UMMBILA EMOYENI ONE WIND ENERGY FACILITY

Non-technical Summary

Wind Energy Facility - DFFE Reference No.: 14/12/16/3/3/2/2160

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.

From a regional perspective, the identified area within the Mpumalanga Province is considered favourable for the development of a commercial WEF by virtue of prevailing climatic conditions, relief, the extent of the affected properties, the availability of a direct grid connection (i.e., a point of connection of the national grid) and the availability of land on which the development can take place.

The Ummbila Emoyeni WEF 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 Ummbila Emoyeni WEF under the Department of Mineral Resources and Energy's (DMRE's) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme or through a similar private programme, 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) published by the Department of Minerals Resources and Energy, with the Ummbila Emoyeni WEF set to inject up to 900MW of electricity into the national grid. 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 WEF 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 (see graph below). This will be vitally important if the JET is to be successfully implemented and is a transition for everyone.

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 was considered within the EIA process for the WEF 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 a development footprint were defined for assessment. The project site is larger than the area required for the development footprint of a 900MW WEF 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 infrastructure associated with the Ummbila Emoyeni WEF includes:

- Up to 111 wind turbines with a maximum hub height of up to 200m. The tip height of the turbines will be up to 300m.
- 33kV cabling to connect the wind turbines to the onsite collector substations, to be laid underground where practical.
- 3 x 33kV/132kV onsite collector substation (IPP Portion), each being 5ha.
- Battery Energy Storage System (BESS).
- Cabling between turbines, to be laid underground where practical.

- Construction compounds including site office (approximately 300m x 300m in total but split into 3ha each of 150m x 200m):
    - Batching plant of up to 4ha to 7ha.
    - 3 x O&M office of approximately 1.5ha each adjacent to each collector SS.
    - 3 x construction compound / laydown area, including site office of 3ha each (150m x 200m each).
- Laydown and crane hardstand areas (approximately 75m x 120m).
- Access roads of 12 -13m wide, with 12m at turning circles.

The development of the WEF 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 WEF 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 WEF. 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 following potential environmental impacts associated with the WEF were assessed through the EIA process:

- 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.
- Noise impacts due to the construction and operation of the wind farm.
- Visual impacts on the area imposed by the components of the facility.
- Positive and negative social impacts.
- Traffic impacts.

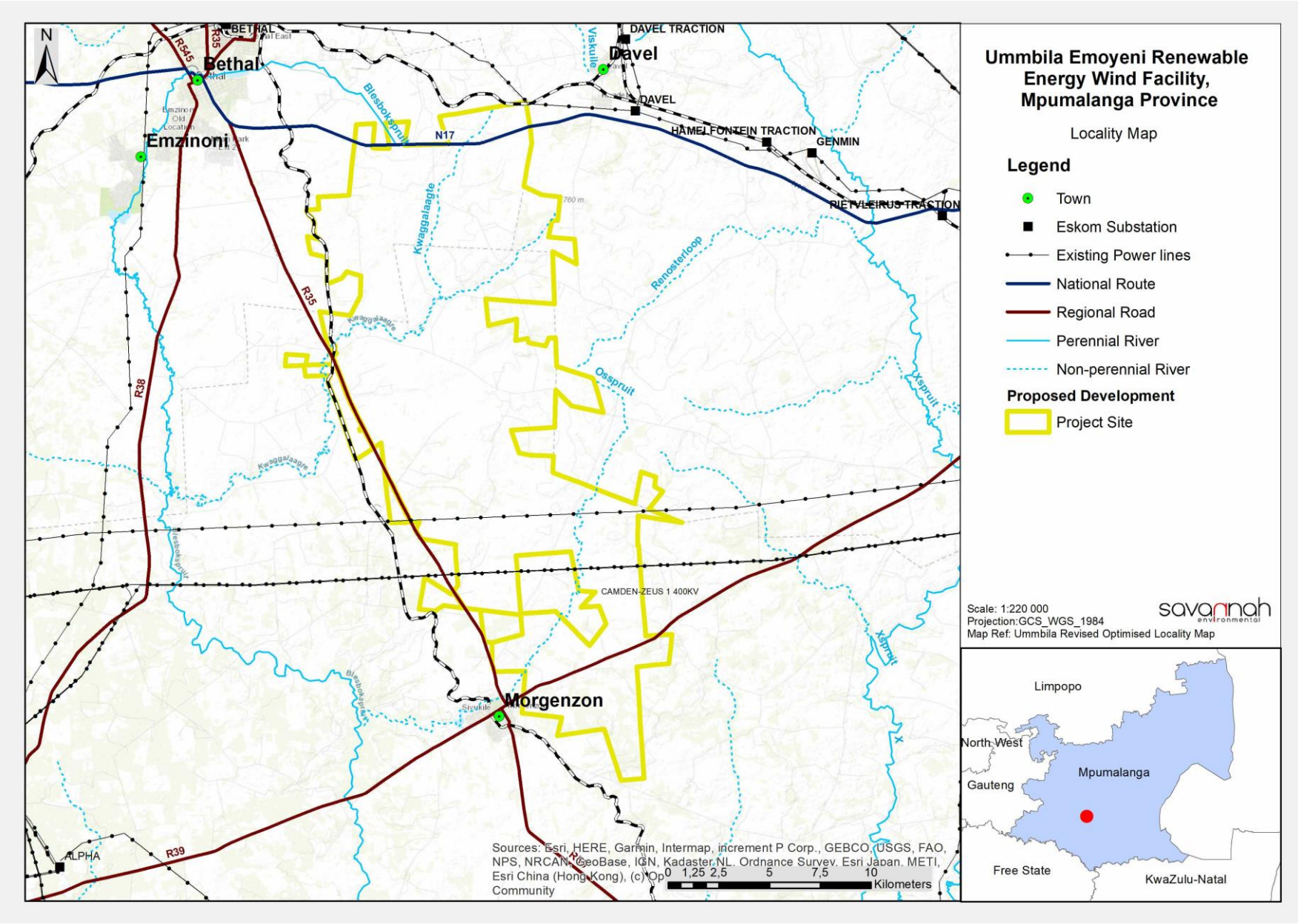

Figure 1: Locality map of the Ummbila Emoyeni Wind Energy Facility (Source: Savannah Environmental, 2022)

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 (7549 ha; 20.7%) or Low (14496 ha; 39.7%) sensitivity. This large extent of low sensitivity areas is fortunate and means that there are ample areas for the development to occur. 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.

