



Umsinde Emoyeni WEF - Avifaunal Pre-Construction Walkdown Report

Murraysburg, Western Cape

November 2022

CLIENT



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| Declaration | <p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p> |

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1 Introduction

The Biodiversity Company was commissioned to undertake the Avifaunal Walkdown for the Umsinde Emoyeni Wind Energy Facility. The Umsinde Wind Energy Facility is part of the Greater Umsinde Emoyeni Wind Energy Facility (previously Phase 1), which is expected to have a maximum generating capacity of 147 MW. In total, the WEF is expected to have 33 wind turbines. The turbines will be a three-bladed horizontal-axis design with a hub height of up to 160 m and a rotor diameter of up to 180 m. The electricity from the turbines will be transferred via a 33 kV electrical network (underground where feasible) to a 33 / 132 kV onsite substation.. The on-site substation will house electrical infrastructure such as transformers and switch gear to enable the energy to be transferred into the existing national grid. A permanent hardstanding area of up to 55 m by 35 m as well as temporary turbine laydown area will be established adjacent to each turbine location. This will be used to provide a platform for cranes to operate during construction (and unscheduled maintenance), as well as a clear area to lay out turbine components prior to erection. Up to three additional temporary laydown areas of up to 150 m by 60 m in size will be required for construction site camps, equipment and component storage during construction. These areas will be levelled and compacted and used for component storage etc.

The project location is situated 24 km North-East of the town Murraysburg and 10 km North from the R63 within the Beaufort West Renewable Energy Development Zone (Phase 2, REDZ 1) of the Western Cape Province.

The project will include the following infrastructure as authorised:

- Up to 33 wind turbines (capped at 147MW total capacity) with a hub height of up to 160m, blade length of 90m and rotor diameter of up to 180m;
- Permanent Hard standing area of up to 55m by 35m per turbine;
- Three temporary Laydown areas of up to 150m by 60m each;
- Temporary turbine laydown areas;
- Electrical cabling and on-site substation;
- Existing farm access tracks and watercourse crossings will be upgraded;
- Internal access roads;
- On-site office compound, including site offices, parking and an operation and maintenance facility including a control;
- Anemometer masts;
- Security fencing; and
- CCTV monitoring towers.

The following properties have been identified for the Umsinde Emoyeni Wind Energy Facility and associated infrastructure:

- Portion 3 (Portion of Portion 1) of the Farm Driefontein No.26;

- Portion 7 (De Tafel) Portion of Portion 2) of the Farm Driefontein No.26;
- Portion 10 (Portion of Portion 1 of the Farm Driefontein No.26;
- Remainder of Portion 2 of Farm Driefontein No.26;
- Portion 1 of the Farm Klein Driefontein No.152;
- Remainder of the Farm Klein Driefontein No.152;
- Portion 2, portion of Portion 9 of Farm Witteklip 32;
- Remainder of the Farm De Hoop No. 30; and
- Portion 4 of the Farm De Hoop No.30.

A requirement of the EA and the Environmental Management Programme report (EMPr) is the undertaking of an Avifaunal Walkdown for the approved turbines, roads and powerline footprint areas. The walkdown was undertaken from the 18th until the 24th of April 2022.

The purpose of the Avifaunal Walkdown was to locate and identify any sensitive ecological habitats, and also took into consideration identified nests and the recommended buffer areas.

This report only presents the findings from the Avifaunal Walkdown, and should be considered in conjunction with other disciplines, specifically the bat findings. These disciplines will collectively provide the demarcation of ecological constraints for the larger area.

1.1 Background

An avifaunal assessment was undertaken by Arcus Consultancy Services (2015) as part of the original EIA process, which has formed the basis for this walkdown. The assessment comprised of 12 months of bird surveys, carried out between October 2013 and October 2014. The following is summarised:

- A combined total of 181 species was recorded in and around the WEF and control sites during the four seasonal surveys;
- This included 29 priority species and 28 South African endemic or near endemic species;
- A total of 13 Regional Red Data species were observed across all surveys including three species listed regionally as Endangered, namely Black Harrier, Ludwig's Bustard and Martial Eagle;
- Raptors constituted the majority of flight paths recorded at vantage points within the WEF site, with Verreaux's Eagle being the most commonly recorded target species;
- The following important nest sites were found:
- 21 active Verreaux's Eagle nests, of which five are situated within the broader assessment area;

- One active Martial Eagle nest outside the WEF site approximately 3.2 km west from the study area;
- Seven Jackal Buzzard nest sites, five of which are situated within the broader study area ;
- 22 Rock Kestrel nest sites, seven of which are situated within the broader study area;
- One Rufous-breasted Sparrowhawk nest situated within the broader study area;
- One Pale Chanting Goshawk nest situated within the broader study area; and
- One Peregrine Falcon nest situated approximately 3.5 km south of the site boundary, outside the WEF site.

Updated Avifaunal Impact Report for Umsinde Emoyeni Wind Energy Facility Phase 1 & 2 and Associated Electrical Grid Connection Phase 1 & 2 was completed by Arcus Consultancy Services (2018), and the following was concluded:

- The proposed amendments would result in a post-mitigation impact significance for collisions with wind turbines (only). The cumulative impact for wind turbines was rated as high;
- The key species identified in the original avifaunal impact assessment as being most at risk are Blue Crane (Near-Threatened) and Verreaux's Eagle (Vulnerable); and
- The land use, vegetation types and bird micro-habits did not change significantly between 2013/2014, 2016/2017 and 2020.

