

# Zen Wind Farm and associated infrastructure, Western Cape Province

Motivation for amendment of Environmental Authorisation

DFFE Reference No.: 14/12/16/3/3/2/322

July 2023

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## PROJECT DETAILS

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<b>Client</b>	:	FE Bonne Esperance (Pty) Ltd
<b>Report Status</b>	:	Report for Review

**When used as a reference this report should be cited as:** Savannah Environmental (2023) Motivation Report for the Amendment to the Environmental Authorisation for the Zen Wind Farm, Western Cape Province.

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## APPENDICES

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- Appendix A:** Birds & Bats Specialist Report
- Appendix B:** Aquatic Specialist Report
- Appendix C:** Ecology Specialist Comment Letter
- Appendix D:** Soil & Agricultural Potential Specialist Report
- Appendix E:** Heritage Specialist Report
- Appendix F:** Visual Specialist Comment Letter
- Appendix G:** Noise specialist Report
- Appendix H:** Social Specialist Comment Letter
- Appendix I:** Public Participation Report
- Appendix J:** Facility Layout Maps
- Appendix K:** Revised EMPr (EMPr Revision 1)

## PURPOSE OF THE REPORT

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FE Bonne Esperance (Pty) Ltd received an Environmental Authorisation (EA) on 3 November 2016 (DFFE Ref.: 14/12/16/3/3/2/322, with four subsequent amendments to the EA) from the Department of Forestry, Fisheries and the Environment (DFFE) for the development of the Zen Wind Farm and associated infrastructure. The Zen Wind Farm is located approximately 10km of the town of Gouda and approximately 4km south of Saron in the Western Cape Province. The project is located within Ward 31 of the Drakenstein Local Municipality and the Cape Winelands District Municipality in the Western Cape Province.

The Zen Wind Farm is to be constructed within the project site which comprises the following farm portions:

- » Portion 1 of the Farm Bonne Esperance 83,
- » Portion 2 of the Farm Bonne Esperance 83,
- » Portion 9 of the Farm No. 88
- » Portion 0 of the Farm Nayoth 458

Due to the proximity to the Bergriver Wind Farm and the operational Gouda Wind Farm, Acciona Energy South Africa Global (Pty) Ltd (AESAG) acquired the project from the original developers and is developing a wind farm cluster. AESAG are now the owners of all three wind projects in this wind farm node north of Gouda. AESAG will adopt the latest wind turbine technology available to Acciona Energy for the project. The facility layout has been designed to optimise the energy yield and considers the latest technology. The project will also utilise combined construction infrastructure (temporary facilities, laydown areas, batch plants) to further reduce the overall impacts of the project and the adjacent Bergriver Wind Farm. Both the Zen and the Bergriver Wind Farm projects are designed to share infrastructure to optimise construction expenses and timeline. The new facility layout also takes into consideration that the ideal point of connection to the grid is via a 132kV collector on-site substation located on the adjacent Bergriver Wind Farm site. This allows for the reduction in impact to the Zen Wind Farm site by removing the need for an additional on-site facility substation in this wind farm cluster/area.

In this regard, the wind farm layout has been amended to optimise efficiency and the most recent layout has been designed considering latest technology available for implementation on this site. The amended and optimised wind farm layout includes the reduction in the number of turbines from 27 to 17, and repositioning the turbines, roads, internal cabling within the authorised development area. The new design ensures that sensitive areas are avoided while maximizing operational efficiency. The on-site substation/grid connection infrastructure is also removed from the facility layout, with direct connection possible to the substation located on the Bergriver Wind Farm site.

In this regard, the following is proposed:

1. Reduction in the number of turbines from 27 to 17;
2. Increase turbine capacity from 6 MW to up to 7.5 MW per turbine
3. Increase the internal roads width from 6m to ~8m
4. Optimise turbine/facility layout based on the energy yield, and revise the layout as required based on the revised turbine numbers and turbine specification; and

5. Optimise internal underground cabling (33kV) to enable a consolidated point of grid connection for the Zen/Bergriver wind farm cluster on the Bergriver site, and remove the on-site substation and overhead power line connection from the project description.

The proposed amendments are not listed activities and do not trigger any new listed activity. No additional properties will be affected by the amendments as the proposed amendments are within the originally authorised development footprint.

In addition to the above, the final facility layout and the revised EMPr for the facility must be made available for comments by registered I&APs and submitted to the Department for approval prior to commencement of the activity, in terms of Condition 13 and Condition 15 of the Environmental Authorisation.

In terms of Condition 5 of the Environmental Authorisation and Chapter 5 of the EIA Regulations of December 2014 as amended, it is possible for an applicant to apply, in writing, to the competent authority for a change or deviation from the project description to be approved.

Savannah Environmental has prepared this Motivation Report in support of this amendment application on behalf of FE Bonne Esperance (Pty) Ltd. This report considers the impacts of the proposed reduction in the number of turbines, as well as the relocation of turbine positions, roads and internal cabling) in order for interested and affected parties to be informed of the proposed amendment and provide comment, and for the competent authority to be able to reach a decision in this regard. This report is supported by specialist studies in order to inform the final conclusion regarding the proposed amendments (refer to **Appendix A to H** of this report). This main report must be read together with these specialist studies in order to obtain a complete understanding of the potential impacts of the proposed change of the position of the facility layout.

This amendment motivation report will be made available to registered interested and affected parties for a 30-day period from **18 July 2023 to 18 August 2023**. The availability of the report was advertised in the Witzenberg Herald on **14 July 2023** (refer to **Appendix I**). The Motivation Report is available for download at <https://savannahsa.com/public-documents/energy-generation/> . To obtain further information, register on the project database, or submit written comment, please contact:

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All comments received during the review period will be included within a Comments and Responses report to be submitted to the DFFE with the Final Motivation Report and updated application for decision-making purposes.



# 1. OVERVIEW OF THE PROJECT

## 1.1. Location

The authorised Zen Wind Farm is located approximately 10km of the town of Gouda and approximately 4km south of Saron in the Drakenstein Local Municipality, which falls within the jurisdiction of Cape Winelands District Municipality in the Western Cape Province. The Zen Wind Farm is to be constructed within the project site which comprises the following farm portions:

- » Portion 1 of the Farm Bonne Esperance 83,
- » Portion 2 of the Farm Bonne Esperance 83,
- » Portion 9 of the Farm No. 88
- » Portion 0 of the Farm Nayoth 458

## 1.2. Project description

The Zen Wind Farm is authorised for the following infrastructure<sup>1</sup>:

<b>Footprint and dimensions</b>	<b>EA and AM</b>
Contracted capacity of 147MW	14/12/16/3/3/2/322/AM2
Up to 27 turbines at 6MW per WTG	14/12/16/3/3/2/322/AM2
Internal access road (using existing farm roads where possible) with a width of approximately 6m	14/12/16/3/3/2/322
Underground cabling within the facility	14/12/16/3/3/2/322
O&M and workshop area	14/12/16/3/3/2/322
On-site facility substation	14/12/16/3/3/2/322
New 132kV power line to connect to LeBonne Substation or LILO the LeBonne-Gouda power line	14/12/16/3/3/2/322

The Zen Wind Farm project site is proposed to accommodate the following infrastructure:

- » Up to 17 wind turbines with each turbine being up to 7.5MW in capacity
- » Cabling between the turbines, to be laid underground where practical
- » Internal access roads (up to 8m in width) linking wind turbines and other infrastructure on the Bergriver Wind Farm site.

The Zen Wind Farm and Bergriver Wind Farm will share the following infrastructure:

- » Temporary facilities, laydown areas and batch plants
- » Onsite Substation, BESS and operational and maintenance (O&M Hub);
  - An on-site facility substation
  - A battery Energy Storage System (BESS)
  - Temporary concrete batching plant; and

<sup>1</sup> Project details have been amended in AM1, AM2, AM3 and AM4.

- Operation and maintenance buildings including a gate house, security building, control centre offices, warehouses, a workshop and visitors centre.

The following infrastructure is no longer required to be constructed on the Zen Wind Farm site, and is to be removed from the Environmental Authorisation:

- » An on-site substation (200m x 200m) to facilitate grid connection.
- » A new 132kV power line (up to 6.5km in length) via a direct connect to the LeBonne Substation or a loop in and loop out connection to the LeBonne-Gouda power line which is located on the Farm LeBonne Esperance (adjacent Wind Farm Site).

### 1.3. Potential Environmental Impacts as determined through the EIA Process

From the specialist investigations undertaken within the EIA process for the wind energy facility, the following environmental impacts were identified:

- » Potential ecology impact;
- » Potential impacts on birds;
- » Potential impacts on bats;
- » Areas of visual impact;
- » Potential noise impact;
- » Potential Impact on heritage;
- » Potential impacts on soils erosion; and
- » Potential impacts on social environment.

#### Key conclusions and recommendations of the EIA pertinent to this application:

From the specialist investigations undertaken as part of the EIA for the wind farm, it was concluded that the majority of impacts are of low to medium significance with the implementation of appropriate mitigation measures. No environmental fatal flaws were identified on the site. Areas of very high sensitivity were identified and avoided through micro siting of the wind turbines. Areas of sensitivity identified during the EIA process include:

#### » **Ecology:**

The majority of the Bergriver Wind Farm project site consists of transformed agricultural areas with the result that there is very little residual terrestrial biodiversity present in these areas. The site is therefore considered low sensitivity and favourable for development of the wind farm. Remnants of Swartland Alluvium Fynbos and Swartland Shale Renosterveld occur on the eastern section of the site. These are Critically Endangered vegetation types and despite their disturbed nature, the presence of some species of conservation concern was confirmed for these areas. No turbines are located within the intact patches of remaining natural vegetation under the layout assessed as part of the EIA process and subsequent amendments. Ecological impacts associated Bergriver Wind Farm are of low significance and there are no impacts that cannot be mitigated to an acceptable level.

#### » **Aquatic Ecology:**

A 100m buffer area has been defined for the Berg River and Klein Berg River measured from the outer edge of channel or delineated floodplain (whichever is the furthest), and a 32m buffer area for Valley Bottom wetlands from the outer edge of the delineated wetland is recommended. The Zen Wind Farm will not have direct impact on any very high sensitivity areas, mainstem riparian systems (outside of the development footprint). No wind turbines are located within any of the delineated freshwater resource features, as well as their recommended buffer areas. Where road infrastructure intersects with high sensitivity freshwater features, existing road crossings are acceptable to be used/upgraded.

» **Avifauna:**

The avifauna described to be associated with Zen Wind Farm project site and the impacts identified and assessed were based on the results of the pre-construction monitoring which was conducted between 2012 and 2015 in accordance with the best practice guidelines at the time<sup>2</sup>. A pre-construction bird monitoring programme and radar survey was undertaken for the Zen site and at a control site over a 27-month period from September 2012 to December 2014, and for a total observation period of > 400 hours.

Key avifauna sensitivities and buffers recommended by the specialist for placement of turbines and include a 200m buffer around drainage features. The buffers are proposed to mitigate the potential disturbance of breeding priority species. No turbines are allowed to be placed within the buffer zones.

Birds in agricultural land already tolerate major seasonal changes in micro-habitat and periods of major human disturbance (ploughing, harvesting, etc.) and therefore displacement for most species is unlikely to be severe. There is ample alternative habitat available and therefore the loss caused by the footprint of the development is considered unimportant. During operation of the facility, the threat of fatalities of avifauna is also considered a potentially significant impact. The main area of concern for avifauna is mortality through collisions with rotor blades. Of the 21 identified priority species, two local resident species – Blue Crane and Spurwinged Goose are at highest risk of mortality through collision and potentially also through displacement from breeding or foraging areas. Most of the other priority species e.g. Greater Flamingo and Martial Eagle, occur in the area of the wind energy facility in far smaller or negligible numbers, and/or too infrequently, to be a source of concern. Karoo Shelduck and Egyptian geese are other species occurring in the area noted to be at higher risk of collision.

The Avifauna Impact Assessment identified that all impacts associated with the development of the Zen Wind Farm development footprint can be mitigated to an acceptable level of impact with the implementation of the recommended mitigation measures.

» **Bats:**

Pre-construction bat monitoring was undertaken within the Zen Wind Farm project site in 2013 accordance with the best practice guidelines (at the time). The monitoring was designed to monitor bat activity across the area for the Zen Wind Farm. The baseline environment was also subsequently investigated by using acoustic monitoring to document bat activity between September 2020 and November 2021.

Key bat habitat features identified present specific uses and opportunities for bats including roosts, foraging resources and commuting resources. The Berg River and the Klein Berg River have been identified as bat sensitive areas and a 200m buffer/setback was recommended. Roosts were identified on the project site

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<sup>2</sup> A rapid survey performed during April 2023 to verify the habitat conditions, general ecology and potential impacts to birds from the revised turbine positions.

and within the broader study area. No turbines are proposed to be located in the vicinity of the bat roosts site or on/within 200m of the Klein Berg River. The Saronsberg mountain range is also a bat sensitive habitat. No development of wind turbines is proposed on the elevated topography. Based on the bat activity recorded at the Zen Wind Farm, which was determined to be Low risk, the significance ratings for the majority of the impacts to bats posed by the development are predicted to be low with mitigation.

» **Land Use, Soil and Agricultural Potential:**

The initial assessment by Terra Soil Science (Van der Waals, 2012), stated that the project site consists of three different soil zones. These zones are shallow duplex soils, shallow rocky soils with rock outcrops and alluvial sand soils. According to this report, the area with shallow duplex soils consists of soils of the Swartland, Estcourt, Sterkspruit, Valsrivier and Glenrosa forms. These soils typically have bleached topsoil with a high fraction of fractured rock and lithic material in the horizon underneath the topsoil. The depth of these soils are shallow and the soils are also prone to erosion.

The original assessment found that the agricultural potential of the site is limited by the shallow and duplex nature of the soils and that the key determinants for successful crop production, are sufficient rainfall and management (Van der Waals, 2012). The shallow soils have limited water-holding capacity and may restrict root development while the duplex soils are highly erodible. The main land use within the Zen project site is rainfed wheat production during the winter season (rainy season). Soils with high agricultural potential were identified within the affected properties. No infrastructure is planned in current irrigated fields. It was agreed with the Department of Agriculture that wherever feasible, existing access roads would be utilised to minimise the need for new route establishment. Centre-pivot irrigation areas are required to be avoided.

» **Heritage Resources (archaeology, palaeontology and cultural landscape)**

All impacts identified on the heritage resources were either of a medium or low significance prior to the implementation of mitigation measures. With the implementation of the mitigation measures the impact significance will be reduced to a low acceptable impact. No impacts of a high significance are expected to occur.

Heritage artefacts (albeit of no important heritage significance) were identified within the project site. These include two old structures /buildings, and Early Stone Age (ESA) material is common on the project site but its density varies considerably according to location. The material at these sites are largely in secondary context having been left on the surface after erosion of the overlying deposits. Two small LSA scatters were found on the banks of the Berg River in the far west of the project site. Neither was dense, and the find was too dispersed to be able to distinguish any source areas. No graves were observed in the study area.

» **Noise**

Considering the ambient sound levels and character of the area, ambient sound levels are generally low and typical of a rural noise district during low wind conditions. Ambient sound levels will likely increase as wind speeds increase. Three potential Noise Sensitive Developments (NSDs) were identified within the project site and ambient noise levels were measured in specific locations.

Noise impacts were noted to 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 low significance for both day- and night-time operation activities. Noise modelling suggested that noise from the wind turbines during operation will be of a low significance. No impacts of a high significance or fatal flaws were identified.

» **Visual**

A visibility analysis was undertaken for the project. The result of the viewshed analysis displays the potential areas of visual exposure, as well as the potential frequency of exposure, and potential visual sensitive receptors. The wind farm will have a high visual impact on observers/visitors residing at homesteads within a 5km radius of the proposed wind turbine structures, on observers travelling along the roads within a 5km radius of the wind turbines, on residents of (or visitors to) homesteads within a 5 - 10km radius of the wind turbine structures, on objecting landowners and residents of (or visitors to) homesteads and tourist facilities within a 10 - 20km radius of the wind turbine structures.