None of the proposed turbine localities occur within drainage areas (“Very High” sensitivity). However, internal access routes will cross drainage areas at sixteen locations. A total of fourteen (14) wind turbines are planned within the natural areas classified as CBA Optimal Areas (“Very High” sensitivity), five (5) wind turbines are planned within natural areas classified as CBA Irreplaceable Areas (“Very High” sensitivity). Furthermore, a total of twenty (20) turbines occur within natural areas, that fall outside of any CBAs (eight of these turbines fall within ESAs) and have subsequently been classified as “Medium” in terms of sensitivity (as determined by the authors of this report via desktop mapping and ground truthing).

A new optimised layout was therefore proposed and according to this layout no wind turbines will be located within any CBA Irreplaceable Areas, with only six wind turbines planned within CBA Optimal Areas. Thus, according to this optimized layout, almost all of the sensitive areas will be avoided and the Ummbila WEF will not significantly impact sensitive areas or impact conservation targets set out by the province.

There are no impacts associated with the proposed WEF 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 WEF 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, the

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.

- All small, endorheic seepages and depressions with a High Ecological Importance: 50m buffers from the outer edge of the freshwater resource features.
- All larger interconnected wetland features with Very Ecological Importance: 100m buffers from the outer edge of the freshwater resource features.
- 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 freshwater resource features' integrity and functioning 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 my 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 WEF as identified in the Freshwater Impact Assessment, 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

Very High sensitivity areas are no-go for the development of WTGs and blade tips are not to allowed to encroach on these areas. Linear infrastructure can traverse these areas, where necessary, following the implementation of appropriate mitigation measures. WTG development is permitted within areas of high sensitivity following the

implementation of additional mitigation requirements, although development within these areas should be avoided, where possible. Development in medium sensitivity areas should also be avoided and reduced wherever practically possible.

Based on the avifaunal sensitivity of the project site, wind turbines (plus 100 m radius representing an assumed blade length) encroach on the revised areas of high avifaunal sensitivity. Note that the 100m is a conservative blade length (blade length and not radius is the important figure) but nonetheless, these will be considered to be relocated, should it be possible to achieve the target generating output of the development within fewer wind turbines, or additional mitigation implemented as recommended in the avifaunal assessment. These include WTGs 6, 9, 11, 13, 19, 24, 26, 28, 29, 30, 32, 34, 36, 49, 52, 59, 61, 64, 82, 83, 84, 96, 100, 101. Nevertheless, all wind turbines in the proposed layout avoid areas identified to be of Very High Avifaunal Sensitivity (wind turbine no-go) areas and the wind turbine layout is therefore acceptable from an avifauna perspective.

The Avifauna Impact Assessment identified that all impacts associated with the development of the Ummbila Emoyeni WEF 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 impacts rated to be of high significance pre-mitigation are not considered as fatal flaws, provided the prescribed mitigation measures are implemented. One of these mitigation measures includes avoiding areas to be of very high sensitivity (no-go). Secondly, the implementation of additional mitigation measures such as observer-based shut-down-on-demand 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-construction avifauna monitoring programme conducted for the Ummbila Emoyeni WEF, 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 species of conservation concern) in the area following the implementation of mitigation measures. It is the specialist's opinion that the proposed development can be approved from an avifaunal perspective and that the indicative positions of all 111 wind turbines in the layout are 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 WEF.

Key habitat features have been identified for bats within the project site. These habitat features present specific uses and opportunities for bats including roosts, foraging resources and commuting resources. 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

To avoid collision impacts, no part of the wind turbines, including the blade tips, shall intrude into the no-go buffers. The turbine assessed has a rotor diameter of 170m and hub height of 150m. Thus, to ensure the turbine blades do not cross into the bat buffers, an additional distance of 42m must be added to the 200m no-go buffers. Six turbines in the

proposed indicative layout assessed in the EIA are currently located within no-go areas: WTG10, WTG61, WTG82, WTG88, WTG100, and WTG101. These turbines must be relocated into low and medium sensitivity areas. In addition, several locations of the construction compounds, laydown areas, batching plants, and substations associated with the WEF, specifically Substation and O&M 1 and Batching Plant 3, Construction Laydown Area 3 and a small portion of Batching Plant 2, Construction Compound 2, also need to be adjusted so that they are outside no-go Areas. The optimised layout addresses this requirement.

Based on the bat activity recorded at the site proposed for the Ummbila Emoyeni WEF, 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 from a medium significance to a low, acceptable significance, no fatal flaws are expected to occur. The specialist indicates that with the implementation of the mitigation measures, the development of the Ummbila Emoyeni WEF will not result in unacceptable impacts to bats, and can be authorised.

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 “Moderately 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 relocating wind turbines and associated infrastructure (e.g., laydown areas, substations, etc.) from the areas characterised by “High” to “Very High” crop fields in order to ensure that these crop fields are preserved, where possible. 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. Approximately 22 turbines are located within sensitivity crop fields.

The Soils and Agricultural Potential Impact Assessment identified that all impacts associated with the development of the Ummbila Emoyeni WEF will be of medium significance before mitigation, and can be mitigated to an acceptable level of impact (i.e., low significance). The proposed development will have an overall low residual impact on the agricultural production ability of the land. It is the specialist’s opinion that the project be approved subject to implementation of the recommended mitigation measures.

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 renewable energy facilities and associated 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 overlap directly with, or lie close to (< 20 m) the proposed infrastructure and no modification of the layouts through micro-siting is proposed here on palaeontological grounds. One fossil site (UMB10) is located in close proximity to a proposed road and turbine; however, this site has low palaeontological significance and has been sufficiently recorded. No further mitigation is recommended for this site.

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.

The facility layout has been assessed to have a high impact on the cultural landscape pre-mitigation as some of the wind turbines fall within the no development 500m buffers along major routes such as the N17, R35 and R39 and the 200m no development buffers along secondary routes. Impacts to the cultural landscape can be reduced to be of low significance following the implementation of mitigation measures. These mitigations have been applied and no turbines are located north of the N17 or within road buffer.

