastructure. Subject to mitigation measures being undertaken, from a Landscape and Visual Impact perspective, it is the specialist's opinion that there is no reason why the proposed project should not be authorised.

## Socio-Economic Impacts

Impacts are expected to occur with the development of the Ummbila Emoyeni EGI during the construction and decommissioning phases. Both positive and negative impacts are identified and assessed.

Impacts during construction include:

- Impact on production.
- Impact on the Gross Domestic Product (GDP).
- Impact on employment creation.
- Skills development.
- Household income and standard living.
- Temporary increase in government revenue.
- Change in sense of place.
- Safety and security.
- Agricultural operations.
- Influx of people.
- Daily movement patterns.

Impacts during the operation phase include:

- Impact on production.

- Impact on the GDP.
- Employment creation.
- Household income and standard of living.
- Increase in government revenue.
- Rental revenue for landowners.
- Improvement in energy sector generation.
- Visual and sense of place impacts.
- Impacts on agricultural operations.

Positive impacts during construction are expected to be of medium significance pre-enhancement and can be increased to medium (different score) post-enhancement. Negative impacts during construction are expected to be of medium and low significance pre-mitigation and can be reduced to medium (different score) and low significance post-mitigation, depending on the type of impact.

The net positive impacts associated with the development of the proposed project are expected to outweigh the net negative effects. The project is also envisaged to have a positive stimulus on the local economy and employment creation, leading to the economy's diversification and a small reduction in the unemployment rate. The project should therefore be considered for development. It should, however, be acknowledged that the negative impacts would be largely borne by the nearby farms and households residing on them, whilst the positive impacts will be distributed throughout both the local and national economies. Due to this imbalance, it is recommended that the mitigation measures suggested being strictly adhered to. Application of these mitigation measures will ensure that the negative impacts on the nearby farms and businesses are minimised and that the distribution of the potential benefits of the project are more balanced.

## Traffic Impacts

It is assumed that if components are imported to South Africa, it will be via the Port of Richards Bay in KwaZulu-Natal, or the ports of East London and Ngqura in the Eastern Cape. The Port of Richards Bay is located ~460km travel distance from the proposed site whilst the ports of East London and Ngqura are respectively located ~1 130km and 1 200km travel distance from the proposed site. The Port of Richards Bay is the preferred port of entry; however, the ports of East London and Ngqura can be used as alternatives, should the Port of Richards Bay not be available.

The proposed site is bounded by the N17 in the south, the R39 in the south and east and the R35 in the west. Access to the proposed site can be obtained from any of these three roads, depending on the traffic volumes of each road. The road carrying the least traffic will be considered as the best option. There is also an existing network of unnumbered gravel roads that might be suitable as a main access road to the proposed site.

The construction and decommissioning phases of an EGI are the only significant traffic generators and therefore noise, dust and exhaust pollution will be higher during these phases. The duration of these phases is short term i.e., the impact of the EGI on traffic on the surrounding road network is temporary. The access point to the proposed site has been assessed and was found to be acceptable from a transport perspective. The development is supported from a transport perspective provided that the recommendations and mitigation measures are adhered to.

## Assessment of Cumulative Impacts

Cumulative impacts and benefits on various environmental and social receptors will occur to varying degrees with the development of several renewable energy facilities in South Africa. The degree of significance of these cumulative impacts is difficult to predict without detailed studies based on more comprehensive data/information on each of the receptors and the site-specific developments. The alignment of renewable energy developments with South Africa's National Energy Response Plan and the global drive to move away from the use of non-renewable energy resources and to reduce greenhouse gas emissions is undoubtedly positive. The economic benefits of renewable energy developments at a local, regional and national level have the potential to be significant.

There are several authorised renewable energy projects within a 30km radius of the proposed site, namely:

- Majuba Solar PV Facility.

- Tutuka Solar PV Facility.
- Forzando North Coal Mine Solar PV Facility.
- Hendrina Renewable Energy Complex.

In addition to the renewable energy facilities listed above, a number of existing power lines and substations are located within the area, including several low voltage power lines supported by wooden poles and high voltage infrastructure such as the Camden / Sol 2 400kV and the Camden / Tutuka 1 400kV power lines which cross the study area.

The majority of cumulative impacts associated with the Umbbila Emoyeni EGI will be of a low significance, medium and high significance, with impacts of a high significance associated with the impacts on bats (which is largely associated with the wind energy facility which the EGI will support) and the socio-economic environment. A summary of the cumulative impacts is included in **Table 2**.