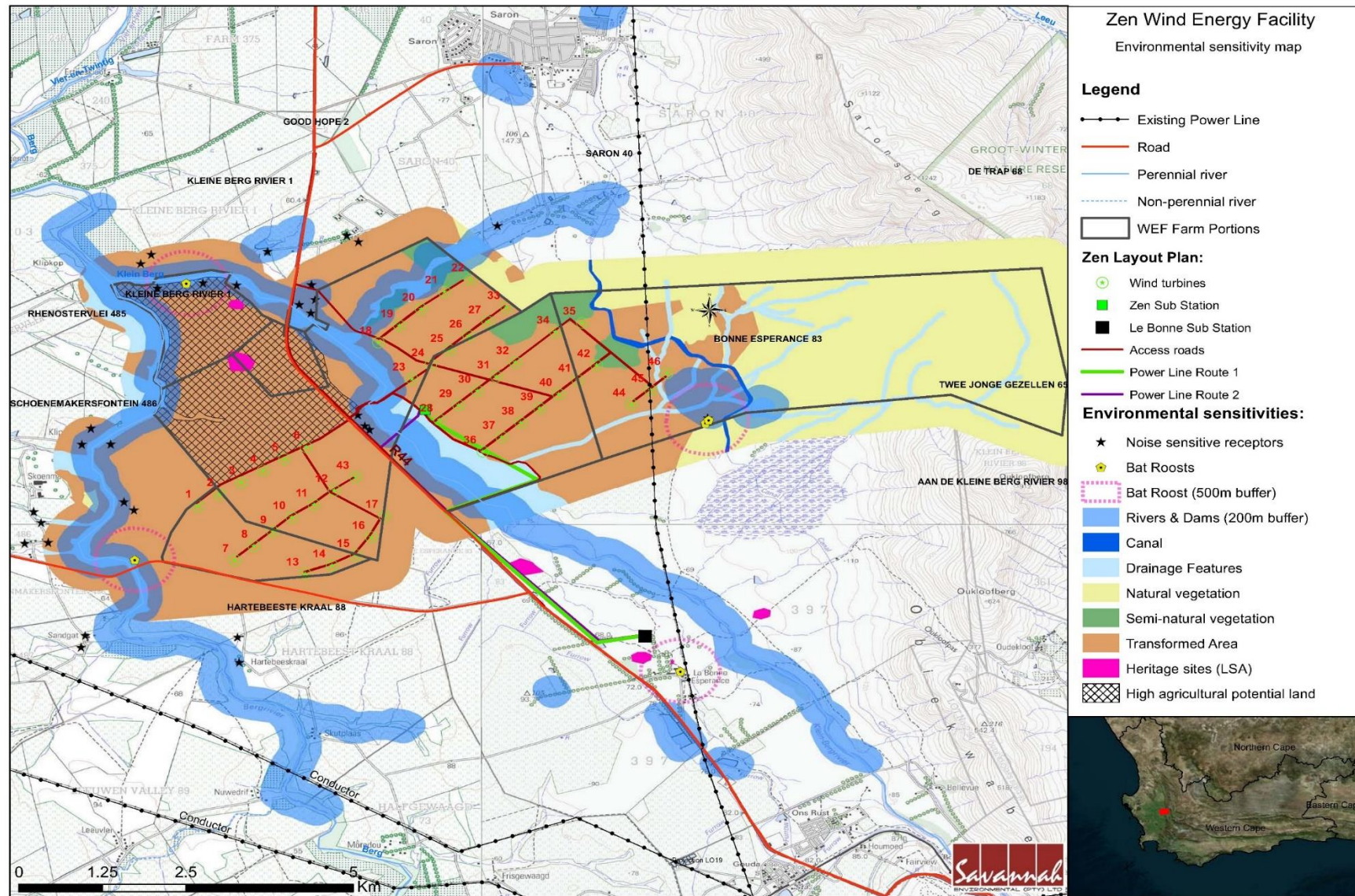
Visual receptors identified include farm homesteads and the town of Saron. The Zen Wind Farm could have a moderate to high visual impact on residents of (or visitors to) homesteads within a 10 - 20km radius of the wind turbine structures.

The greater environment has a rural, undeveloped character and a natural appearance. These generally undeveloped landscapes are considered to have a high visual quality. The significance of the visual impacts on the sense of place within the region (i.e. beyond a 20km radius of the development and within the greater region) is expected to be of low significance. No mitigation of this impact is possible (i.e. the structures will be visible regardless), but general mitigation and management measures are recommended as best practice.

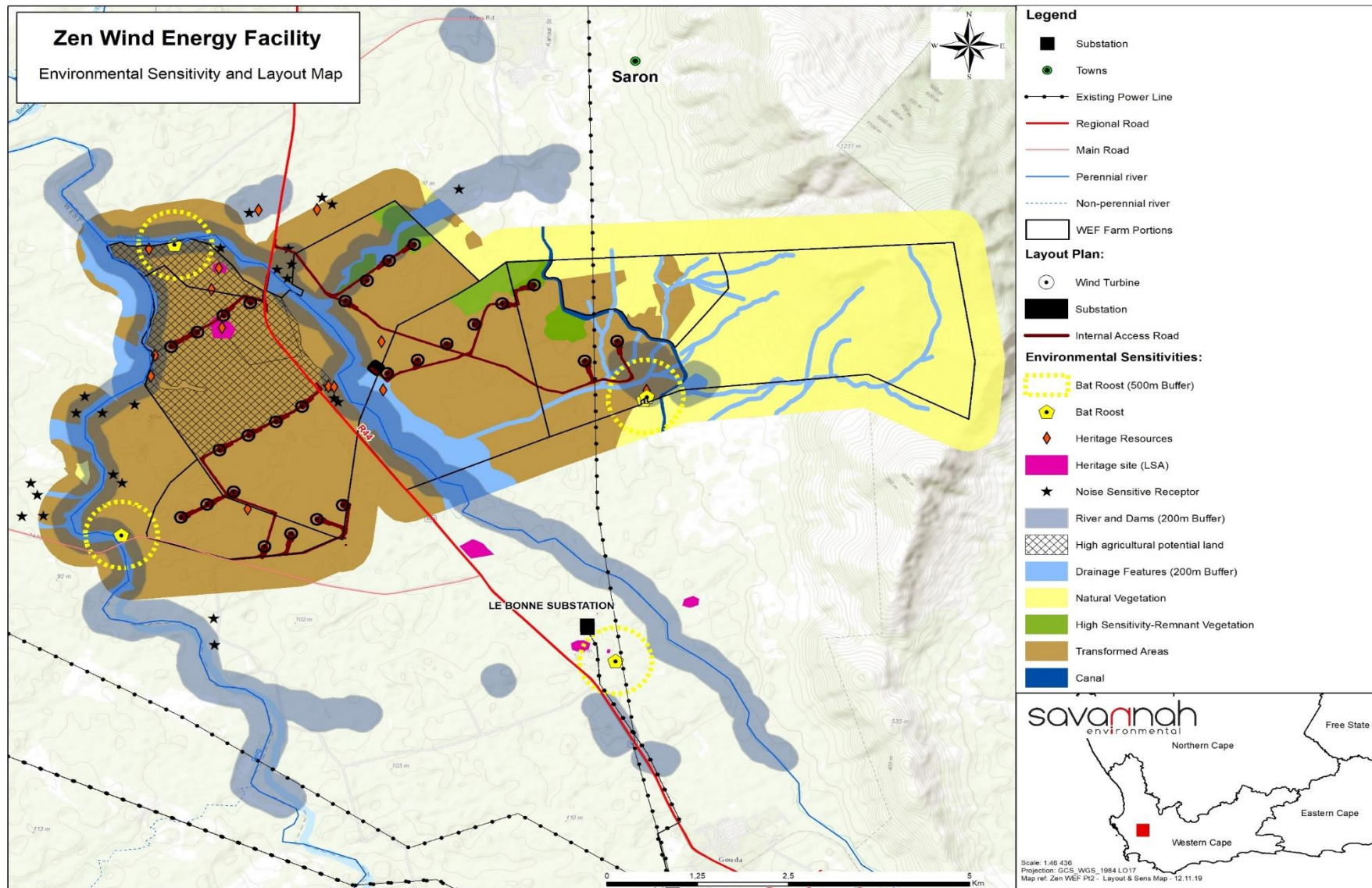
**Summary of EIA Findings**

As part of the planning mitigation strategy, the applicant considered all the above-mentioned findings and sensitivities, and duly made the necessary amendments to the layout considered in the EIA in order to reduce impacts to an acceptable level. No environmental fatal flaws were identified to be associated with the proposed Zen Wind Farm layout. Environmental specifications for the management of potential impacts are detailed within the Environmental Management Programme (EMPr).

The layout presented for the Environmental Impact assessment submitted to DFFE in April 2015 is provided as Figure 1.1 and the revised Zen Wind Farm Layout showing the new 27 turbine layout amended in 2019 is provided in Figure 1.2. In accordance with Condition 13 of the EA (dated 3 November 2016), the facility layout is required to be finalised and submitted for approval. The Final layout must be made available for comments by registered I&APs and submitted to the Department for approval prior to commencement of the activity. The Amended Facility Layout Map for the Zen Wind Farm, including all identified and verified environmental sensitivities (map ref: Zen Wind Farm Amended Layout & Sens Rev2 Jul'23) is included in Section 2, and also included in **Appendix J**.



**Figure 1.1:** Layout and sensitivity map for the Zen Wind Farm presented in the Final Environmental Impact Assessment submitted in 2015 also included in **Appendix J**.



**Figure 1.2:** Amended facility layout for the Zen Wind Farm approved through the Amendment Application (AM2 in 2019), showing the adjusted 27 turbine layout (map ref: Zen WEF Pt2-Layout & Sens Map – 12-11-19))

## 2. DETAILS OF THE AMENDMENTS APPLIED FOR

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The amendments being applied relate to the authorised Zen Wind Farm as detailed in the EA dated 3 November 2016, and the four subsequent amendments to the EA. This requested amendment will result in an optimisation of the layout and EMPr assessed within the EIA. This amended updated layout is presented in **Figure 2.1** and a revised EMPr is included as **Appendix K**. It must be noted that this facility layout and the EMPr will be finalised following the review period and submitted to the DFFE for review and approval (in accordance with Conditions 13 and 15 of the EA).

This section of the report details the amendments considered within this report and by the specialist investigations (refer to **Appendix A – H**). Each amendment request is detailed below.

### 2.1. Amend the contact details of the EA Holder contact person:

The contact person and relevant details of the holder of the environmental authorisation (14/12/16/3/3/2/322) are required to be amended to reflect the new contact person, current postal address, and relevant cell phone and email contact details. The amendments are as follows (Cover page, and Page 2 of 25 of EA, and AM1, AM2, AM3 and AM4):

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## 2.2. Amendment of the Wind Farm Layout:

The wind farm layout has been amended to optimise efficiency and the most recent layout has been designed considering latest technology available for implementation on this site. The amended and optimised wind farm layout includes a reduction in the number of authorised turbines (from 27 to 17 turbines), changes to roads and internal cabling, and removal of the on-site substation/grid connection infrastructure within the authorised area. The amended facility design ensures that sensitive areas are avoided while maximizing operational efficiency.

In this regard, the following is proposed:

1. Reduction in the number of turbines from 27 to 17;
2. Increase turbine capacity from 6 MW to up to 7.5 MW per turbine;
3. Increase the internal roads width from 6m to ~ 8m;
4. Optimise turbine/facility layout based on the energy yield, and revise the layout as required based on the revised turbine numbers and turbine specification; and
5. Optimise internal underground cabling (33kV) to enable a consolidated point of grid connection for the Zen/Bergriver wind farm cluster on the Bergriver site and remove the on-site substation and overhead power line connection from the project description.

The proposed amendments are not listed activities and do not trigger any new listed activity. No additional properties will be affected by the amendments as the proposed amendments are within the originally authorised development footprint.

The final layout must be made available for comments by registered I&APs and submitted to the Department for approval prior to commencement of the activity, in terms of Condition 13 of the Environmental Authorisation.

*As per condition 13 of the Environmental Authorisation, "A copy of the final development layout map must be made available for comments by registered Interested and Affected Parties and the applicant must consider such comments. Once amended, the final development layout map must be submitted to the department for written approval prior to commencement of the activity. All available biodiversity information must be used in the finalisation of the layout plan. Existing infrastructure must be used as far as possible e.g. roads.*

The applicant is requesting that the layout be amended in order to avoid identified sensitive areas and optimise the facility layout. In addition, the revised layout also takes into consideration the ideal point of connection to the grid, which is a direct connection to the adjacent authorised 132kV Bergriver facility substation. The project will also utilise combined construction infrastructure (temporary facilities, laydown areas, batch plants) to be shared with the adjacent Bergriver Wind Farm to further reduce the overall impacts of the project.

The amended facility layout considering these amendments is illustrated in **Figure 2.1** (map ref: Zen Wind Farm Amended Layout Rev2 Jul'23). The amended Zen Wind Farm facility layout and sensitivity map is presented in **Figure 2.2** (map ref: Zen Wind Farm Amended Layout & Sens Rev2 Jul'23). The following is included on the amended facility layout map/s:

1. 17 turbine locations are clearly indicated as a larger area which include the rotor swept area.
2. The location of all associated infrastructure is included and clearly annotated. This includes existing roads (dark brown) and the new planned roads (light brown). Cabling is proposed to be along road routes.
3. All features of sensitivity (together with the sensitivity rating) are provided on the map and explained in the map legend.
4. All no-go areas as well as any buffer areas are clearly indicated on the map and explained in the map legend.

The Applicant will finalise the layout following the review period, and the Final Facility layout will be submitted to the DFFE for approval (in accordance with Condition 13 of the EA) together with the Final Motivation report, as well as the revised EMPr (in accordance with Condition 13 and 15 of the EA).

The EMPr is a dynamic document, which must be revised to include any additional specifications as and when required. The EMPr for the project was submitted as part of the EIAR dated April 2015 and was not approved. In terms of Condition 15 of the EA (dated 3 November 2016) and Chapter 5 of the EIA regulations of December 2014 (as amended), changes to the EMPr must be submitted to the Competent Authority for approval. The EMPr must be revised to include any additional mitigation measures recommended by the specialists as part of the EA amendment process to ensure appropriate management of impacts.

### **2.3. Amend the project description, as required:**

The number of wind turbines are proposed to be decreased from 27 turbines to 17 turbines, with a greater capacity per turbine. The turbine specifications remain unchanged (hub height and rotor diameter). It is therefore requested that the project description in the EA be amended to include the revised number of turbines proposed to be installed at the site. The following wording as specified on page 9 of the EA, and page 1 of AM2, therefore requested to be changed to accommodate the amendments listed in Section 2.2 above:

#### **From:**

The infrastructure associated with this facility includes:

- The site proposed to accommodate up to 27 wind turbines. The facility would be operated as a single facility with each turbine being up to 6MW in capacity.
- Internal access roads (up to 6m in width) linking the wind turbines and other infrastructure on the site. Existing farm roads will be utilised and upgraded.
- An on-site substation (200m x 200m) to facilitate grid connection.
- A new 132kV power line (up to 6.5km in length) via a direct connect to the LeBonne Substation or a loop in and loop out connection to the LeBonne-Gouda power line which is located on the Farm LeBonne Esperance (adjacent Wind Farm Site).

#### **To:**

The infrastructure associated with this facility includes:

- The site proposed to accommodate up to **17 wind turbines**, with each turbine being up to 7.5MW in capacity.
- Internal access roads (**up to 8m** in width) linking the wind turbines and other infrastructure on the site. Existing farm roads will be utilised and upgraded.
- **Cablings between the turbines, to be laid underground where practical.**

Reference to the 132kV on-site substation/overhead grid connection infrastructure within the authorised area can be removed. The grid connection infrastructure which will remain is the cabling between the turbines and to the Bergriver Substation, to be laid underground where practical.

Reference to the 6m wide access roads is required to be amended to 8m wide access roads in the description of the Listed Activities (Activities 22 and 47 of GNR544).

#### **2.4. Remove co-ordinates of infrastructure that is no longer applicable to the project:**

The amended and optimised wind farm layout includes the removal of the 132kV on-site substation and overhead grid connection infrastructure within the authorised area. The co-ordinates are no longer required to be included in the EA.

	<b>Latitude (S)</b>	<b>Longitude (E)</b>
<b>Substation</b>	33°14'0.34" S	18°59'32.16" E
<b>Power line</b>		
Start:	33°14'0.34" S	18°59'32.16" E
Middle	33°14'0.34" S	18°59'32.16" E
End	33°14'0.34" S	18°59'32.16" E

#### **2.5. Remove EA Conditions no longer applicable to the project description:**

The amended and optimised wind farm layout includes the removal of the 132kV on-site substation and overhead grid connection infrastructure within the authorised area. Condition 45 and Condition 46 of the EA relate to the overhead grid connection infrastructure and are required to be removed.

##### **Condition 45 (page 15 of the EA)**

45. Anti-collision devices such as bird flappers must be installed where power lines cross avifaunal corridors (e.g. grasslands, rivers, wetlands, and dams). The input of an avifaunal specialist must be obtained for the fitting of the anti-collision devices onto specific sections of the power line once the exact positions of the towers have been surveyed and pegged. Additional areas of high sensitivity along the preferred alignment must also be identified by the avifaunal specialist for the fitment of anti-collision devices. These devices must be according to Eskom's Transmission and EWT's Guidelines.