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

Noise Impacts

Ambient (background) sound levels were measured over a period of up to seven nights from 9 to 15 March 2022 at five locations in the vicinity of the project site. Considering the results of the ambient sound levels and the developmental character of the area, ambient sound levels were elevated, especially at night. The acceptable zone sound level (noise rating level) during low and no-wind conditions would be typical of a rural (daytime) to suburban (night-time) noise district, e.g.: 45 dBA for the daytime period and 40 dBA for the night-time period.

Numerous noise-sensitive developments, receptors and communities were identified within the potential area of influence (within 2 000m from a wind turbine). Based on the results of the Noise Impact Assessment, adjustments in terms of the proposed layout are required as there are potential noise sensitive receptors (NSRs) are located within 1 000m of some of the wind turbines, namely, NSR47, NSR40 and NSR46. The specialist recommended that should it be found that the structures at these noise sensitive receptors are used for residential purposes at the time of operation of the wind farm, the residents must be relocated, or the wind turbine located within 1 000m from these noise sensitive receptors must be moved further than 1 000m from these noise sensitive receptors.

Noise impacts will be of low significance for daytime construction activities, of medium significance for night-time construction activities (with mitigation proposed to reduce the significance to low), and of medium significance for day-time operation activities and high significance for night-time operation activities (with mitigation proposed to reduce the significance to low). Most of the higher significance ratings relate to the potential noise impact on specific NSRs (namely, NSR 40, 46 and 47).

Because the total projected noise levels will exceed the rural rating levels, with the projected noise level exceeding 42 dBA, active noise monitoring is recommended. Once-off noise measurements are recommended at the locations of NSRs located within the 42 dBA noise level contour before the WEF is developed, to be repeated once within a year after the WEF is fully operational.

It is recommended that the proposed Ummbila Emoyeni WEF and associated infrastructure project be authorised, provided that the applicant can reduce the noise levels to less than 45 dBA at all receptors (structures used for residential purposes) through the implementation of recommended mitigation measures. The proposed layout (i.e., turbine placement) is considered to be acceptable from a noise perspective with the implementation of appropriate mitigation measures to ensure that the total noise levels are less than 45 dBA at all structures used for residential purposes. The locations of facility substations, BESS and O&M hubs are acceptable.

Visual Impacts

The following sensitivities have been 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 1 000m buffer is proposed (and has been applied in the indicative layout) 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.

    - 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.

Considering the visual sensitivities overlain on the wind farm layout, the following can be noted:

- Three turbines are located within the high sensitivity area beside the N17.
- Two turbines are located within the high sensitivity area beside the R35.
- Two turbines are located in the high sensitivity area beside the R39.
- Approximately 95 turbines are located within the shadow flicker risk area.
- Fourteen turbines are located within or on the edge of the 1 000m homestead buffer.

A visibility analysis was undertaken for the project. Based on the results of the visibility analysis, the turbines, are likely to be visible within a 10km buffer, and are only likely to be visible over high sections of the landscape within the 30km buffer. Outside the 30km buffer, turbines are unlikely to be seen as being prominent. None of the proposed onsite substations are likely to be highly visible, although they may be intermittently visible to main roads, but are unlikely to be obvious.

The proposed project will generally result in landscape and visual impacts of low to high significance, depending on the distance from the facility. Subject to mitigation measures being undertaken, particularly the necessary shadow flicker study and the implementation of recommended mitigation measures within the final design, 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 WEF during the construction, operation 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 both construction and operation are expected to be of medium and high significance pre-enhancement and can be increase to medium and high post-enhancement. Negative impacts during both construction and operation 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 and operation 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. It is the specialist's opinion that the project should therefore be considered for authorisation.

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 a wind farm 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 Wind Farm 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.

The 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, one new renewable energy facility (a solar energy facility) is proposed by Emoyeni Renewable Energy Farm (Pty) Ltd, within the footprint of the Ummbila Emoyeni WEF, namely:

- Ummbila Emoyeni Solar Energy Facility.

The Ummbila Emoyeni Renewable Energy Farm will also include grid connection infrastructure comprising 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 to evacuate the generated power to the national grid.

The majority of cumulative impacts associated with the Ummbila Emoyeni WEF will be of a low significance, medium and high significance, with impacts of a high significance associated with the impacts on bats 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 Ummbila Emoyeni WEF

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	Low	Medium
Bats	Medium	High
Soils and Agricultural Potential	Low	Low
Heritage (including archaeology, palaeontology and sense of place)	Medium	Medium
Noise	There is a very low risk of cumulative noises during the construction phase since there are no other wind energy facilities proposed within the area of potential influence. Similarly, because there are no other wind energy facilities within the area of influence, there are no risk of a cumulative noise impact.	
Visual	Low	Low and Medium
Socio-Economic	*Positive impacts:* Medium and High *Negative impacts:* Medium	*Positive impacts:* Medium and High *Negative impacts:* 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 Ummbila Emoyeni WEF 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 Ummbila Emoyeni WEF cumulative impacts will be of low, medium and high significance, with impacts of a high significance mainly relating to impacts on bats and the positive impacts on the socio-economic environment. From a bats perspective, the WEF may result in unacceptable loss to local bat populations, which can be reduced to an acceptable level with the implementation of recommended mitigation measures. Based on all other areas

of study considered as part of this EIA report, the development of the Ummbila Emoyeni WEF will not result in unacceptable, high cumulative impacts and will not result in a whole-scale change of the environment.

Optimisation of the Facility Layout

The indicative facility layout/development footprint assessed within the EIA Report 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.

Considering this proposed layout, the following specialists identified and confirmed specific turbines and associated infrastructure to be unacceptably placed within the project site (refer to **Table 3**).