An amendment to the (abovementioned) assessment was completed by Arcus Consultancy Services (2020), The site visit was conducted over five days between 22 to 26 June 2020 which included a confirmation of the status of nests of Priority Species, a search for additional nests and time spent on and around the project site to determine if any significant changes in land use relevant to avifauna had occurred. The following is measures are sourced from the report:

- To further reduce the potential risks imposed on Verreaux's Eagle the VERA model was employed;
- The mitigation measures in the original avifaunal impact assessment and EMPr remain relevant and necessary, but pertinent measures included:
- Areas identified by the updated sensitivity map as 'no-go' areas for the placement of turbines and overhead powerlines should be explicitly stated as such in the EMPr;
- The final layout must be informed by the updated avifaunal sensitivity map and turbines that fall inside the revised 'no-go' areas must be moved to lower sensitivity areas or removed completely from the layout (this has been done);

- Should fewer turbines be required to meet the maximum generation capacity of the development than the number authorised, turbines closest to 'no-go' areas and those in areas identified as being of Medium collision risk by the VERA model must be the first up for consideration to forgo where practically possible;
- Construction-phase monitoring as recommended by the Verreaux's Eagle guidelines;
- Post-construction/operational monitoring must be done in line with the latest Best Practice Guidelines and must be conducted as soon as the turbines become operational, any mortalities must be reported to BirdLife SA;
- Mitigation measures (e.g. curtailment or shut-down-on-demand) must be implemented on any turbines responsible for the fatalities of two or more Verreaux's Eagle;
- Consultation with the South African Civil Aviation Authority (SACAA) should be undertaken to determine the potential mitigation measure of painting one turbine blade per turbine black to further reduce the risk of bird collisions, this mitigation measure is recommended at the facility should SACAA agree to its implementation;
- No construction activities (e.g. of new roads) is allowed within 1 km of active nests during the breeding season (May, June, July and August) as per the Verreaux's Eagle guidelines;
- Nests of Verreaux's Eagle must be monitored for breeding activity throughout the lifespan of the facility as per the Verreaux's Eagle guidelines, including during construction;
- It is recommended that tracking of sub-adult and non-territorial adult Verreaux's Eagles be considered in close consultation with BLSA and an academic institution to gain a better understanding of the movement of these birds across the landscape, should the timing and utility of such a study be considered to be of value by those institutions.

1.2 Terms of Reference

The Terms of Reference (ToR) for this assessment include the following:

- Review of existing information related to the development;
- Conduct an Avifaunal Walkdown for the planned footprint areas;
- Compilation of a report detailing the results of the walkdown:
- Detail and ecological constraints identified for the planned infrastructure; and
- Provide information and recommendations for the micro-siting of relevant infrastructure.
- Provide information to adequately inform any contractors, environmental officers and personnel pertaining to the ecological significance for the area.

1.3 Assumptions and Limitations

The following assumptions and limitations should be noted for the assessment:

- The assessment area was based on the spatial file provided by the client and any alterations to the development area subsequent to the site visit may affect the results;
- The field assessment was limited to accessible turbines due to time and weather constraints, where turbines and roads could not be reached, notes were made of similar habitat within the general WEF area;
- The document titled “*Arcus, 2018. Updated Avifaunal Impact Report for Umsinde Emoyeni Wind Energy Facility Phase 1 & 2 and Associated Electrical Grid Connection Phase 1 & 2, January 2018*” was not made available for review, but was considered for the amendment report (Arcus, 2020);
- Only a single season survey was undertaken, thus no temporal variances have been considered;
- The site visit was conducted in April and the layout provided in October. Thus the sensitivity and sitting analyses have been based primarily on GIS and Arcus report results; and
- All regional and site-specific environmental information are contained within the original (submitted) documents and were therefore not repeated within this document. This document focuses only on the very specific mandate and findings of the walkdown and its associated ecosystem evaluations.

2 Approach

2.1 Spatial Data

Turbine, road and powerline positions were supplied by the client. A 150 m corridor width (total width is 300 m) was considered for the road and powerline routes and a 200 m buffer around each turbine and around ancillary infrastructure. These corridors were used as guidelines during the walkdown and ecosystem evaluation phase. GPS accuracy during the field surveys varied from 4 to 15 m. The findings for the turbine and road are discussed in the subsequent sections.

2.2 Ecological Information

2.2.1 Avifauna

Arcus Consultancy Services (2015) recommended a number of avoidance (buffer) areas for the project, all of which have been achieved for the planned layout. Figure 2-1 presents the project infrastructure.

ARCUS (2020) have developed an Avifauna No-Go map which indicates which areas should not be developed as there is a high risk of avifaunal impacts in these areas (Figure 2-2). Turbines should not be placed in these areas to avoid impacts to avifauna.

As part of the sensitivity assessment, the Verreaux’s Eagle Risk Assessment Tool (VERA) was used to create a relative collision risk map for Verreaux’s Eagle for the site (ARCUS 2020). This allows for the placement of turbines in areas with less risk to flying eagles. This

map can be seen in Figure 2-3. This model includes all nests at the site, including those unoccupied (using the precautionary principle). High collision risk (sensitivity) areas are those predicted to be the most intensely used by eagles and development of turbines should not be allowed in these areas. Medium collision risk areas should be avoided where possible and development should proceed only with specialist input (ARCUS 2020). All turbines in the final layout avoid the avifaunal no-go areas delineated by ARCUS. The Umsinde WEF layout has been modified to make sure that the turbine placements are within Low collision risk areas.