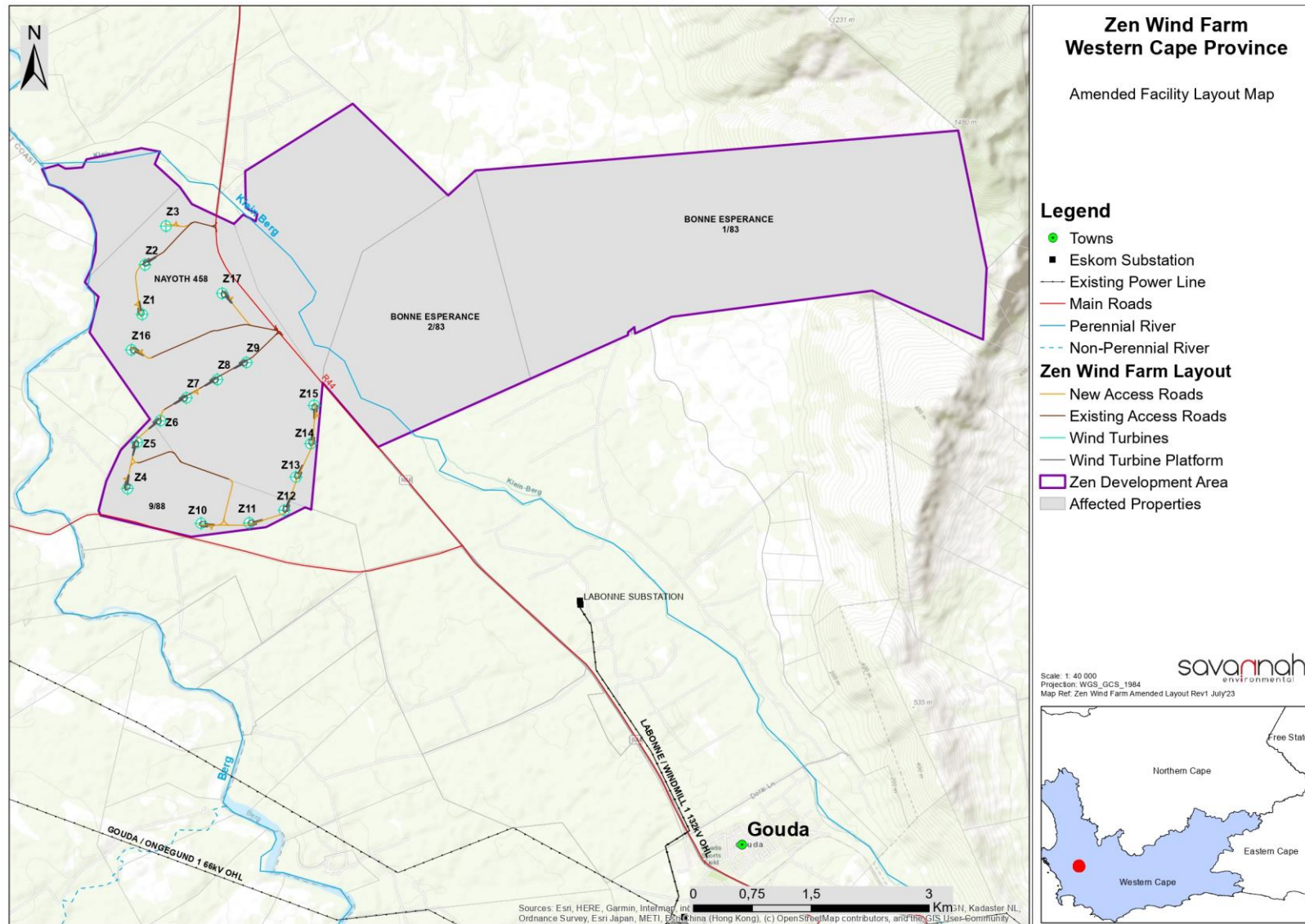
##### **Condition 46 (page 15 of the EA)**

46. A pre-construction walk through on the selected power line alignment by a bat specialist, avifaunal specialist and ecologist, must be conducted to ensure that the micro-siting of the turbines has the least possible impact, there are no nests sites of priority species on or close to the construction corridor, and all protected plant species impacted are identified.

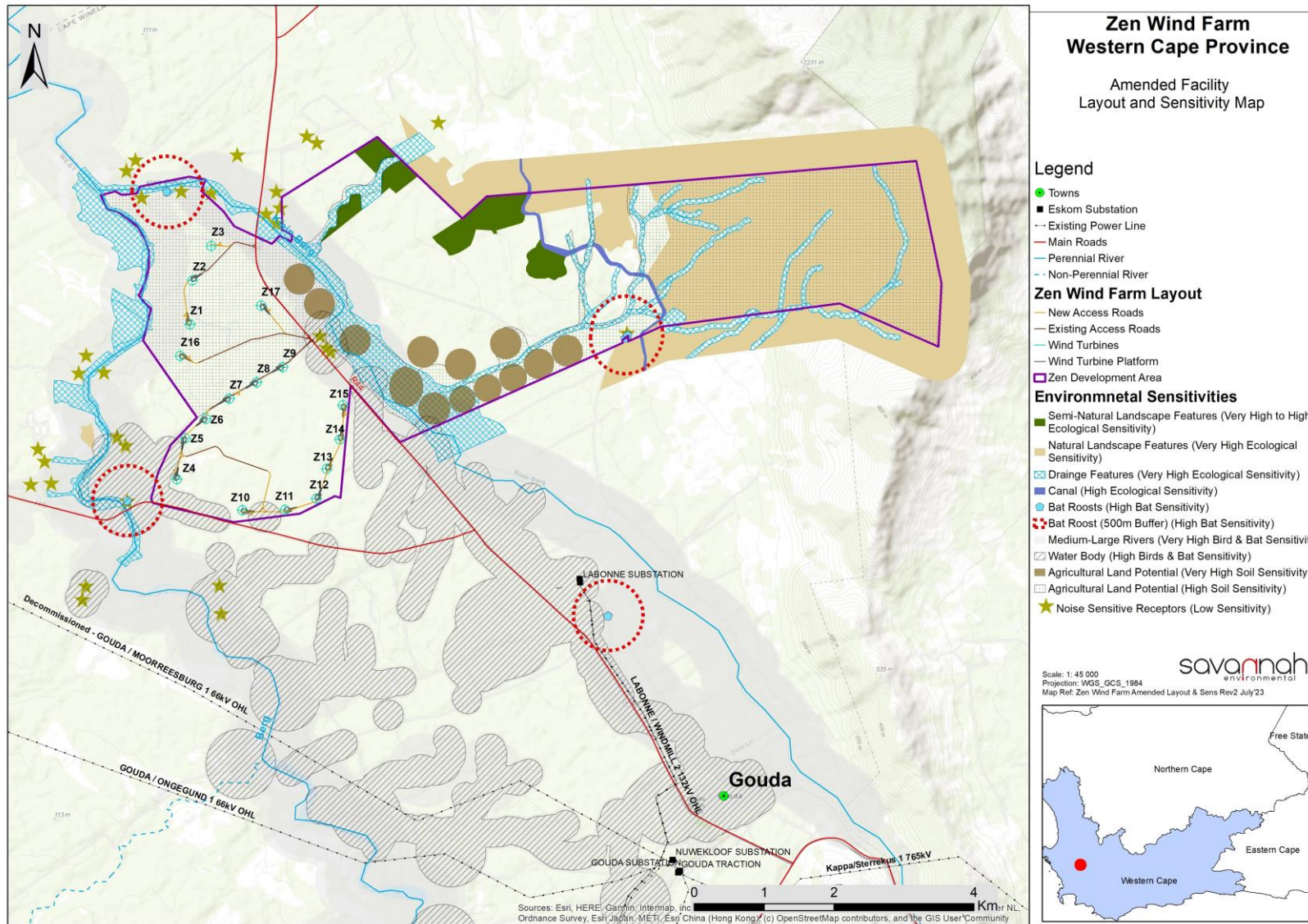
**2.6. Remove Listed Activities included in the EA which are no longer applicable to the project description:**

The internal underground cabling (33kV) to enable a consolidated point of grid connection for the Zen/Bergriver cluster is optimised in the final facility layout, and the 132kV on-site substation and overhead power line connection are requested to be removed from the project description. Therefore, Activity 10 of GNR544 is no longer applicable to or relevant to the project description, and is requested to be removed from the EA.

<b>Authorised Listed Activity in terms of the EIA Regulations (2006) as included in the EA</b>	<b>Reason for removal</b>
<p>GN R. 544 Item 10                      "The construction of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."   <b>An onsite substation (66kV or 132kV) is required for the project</b></p>	<p>This Listed activity is no longer relevant as the turbines within the Zen Wind Farm will be connected to a shared substation on the Bergriver Wind Farm project site through underground 33kV cabling/grid lines. This electrical infrastructure allows for the transfer of power generated by the turbines to the substation. No substation is planned as part of the Zen Wind Farm.</p>



**Figure 2.1:** Amended Facility Layout Map for the Zen Wind Farm, including all identified and verified environmental sensitivities ((map ref: Zen Wind Farm Amended Layout Rev2 Jul'23 also included in **Appendix J**)



**Figure 2.2:** Amended Facility Layout Map for the Zen Wind Farm, including all identified and verified environmental sensitivities (map ref: Zen Wind Farm Amended Layout & Sens Rev2 Jul'23 also included in **Appendix J**)

### 3. MOTIVATION FOR THE PROPOSED AMENDMENTS

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#### 3.1. Amend the contact details of the EA Holder contact person:

The contact person and relevant details for the Holder of the EA (ie FE Bonne Esperance (Pty) Ltd) have changed. The contact details as reflected on the EA are no longer for the person responsible for the EA. Therefore, the EA Holder requires these details to be amended to ensure that the EA lists the most current contact details of the relevant contact person. The SPV which is Holder of the EA remains the unchanged. The contact person for the Holder of the EA accepts all rights, responsibilities and obligations which are binding on a holder of an EA (as per Conditions 2 and 3 of the EA).

#### 3.2. Amendment to the Wind Farm Layout

Due to the proximity to the Bergriver Wind Farm and the operational Gouda Wind Farm, Acciona Energy South Africa Global (Pty) Ltd (AESAG) acquired the project from the original developers and is developing a wind farm cluster. AESAG will adopt the latest wind turbine technology available to Acciona Energy for the project. The facility layout has been designed to optimise the energy yield and considers the latest technology. The project will also utilise combined construction infrastructure (temporary facilities, laydown areas, batch plants) to further reduce the overall impacts of the project and the adjacent Bergriver Wind Farm. Both the Zen and the Bergriver Wind Farm projects are designed to share infrastructure to optimise construction expenses and timeline. The new facility layout also takes into consideration that the ideal point of connection to the grid is via a 132kV collector on-site substation located on the Bergriver Wind Farm site. This allows for the reduction in impact to the Zen Wind Farm site by removing the need for an additional on-site facility substation in this wind farm cluster/area.

The reduction in number and repositioning of turbines, coupled with infrastructure adjustments, ensures that the wind farm layout is optimised to both maximise operational efficiency and remain outside of identified sensitive areas. The facility layout has 10 turbines less than the previously authorised layout, and none of these are located to the east of the R44, which included more sensitive environments such as natural and semi-natural areas, elevated terrain, and irrigated centre pivots. This comprehensive approach allows for a more sustainable and effective utilisation of the wind energy resources while minimising the potential for environmental impacts. The following has been applied:

- » **Decreased development footprint:** The Zen Wind Farm amended facility layout reduces the number of the wind turbines as assessed in the EIA, as well as subsequent amendments (from the original 46 turbines, to 27 turbines, to now 17 turbines). This is a reduction of 29 turbines from the original assessment, and a reduction of 10 turbines from the 2019 amendment assessment. This change significantly reduces the area occupied by the development footprint. This change is facilitated by the change in turbine technology, which allows for a larger wind turbine generator to be installed, using the same turbine specifications as already authorised. As the major change to the Zen Wind Farm in terms of the amendment is the reduction in the number of turbines resulting in a decreased footprint, the changes can be seen as neutral or positive (advantage) to the social and biophysical environment. There are no disadvantages of the amended layout as compared to original layout. No high sensitivity areas were impacted by the amended layout, and as a result no new impacts were identified.

- » **Sensitive areas avoidance:** The reduction in number and repositioning of turbines takes into account all identified sensitive areas, and the optimised turbine locations avoid infringement on sensitive ecosystems, habitats, or heritage sites. The final turbine positions have been verified by specialist consultants, and all specialists have confirmed the acceptability of the revised facility layout (specialist findings are provided in Section 5, and provide motivation for the change to the facility layout). The location in areas of higher agricultural soils is acceptable as the disturbance is within the define allowable limits and makes use of existing access roads where possible.
- » **Operational efficiency:** The repositioning aims to maximise the operational efficiency of the wind farm. This involves analysing factors such as wind patterns, terrain conditions, and potential obstructions. By strategically placing the turbines in areas with optimal wind resources and minimal obstructions, the overall energy production of the wind farm can be enhanced.
- » **Infrastructure adjustments:** Along with repositioning the turbines, the new design also involves making necessary changes to associated infrastructure. This includes taking into consideration that the optimal point of connection to the grid is via a 132kV collector on-site substation located on the Bergriver Wind Farm site. This allows for the reduction in impact to the Zen Wind Farm site by removing the need for an additional on-site facility substation in this wind farm cluster/area. These adjustments are aimed at improving the overall functionality and performance of the wind farm.

The EIAR and all specialist studies assessed the full extent of the project development area, which remains unchanged with this amendment. The amendment does not trigger any new listed activities.

The amended Zen Wind Farm facility layout is presented in **Figure 2.1** (map ref: Zen Wind Farm Amended Layout Rev2 Jul'23). The Applicant will finalise the layout following the review period, and the Final Facility layout will be submitted to the DFFE for approval (in accordance with Condition 13 of the EA) together with the Final Motivation report as well as the revised EMPr (in accordance with Condition 15 of the EA).

The EMPr must be updated to include any additional mitigation. The EMPr for the project was submitted as part of the EIAR dated 2015 and was not approved. In terms of Condition 15 of the EA (dated 3 November 2015) and Chapter 5 of the EIA regulations of December 2014 (as amended), changes to the EMPr must be submitted to the Competent Authority for approval. The EMPr must be revised to include any additional mitigation measures recommended by the specialists as part of the EA amendment process to ensure appropriate management of impacts.

### **3.3. Amend the project description as required:**

The requested amendment to the Environmental Authorisation ensures that the project description contains all relevant and updated information, facilitating compliance monitoring by both the applicant and the DFFE during project implementation, leading to better environmental protection.

### **3.4. Remove co-ordinates of infrastructure that is no longer applicable to the project:**

Removing the coordinates of infrastructure that are no longer applicable to the project in the Environmental Authorisation (EA) is essential to maintain accuracy, avoid confusion, and ensure regulatory compliance, as it reflects the current and relevant scope of the project, preventing unintended impacts on the environment.

### **3.5. Remove EA Conditions no longer applicable to the project description:**



The amended and optimised wind farm layout includes the removal of the on-site substation and overhead grid connection infrastructure within the authorised area. Reference to the on-site substation/grid connection infrastructure within the authorised area can therefore be removed. Condition 45 and Condition 46 of the EA relate to the overhead grid connection infrastructure, and are required to be removed.

#### **Condition 45 (page 15 of the EA)**

45. Anti-collision devices such as bird flappers must be installed where power lines cross avifaunal corridors (e.g. grasslands, rivers, wetlands, and dams). The input of an avifaunal specialist must be obtained for the fitting of the anti-collision devices onto specific sections of the power line once the exact positions of the towers have been surveyed and pegged. Additional areas of high sensitivity along the preferred alignment must also be identified by the avifaunal specialist for the fitment of anti-collision devices. These devices must be according to Eskom's Transmission and EWT's Guidelines.

The motivation for the removal of Condition 45 relates to:

- a. The amended and optimised wind farm layout includes the removal of the on-site substation and overhead grid connection infrastructure with a capacity of >33kV within the authorised area. No overhead power line would be required to cross avifauna corridors.
- b. Condition 37 indicated that all power lines linking wind turbines to each other and to the internal substation must be buried. And therefore, this condition is contradictory.

#### **Condition 46 (page 15 of the EA)**

46. A pre-construction walk through on the selected power line alignment by a bat specialist, avifaunal specialist and ecologist, must be conducted to ensure that the micro-siting of the turbines has the least possible impact, there are no nests sites of priority species on or close to the construction corridor, and all protected plant species impacted are identified.

The motivation for the removal of Condition 46 relates to:

- a. The selected power line alignment is no longer relevant to the project description – this alignment was described on page 6 of the EA as a “new 132kV power line (up to 6.5km in length) via a direct connection to the LeBonne Substation or a loop in and loop out connection to the LeBonne-Gouda power line which is located on the Farm LeBonne Esperance (adjacent to the Zen Wind Farm site)”.
- b. The amended and optimised wind farm layout includes the removal of the on-site substation and overhead grid connection infrastructure with a capacity of >33kV within the authorised area. No pre-construction walk through on the selected power line alignment would be required.