Table 3: Turbines and associated infrastructure not considered to be acceptable in the positions as proposed in the facility layout/development footprint based on specialist findings

Specialist finding	Turbines/associated infrastructure affected
The bats specialist indicates that six (6) turbines and some of the infrastructure associated with the WEF are located within the no-go buffer areas.	» WTG10, WTG61, WTG82, WTG88, WTG100, and WTG101 » Substation and O&M 1 and Batching Plant 3, Construction Laydown Area 3 and a small portion of Batching Plant 2, Construction Compound 2
The heritage specialist indicates that one turbine is located within the 50m no-go development buffer around burial grounds, and that there is a road that infringes into the 50m no-go development buffer around burial grounds.	WTG101 and road to WTG60
The noise specialist indicates that three (3) turbines are located within 500m and 1 000m (close to the 500m buffer) of noise sensitive receptors (NSR 40, 46 and 47) and would therefore result in significant noise impacts should these residences be occupied at the time of operation of the wind farm.	WTG76, WTG67 and WTG61

Based on the findings as documented in **Table 3**, a revision to the facility layout was undertaken and an optimised layout[1] provided which addressed the need to relocate the turbines and associated infrastructure, as listed in **Table 3**.

Further scrutiny of the optimised layout by specialists identified and confirmed that specific turbines and associated infrastructure were still unacceptably placed within the project site (refer to **Table 4** and **Figure 2**).

Table 4: Turbines and associated infrastructure not considered to be acceptable in the positions as proposed in the optimised layout based on specialist findings

Specialist finding	Turbines/associated infrastructure affected
The terrestrial ecology specialist indicates that some of the internal roads for the optimised layout fall within no-go areas from a terrestrial ecology perspective.	» A section of the road to WTG19 crosses a CBA1: Irreplaceable » A section of the road to WTG44 crosses a CBA1: Irreplaceable » A section of the road to WTG56 crosses a CBA1: Irreplaceable

[1] It should be noted that the turbine numbering within the assessed and optimised layout differs.

Specialist finding	Turbines/associated infrastructure affected
The freshwater ecology specialist indicates that one (1) turbine from the optimised layout falls within no-go buffer around the one of the freshwater/drainage features.	WTG10
The bats specialist indicates that some of the infrastructure associated with the WEF falls within bat no-go areas.	Substation and O&M 1 and Batching Plant 3, Construction Laydown Area 3 and a small portion of Batching Plant 2, Construction Compound 2
The noise specialist indicates that optimisation of the layout would change the noise levels as well as the receptors that are impacted and as such, the same mitigation measures applied to the assessed layout should be considered for the optimised layout.	N/A

Based on the findings as documented in **Table 4**, the optimised layout was further refined and a layout which addresses the need to relocate the turbines and associated infrastructure, as listed in **Table 4** was designed (refer to **Figure 3**). The result is that the refined optimised facility layout has repositioned turbines and associated infrastructure outside of the sensitive areas and features regarded to be no-go for development, following the principle of the mitigation hierarchy where avoidance of impact is the preferred approach. In addition, the applicant undertook a shadow flicker study as recommended by the visual specialist study. A number of houses will potentially be affected by shadow flicker and would require mitigation (such as relocation of receptors or implementation of a shadow flicker protection system) to be implemented during the final planning and micro-siting of the facility.

With the implementation of the refined optimised layout, the development footprint is considered to be suitable and appropriate from an environmental perspective for the wind farm, as it ensures the avoidance, reduction and/or mitigation of all identified detrimental or adverse impacts on sensitive features as far as possible. For the avoidance of doubt, all 111 WTG positions are now placed in acceptable locations from a sensitivity perspective in the refined optimized layout.

All specialists assessed the full extent of the project site as shown in the sensitivity map. This refined Optimised Facility Layout considers the required mitigation measures as stated by the specialists and represents a positive outcome in terms of impact avoidance, reduction and mitigation. As such, the impact of this refined Optimised Facility Layout is considered to be acceptable and the layout is preferred. Final micro-siting must however be undertaken prior to construction considering all mitigation measures recommended within this EIA Report and associated specialist studies.