Walkdown Results

The specialist ecologists traversed the planned footprint areas searching for ecologically sensitive habitats and any species of conservation concern within the corridor. Each accessible turbine position was visited on foot and evaluated according to the potential impact on the surrounding ecosystems. Each accessible road route between turbines was inspected and evaluated.

As much as possible of the roads and turbine layout was assessed on foot and by 4x4 vehicle. Findings are presented in Table 2-1..

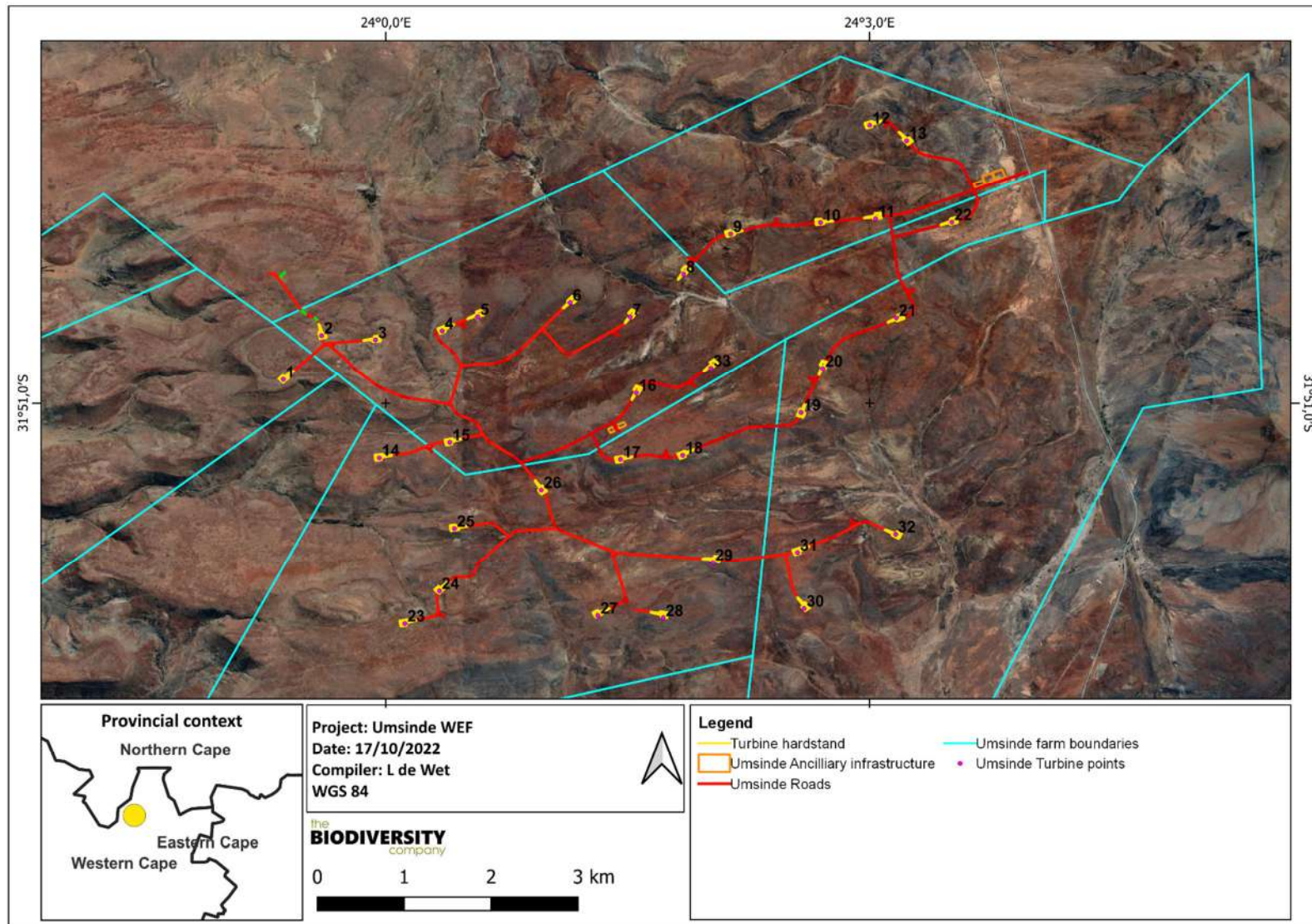


Figure 2-1 The Wind turbines as well as the associated roads for the Umsinde WEF.