### **3.6. Remove Listed Activities included in the EA which are no longer applicable to the project description:**

The internal underground cabling (33kV) to enable a consolidated point of grid connection for the Zen/Bergriver cluster is optimised in the final facility layout, and the on-site substation and overhead power line connection are requested to be removed from the project description. Therefore, Activity 10 of GNR544 is no longer applicable to or relevant to the project description, and is requested to be removed from the EA.

## 4. CONSIDERATIONS IN TERMS OF THE REQUIREMENTS OF THE EIA REGULATIONS

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In terms of Regulation 31 of the EIA Regulations 2014, as amended, an environmental authorisation may be amended by following the process in this Part (i.e. a Part 2 amendment) if it is expected that the amendment may result in an increased level or change in the nature of impact where such level or change in nature of impact was not:

- a) Assessed and included in the initial application for environmental authorisation; or
- b) Taken into consideration in the initial authorisation.

The amended/optimised facility layout was not considered in the initial application for environmental authorisation. The change does not however, on its own, constitute a listed or specified activity. Therefore, the application is made in terms of Regulation 31(a). As required, the following is considered for the proposed amendments:

- (i) an assessment of all impacts related to the proposed change;
- (ii) advantages and disadvantages associated with the proposed change;
- (iii) measures to ensure avoidance, management and mitigation of impacts associated with such proposed change; and
- (iv) any changes to the EMPr.

In terms of Condition 5 of the Environmental Authorisation and Chapter 5 of the EIA Regulations of December 2014 as amended, it is possible for an applicant to apply, in writing, to the competent authority for a change or deviation from the project description to be approved.

Savannah Environmental has prepared this Motivation Report in support of this amendment application on behalf of FE Bonne Esperance (Pty) Ltd.

## 5. POTENTIAL FOR CHANGE IN THE SIGNIFICANCE OF IMPACTS AS ASSESSED IN THE EIA AS A RESULT OF THE PROPOSED AMENDMENTS

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In terms of Regulation 32(1)(a)(i), the following section provides an assessment of the impacts related to the proposed amendments. Understanding the nature of the proposed amendments and the impacts associated with the project (as assessed within the EIA), the following has been considered:

- » Impacts on avifauna and bats
- » Impacts on aquatic ecology
- » Impacts on ecology, flora and fauna
- » Impacts on land use, soils and agricultural potential
- » Potential impacts on heritage resources, including archaeology, palaeontology and the cultural landscape
- » Visual impacts on the area imposed by the components of the facility
- » Noise impacts due to the construction and operation of the wind farm
- » Socio- economic impacts

The potential for change in the significance and/or nature of impacts based on the proposed amendments as described within this motivation report is discussed below and detailed in the specialists assessment letters and reports (as applicable) contained in **Appendix A-H**<sup>3</sup>. This section of the main report must be read together with the specialist reports contained in **Appendix A-H** in order for the reader to obtain a complete understanding of the proposed amendments and the implications thereof. Additional mitigation measures recommended by the specialists have been included within the Environmental Management Programme (EMPr) for the project, which is revised and submitted in terms of the requirements of Condition 15 of the EA. Additions and/or changes to the EMPr are underlined and summarised for ease of reference.

### 5.1. Impacts on Birds and Bats

Enviro-Insight, the Birds and Bats specialists that conducted the original Environmental Impact Assessment (EIA), conducted a field survey on 17-18 April 2023 to verify the current status of the environment. This survey enabled the specialist to determine whether any changes have occurred since the initial assessment and provide a statement supported by a site verification survey. The Birds and Bats specialist report is included as **Appendix A**. This report includes the assessment and findings for both birds and bats, as well as considers both the Zen Wind Farm as well as the Bergriver Wind Farm.

A combined Birds and Bats report was considered to be most appropriate by the specialist due to the Zen and Bergriver Wind Farm projects being located directly adjacent to each other. These projects are proposed to be developed as a cluster and designed to share infrastructure, thereby optimising construction expenses and timeline. The specialist took into account the changes and associated impacts together in one report. This approach is considered preferable as it allows for:

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<sup>3</sup> It must be noted that the original specialists who undertook the EIA studies have been used for these assessments as far as possible. However, where the original specialists were not available, suitably qualified and experienced specialists have been used to provide an assessment of the proposed amendments.

- » Updating and standardisation of mitigation measures applied across both projects due to the shared landscape features between both projects (e.g. the Berg River) and therefore near-identical ecology. This ensures a comprehensive and integrated approach to managing the potential effects on birds and bats from both wind farms, providing a holistic understanding of the overall impact and facilitating coordinated mitigation efforts;
- » More appropriate consideration of cumulative impacts, which can inform better decision-making and adaptive management;
- » Removal of unnecessary duplication of information leading to potential confusion;
- » A single consolidated set of recommendations and instructions for the Applicant aiming to develop the two authorised facilities as one entity.

A total of four priority bird species were recorded during the site visit and these species are: Secretary bird, Jackal Buzzard, Ludwigs's Bustard and Blue Crane. These species are considered as a priority in relation to wind energy developments as they are at risk from collision with the spinning turbine blades. Three of these species are also considered to be species of conservation concern as they are Threatened with extinction as evaluated by the IUCN, either globally or locally (Taylor et al. 2015). As it is a requirement of the animal species protocol that observations of a species of conservation concern must be disseminated to a public database prior to the submission of the report to the client, these observation records were submitted to iNaturalist<sup>4</sup>. Secretary bird (Endangered) and Ludwig's Bustard (Endangered) were not observed during comprehensive surveys performed by Williams (2015) or Laurence (2022) but were predicted to occur sporadically within this region. Furthermore, Calidris (2019) also reported observations of these species.

The overall habitat and land use in the survey area surrounding the turbine layout have not significantly changed compared to the descriptions provided in the previous Environmental Impact Assessment (EIA) report. The habitat for each turbine position are in homogenous agricultural fields. All turbines are positioned within transformed agricultural fields, which are considered to have a low sensitivity for avifauna and bats.

The Zen Wind Farm study, which was conducted in 2013 with an update in 2015 only recommended a 200m buffer for sensitive habitats (Bio3 2013). This buffer is considered insufficient given the advanced understanding of the impacts to birds and bats from wind turbines, and a 500m buffer for rivers or waterbodies is now recommended. This brings the Zen Wind farm's sensitivity buffer in line with that applied to the adjacent Bergriver Wind Farm. A consistent buffer across both Zen and Bergriver wind farm sites has been recommended and applied, and each habitat is required to be buffered according to the largest recommended buffer by the specialist studies. The amended layout (refer to **Figure 5.1**) confirms that there are no overlaps between the positions of the turbine bases, their blade reaches, and the consolidated areas of high sensitivity for bats and birds for the Zen Wind Farm. Consequently, the amended facility layout, with its finalised turbine positions is considered to comply with the requirements for infrastructure siting in relation to birds and bats.

### **5.1.1. Assessment of Amended Facility Layout**

The potential impacts to avifauna and bats were reviewed and found to be relevant in terms of their description and evaluation of significance to the amended turbine layout. Therefore, there are no changes in the significance of assessed impacts, and no additional impacts from the amended turbine layout are expected for the Zen Wind Farm.

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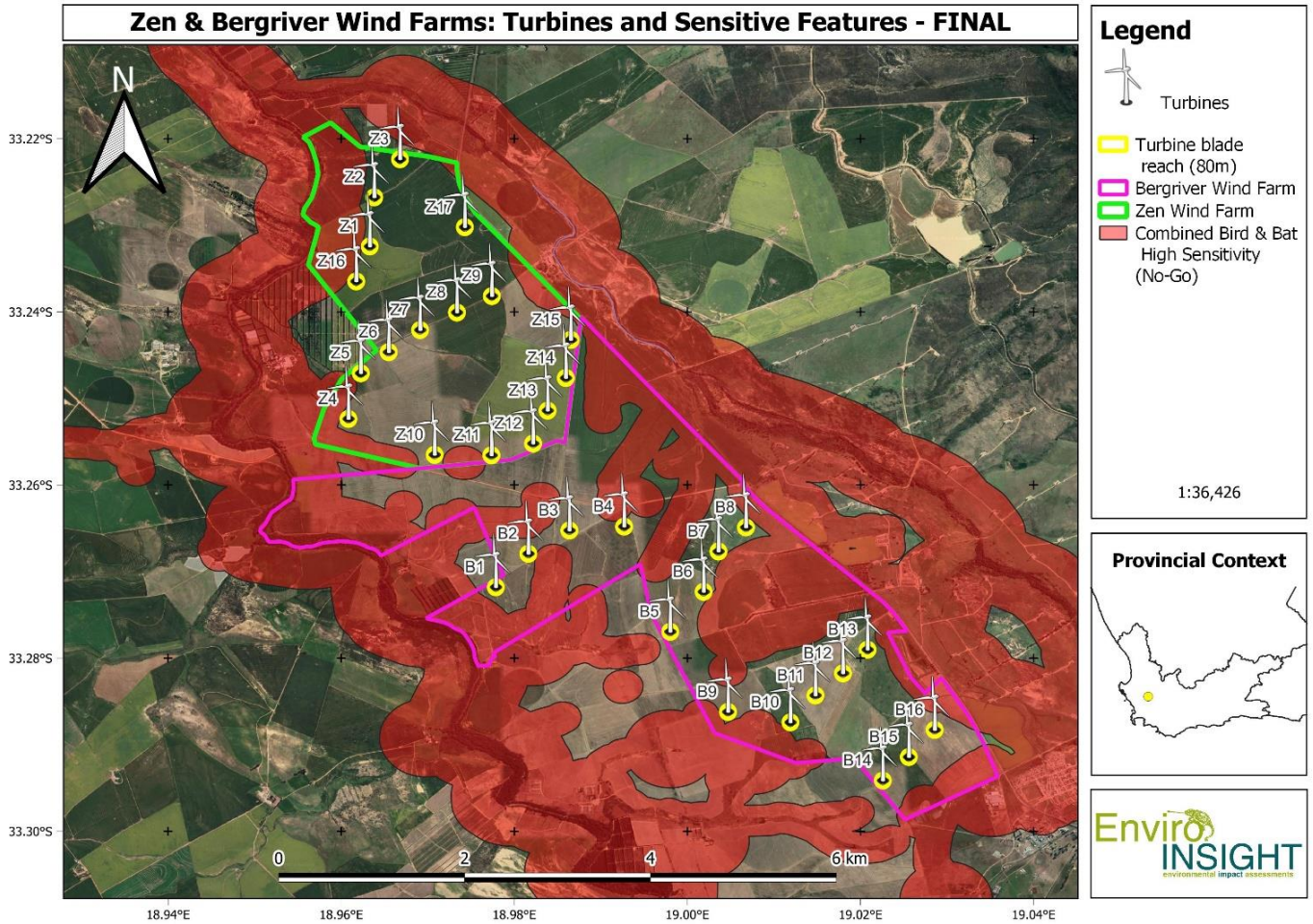
<sup>4</sup> <https://www.inaturalist.org/observations/>: 156866681, 156866684, 156866682

Changes from the initial turbine layout are expected to reduce the likelihood of collision mortalities for both birds and bats as all turbines associated with the Zen Wind Farm are now placed at least 500m away from rivers and their riparian vegetation, leading to a reduction in both the likelihood and severity of this anticipated impact. In addition, the facility layout has 10 turbines less than the previously authorised layout, with all turbines located to the east of the R44, and away from sensitive environments such as natural and semi-natural areas, elevated terrain, and irrigated centre pivots.

The Birds and Bat specialist report confirms that the proposed amendment to the facility layout for the wind farm will result in no change to the significance rating of the impacts of disturbance, turbine collisions, bird mortality through collision/electrocution with power lines, disruption of movement patterns, and cumulative impacts, as they have been rated previously in the specialist assessment included in the 2019 Amendment Application for the Zen Wind Farm.

The EMPr for the Zen Wind Farm is required to be updated to include the current post-construction monitoring requirements and specify the amended sensitive habitat buffers as per the consolidated sensitivity mapping (e.g. 500 m [not 200 m] buffer from the river; refer to Error! Reference source not found.**re 5.1**) with updated sensitivity mapping provided. The following revisions to the Zen Wind Farm EMPr are recommended to address avifauna and bat requirements:

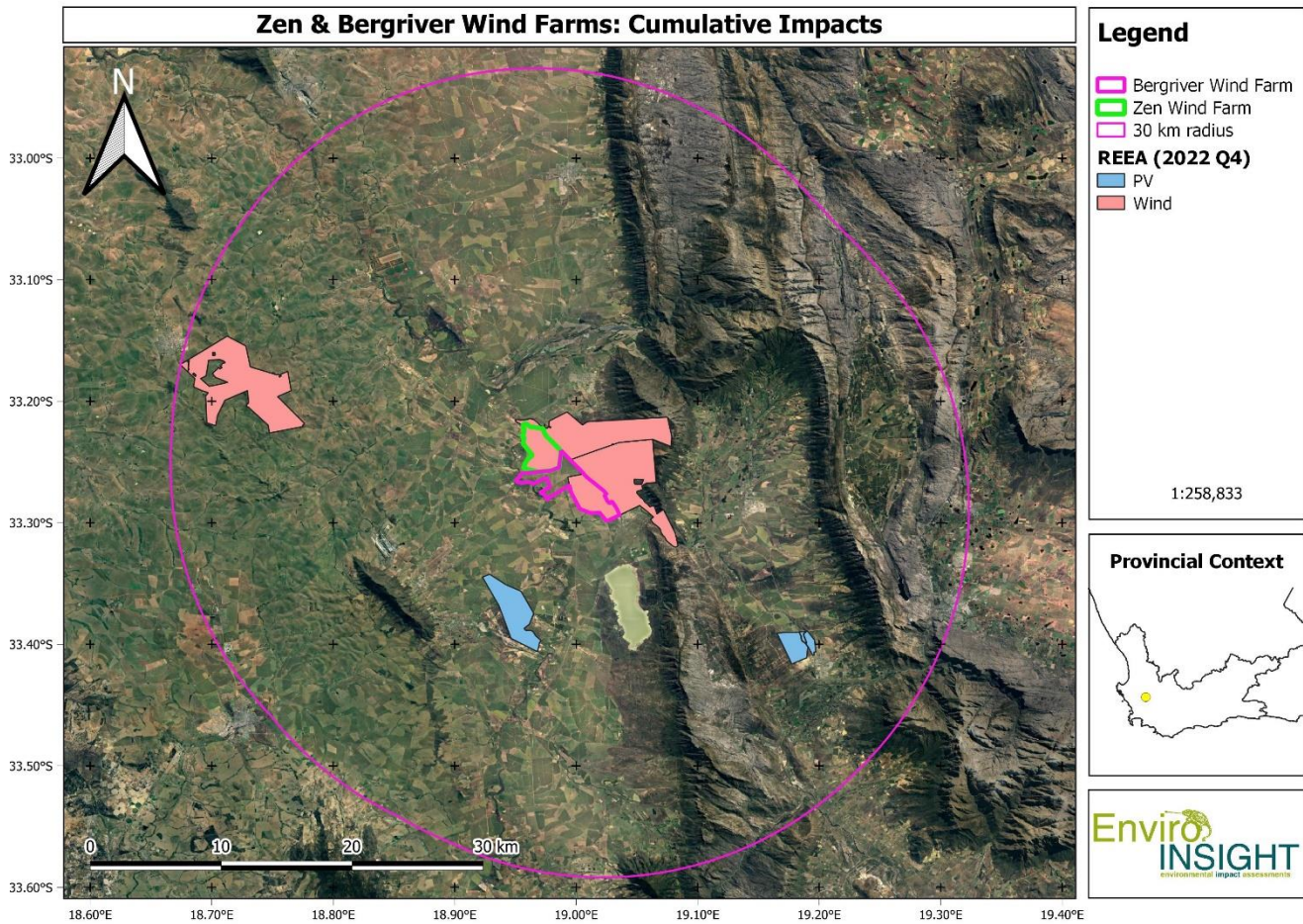
- » The EMPr must specifically include the necessity for post-construction avifauna and bat monitoring as stipulated in Jenkins et al. (2015) and Aronson et al. (2020) respectively. Currently, only Jenkins et al. (2015) is referred to.
- » Update requirements for bat fatality monitoring and reporting to be in line with that required by Aronson et al (2020) or refer directly to this reference to be implemented. Currently the EMPr does not appropriately stipulate the requirements for operational bat fatality monitoring and must include at minimum the following statement: "post-construction bat monitoring must take place and must be fully compliant with Aronson et al. (2020)".
- » Include the mitigation options of using technology-assisted management of SOD ("Smart System" from Wildlife Acoustics), to limit bat collision fatalities as described above (currently only available for birds).
- » Update reference for MacEwan et al. (2018) to the latest edition: MacEwan, K., Aronson, J., Richardson, K., Taylor, P., Coverdale, B., Jacobs, D., Leeuwner, L., Marais, W. and Richards, L. 2020. South African Bat Fatality Threshold Guidelines- 3rd ed. South African Bat Assessment Association.
- » Update "Objective 4: Protection of bat species" under "Mitigation: Action/control" to include the following statement: "Develop and implement a post-construction bat monitoring programme which includes carcass searches for bats during the first two years of operation, to be fully compliant with Aronson et al. (2020). Should post- construction fatality monitoring reveal high levels of fatality, automated real-time bat monitoring and analysis systems are recommended as the primary method for automated and near-real-time bat fatality mitigation".