**Table 2:** Summary of the cumulative impact significance for the Umbbila Emoyeni EGI

Specialist assessment	Overall significance of impact of the proposed project considered in isolation	Cumulative significance of impact of the project and other projects in the area
Terrestrial Ecology	Low	Low and Medium
Freshwater Ecology	Low	Low
Avifauna	High	Medium
Bats	Medium	High
Soils and Agricultural Potential	Low	Low
Heritage (including archaeology, palaeontology and sense of place)	Medium	Medium
Visual	Low	Low and High
Socio-Economic	<i>Positive impacts:</i> Medium  <i>Negative impacts:</i> Medium	<i>Positive impacts:</i> Medium  <i>Negative impacts:</i> Medium
Traffic	Low	Medium (assuming all projects in the area are constructed at the same time)

Based on the specialist cumulative assessment and findings, the development of the Umbbila Emoyeni EGI and its contribution to the overall impact of all renewable energy projects to be developed within a 30km radius, it can be concluded that the Umbbila Emoyeni EGI cumulative impacts will be of low, medium and high significance, with impacts of a high significance mainly relating to visual impacts and the positive impacts on the socio-economic environment. Based on all other areas of study considered as part of this EIA report, the development of the Umbbila Emoyeni EGI will not result in unacceptable, high cumulative impacts and will not result in a whole-scale change of the environment.

### Assessment of No-go Alternative

The no-go option is the continuation of the existing land use, i.e. maintain the status quo. As detailed in the sections above, there would be no environmental impacts on the site or to the surrounding local area due to the construction activities of grid connection infrastructure with the implementation of this alternative. All negative impacts, specifically related to the development of the EGI, discussed in this report will not materialise.

The 'do-nothing' alternative will do little to influence the renewable energy targets set by government. However, as the project would provide essential supporting infrastructure to the proposed Umbbila Emoyeni Wind Energy Facility and Umbbila Emoyeni Solar Energy Facility (a total of up to 1GW), not developing the Umbbila Emoyeni EGI would see the opportunity to develop these renewable energy projects being lost as there would be no means for them to connect to the electricity grid. Therefore, the 'do-nothing' alternative is not preferred.

From the specialist studies undertaken, no environmental fatal flaws were identified to be associated with the Ummbila Emoyeni EGI subject to implementation of the recommended mitigation measures. All impacts associated with the project can be mitigated to acceptable levels. If the grid connection infrastructure is not developed, the following positive impacts will not be realised:

- Job creation from the construction and operation phases.
- Economic benefit to participating landowners due to the revenue that will be gained from leasing the land to the developer.
- Meeting of energy generation mix in a most economic and rapid manner.
- Provision of clean, renewable energy in an area where it is optimally available.

As detailed above, the 'do-nothing' alternative will result in a number of lost opportunities. The 'do nothing' alternative is therefore not preferred and not proposed to be implemented for the development of the Ummbila Emoyeni EGI.

## Assessment of the Grid Layout

The indicative EGI layout/development footprint assessed within this EIA Report (**Figure 2**) was designed by the project developer in order to respond to and avoid the sensitive environmental and social features located within the project site, which were identified by the specialists during the Scoping Phase of the EIA process. This approach ensured the application of the mitigation hierarchy (i.e., avoid, minimise, mitigate, and offset) to the proposed project, which ultimately ensures that the development is appropriate from an environmental perspective and is suitable for development within the project site.

Based on the findings as documented in this EIA report, it was concluded that this layout avoids areas of sensitivity and therefore no further optimisation was recommended. As such, the impact of this proposed Facility Layout is considered to be acceptable and the layout is recommended for approval. Final micro-siting must however be undertaken prior to construction considering all mitigation measures recommended within this EIA Report and associated specialist studies.

## Environmental Costs versus Benefits of the Ummbila Emoyeni Renewable Energy Facility

Environmental costs (including those to the natural environment, economic and social environment) can be anticipated at a local and site-specific level and are considered acceptable provided the mitigation measures as outlined in the EIA Report and the EMP are implemented and adhered to. No fatal flaws have been identified. These environmental costs could include:

- *Loss of biodiversity, flora and fauna due to the clearing of land for the construction and utilisation of land for the wind farm* - The cost of loss of biodiversity has been minimised/avoided through avoiding placement of project components and infrastructure within the ecological features considered to be of very high sensitivity (no-go areas).
- *Impacts on freshwater resources* - the impacts on freshwater resources have been minimised through the avoidance of the sensitive features by project infrastructure. Access roads will however need to cross some freshwater resource features, some of which will be on existing gravel roads.
- *Visual impacts associated with the wind farm/impacts to the sense of place* - The Ummbila Emoyeni EGI will be visible to receptors up to a distance of 22km. No mitigation of this impact is possible (i.e., the structures will be visible in the landscape), but general mitigation and management are required as best practise to minimise secondary visual impacts which may arise from mismanagement of the site. Other large scale industrial operations including transmission lines and substations, mining operations and power stations are relatively obvious in the region. Whilst the proposed project will create a new large scale industrial operation and change the character of an area of rural landscape, this is not entirely out of character with the region.
- *Loss of land for agriculture* – The development will remove areas available for agricultural activities; however, based on the small development footprint of the EGI and the fact that agricultural activities can continue on the properties together with the development, this will be limited and not significant.

- *Impacts on birds and bats* – loss of birds and bats species due to collision with infrastructure and habitat destruction. The impact has been minimised through the avoidance of areas of very high sensitivity (no-go areas) and is considered to be acceptable with implementation of mitigation measures.
- *Negative impact to the cultural landscape* - The Umbila Emoyeni EGI is proposed within a landscape area with an overriding rural character within which there are large industrial nodes including mining operations and coal fired power stations. Whilst the proposed project will create a new large scale industrial node within the agricultural landscape, this is not entirely out of character with the broader region. However, it will be a significant local character change.
- *Loss of heritage and palaeontological resources* – Six burial grounds were identified within and close to the project site, around which a 50m no-go buffer has been recommended. With the exception of one fossil site of low scientific value, none of the recorded fossil sites overlaps directly with, or lies close to (< 20m) the proposed infrastructure.

Benefits of the Umbila Emoyeni EGI include the following:

- The project will facilitate the connection of the wind and solar energy facilities proposed as part of the Umbila Renewable Energy Farm to the national grid. This is a total of 1GW of additional electricity available to the national grid. This will have benefits for the whole country and is equal to alleviating up to two levels of load shedding..
- The project will result in important economic benefits at the local and regional scale through job creation, income and other associated downstream economic development. These will persist during the pre-construction, construction, operational and decommissioning phases of the project. This is specifically important in the Mpumalanga Province as the Just Energy Transition from carbon-based fuel to renewable energy sources occurs. It means that valuable jobs will be created in the Province for those workers who need them.
- The project contributes towards the Provincial and Local goals for the development of renewable energy as outlined in the respective IDPs, as it provides essential infrastructure for solar and wind energy facilities.
- The project supports wind and solar developments which serve to diversify the economy and electricity generation mix of South Africa, in line with national policy regarding energy generation.
- South Africa's per capita greenhouse gas emissions are amongst the highest in the world due to the reliance on fossil fuels. The Umbila Emoyeni EGI will support up to 1GW of renewable energy which will contribute to achieving goals for implementation of renewable energy and sustaining a 'green' economy within South Africa.

The benefits of the Umbila Emoyeni EGI are expected to occur at a national, regional and local level. As the costs to the environment at a site-specific level have been largely limited through the appropriate placement of infrastructure on the project site within lower sensitive areas, the benefits of the project are expected to partially offset the localised environmental costs of the grid connection infrastructure, provided that the mitigation measures, as recommended by the specialists are adhered to.

## Overall Conclusion (Impact Statement)

The preferred activity was determined by the developer to be the development of grid connection infrastructure, including 132kV and 400kV infrastructure, to transmit and distribute electricity generated from the proposed renewable energy facilities included within the Umbila Renewable Energy Farm. A technically viable development footprint was proposed by the developer considering of environmental sensitivities identified in the scoping study and assessed as part of the EIA process. The assessment of the development footprint within the project site was undertaken by independent specialists and their findings have informed the results of this EIA Report.

From a review of the relevant policy and planning framework, it was concluded that the project is well aligned with the policy framework as a result of it providing essential supporting infrastructure for renewable energy development, and a clear need for the project is seen from a policy perspective at a local, provincial and National level.

The specialist findings from the EIA studies undertaken have indicated that there are no identified fatal flaws associated with the implementation of the development footprint within the project site subject to implementation of the recommended mitigation measures. The developer has designed a project development footprint in response to the identified sensitive environmental features and areas present within the project site. This approach is in line with

the application of the mitigation hierarchy, where all the sensitive areas which could be impacted by the development have been avoided (i.e., tier 1 of the mitigation hierarchy).

Impacts can be mitigated to acceptable levels or enhanced through the implementation of the recommended mitigation or enhancement measures. This is however not relevant for the visual impact of the grid connection infrastructure as the EGI components will be visible regardless of the mitigation applied. This high significance rating is, however, not considered as a fatal flaw by the specialist.