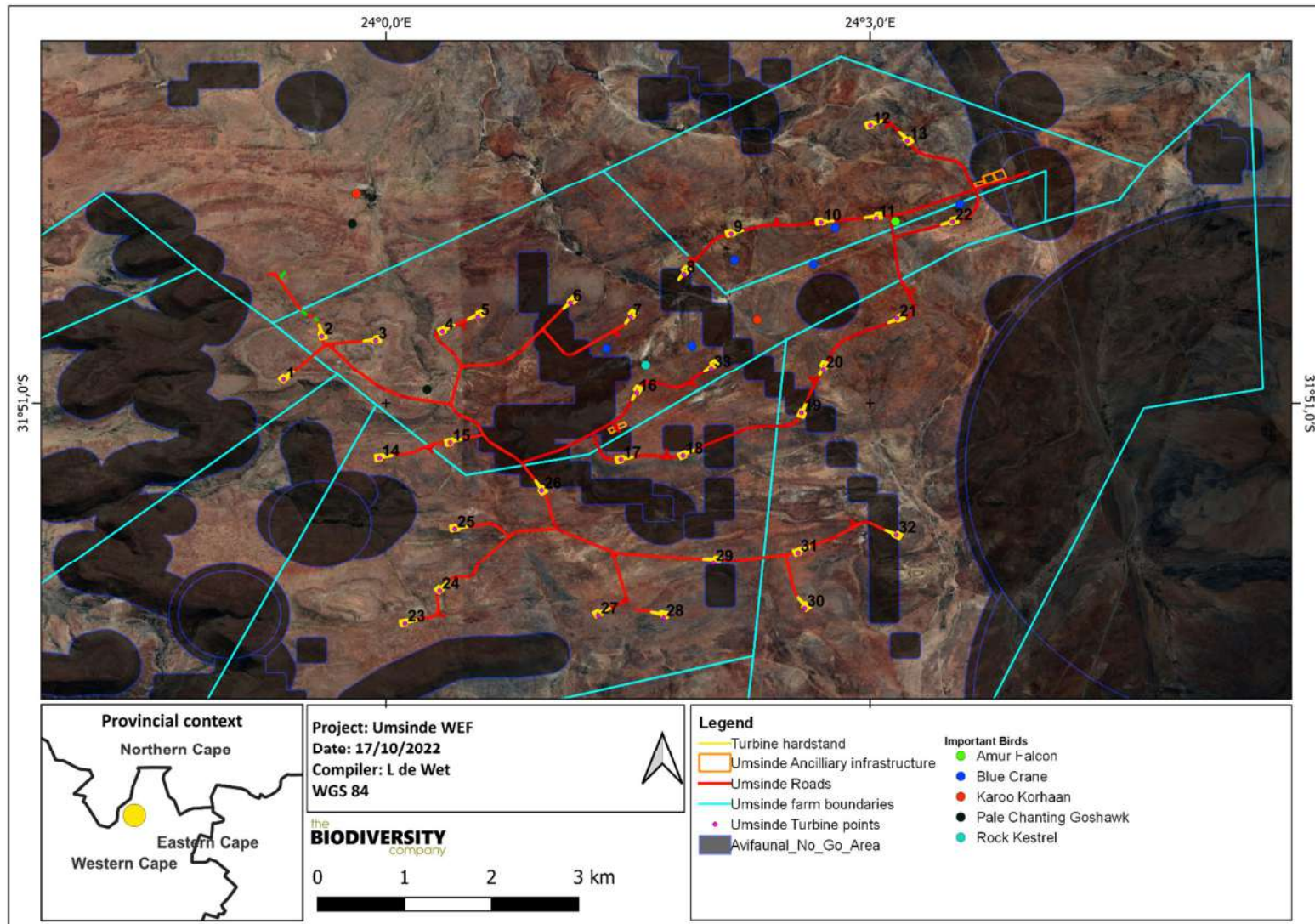


Figure 2-2 The Umsinde WEF and Avifauna No-Go areas along with points of SCC avifauna spotted during the walkdown.