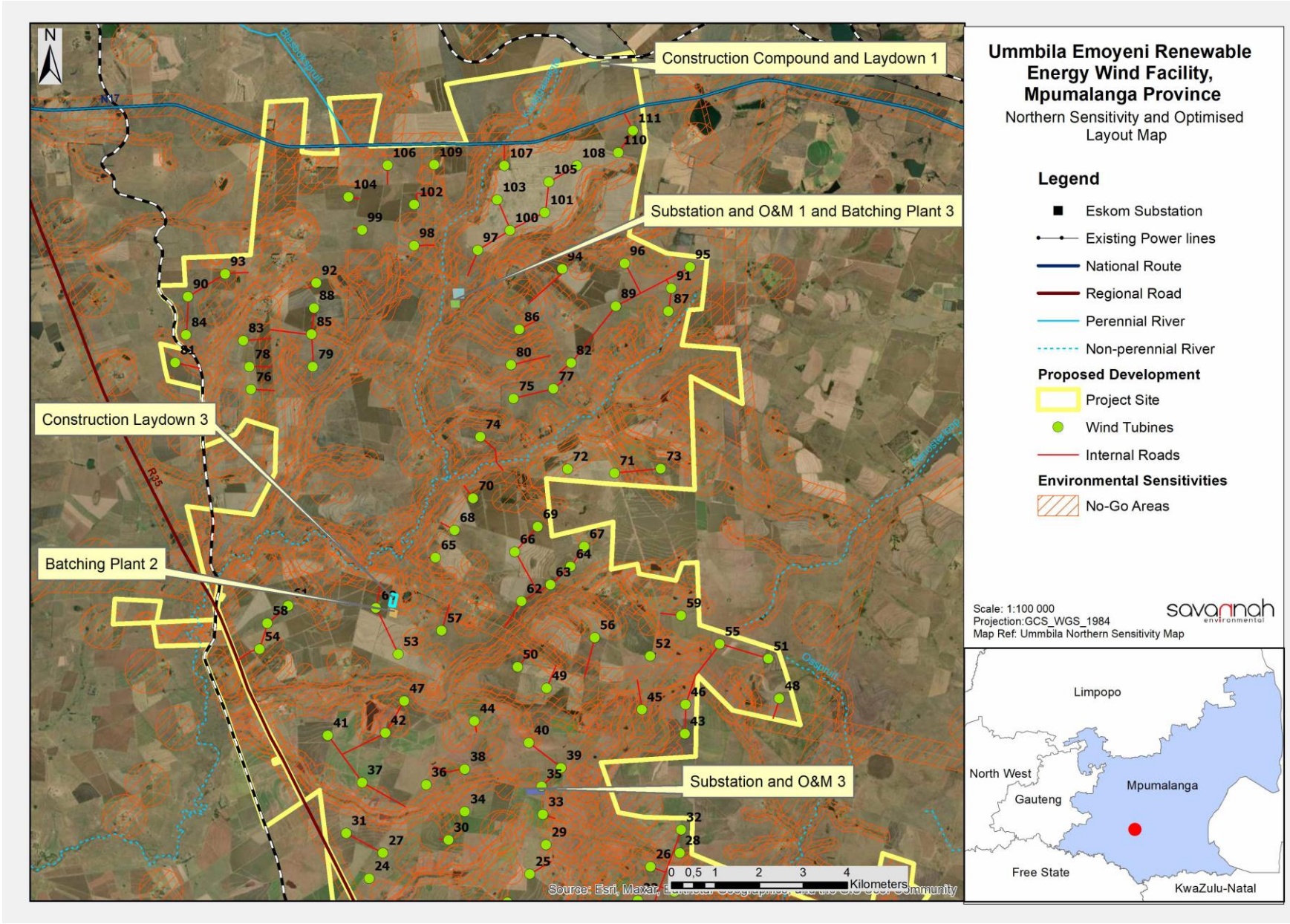

Figure 2a: Optimised layout for the Ummbila Emoyeni WEF, overlain with the identified environmental sensitivities (northern portion)

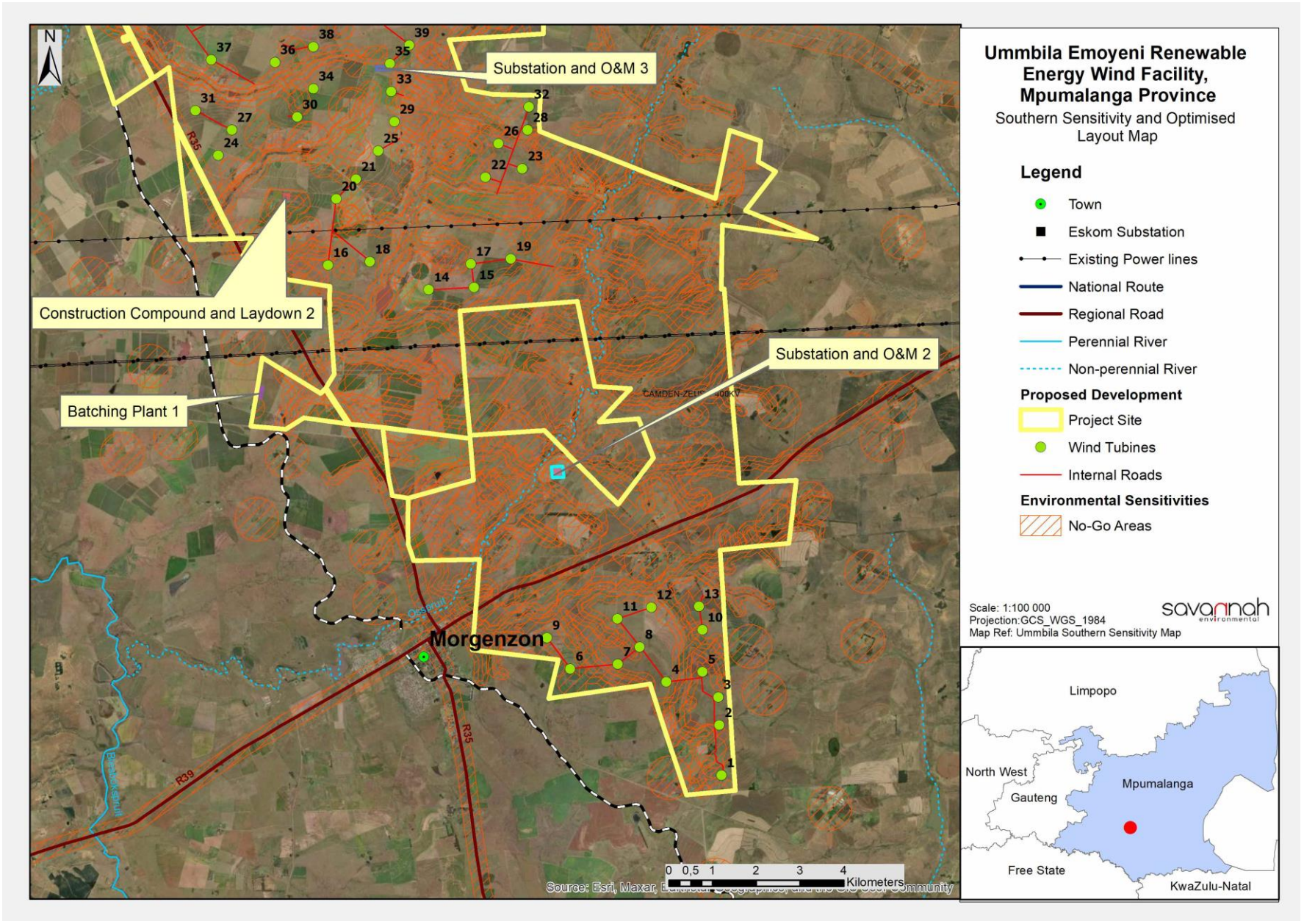

Figure 2b: Optimised layout for the Ummbila Emoyeni WEF, overlain with the identified environmental sensitivities (southern portion)