As detailed in the cost-benefit analysis, the benefits of the Ummbila Emoyeni EGI are expected to occur at a national, regional and local level. As the costs to the environment at a site-specific level have been largely limited through the appropriate placement of infrastructure on the project site within lower sensitive areas through the avoidance of features and areas considered to be sensitive/no-go for development, the benefits of the project are expected to partially offset the localised environmental costs of the grid connection infrastructure. From a social perspective, both positive and negative impacts are expected.

Through the assessment of the development footprint within the project site, it can be concluded that the development of the Ummbila Emoyeni EGI will not result in unacceptable environmental impacts (subject to the implementation of the recommended mitigation measures).

## Overall Recommendation

Considering the findings of the independent specialist studies, the impacts identified, the development footprint proposed by the developer, the avoidance of the sensitive environmental features within the project site, as well as the potential to further minimise the impacts to acceptable levels through mitigation, it is the reasoned opinion of the EAP that the Ummbila Emoyeni EGI is acceptable within the landscape and can reasonably be authorised subject to implementation of the refined optimised facility layout and the mitigation and enhancement measures recommended by the specialists.

The grid connection infrastructure will include:

- A new 400/132 kV Main Transmission Substation (MTS), to be located adjacent to the Camden SOL Overhead Lines (OHLs).
- 3 x new collector stations: each will comprise several incoming 132 kV lines from each project switching station, feeder bays, 132kV bus bars and outgoing line to the MTS.
- Two 400kV turn in and out lines that will loop into the existing Camden-Sol 400kV transmission line.
- On-site switching stations (132kV in capacity) at each renewable energy facility.
- 132kV power lines from the switching stations to the collector substations and ultimately to a new MTS.
- On-site IPP substations where the generated power will be transformed from 33 kV to 132 kV so that it can be evacuated to Collector station and MTS
- Access roads up to 8m wide.

The 400/132kV MTS will serve as the main point of connection to which the internal 132kV power lines of the proposed Ummbila Emoyeni Wind and Solar Energy facilities will connect. The connection of the proposed 400/132kV MTS to the national grid will be via a new loop-in loop-out 400kV power line that will connect into the existing Camden-Sol 400kV transmission line.

The following key conditions would be required to be included within an authorisation issued for the Ummbila Emoyeni EGI:

- All mitigation measures detailed within this EIA Report, as well as the specialist reports, are to be implemented.
- The EMPs (for the power lines and onsite substations) should form part of the contract with the Contractors appointed to construct and maintain the grid connection infrastructure in order to ensure compliance with environmental specifications and management measures. The implementation of the EMP for all life cycle phases of the Ummbila Emoyeni EGI is considered key in achieving the appropriate environmental management standards as detailed for this project.

- Following the final design of the Ummbila Emoyeni EGI, a final layout must be submitted to DFFE for review and approval prior to commencing with construction. Micro-siting must take all recommended mitigation measures into consideration. No development is permitted within the identified no-go areas.
- An Environmental Site Officer (ESO) must form part of the on-site team to ensure that the EMP is implemented and enforced and an Environmental Control Officer (ECO) must be appointed to oversee the implementation activities and monitor compliance for the duration of the construction phase.
- Preconstruction walk-through of the final development footprint for protected species that would be affected and that can be translocated must be undertaken. The survey must also cover sensitive habitats and species that are required to be avoided. Permits from the relevant provincial authorities, will be required to relocate and/or disturb listed plant species.
- Prevent birds from nesting in substation infrastructure through exclusion covers or spikes if required (determined on a case-by-case basis).
- All other relevant environmental permits must be obtained prior to the construction of the facility.
- A validity period of 10 years of the Environmental Authorisation is requested, should the project obtain approval from DFFE.

## Environmental Authorisation

The Environmental Authorisation for the EGI was issued by the DFFE in January 2023. The Environmental Authorisation was subsequently amended to allow for the development to take place in phases, with the layout and EMPs approved in phases by the DFFE.