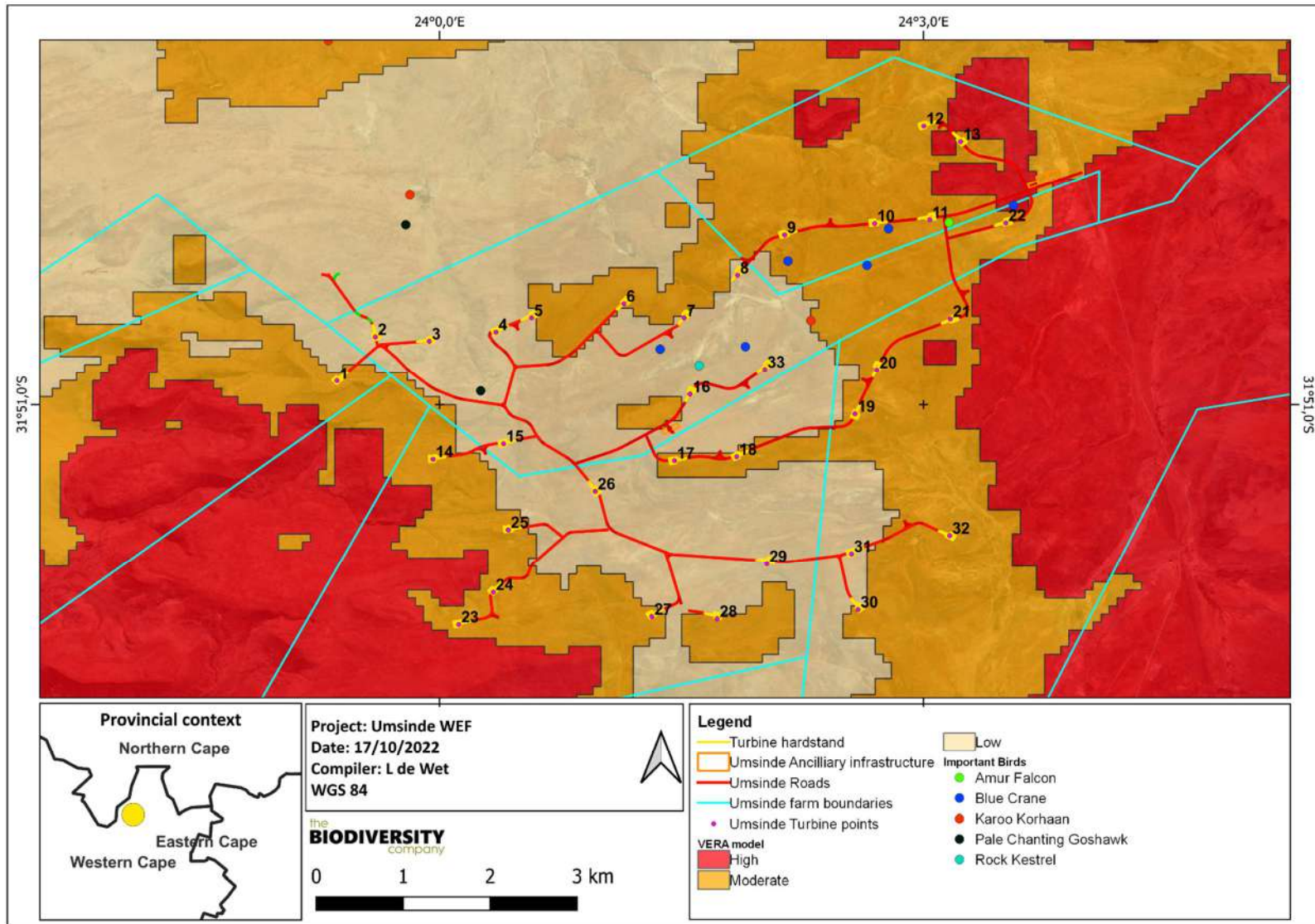


Figure 2-3 The Umsinde WEF and Avifauna VERA sensitivities.

Table 2-1 Summary Site specific comments and recommendations on the selected turbines for Umsinde WEF

| Turbine | Comments and recommendations |
|----------------|---|
| 1 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 2 | This turbine is located in an area of Low sensitivity as per the VERA model This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 3 | This turbine is located in an area of Low sensitivity as per the VERA model This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 4 | This turbine is located in an area of Low sensitivity as per the VERA model This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 5 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 6 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. The turbine laydown/hardstand area is also partially located within an avifaunal No-Go area. As only construction phase impacts will impact on the No-Go area, this turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 7 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 8 | This turbine is located in an area of Low sensitivity according to the VERA model. The turbine laydown/hardstand area extends into an avifauna No-Go area, the turbine itself is located outside a No-Go area (Figure 2-4). As only construction phase impacts will impact on the No-Go area, this turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 9 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 10 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 11 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 12 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 13 | This turbine is located in an area of Medium sensitivity, with a small section located in an area of High sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. As only construction phase impacts will be located within the area of high sensitivity, this turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 14 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 15 | This turbine is located in an area of Low sensitivity as per the VERA model This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |

| | |
|----|--|
| 16 | This turbine is located in an area of Low sensitivity as per the VERA model This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 17 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 18 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. The turbine laydown/hardstand area is partially located within an avifaunal No-Go area. As only construction phase impacts will impact on the No-Go area, this turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 19 | This turbine is located in an area of Low sensitivity according to the VERA model. The turbine laydown/hardstand area extends into an avifauna No-Go area, the turbine itself is located outside the No-Go area (Figure 2-5). As only construction phase impacts will impact on the No-Go area, this turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 20 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 21 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 22 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 23 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 24 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 25 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 26 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. The turbine laydown/hardstand area is partially located within an avifaunal No-Go area. As only construction phase impacts will impact on the No-Go area, this turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 27 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 28 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 29 | This turbine is located in an area of Low sensitivity as per the VERA model This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 30 | This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located in an area surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 31 | This turbine is located in an area of Low sensitivity as per the VERA model This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to. |
| 32 | This turbine is located in an area of Low sensitivity according to the VERA model. The turbine laydown/hardstand area extends into an avifauna No-Go area, the turbine itself is located outside the No-Go area (Figure 2-5). |

As only construction phase impacts will impact on the No-Go area, this turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to.

33

This turbine is located in an area of Low sensitivity as per the VERA model
This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to.