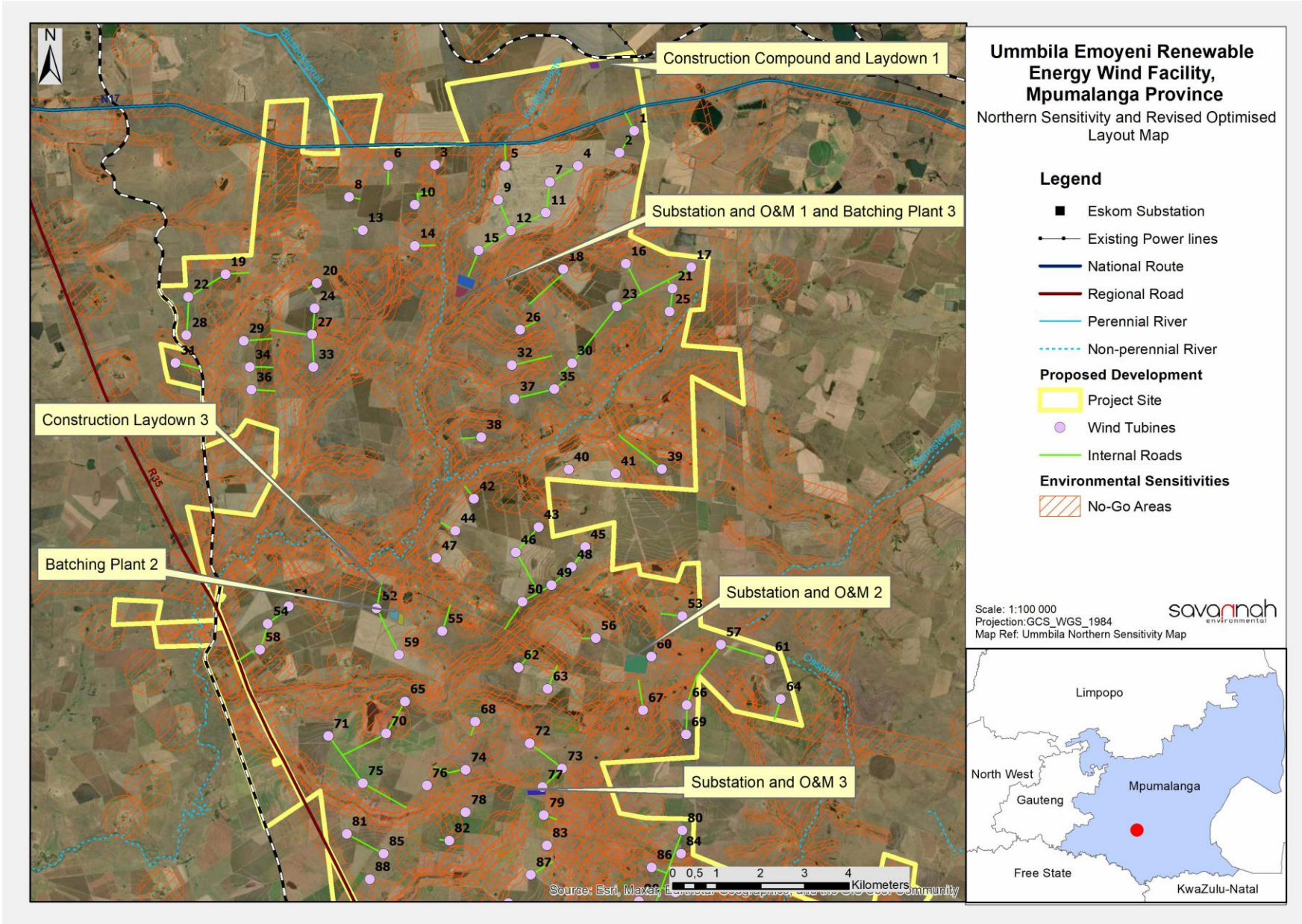

Figure 3a: Refined optimised layout for the Ummbila Emoyeni WEF considered to be acceptable for development (northern section)

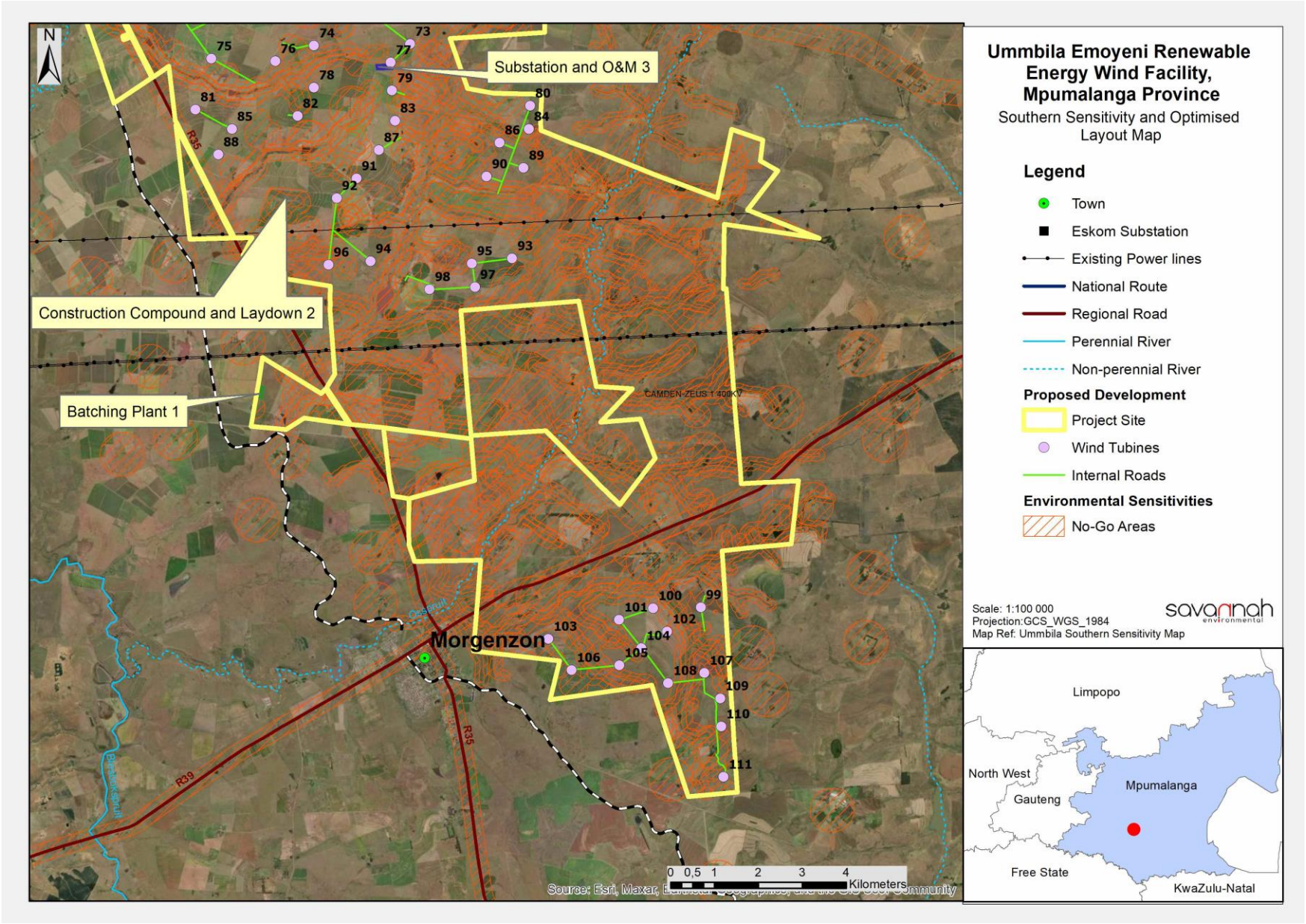

Figure 3b: Refined optimised layout for the Ummbila Emoyeni WEF considered to be acceptable for development (southern section)