**Figure 5.1:** Consolidated bat and bird sensitivity mapping for the Zen & Bergriver Wind Farms, showing the final revised turbine positions which remain outside all high sensitivity areas and buffers

**5.1.2. Cumulative Impact**

The revised turbine layout of 33 turbines (considering both Bergriver and Zen Wind Farms collectively) including blade reaches, represents an area of ~2000 ha, hereafter referred to as the development footprint, which is 0.6 % of the 30 km radius area . An additional 750 ha of non-approved wind energy development area will be added by the proposed facility, as the majority of the Zen Wind Farm and the Bergriver Wind Farm project areas are already approved for wind energy developments according to REEA 2022-Q4 **Figure 5.2**. It is important to note that the development footprint area is not totally transformed during development. The total area of approved WEFs in this region (development unconfirmed, and only based on REEA 2022-Q4) represents 6.8% of the land area and with the additional 750 ha of the Zen Wind Farm and the Bergriver Wind Farm project area boundary, will increase to 7.0%. This is considered to be an acceptable level of cumulative impact, given that is a relatively small proportion of the region, utilising agriculturally transformed land only, with appropriate avoidance of sensitive habitats.



**Figure 5.2:** Location of the known regional renewable energy projects in relation to the proposed Zen Wind Farm and Bergriver Wind Farm

### 5.1.3. Conclusion

The amended facility layout for the Zen Wind Farm is considered suitable for development from both an avifauna and bat perspective. The Specialist confirms the acceptability of the revised facility layout, which is intended for submission to and approval by DFFE. An amendment to measures for avoiding, managing, and mitigating impacts resulting from the proposed changes, and the additions/changes to the Environmental Management Programme (EMPr) have been provided.

## 5.2. Impacts on Aquatic Resources

The original Environmental Impact Assessment (EIA) did not include an assessment report for the Aquatic Impacts. EnviroSci, the aquatic specialist was appointed to conduct a field survey in April 2023. The purpose of this survey was to verify/confirm the current status of the environment. The findings of this survey enabled the Specialist to provide a statement supported by a site verification survey. The Aquatic specialist report is included as **Appendix B**.

The development area contains short tributaries that link to the Berg River and Klein Berg River, consisting mostly of perennial watercourses, non-perennial rivers some with valley bottom wetlands (Klein Berg) that are highly constrained by the conversion of the previously natural Swartland Shale Renosterveld to

agricultural fields, i.e. the only remaining natural vegetation within the study area are these remaining wetland areas. This was confirmed in the 2023 site visit.

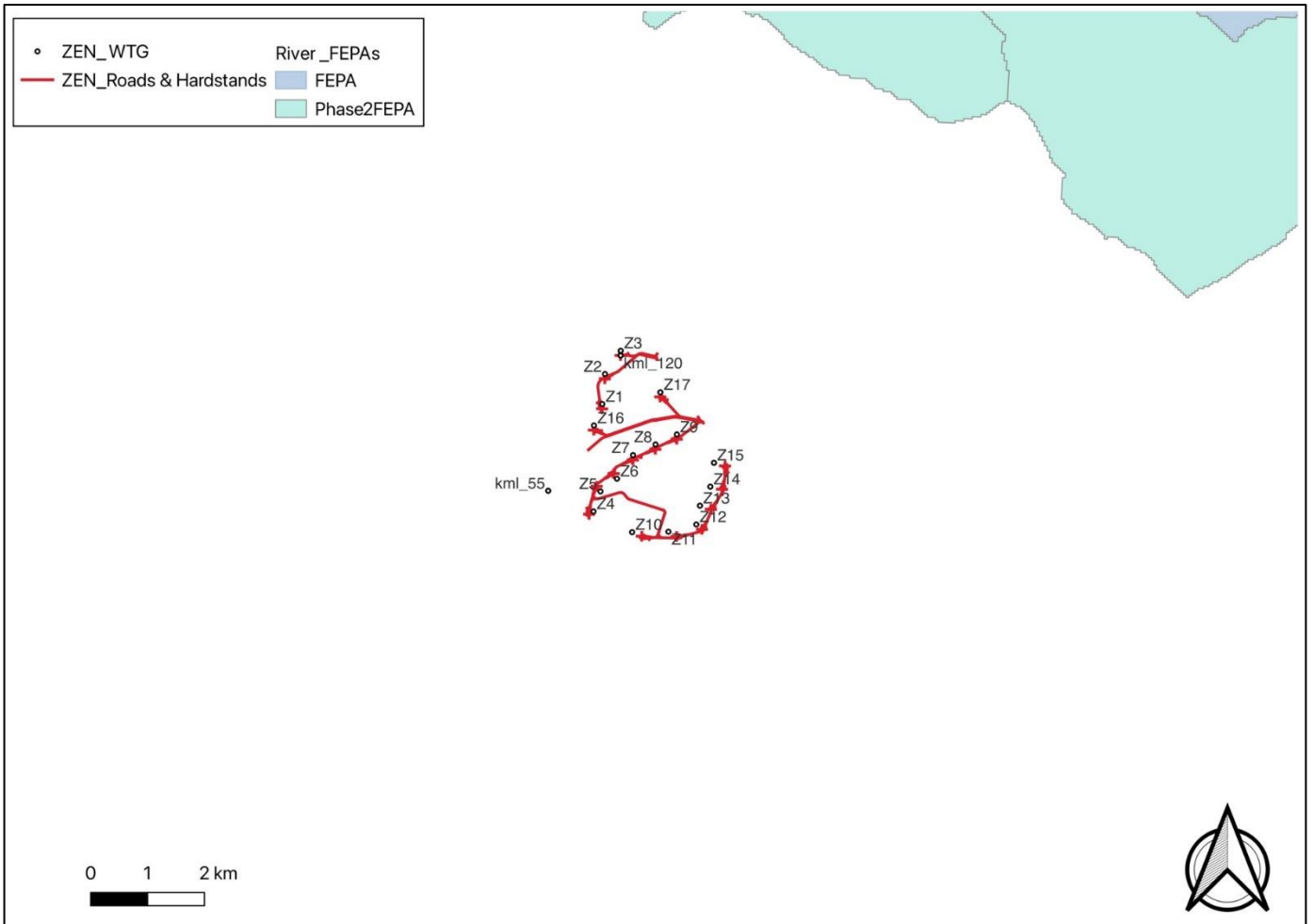
Overall, these wetland systems would be considered Largely Modified, however it is still important to protect these areas due to the vegetation and fauna still observed within these habitats. The ecosystem services function of the wetlands would thus also include the protection of the downstream riverine areas (Berg River) from higher levels of sediment and nutrient input if these wetlands were lost.

The National Wetland Inventory v5.2 spatial data (NWI) confirmed the presence of the wetland areas. The observed aquatic systems due to the overall habitat degradation in the region are not included in any and National Freshwater Ecosystems Priority Areas (NFEPA), Wetland Clusters or Strategic Water Resources Areas. These are however shown as Ecological Support Areas (ESA Type 2) in the Western Cape Biodiversity Spatial Plan (WCBSP) – Drakenstein Municipality. The downstream reach Berg River associated with the study area forms part of a Critical Biodiversity Area (CBA Type 1) in the WCBSP.

The only dense riparian vegetation was found along reaches of the Berg River, dominated by sedges and grasses (*Cynodon dactylon*, *Cyperus spp*, *Phragmites australis*) on the river edge, while tall trees on the steep banks were dominated by alien species (*Acacia mearnsii* & *Eucalyptus spp*). The wetland areas were dominated by sedges (*Ficinia littoralis*, *Juncus spp*) and various ruderal weeds and grass associated with the adjacent agricultural areas.

No aquatic species of special concern were observed within the development area during the time of the survey.





**Figure 5.3:** The respective sub quaternary catchments rated in terms of Freshwater Ecosystem Priority Areas (FEPAs) in relation to the development area.

**5.2.1. Present Ecology State, conservation importance and final sensitivity rating**

The Present Ecological State (PES) and the Ecological Importance and Sensitivity Scores (EIS) were based on the current state and function of the natural systems observed, or where systems contributed to the ecological character of the study area. These ratings were then translated in the respective sensitivity ratings of the various aquatic systems (High to Low), and used to prepare a sensitivity map, used in guiding the preparation of the layout.

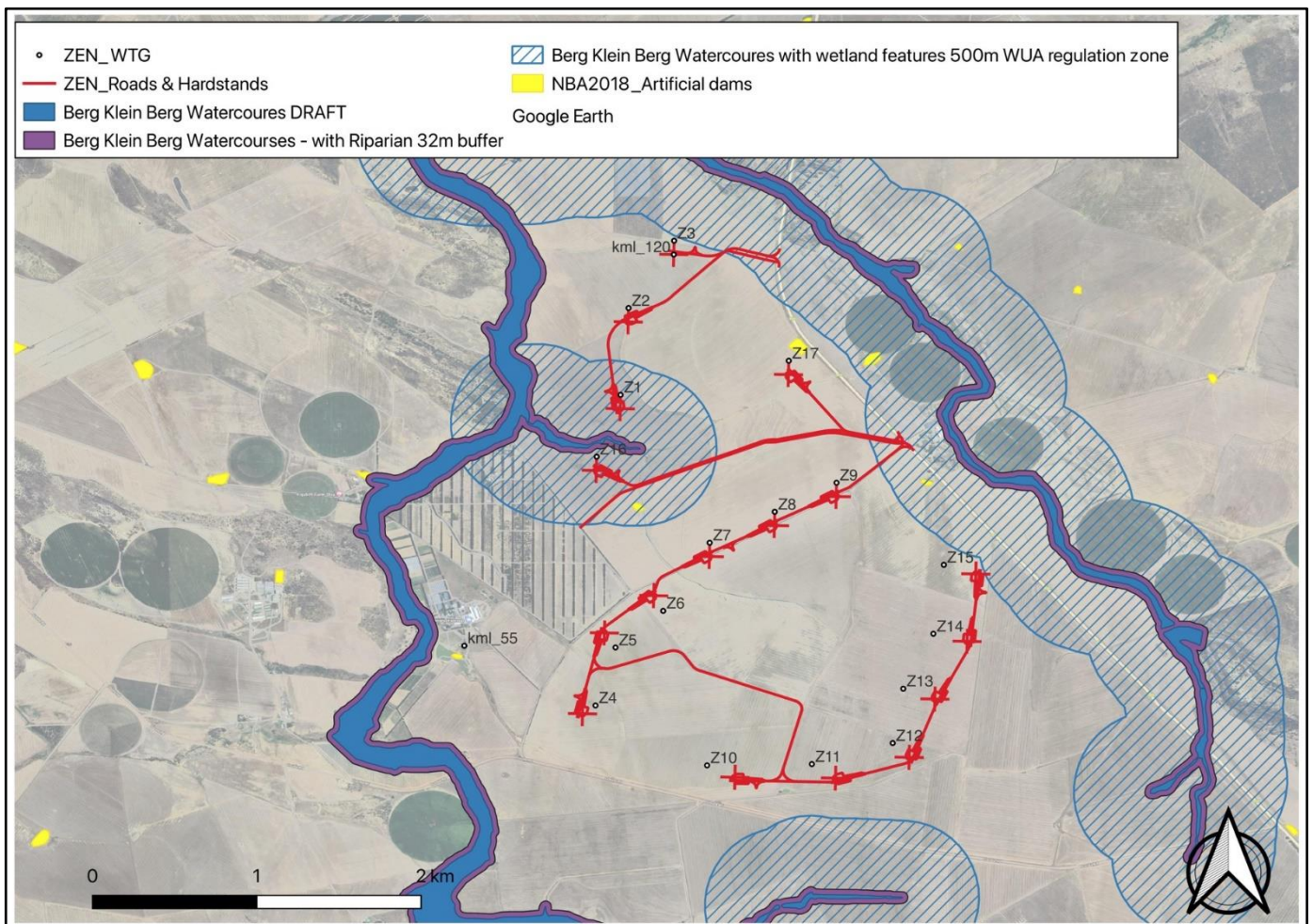
The following summary is present of the PES/EIS score of the natural wetlands found within the area and compared to the riverine sites (no specific wetlands were included) assessed in the water resource classes and resource quality objectives (Government Notice 695, 10 May 2019):

Feature Label	Hydrogeomorphic Type	Present Ecological Sate	Ecological Importance and Sensitivity	Overall Sensitivity	Buffer as per Macfarlane & Bredin (2017) Model
Berg River with riparian zones (alien vegetation)	Riverine	D (Gazetted PES = D for this riverine reach)	High	Moderate	100m

Valley Bottom Wetland 1	Valley Bottom Wetland (portions channelled)	D	Low	Moderate	35m
Klein Berg River	Riverine	D (Gazetted PES = D for this riverine reach)	High	Moderate	35m
Valley Bottom Wetland 2	Valley Bottom Wetland (portions channelled)	D	Low	Moderate	35m
Valley Bottom Wetland 3	Valley Bottom Wetland (portions channelled)	D	Low	Moderate	35m

In brief the observed systems within the study area are Largely Modified (PES = D), with a Moderate Ecological Importance and Sensitivity Score, which equates to a Moderate Sensitivity rating spatially.

The facility layout avoids the observed systems (inclusive of the associated buffers) as these areas corresponded to the Very High Sensitivity systems considered in the DFFE Screening Tool spatial data (refer to **Figure 5.4**).



**Figure 5.4:** Delineated wetlands (= Moderate sensitivity areas) and watercourses (= Moderate sensitivity areas) in relation to the activities, with buffers and the 500m regulated WULA zone.

### 5.2.2. Assessment of the Amended Facility Layout

The revised layout for the facility would result in a low impact on the aquatic systems after mitigation. Based on the findings of this study, no objection to the amendment of the revised facility layout as provided by the

developer. As the proposed activities have the potential to create erosion or impact on a freshwater system, the following recommendations are proposed to ensure are adequately included in the Environmental Management Programme (EMPr):

- » Vegetation clearing should occur in a phased manner in accordance with the construction programme to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment, and suitable dust and erosion control mitigation measures should be included in the EMPr to mitigate the impact.
- » All construction materials including fuels and oil should be stored in demarcated areas that are contained within berms / bunds to avoid the spread of any contamination / leaks outside of any delineated waterbodies and their buffers. Washing and cleaning of equipment should also be done in berms or bunds to trap any cement / hazardous substances and prevent excessive soil erosion. Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any watercourse
- » An Environmental Control Officer (ECO), with a good understanding of the local flora be appointed during the construction phase. The ECO must be able to make clear recommendations with regards to the re-vegetation of the newly completed / disturbed areas along aquatic features.
- » All alien plant re-growth must be monitored and should these alien plants reoccur these plants must be re-eradicated.
- » A comprehensive rehabilitation plan be implemented from the project onset within watercourse areas (including buffers) to ensure a net benefit to the aquatic environment.

### **5.2.3. Conclusion**

The proposed amendment will have Low impact significance ratings after mitigation. In addition to this, mitigation measures are required are to be add to the EMPr.

The amended facility layout for the Bergriver Wind Farm is considered suitable for development as the facility layout avoids the observed systems (inclusive of the associated buffers). The Specialist confirms the acceptability of the revised facility layout, which is intended for submission to and approval by DFFE.

### **5.3. Ecological Impact**

3Foxes Biodiversity Solutions, the Ecology specialist that conducted the original Environmental Impact Assessment (EIA), verified the acceptability of the revised facility layout considering the current state of the environment. A field survey was not required, as the project site is already transformed due to agricultural activity on the site, and there are no impacts on sensitive areas. The Ecology specialist statement is included as **Appendix C**.

the Zen Wind Farm includes a reduction in the number of turbines from 27 down to 17, but an increase in the road width from 6m to 8m. These would to some extent compensate for one another and the overall final footprint would decrease given that the substation has also been removed from the facility layout (the position of on-site facility substation has been optimised on the Bergriver site to enable a consolidated point of grid connection for the Zen/Bergriver wind farm cluster). The change reduces the extent of the development footprint, but remains fully within the assessed development area. No turbines are planned east of the R44 road. As such, the development would not result in an increase in the terrestrial footprint associated with the development. In addition, the project site is almost entirely transformed and the layout

does not impact any potentially sensitive areas. As a result, there are no assessed differences between the current layout and the original layout as assessed within the EIA and subsequent amendments.