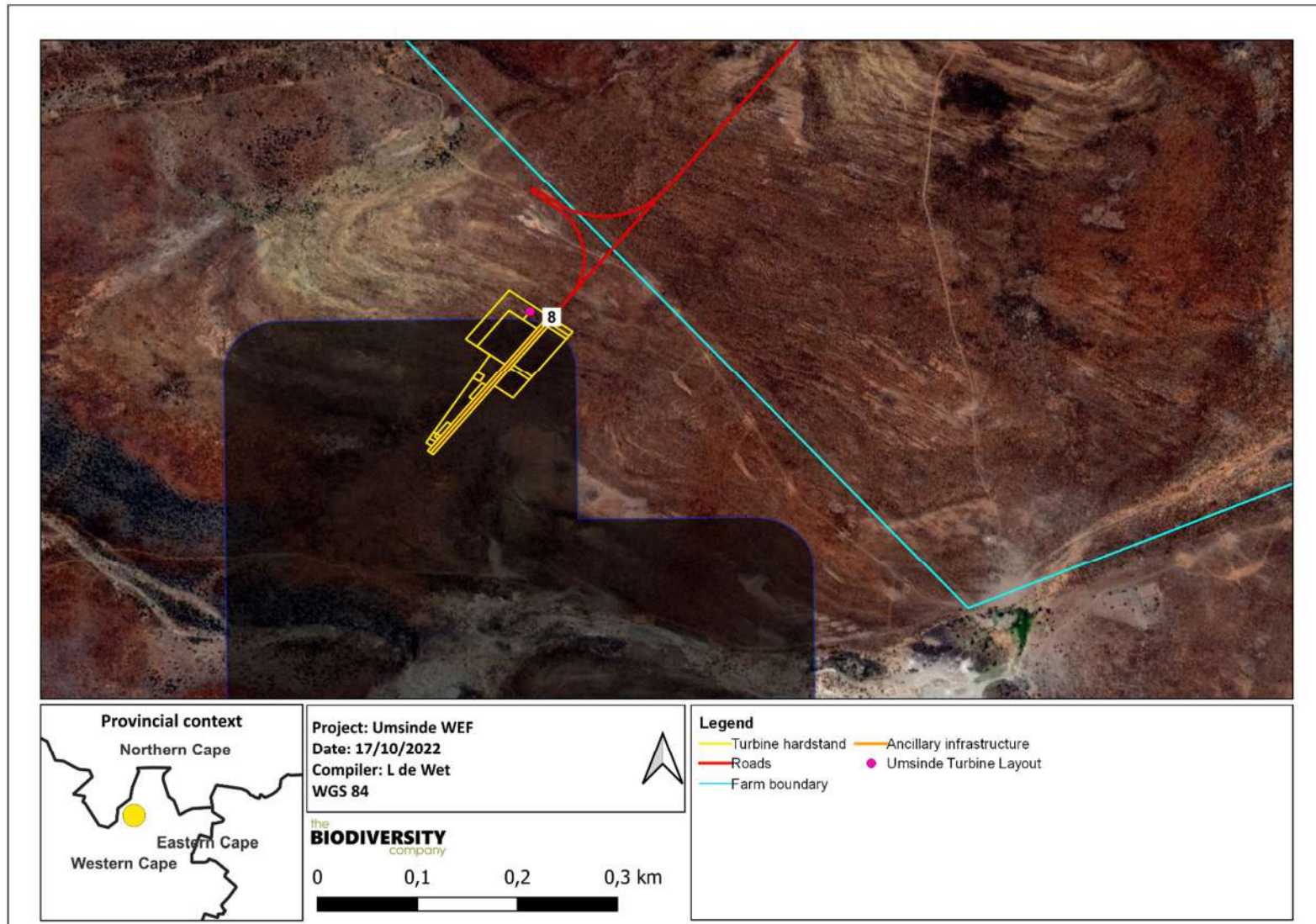


Figure 2-4 The Umsinde WEF Turbine 8 laydown/hardstand area partially located in an Avifauna No-Go area with the turbine point located outside the No-Go area.