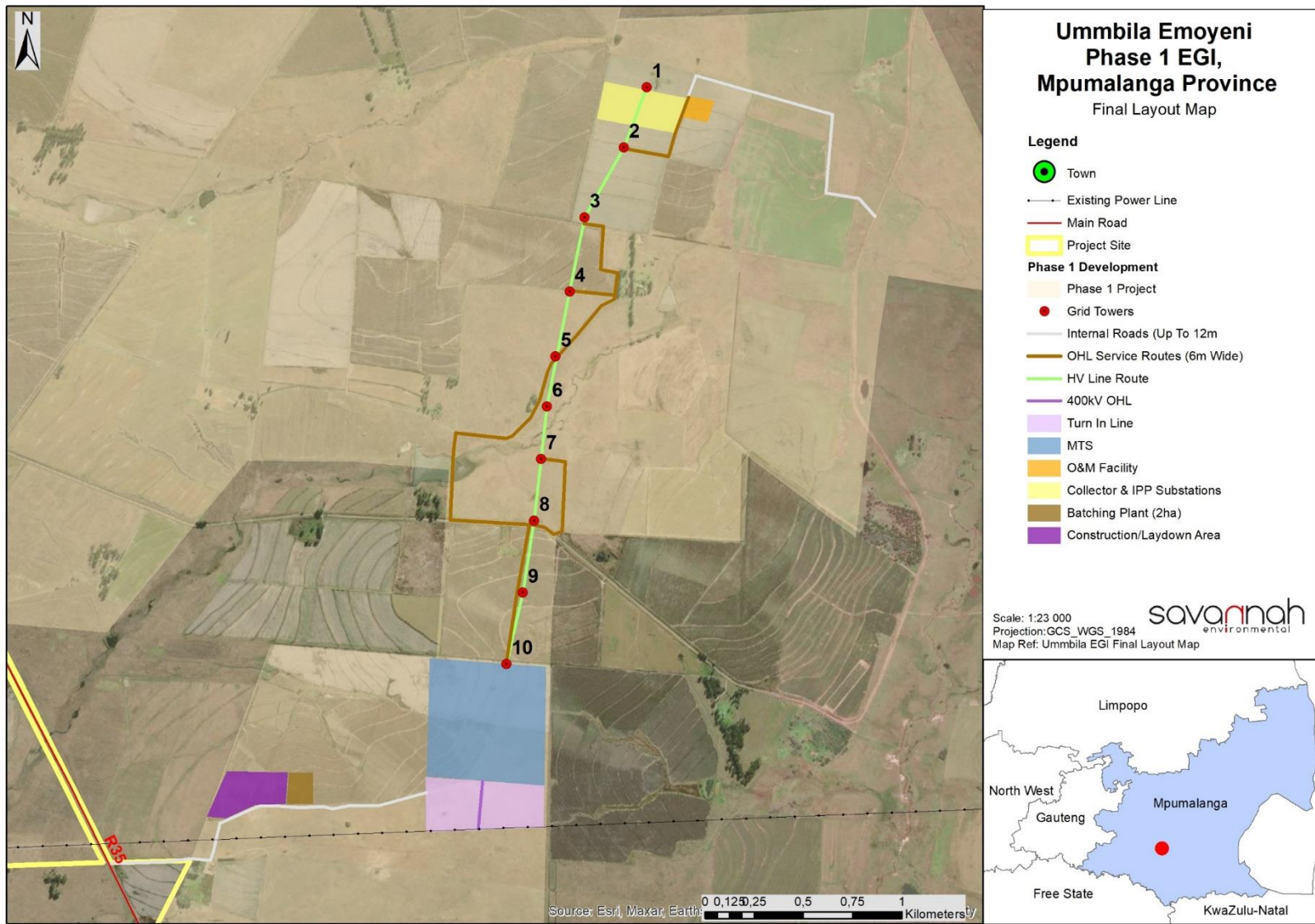
## Ummbila Emoyeni Phase One

Ummbila Emoyeni Phase One EGI comprises (**Figure 3**):

- A new 400/132 kV Main Transmission Substation (MTS), to be located adjacent to the Camden SOL Overhead Lines (OHLs).
- New collector stations: with:
  - 132 kV feeder bays
  - 132 kV busbar
  - 132 kV switchgear
  - 90 MVA 132/33 kV transformers
  - 33 kV switchgear
  - Capacitor Bank
- 33 kV network connecting wind turbines to IPP substation
- 400kV loop-in loop-out OHLs to the existing Camden-Sol 400kV transmission line from the MTS.
- On-site switching stations (132kV in capacity), adjacent to the IPP substation.
- 132kV power line from the collector substation to the new MTS.
- On-site IPP substation where the generated power will be transformed from 33 kV to 132 kV so it can be evacuated to the switching station and from there to the Collector station and MTS.
- Access roads up to 12m wide.

The layout and EMPs for Phase One were approved by the DFFE in July 2023, following the mandatory public consultation phase (30 days).





**Figure 3:** Final layout map of the Umbila Emoyeni EGI – Phase One, including all infrastructure