### **5.3.1. Assessment of Amended Facility Layout**

The specialist report confirms that the impact rating, as provided in the initial assessment, remains valid. The mitigation measures provided in the initial assessment are still applicable. Measures for avoidance, management, and mitigation of impacts remain the same as those recommended in the original Environmental Impact Assessment (EIA). The proposed change falls within the assessed development footprint and does not introduce new or increased impacts. Cumulative impacts are considered to be the same as previously assessed, and the recommended mitigation and avoidance measures from the EIA still apply.

No changes are recommended for the Environmental Management Programme (EMPr), and all the mitigation and avoidance measures from the EIA are applicable to the amended layout.

### **5.3.2. Conclusion**

The change in the facility layout and the position of on-site facility substation associated with the proposed amendment to the Bergriver Wind Farm EA is supported from an ecological point of view as the change would not generate novel impacts or increase the severity of existing impacts associated with the development. No additional mitigation or avoidance measures, beyond those already recommended in the EIA study are required for the amendment. As such, there are no reasons to oppose the proposed amendment. In addition, the Specialist confirms the acceptability of the amended facility layout (for submission to and approval by DFFE), and that no additions/changes to the Environmental Management Programme (EMPr) are required.

## **5.4. Impacts on Soil and Agricultural Potential**

The original assessment was conducted and submitted by J.H. van der Waals of Terra Soil Science (January 2012). TerraAfrica Consult, the Soil and Agriculture specialist conducted a field survey on 11 April 2023 to verify the current status of the environment. This survey enabled the specialist to determine whether any changes have occurred since the initial assessment and provide a statement supported by a site verification survey. The Soil and Agriculture specialist report is included as **Appendix D**.

The results from the field survey confirm with the findings of the assessed EIA with regarding the dominant soil forms. Most areas where the amended layout will impact on the soil surface, consists of a combination of Mispah and Glenrosa soil. The agricultural potential assigned to these soil forms during the assessed EIA, also remains the same. The proposed amended layout of the Zen Wind Farm was evaluated and the new infrastructure layout will fall either on soils with High agricultural potential (according to the delineation by Van der Waals, 2012) or Medium agricultural potential. During the site visit, the landowner was applying soil amendments to maintain or improve the agricultural potential of the soils. The amended layout of the project's infrastructure will affect land with Medium and High agricultural sensitivity as can be seen in **Figure 5.5**. No areas with Very high sensitivity are affected by the infrastructure.

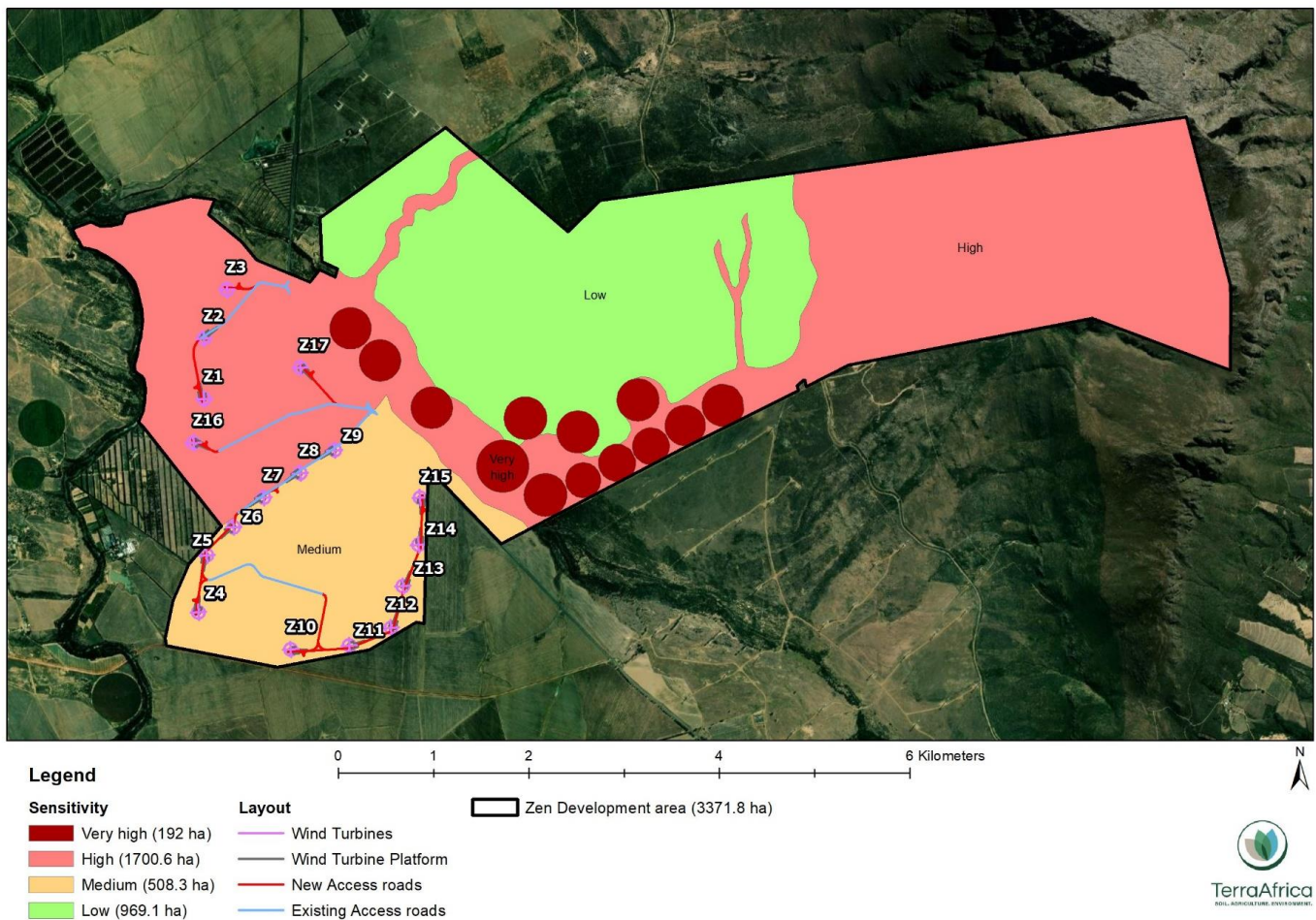
The site verification survey confirmed that the land use within the project site has remained the as in the assessed EIA. The dominant land use is still rainfed wheat production with cattle farming as secondary land

use and old wheat stalks that remained in the fields after the previous harvest, were observed. There are centre pivot irrigated fields located east of the Klein Berg River and these pivots are mainly used for the production of pastures. All the infrastructure components of the amended layout is either located in the fields where wheat produced on the western side of the project site (west of the R44), or are access roads that already existed. No new access roads have been constructed within the project site.

**5.4.1. Assessment of Amended Facility Layout**

The impact rating provided in the assessed EIA remains valid and is still applicable. No additional impacts or change in impact significance will occur because of this amendment. No additional mitigation and management measures are required because of the proposed amendment to the facility layout.

The sensitivity analysis of the assessed EIA classified the Zen Wind Farm into three different categories of agricultural sensitivity which included Low, Medium and High. **Figure 5.5** shows the amended facility layout remains within the Medium and High sensitivity. The amended layout avoids all the Very High agricultural sensitivity areas. Turbines located within areas with soils of high sensitivity are considered acceptable for development (refer to allowable limits as discussed below). In addition, roads existing in this area, and can be readily used for accessing the planned turbine locations.



**Figure 5.5:** Amended layout for the Zen Wind Farm superimposed on the verified sensitivity

The verified sensitivity delineation of the surface footprint area differs from the agricultural sensitivity as provided by the screening tool. According to the screening tool, the largest part of the area consists of land with High agricultural sensitivity because of rainfed crop cultivation and Moderate-High (Class 09 and 10) land capability. The baseline information on soil and agricultural potential as discussed above, only partially agrees with this rating and indicates that the southern part of the site should rather be rated as Medium sensitivity.

### **Allowable development Limits**

All infrastructure of the amended layout is located in crop fields with either High or Medium agricultural sensitivity. The surface footprint of the amended layout that must be considered for the allowable development limits, is 8.96ha. This consists of 17 wind turbines with each wind turbine platform about 400m<sup>2</sup>, affecting a total area of 6800m<sup>2</sup>. It includes for the permanent width (8m) of the 8785m new access roads (total area of 7.0ha) as well as widening of existing access roads from 6m to 8m (1.26ha) but excludes the temporary widening of the new and existing access roads to 10m as this will only be required during the construction phase.

The results of the calculations showed that the amended infrastructure layout is within the Allowable Development Limits for a project that generates 120MW of energy refer to **Table 5.8**.

**Table 5.8:** Calculated allowable development limits for amended infrastructure layout of the Zen Wind Farm

<b>Sensitivity class</b>	<b>Area that will be affected by development footprint (ha)</b>	<b>Allowable limit (ha/MW)</b>	<b>Area allowed for a 120 MW development (ha)</b>	<b>Area that exceeds allowable limit (ha)</b>
Very High	0.00	0.00	0.00	0.00
High/Medium (within crop field boundaries)	8.96	0.20	22.40	0.00

Even if the construction phase footprint is considered, i.e., the temporary widening of both new and existing access roads with 2m (to reach a width of 10m) as well as the temporary facilities of 7.2ha, the project footprint is still within the allowable development limits, the total area affected during the construction phase will be 14.51ha.

### **5.4.2. Conclusion**

The amended layout of the Zen Wind Farm is considered an acceptable change of the original layout, from the perspective of the project's impact on the agriculture resources of the area. The statement follows the consideration of the amended layout of Zen Wind Farm, as well as confirmation that all baseline conditions remained the same as during the original assessment. The baseline conditions remain unchanged since the original assessment and the infrastructure footprint still affects land with High and Medium agricultural sensitivity.

The impact rating, as provided in the original assessment, remains valid and the mitigation measures provided in the initial assessment are still applicable. During this assessment, the cumulative impacts as a result of this project as well as other similar projects in the area, were rated and mitigation measures provided. Apart from the mitigation and management measures for cumulative impacts, no additional mitigation and management measures are required to be included for the management of agricultural and soil impacts in the Environmental Management Programme (EMPr).

The amended layout to 17 turbines will have a reduced effect on the significance of impacts identified in the EIA report, as the surface footprint of the amended layout is smaller than the footprint of the original layout. In addition, the project development footprint is within the allowable development limits and meets the requirements of GNR 320 (not applicable at the time of the original assessment). The amended facility layout is supported.

In addition, the Specialist confirms the acceptability of the amended facility layout (for submission to and approval by DFFE), and that no additions/changes to the Environmental Management Programme (EMPr) are required.

### **5.5. Impacts on heritage (including Archaeology and Palaeontology)**

CTS Heritage, the Heritage specialist that conducted the original Environmental Impact Assessment (EIA), conducted a field survey on 19 April 2023 to verify the current status of the environment. This survey enabled the specialist to determine whether any changes have occurred since the initial assessment and provide a statement supported by a site verification survey. The Heritage specialists report is included as **Appendix E**. This report includes the assessment and findings for the archaeology walkdown, heritage as well as palaeontology study on the Zen Wind Farm (as well as the adjacent Bergriver Wind Farm site).

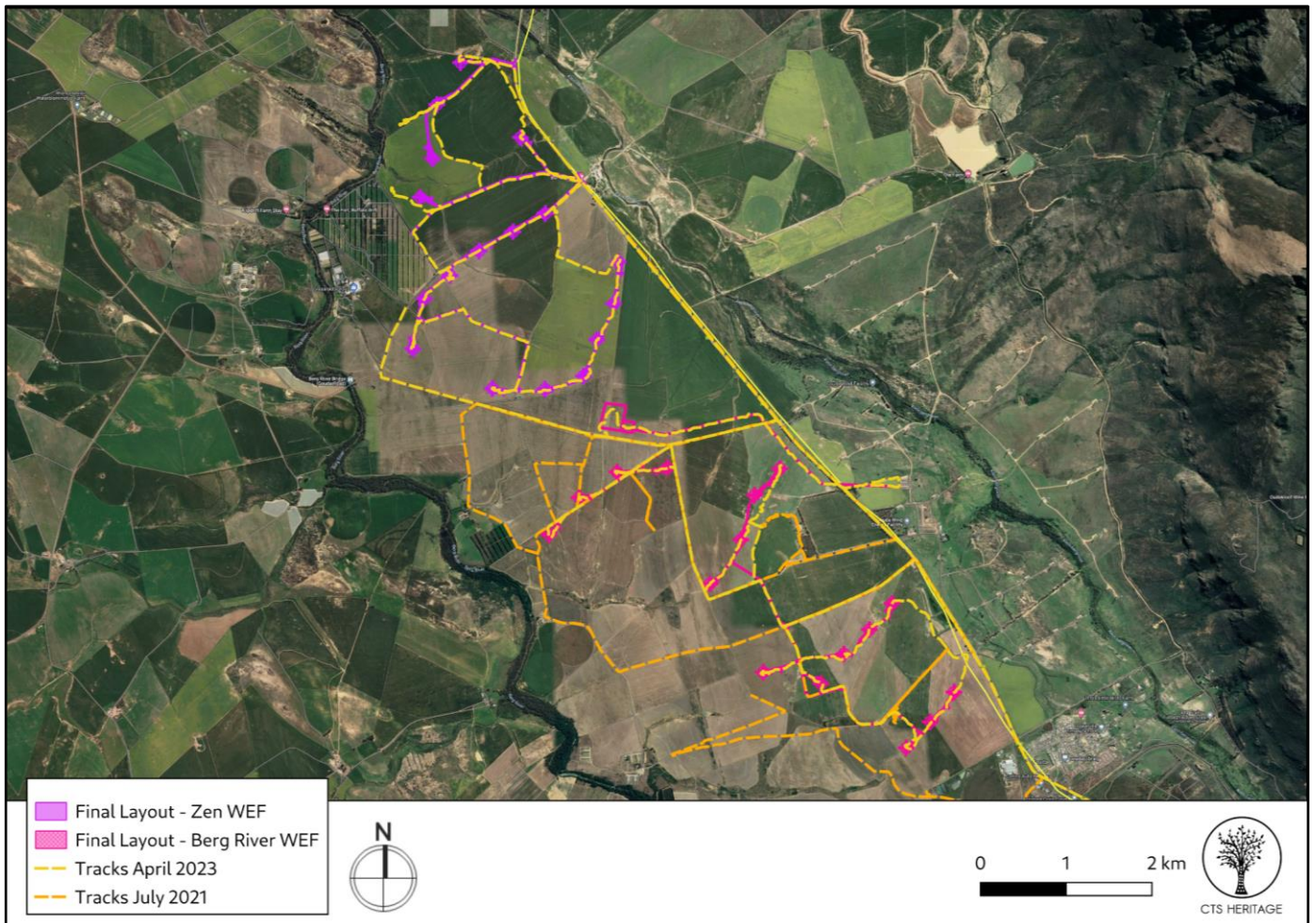
#### **Archaeology Walkdown**

The Berg River alluvial terraces contain Early and Middle Stone Age artifacts, indicating human occupation for over a million years. However, the proposed development is not expected to directly impact these resources.

The presence of Early Stone Age artifacts varied across locations, and while they are generally considered to have little heritage conservation value, certain areas with high artifact densities may require mitigation if disturbed. Middle Stone Age artifacts were sparsely represented in the landscape. Two small Late Stone Age scatters were found on the banks of the Berg River.

The survey was conducted after the harvest, several scatters of early Middle Stone Age (MSA) artifacts were found throughout the study area. The majority of the artifacts were made from local quartzites sourced from the Klein Berg and Berg Rivers, with a smaller percentage made from quartz. These artifacts have undergone significant disturbance due to wheat cultivation and lack primary context. However, their presence contributes to the overall understanding of the distribution of these scatters in the area.

These findings align with the previous assessment conducted by CTS Heritage and Orton (2012) in terms of the types of tools identified. No engravings or graves were found within the development footprint, and the built structures consisted of modern cattle farming infrastructure, farm roads, jeep tracks, and fences.