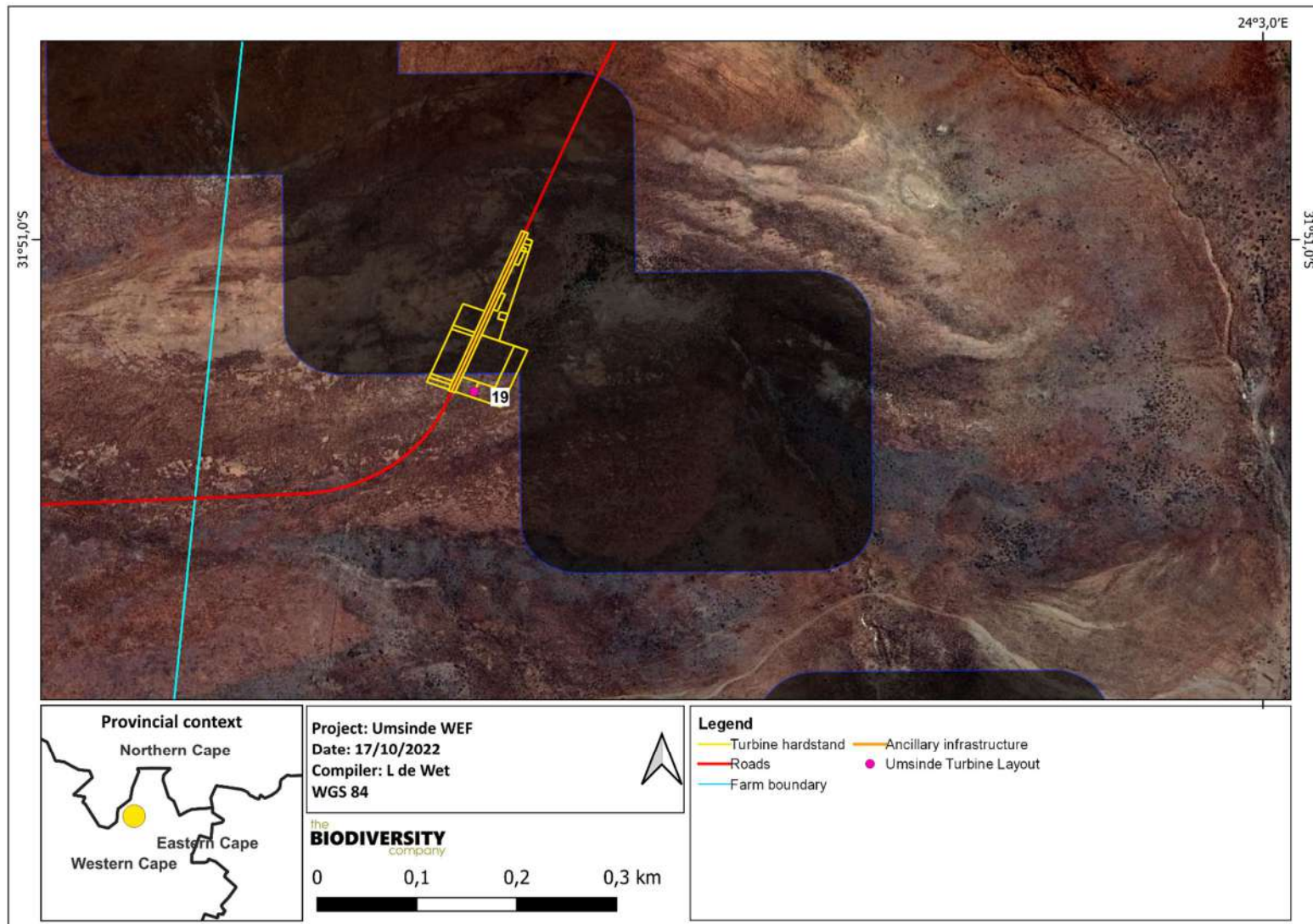


Figure 2-5 The Umsinde WEF Turbine 19 laydown/hardstand area partially located in an Avifauna No-Go area with the turbine point located outside the No-Go area.

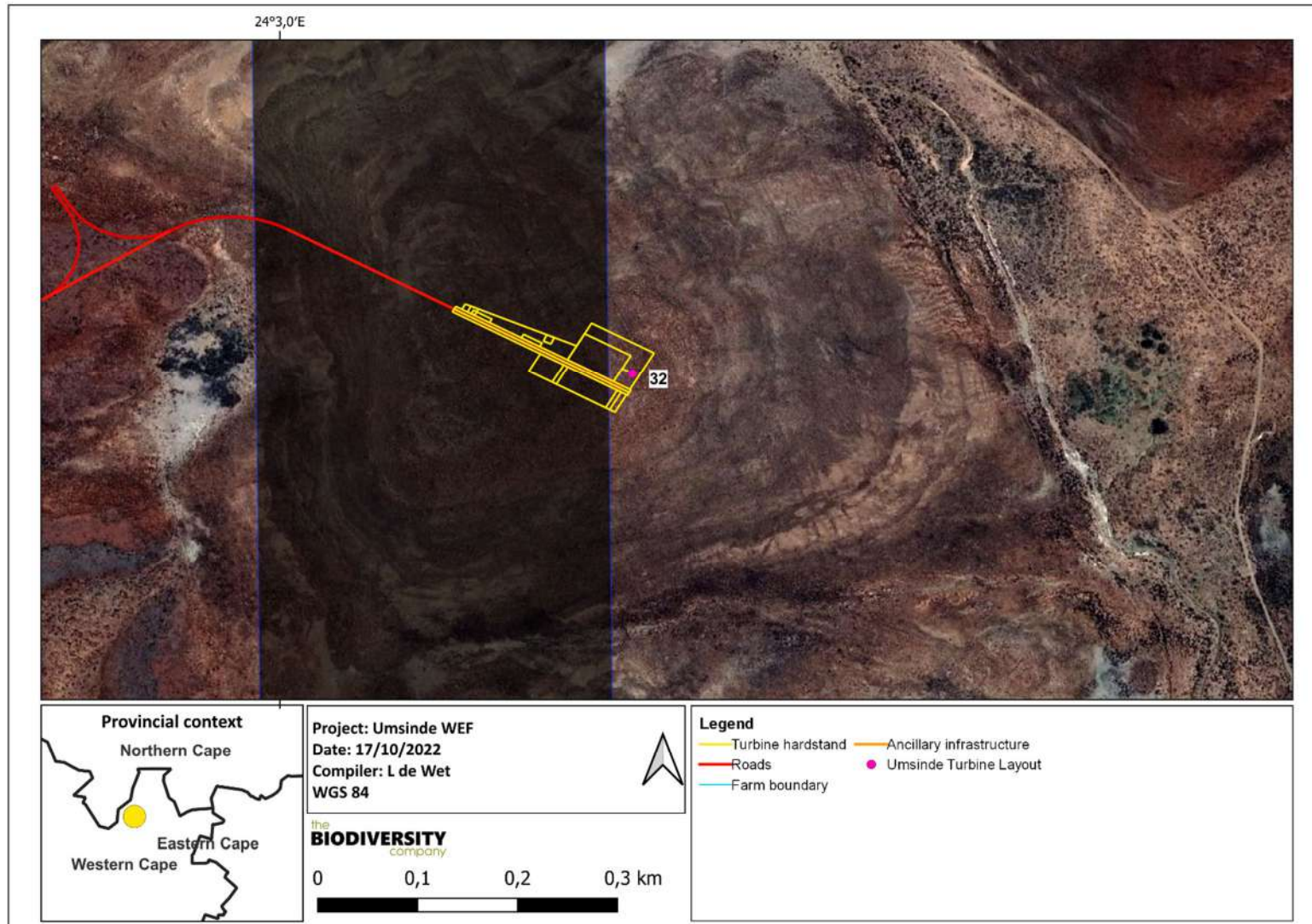


Figure 2-6 The Umsinde WEF Turbine 32 laydown/hardstand area partially located in an Avifauna No-Go area and the turbine point located outside the No-Go area

2.3 Observations

The following are observations made in the general area during the walkdown:

- Some turbine laydown/hardstand areas are located in avifauna No-Go areas, however no turbines are located within these areas thus no turbines need to be relocated;
- No turbines are located in areas of high collision risk according to the VERA model;
- Species of Conservation Concern (SCC) were recorded as being present within the project area (Figure 2-7).