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 EMPr 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. The internal access roads and MV Cabling 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 WEF will be visible to receptors up to a distance of 10km from the site and mainly of a high significance. 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 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 wind farm and the fact that agricultural activities can continue on the properties together with the wind farm, this will be limited and not significant.
- Impacts on birds and bats – loss of birds and bats species due to collision with turbines. 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 Ummbila Emoyeni WEF 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 Ummbila Emoyeni WEF include the following:

- The project will result in important economic benefits at the local and regional scale through job creation, income and other associated downstream economic development, supporting the Just Energy Transition in the region. These will persist during the pre-construction, construction, operation and decommissioning phases of the project.
- The project provides an opportunity for a new land use on the affected properties which would result in additional financial benefits to the directly affected landowners through compensation. It is important to note that the construction and operation of a wind farm can occur in tandem with crop production.

- The project contributes towards the Provincial and Local goals for the development of renewable energy as outlined in the respective IDPs.
- The project serves to diversify the economy and electricity generation mix of South Africa through the addition of wind energy, in line with national policy regarding energy generation.
- The water requirement for a wind farm is negligible compared to the levels of water used by coal-based technologies. This generation technology is therefore supported in dry climatic areas.
- South Africa's per capita greenhouse gas emissions are amongst the highest in the world due to the reliance on fossil fuels. The Ummbila Emoyeni WEF will contribute to achieving goals for implementation of renewable energy and sustaining a 'green' economy within South Africa.

The benefits of the Ummbila Emoyeni WEF 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 wind farm, 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 a renewable energy facility on site using wind as the preferred technology, due to the availability of a strong wind resource, available grid capacity, benign topography, and good access. A technically viable development footprint was proposed by the developer considering 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 the 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, 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). Feedback from the bat and heritage specialists has indicated some of the turbines and associated infrastructure need to be relocated to avoid areas of very high sensitivity. This recommendation has been adhered to by the developer which has designed an optimised layout (refer to **Figure 2**) which is in-line with these requirements to ensure environmental acceptability. Further scrutiny of the optimised layout identified and confirmed that specific turbines and associated infrastructure were still unacceptably placed within the project site. Based on the findings as documented in **Table 4**, the optimised layout was further refined and a layout which addresses the need to relocate the turbines and associated infrastructure, as listed in **Table 4** was designed (refer to **Figure 3**). The result is that the refined optimised facility layout has repositioned turbines and associated infrastructure outside of the sensitive areas and features regarded to be no-go for development.

The impacts that are expected to remain after the avoidance of the sensitive areas by the refined optimised facility layout have been reduced to acceptable levels through the recommendation of specific mitigation measures by the specialists. The minimisation of the significance of the impacts is in line with tier 2 of the mitigation hierarchy.

Therefore, 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 wind farm as the turbines 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 WEF 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 wind farm. 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 WEF 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 WEF 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 Ummbila Emoyeni WEF with a contracted capacity of up to 900MW includes the following infrastructure (to be included within an authorisation issued for the project):

- Up to 111 wind turbines with a maximum hub height of up to 200m. The tip height of the turbines will be up to 300m.
- 33kV cabling to connect the wind turbines to the onsite collector substations, to be laid underground where practical.
- 3 x 33kV/132kV onsite collector substation (IPP Portion), each being 5ha.
- Battery Energy Storage System (BESS) (200MW/800MWh).
- Cabling between turbines, to be laid underground where practical.
- Construction compounds including site office (approximately 300m x 300m in total but split into 3ha each of 150m x 200m):
- Batching plant of up to 4ha to 7ha.
- 3 x O&M office of approximately 1.5ha each adjacent to each collector SS.
- 3 x construction compound / laydown area, including site office of 3ha each (150m x 200m each).
- Laydown and crane hardstand areas (approximately 75m x 120m).
- Access roads of 12 -13m wide, with 12m at turning circles.

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

- All mitigation measures detailed within the EIA Report, as well as the specialist reports, are to be implemented.
- The EMPrs (for the facility and onsite substation) should form part of the contract with the Contractors appointed to construct and maintain the wind farm in order to ensure compliance with environmental specifications and management measures. The implementation of the EMPr for all life cycle phases of the Ummbila Emoyeni WEF is considered key in achieving the appropriate environmental management standards as detailed for this project.
- Following the final design of the Ummbila Emoyeni WEF, a revised 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 EMPr is implemented and enforced and an Environmental Control Officer (ECO) must be appointed to

oversee the implementation activities and monitor compliance for the duration of the construction phase.