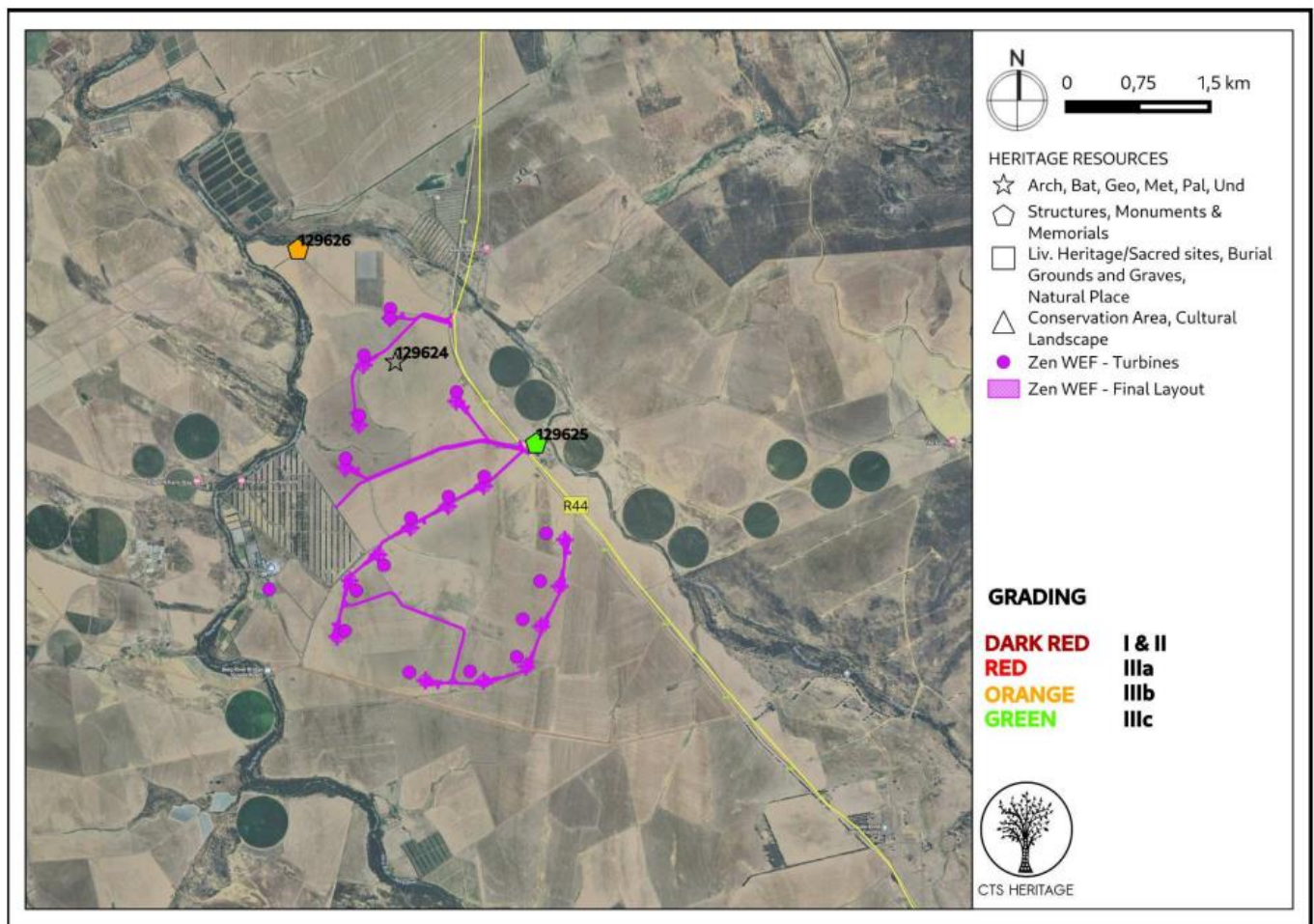
**Figure 5.6:** Overall track paths of foot survey from both 2021 (orange) and 2023 (yellow)

**Table 5.8:** Summary of observations noted during the field assessment completed in April 2023

POINT ID	Description	Type	Period	Density	Co-ordinates	Grading	Mitigation
001	Quartzite cobble core	Artefacts	MSA	0 to 5	-33.28475 19.010343	NCW	NA
002	Early MSA quartzite core, ~30% cortex	Artefacts	MSA	0 to 5	-33.284664 19.010927	NCW	NA
003	More Early MSA – core with several dorsal scars	Artefacts	MSA	0 to 5	-33.284544 19.011048	NCW	NA
004	Quartzite flake with hinge terminations	Artefacts	MSA	0 to 5	-33.284597 19.011295	NCW	NA
005	Quartzite radial core	Artefacts	MSA	0 to 5	-33.284787 19.012448	NCW	NA
006	Quartzite cores, flakes	Artefacts	MSA	5 to 10	-33.2849 19.014262	NCW	NA
007	Quartzite core	Artefacts	MSA	0 to 5	-33.283356 19.017041	NCW	NA
008	Early MSA quartzite flakes, cores	Artefacts	MSA	5 to 10	-33.285886 19.007322	NCW	NA
009	Quartzite cobble core with flake scars	Artefacts	MSA	0 to 5	-33.292512 19.023577	NCW	NA
010	Core, quartzite	Artefacts	MSA	0 to 5	-33.291392 19.026057	NCW	NA
011	Various quartzite flakes, prep. Platforms	Artefacts	MSA	5 to 10	-33.271187 19.002687	NCW	NA
012	Quartzite flake	Artefacts	MSA	0 to 5	-33.269405 19.004586	NCW	NA
013	Hammerstone and point, quartzite	Artefacts	MSA	0 to 5	-33.270259 19.003185	NCW	NA
014	Large silcrete core with several scars, partial radial core. Quartzite cores, flakes	Artefacts	MSA	5 to 10	-33.269452 19.004096	NCW	NA
015	Quartzite cores, flakes	Artefacts	MSA	5 to 10	-33.26805 19.005048	NCW	NA



016	Quartzite core	Artefacts	MSA	0 to 5	-33.267244	19.005452	NCW	NA
017	Quartzite cores, flakes	Artefacts	MSA	5 to 10	-33.265673	19.006568	NCW	NA
018	Quartzite flake, dorsal spine and hinge termination	Artefacts	MSA	0 to 5	-33.256998	18.971708	NCW	NA
019	Radial core, cores, flakes, quartzite	Artefacts	MSA	10 to 30	-33.235169	18.98188	NCW	NA
020	Quartzite cores and flakes in ploughed area	Artefacts	MSA	5 to 10	-33.246404	18.986436	NCW	NA
021	Quartzite cores	Artefacts	MSA	0 to 5	-33.238093	18.97879	NCW	NA
022	Flakes and cores, quartzite	Artefacts	MSA	5 to 10	-33.254991	18.982999	NCW	NA
023	Quartz flake, quartzite core	Artefacts	MSA	0 to 5	-33.245035	18.965898	NCW	NA
024	Quartzite cobbles and cores	Artefacts	MSA	5 to 10	-33.24061	18.973141	NCW	NA
025	Quartzite flakes	Artefacts	MSA	0 to 5	-33.237265	18.960932	NCW	NA
026	More Early MSA cobbles, cores, flakes	Artefacts	MSA	5 to 10	-33.237454	18.964205	NCW	NA
027	Quartzite flakes and cores	Artefacts	MSA	0 to 5	-33.228679	18.95989	NCW	NA
028	Quartzite core flakes, point	Artefacts	MSA	0 to 5	-33.222156	18.969463	NCW	NA
029	Quartzite core and flakes	Artefacts	MSA	5 to 10	-33.229726	18.974679	NCW	NA



**Figure 5.7:** Map of heritage resources identified during the field assessment relative to the amended facility layout/s.

### **5.5.1. Assessment of Amended Facility Layout**

The EIA indicated that the archaeological resources in the area are mainly of low significance and not conservation-worthy. The layout amendment is not expected to have a significant negative impact on these resources, and even if some Stone Age material is disturbed during construction, the overall impact is considered inconsequential. Therefore, the initial assessment's indication that the impact on archaeological heritage resources is low and inconsequential remains valid based on the new information from the recent surveys.

The initial assessment provided adequate mitigation measures which are likely to still be applicable, as the impact rating remains low. These measures include careful excavation and monitoring during construction to minimize any potential damage to archaeological resources, as well as guidelines for protecting any significant finds that might be encountered during the development process.

The field survey undertaken as part of the Archaeology walkdown indicated that the development area has a low to moderate sensitivity palaeontology impact based on the geological sediment as it was in the assessed EIA. There is no indication of significant palaeontological heritage resources in the area, and no further assessments are recommended.

The impact on cultural heritage, including historic settlements, scenic routes, and cultural landscapes, is expected to be negligible due to the development's location within an existing wind farm cluster with pre-existing electrical infrastructure. However, measures to minimize potential impacts on identified cultural heritage sites should still be considered in the assessed EIA. Therefore, the impact rating as provided in the initial assessment remains valid and mitigation measures provided in the initial assessment are still applicable.

The cumulative impacts resulting from this project and other similar projects in the surrounding environment have been considered, and the existing mitigation measures are deemed adequate to manage these impacts. It is unlikely that the amendment to the Zen Wind Farm layout will negatively impact archaeological resources, palaeontological resources or the cultural landscape of the broader Riebeeck Valley. As such, it is recommended that no further heritage assessments are required for this proposed amendment in terms of section 38 of the NHRA.

Overall, the impact rating of low significance and the existing mitigation measures can be reaffirmed based on the provided information. However, additional measures to handle any new discoveries should be included in the EMP to ensure proper protection and documentation of any significant archaeological resources found during the development.

### **5.5.2. Conclusion**

The amended facility layout for the Zen Wind Farm is considered an acceptable change from the perspective of the project's impact on the heritage and archaeological resources of the area. The original impact rating, which indicated low to moderate sensitivity for impacts on palaeontology and negligible impact on cultural heritage, remains valid. No additional mitigation and management measures are required to be included in the Environmental Management Programme (EMP) regarding heritage and archaeological resources impacts.

The Specialist confirms the acceptability of the revised facility layout, which is intended for submission to and approval by DFFE.

## 5.6. Visual Impact

LoGIS, the visual specialist that conducted the original Environmental Impact Assessment (EIA), verified the acceptability of the revised facility layout considering the current state of the environment. A field survey was not required, as the description of the affected environment, as described in the original VIA report remains unchanged. There has been no change in land use for the proposed development site, no new developments have been constructed on or near the development site, and the land use zonation (agriculture) remains the same. The Visual specialist statement is included as **Appendix F**. This statement confirms the status of the environment compared to that at the time of the original assessment.

### 5.6.1. Assessment of Amended Facility Layout

The proposed amendment to the project infrastructure is not expected to significantly alter the influence of the wind farm on *areas of higher viewer incidence* (observers traveling along the roads within the region) or *potential sensitive visual receptors* (residents of homesteads in closer proximity to the facility). No additional sensitive visual receptors are located within the area of increased visual exposure. The increased area of visual exposure does not include any additional exposure to major roads within the study area. The location of La Gratitude, Kleinbergvrievier and La Bonne Esperance on properties earmarked for existing or potential wind energy facility developments reduces the probability of this impact occurring. The residents of Saron have not objected to the development of the wind energy facility, and the residential (built-up) nature of the town is expected to contain the visual impact to acceptable levels. It is therefore expected that the wind turbine structures, taking into consideration the reduction in the number of turbines, would be equally visible and noticeable from both the roads and homesteads.

This proposed amendment to the project infrastructure is not expected to significantly alter the influence of the WEF on *areas of higher viewer incidence* (observers traveling along the roads within the region) or *potential sensitive visual receptors* (residents of homesteads in closer proximity to the facility). Turbines will still be visible, albeit that there will be fewer turbines clustered to the west of the R44 road. The placement of all of the Zen Wind Farm turbines west of the R44 arterial road is preferred from a visual perspective.

The proposed amendment to the project infrastructure (turbine locations as well as the removal of the on-site facility substation) is consequently not expected to influence the anticipated visual impact, as stated in the original VIA report (i.e. the visual impact is expected to occur regardless of the amendment). This statement relates specifically to the assessment of the visual impact within a 5km radius of the wind turbine structures (potentially *high* significance), but also generally apply to potentially *moderate* to *low* visual impacts at distances of up to 30km from the structures.

From a visual perspective, the proposed amendment will therefore require no (zero) changes to the significance rating within the original visual impact assessment report that was used to inform the approved EIA. In addition to this, no new mitigation measures are required.

There are no new assessment guidelines which are now relevant to the authorised development which were not undertaken as part of the initial visual impact assessment. Additional to this, and as stated above, there

have been no changes to the environment of the proposed development site or the surrounding environment.

### **5.6.2. Cumulative visual impact**

The Zen Wind Farm is located immediately north-west of the operational Gouda Wind Farm (an existing visual disturbance). The close proximity of these two wind farms to each other is considered to consolidate and concentrate the wind energy generation infrastructure within this locality, as opposed to scattering it throughout the region (i.e. if they were placed beyond a 5km radius of each other). The placement of all of the Zen Wind Farm turbines west of the R44 arterial road is also preferred and the cumulative visual impact is deemed to be of an acceptable level.

Notwithstanding this statement, this landscape (based on the scenic nature of the receiving environment, the presence of declared scenic mountain ranges, proclaimed protected areas, and the number of potentially affected sensitive visual receptors located within the study area), has fast approached its capacity or threshold to accommodate wind energy infrastructure (in terms of visual quality and landscape character of the area). This statement considers and takes into account the wind turbines from the existing Gouda Wind Farm, as well as the potential future wind turbine structures associated with the Zen Wind Farm and the Zen Wind Farm. Cumulative visual impacts are assessed as acceptable, but the construction of any additional Wind Farms may exacerbate the potential for significant impact.

### **5.6.3. Conclusion**

The proposed amendment will require no changes to the impact significance ratings as stated within the original VIA report which was used to inform the approved EIA. The amended layout is supported. In addition to this, no new mitigation measures are required.

The Specialist confirms the acceptability of the amended facility layout (for submission to and approval by DFFE), and that no additions/changes to the Environmental Management Programme (EMPr) are required.

## **5.7. Noise impact**

M2 Environmental Connections cc now known as Enviro Acoustic Research, the Noise specialist that conducted the original Environmental Impact Assessment (EIA), was appointed to verify the current status of the environment. Field survey was not required as the description of the affected environment, as described in the original VIA report remains unchanged. The Noise specialist report is included as **Appendix G**.

There is a low significance rating for a cumulative noise impact to occur during the operational phase (the same finding as the per the 2022 noise assessment). The impact rating as provided in the initial assessment remains valid as well the mitigation measures provided in the assessed EIA are still applicable.

### **5.7.1. Assessment of the Amended Facility Layout**

The overall impact rating provided in the assessed EIA remains valid and is still applicable. No additional impacts or change in impact significance will occur because of this amendment.

The significance of the noise impact will be of a low significance for both daytime and nighttime construction activities and additional mitigation measures are not required or recommended. However, night-time construction activities may generate noises at a sufficient level to be annoying to some NSR and this assessment include recommendations that may reduce annoyance with night-time construction activities.

The noise report considers the potential noise impact on the surrounding environment due to the construction, operational and future decommissioning activities associated with the Project. It makes use of conceptual scenarios to develop noise propagation models to estimate potential noise levels. Considering the ambient sound levels measured onsite, the proposed noise limits as well as the calculated noise levels, it was determined that the significance of the potential noise impacts would be:

- » of a low significance for the construction of access roads. The potential impact associated with the construction of the access road was not previously assessed as the road layout was not available;
- » of a low significance relating to noises from construction traffic. The potential impact associated with construction traffic passing NSR was not previously assessed as the road layout was not available;
- » of a low significance for the daytime construction activities (hard standing areas, excavation and concreting of foundations and the assembly of the WTG and other infrastructure). This is the same finding as the per the 2019 comparative noise assessment;
- » of a potential low significance for the night-time construction activities (the potential pouring of concrete, erection of WTG). Night-time construction activities were not specifically assessed in the 2019 comparative assessment;
- » of a low significance for daytime operational activities (noises from wind turbines) when considering the worst-case SPL. Night-time construction activities were not specifically assessed in the 2019 comparative assessment; and
- » of a medium significance for night-time operational activities (noises from wind turbines) when considering the worst-case SPL. This is a higher significance than the low significance determined in the 2019 comparative noise assessment, with the significance mainly relating to the use of a WTG with a higher SPL. Mitigation is available to reduce the noise level as well as the potential significance of the noise impact.

The EMPr for the Zen Wind Farm sufficiently captures the mitigation and post-construction monitoring requirements for impacts from noise. The following amendment to the Zen Wind Farm the following EMPr are recommended:

- » The applicant re-evaluate the noise impact should the layout be further revised where:
  - any WTG, located within 1,500 m from a confirmed NSR, are moved closer to the NSR;
  - the number of WTG within 2,000m from an NSR are increased.
  - if the final make and model of the WTG is different from the WTG assessed in this report
- » Design and implement a noise monitoring program, measuring ambient sound levels before construction activities start, as well as during the operational phase (recommended at NSR01/02/03, NSR 17/18, NSR26/28, NSR04, NSR05/06 and NSR14);
- » Ensure that mobile heavy equipment is well maintained and fitted with the correct and appropriate noise abatement measures. Engine bay covers over heavy equipment could be pre-fitted with sound absorbing material. Heavy equipment that fully encloses the engine bay should be considered, ensuring that the seam gap between the hood and vehicle body is minimised;

- » Include a component covering environmental noise in the Health and Safety Induction to sensitize all employees and contractors about the potential impact from noise, especially those employees and contractors that have to travel past receptors at night, or might be required to do work close (within 1,000m) to NSR at night. This should include issues such as minimising the use of vehicle horns;
- » Investigate any reasonable and valid noise complaint if registered by a receptor staying within 2,000 m from the location where construction activities are taking place, or where night-time construction activities are required, or where an operational WTG are located. A complaint register, keeping a full record of the complaint, must be kept by the applicant;
- » With regard to unavoidable noisy night-time construction activities in the vicinity of NSR (closer than 1,000m from any identified NSR), the contractor and Environmental Control Officer (ECO) must liaise with local NSR on how best to minimise impact and the NSR must be kept informed of the nature and duration of intended activities; and 8. where practicable, mobile equipment should be fitted with broadband (white-noise generators/alarms 34 35), rather than tonal reverse alarms.