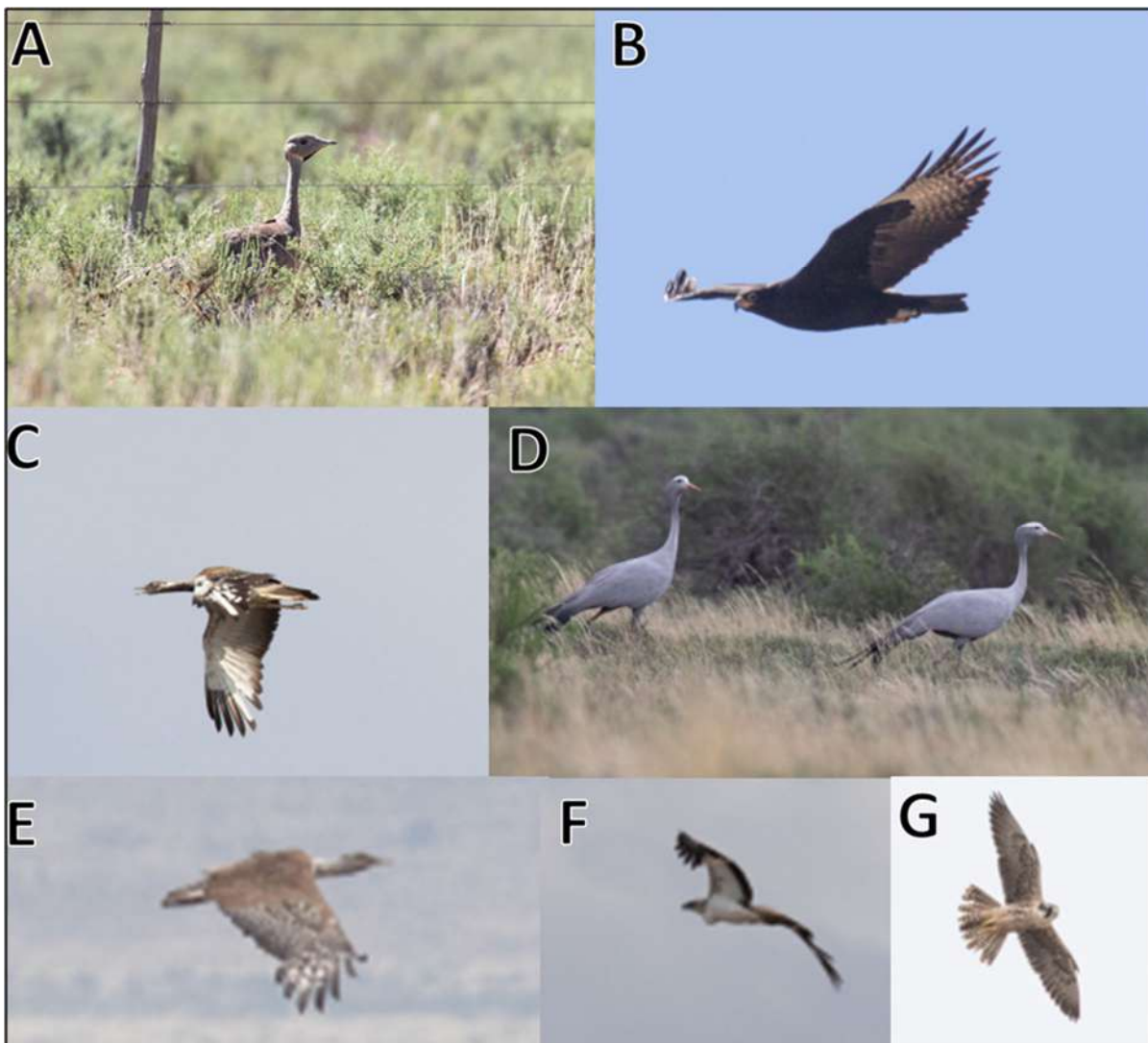


Figure 2-7 Species of Conservation Concern recorded during the Avifaunal Walkdown. A: Karoo Korhaan, B: Verreaux's Eagle, C: Ludwig's Bustard, D: Blue Crane, E: Kori Bustard, F: Martial Eagle (juvenile) and G: Lanner Falcon.

2.4 Recommendations

Recommendations have been provided for the footprint areas that will have notable impacts on the local habitats and / or species of conservation concern. The following recommendations are in addition to what has been provided for the footprint areas:

- All mitigation measures prescribed by Arcus (2015 and 2020) remain applicable for the development and must be adhered to;
- Proven best proactive mitigation measures must be implemented prior to commencement of construction as per Arcus (2015 and 2020) recommendations;
- Where feasible, and other constraints permit, all 33kV cables should be installed below ground;
- Where cables are required to be aboveground, pole designs and spanning mitigation measures should be informed by the Endangered Wildlife Trust; and
- Bird flight diverters should be fitted to all overhead powerline within the WEF.

2.5 Conclusion

The layout of the WEF is acceptable as no turbines are located in areas of high Collision risk according to the VERA model, nor are any located within avifauna No-Go areas.

3 References

Arcus Consultancy Services (2015). Avifauna Specialist Report. Umsinde Emoyeni Wind Energy Facility Phase 1 & 2 Western Cape & Northern Cape.

Arcus, 2018. Updated Avifaunal Impact Report for Umsinde Emoyeni Wind Energy Facility Phase 1 & 2 and Associated Electrical Grid Connection Phase 1 & 2, January 2018.

Arcus Consultancy Services (2020). Amendment to the Avifaunal Impact Assessment conducted for the authorised Khangela Emoyeni (Phase 2) Wind Energy Facility near Murraysburg, Western Cape Province.