- 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.
- Observer-based Shut-down-on-demand or similar technology is to be implemented for all WTGs placed in identified sensitive areas as well as those WTGs that remain within 3 000m of VPs 1, 2, 3 and 10.
- Develop and implement a carcass search and bird activity monitoring programme in-line with the latest applicable guidelines. Regular reviews of operational phase monitoring data (activity and carcass) and results to be conducted by an avifaunal specialist. The above reviews should strive to identify sensitive locations including WTGs and areas of increased collisions that may require additional mitigation.
- Prevent birds from nesting in substation infrastructure through exclusion covers or spikes if required (determined on a case-by-case basis).
- Implement bat fatality monitoring throughout the operational phase and apply curtailment or deterrents if fatality thresholds are exceeded.
- If the structures located at NSR47 are used for residential purposes, the resident(s) must be relocated, or the WTG located within 1 000m from these NSR should be moved further than 1 000m from these NSR.
- Active noise monitoring (i.e., the measurement of noise levels at identified locations) is recommended throughout the operation phase at NSRs within 2000m of a wind turbine before the development of the WEF, with the measurements repeated after the first year of operation. Should any of these locations not be used for residential purposes, measurements at these NSRs would not be required.
- Should a reasonable and valid noise complaint be registered, the developer must investigate the noise complaint as per the guidelines contained in the noise impact assessment report. Once-off noise measurements must be conducted at the location of the person that registered a valid and reasonable noise complaint. The measurement location should consider the direct surroundings to ensure that other sound sources cannot influence the reading. These measurement locations can be reduced accordingly if the NSR are relocated, or the dwelling are no longer used for residential purposes.
- In order to minimise noise impacts on NSRs used for residential purposes within 1 000m of WTGs at the time of implementation of the project:
  - the resident(s) could be relocated, or;
  - the WTG located within 1 000m from these NSR be moved further than 1 000m from these NSR; or
  - the applicant can select to use a quieter WTG (with a SPL less than 108.5 dBA as per the IEC 61400-14 certificate) within 1 500m from NSR 40 and 46.
- Implement recommendations of the shadow flicker study to inform the final design and appropriate mitigation.
- 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 WEF 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 EMPrs approved in phases by the DFFE.

Ummbila Emoyeni Phase One

Ummbila Emoyeni Phase One comprises (**Figure 4**):

- 25 wind turbines with a maximum hub height of 130m. The tip height of the turbines will be a maximum of 250m.
- 33kV cabling to connect the wind turbines to the onsite collector substation, to be laid underground where practical.
- 1 x 33kV/132kV onsite collector substation (IPP Portion), being 5ha in extent.
- Cabling between turbines, to be laid underground where practical.
- Construction compound including site office (approximately 3ha (150m x 200m)):
  - 1 x Batching plant of up to 4ha to 7ha.
  - 1 x O&M office of approximately 1.5ha adjacent to a collector SS.
  - 1 x construction compound / laydown area, including site office of 3ha (150m x 200m).
- Laydown and crane hardstand areas (approximately 75m x 120m).
- Access roads of 12 -13m wide, with 12m at turning circles.

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

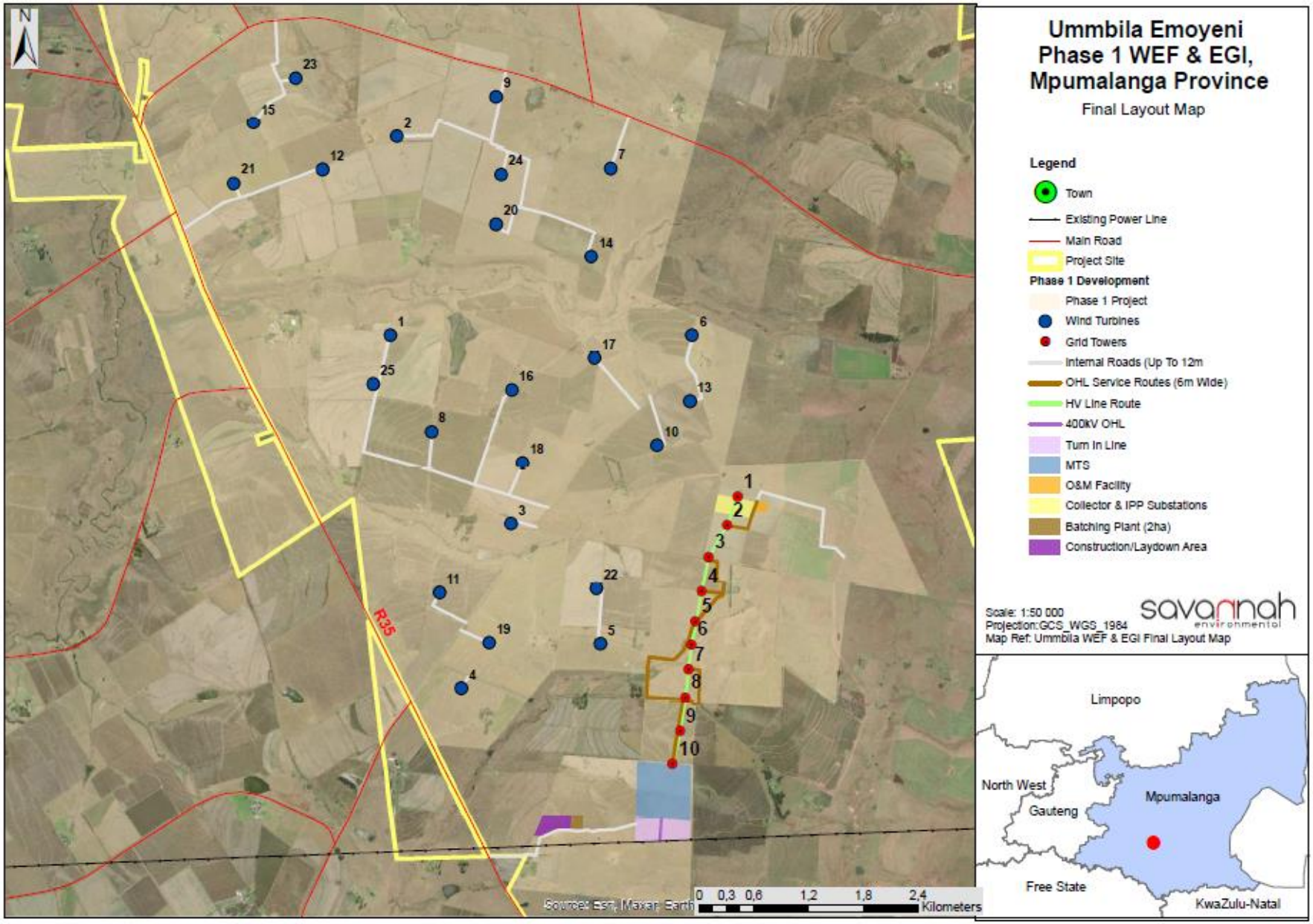

Figure 4: Ummbila Emoyeni Phase One WEF layout