### **5.7.2. Cumulative noise impact**

NSR14 and NSR116 are located between the WTG of the proposed Zen Wind Farm and Bergrivier Wind Farm, and there is a cumulative impact at these NSR. Total cumulative noise levels however will be well less than 45 dBA at these NSR and of a low concern.

Noises from other wind farms within 35 km will have an insignificant influence on the noise levels at the NSR.

### **5.7.3. Conclusion**

Active noise monitoring is recommended because the projected noise levels are more than 38.7 dBA (the level defined by the WHO where noise levels from WTG may become annoying) for the layout and WTG as assessed in this report. Noise levels may be higher than 45 dBA at certain NSR for a WTG with an SPL similar to the Nordex N163/5.X (109.2 dBA re 1 pW).

From an acoustic perspective the reduction in turbine numbers and the amended facility layout is acceptable subject that the applicant implements mitigation measures to ensure total noise levels less than 45 dBA at NSR used for residential purposes. It is recommended that the changes to the Zen Wind Farm facility layout be authorised. Additional mitigation measures are included in this comparative assessment (compared to the 2019 noise report), due to the change in layout as well as the use of a WTG with a higher SPL.

The amended facility layout for the Zen Wind Farm is considered suitable for development. The Specialist confirms the acceptability of the revised facility layout, which is intended for submission to and approval by DFFE. An amendment to measures for avoiding, managing, and mitigating impacts resulting from the proposed changes, and the additions/changes to the Environmental Management Programme (EMPr) have been provided.

## **5.8. Socio-economic**

Tony Barbour was the specialist for the original SIA (Social Impact Assessment) for the Zen Wind Farm and also verified the current status of the environment. A field survey was not required as the project area has not changed since the EIA (Environmental Impact Assessment) was undertaken. The Social specialist's

statement is included as **Appendix H**. This statement confirms the status of the environment compared to that at the time of the original assessment.

#### **5.8.1. Assessment of the Amended Facility Layout**

There are no changes to the significance ratings reflected in the SIA undertaken by Social Impact Assessors 2013 as a result of the change to the facility layout. In this regard the:

- » The social issues identified and associated impact ratings for the construction and operational phase contained in the 2013 SIA (Barbour and van der Merwe 2013) remain valid for the Zen Wind Farm. The associated mitigation measures remain applicable.
- » The mitigation and enhancement measures listed in the 2013 SIA (Barbour and van der Merwe 2013) remain valid for the Zen Wind Farm. No additional management outcomes or mitigation measures in terms of social impacts are therefore required.

The findings of the SIA undertaken by Social Impact Assessors in 2013 and associated enhancement and mitigation measures therefore remain valid.

#### **5.8.2. Conclusion**

Based on the experience of the author the findings of the SIA undertaken in 2013 remain valid for the reduced number of wind turbines and the change to the facility layout. The enhancement and mitigation measures listed in the 2013 SIA also remain valid. The application for the Zen Wind Farm, including the reduction and reposition of turbines, is acceptable and supported from a social and socio-economic perspective.

The conclusion drawn by the specialist is that the environment has not significantly changed since the undertaking of the EIA, and it can be concluded that the proposed amendments will not lead to any additional impacts other than those identified and assessed within the EIA. The amendments will not increase the significance of the impacts originally identified and assessed in the EIA or lead to any additional impacts that cannot be mitigated to a low significance following the implementation of the recommended mitigation measures. The mitigation measures recommended in the EIA are adequate to manage the expected impacts as a result of the proposed amendments. No additional mitigation measures are recommended as a result of the proposed amendments.

## 6. ADVANTAGES AND DISADVANTAGES OF THE PROPOSED AMENDMENTS

In terms of Regulation 32(1)(a)(ii), this section provides details of the advantages and disadvantages of the proposed amendment.

The amended layout considering these amendments is illustrated in **Figure 2.1**. The amended Zen Wind Farm facility layout and sensitivity map is presented in **Figure 2.2** (map ref: Zen Wind Farm Amended Layout Rev2 July'23). The following is included on the amended facility layout map/s:

- » 17 wind turbines, all located on the farm portions west of the R44.
- » Internal access roads linking wind turbines and other infrastructure on the Zen Wind Farm site.

### 6.1. Advantages of the Amended Facility Layout

The repositioning and reduction in the number of turbines, coupled with road and cabling infrastructure adjustments, ensures that the wind farm layout is optimised to both maximise operational efficiency and remain outside of identified sensitive areas. This comprehensive approach allows for a more sustainable and effective utilisation of the wind energy resources while minimising the potential for environmental impacts. The following applies:

- **Decreased development footprint:** The Zen Wind Farm amended facility layout reduces the number of the wind turbines as assessed in the EIA, as well as subsequent amendments (from the original 46 turbines, to 27 turbines, to now 17 turbines). This is a reduction of 29 turbines from the original assessment, and a reduction of 10 turbines from the 2019 amendment assessment. This change significantly reduces the area occupied by the development footprint. This change is facilitated by the change in turbine technology, which allows for a larger wind turbine generator to be installed, using the same turbine specifications as already authorised. As the major change to the Zen Wind Farm in terms of the amendment is the reduction in the number of turbines resulting in a decreased footprint, the changes can be seen as neutral or positive (advantage) to the social and biophysical environment. There are no disadvantages of the amended layout as compared to original layout. No high sensitivity areas were impacted by the amended layout, and as a result no new impacts were identified.
- **Area occupied:** The facility layout has 10 turbines less than the previously authorised layout, and no turbines are located to the east of the R44, which included more sensitive environments such as natural and semi-natural areas, elevated terrain, and irrigated centre pivots.
- **Sensitive areas avoidance:** The repositioning takes into account all identified sensitive areas, and the optimised turbine locations avoid infringement on sensitive ecosystems, habitats, or heritage sites.
  - Changes from the initial turbine layout are expected to reduce the likelihood of collision mortalities for both birds and bats as all turbines associated with the Zen Wind Farm are now placed at least 500m away from rivers and their riparian vegetation, leading to a reduction in both the likelihood and severity of this anticipated impact.
  - The location of all associated infrastructure includes existing roads (dark brown) and the new planned roads (light brown), and the amended location for the facility substation is provided. There is no substation position (as this infrastructure will be shared with the Bergriver Wind Farm).
  - The facility layout avoids the observed aquatic/freshwater systems (inclusive of the associated buffers)
  - As the project site is already transformed due to agricultural activity on the site, and there are no impacts on sensitive ecological areas.



- The amended facility layout avoids all the High agricultural sensitivity areas, and is well within the allowable development limits.
- There are no impacts on sensitive Heritage sites or areas.
- **Significance of impacts:** The amended facility layout does not introduce any new impacts or increase the significance of impact already identified.
- **Operational efficiency:** The repositioning aims to maximise the operational efficiency of the wind farm. This involves analyzing factors such as wind patterns, terrain conditions, and potential obstructions. By strategically placing the turbines in areas with optimal wind resources and minimal obstructions, the overall energy production of the wind farm can be enhanced. The operational efficiency can be achieved with no change to the authorised specifications of the wind turbines.
- **Infrastructure adjustments:** Along with reduction in number and the repositioning the turbines, the new design also involves making necessary changes to associated infrastructure. The use of existing roads as far as possible has been achieved. The revised layout also takes into consideration the ideal point of connection to the grid, which is a direct connection to the adjacent authorised 132kV Bergriver facility substation. The project will also utilise combined construction infrastructure (temporary facilities, laydown areas, batch plants) to be shared with the adjacent Bergriver Wind Farm to further reduce the overall impacts of the project.

## 6.2. Disadvantages of the Amended Facility Layout

Based on the minor changes in the facility layout, there are no disadvantages identified.

Based on the above, it can be concluded that the advantages of the proposed change outweigh the disadvantages from an environmental and technical perspective.

## 7. REQUIREMENTS FOR ADDITIONAL MITIGATION AS A RESULT OF THE PROPOSED AMENDMENTS

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As required in terms of Regulation 32(1)(a)(iii), consideration was given to the requirement for additional measures to ensure avoidance, management and mitigation of impacts associated with the proposed change. From the specialist inputs provided into this amendment motivation, it is concluded that the mitigation measures proposed within the EIA would be sufficient to manage potential impacts within acceptable levels. Updated mitigation measures are however provided by the avifauna, bat, aquatic and noise specialists as follows:

### **Birds and Bats**

- » The EMPr must specifically include the necessity for post-construction avifauna and bat monitoring as stipulated in Jenkins et al. (2015) and Aronson et al. (2020) respectively. Currently, only Jenkins et al. (2015) is referred to.
- » Update requirements for bat fatality monitoring and reporting to be in line with that required by Aronson et al (2020) or refer directly to this reference to be implemented. Currently the EMPr does not appropriately stipulate the requirements for operational bat fatality monitoring and must include at minimum the following statement: "post-construction bat monitoring must take place and must be fully compliant with Aronson et al. (2020)".
- » Include the mitigation options of using technology-assisted management of SOD ("Smart System" from Wildlife Acoustics), to limit bat collision fatalities as described above (currently only available for birds).
- » Update reference for MacEwan et al. (2018) to the latest edition: MacEwan, K., Aronson, J., Richardson, K., Taylor, P., Coverdale, B., Jacobs, D., Leeuwener, L., Marais, W. and Richards, L. 2020. South African Bat Fatality Threshold Guidelines- 3rd ed. South African Bat Assessment Association.
- » Update "Objective 4: Protection of bat species" under "Mitigation: Action/control" to include the following statement: "Develop and implement a post-construction bat monitoring programme which includes carcass searches for bats during the first two years of operation, to be fully compliant with Aronson et al. (2020). Should post- construction fatality monitoring reveal high levels of fatality, automated real-time bat monitoring and analysis systems are recommended as the primary method for automated and near-real-time bat fatality mitigation".

### **Aquatic**

- » Vegetation clearing should occur in a phased manner in accordance with the construction programme to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment, and suitable dust and erosion control mitigation measures should be included in the EMPr to mitigate the impact.
- » All construction materials including fuels and oil should be stored in demarcated areas that are contained within berms / bunds to avoid the spread of any contamination / leaks outside of any delineated waterbodies and their buffers. Washing and cleaning of equipment should also be done in berms or bunds to trap any cement / hazardous substances and prevent excessive soil erosion. Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any watercourse
- » An Environmental Control Officer (ECO), with a good understanding of the local flora be appointed during the construction phase. The ECO must be able to make clear recommendations with regards to the re-vegetation of the newly completed / disturbed areas along aquatic features.

- » All alien plant re-growth must be monitored and should these alien plants reoccur these plants must be re-eradicated.
- » A comprehensive rehabilitation plan be implemented from the project onset within watercourse areas (including buffers) to ensure a net benefit to the aquatic environment.

### **Noise**

- » The applicant re-evaluate the noise impact should the layout be further revised where:
  - any WTG, located within 1,500 m from a confirmed NSR, are moved closer to the NSR;
  - the number of WTG within 2,000m from an NSR are increased.
  - if the final make and model of the WTG is different from the WTG assessed in this report
- » Design and implement a noise monitoring program, measuring ambient sound levels before construction activities start, as well as during the operational phase (recommended at NSR18/19, as well as NSR12 and NSR13);
- » Ensure that mobile heavy equipment is well maintained and fitted with the correct and appropriate noise abatement measures. Engine bay covers over heavy equipment could be pre-fitted with sound absorbing material. Heavy equipment that fully encloses the engine bay should be considered, ensuring that the seam gap between the hood and vehicle body is minimised;
- » Include a component covering environmental noise in the Health and Safety Induction to sensitize all employees and contractors about the potential impact from noise, especially those employees and contractors that have to travel past receptors at night, or might be required to do work close (within 1,000m) to NSR at night. This should include issues such as minimising the use of vehicle horns;
- » Investigate any reasonable and valid noise complaint if registered by a receptor staying within 2,000m from the location where construction activities are taking place, or where night-time construction activities are required, or where an operational WTG are located. A complaint register, keeping a full record of the Complaint, must be kept by the applicant; with regard to unavoidable noisy night-time construction activities in the vicinity of NSR (closer than 1,000 m from any identified NSR), the contractor and Environmental Control Officer (ECO) must liaise with local NSR on how best to minimise impact and the NSR must be kept informed of the nature and duration of intended activities; and
- » Where practicable, mobile equipment should be fitted with broadband (white-noise generators/alarms 34 35), rather than tonal reverse alarms.

No other novel mitigation measures are introduced from the other specialists. These additional mitigation measures are not directly related to the amended facility layout, but rather due to additional information now available as a result of updated guidelines and experience gained on operational facilities.

These updated mitigation measures are included within the EMPr (refer to **Appendix K**). The EMPr for the project was submitted as part of the EIAr 2015 and was not approved. In terms of Condition 15 of the EA (dated 3 November 2016) and Chapter 5 of the EIA regulations of December 2014 (as amended), changes to the EMPr must be submitted to the Competent Authority for approval. The EMPr has been revised to include all additional mitigation measures recommended by the specialists as part of the EA amendment process to ensure appropriate management of impacts.

## 8. PUBLIC PARTICIPATION

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A public participation process is being conducted in support of a Part 2 application for amendment of the Environmental Authorisation for the Zen Wind Farm and associated infrastructure, Western Cape Province. This public participation is included as **Appendix I** and includes:

- » Site notices were placed at the site on **29 May 2023**.
- » The draft motivation report being made available for a public review period on <https://savannahsa.com/public-documents/energy-generation/zen-wind-farm/> from **18 July 2023 until 18 August 2023**.
- » Written notification to registered I&APs regarding the availability of the amendment motivation report was distributed on **18 August 2023**.
- » An advertisement was placed in the Witzenberg Herald newspaper on **14 July 2023**.

Comments received during the public review period will be included in the final submission to the DFFE for consideration in the decision-making process.

## 9. CONCLUSION

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The facility layout has been designed to achieve several important objectives, ultimately optimizing the energy yield and ensuring the wind farm's sustainable and environmentally conscious operation. The inclusion of the latest technology and a strategic approach to turbine positioning and infrastructure adjustments are key features of this comprehensive plan. The specific aspects of the wind farm layout optimisation include:

1. **Maximizing Energy Yield:** The layout's primary goal is to extract the maximum energy yield from the wind resources available. By analysing wind patterns, the layout identifies regions with consistent and strong winds, which are then prioritised for turbine placement. This ensures that the wind farm can generate the same power more efficiently, and with a reduced number of turbines.
2. **Grid Connection and Substation Location:** The layout also takes into consideration the ideal point of connection to the electrical grid. By strategically positioning the wind farm in relation to the grid infrastructure located on the adjacent Bergriver Wind Farm, the revised layout also takes into consideration the ideal point of connection to the grid. The direct connection to the adjacent authorised 132kV Bergriver facility substation means that a second substation and overhead power line is no longer required on the Zen Wind farm site. This has a positive environmental impact. In addition, it will also enable the utilisation of combined construction infrastructure (temporary facilities, laydown areas, batch plants) to be shared with the adjacent Bergriver Wind Farm to further reduce the overall impacts of the project.
3. **Combined Construction Infrastructure:** The project's use of combined construction infrastructure, such as temporary facilities, laydown areas, and batch plants is a resource-efficient approach. This strategy minimises the need for extensive new infrastructure and reduces the overall environmental impact during the construction phase.
4. **Decreased development footprint:** The Zen Wind Farm amended facility layout reduces the number of the wind turbines as assessed in the EIA, as well as subsequent amendments (from the original 46 turbines, to 27 turbines, to now 17 turbines). This is a reduction of 29 turbines from the original assessment, and a reduction of 10 turbines from the 2019 amendment assessment. This change significantly reduces the area occupied by the development footprint. This change is facilitated by the change in turbine technology, which allows for a larger wind turbine generator to be installed, using the same turbine specifications as already authorised. As the major change to the Zen Wind Farm in terms of the amendment is the reduction in the number of turbines resulting in a decreased footprint, the changes can be seen as neutral or positive (advantage) to the social and biophysical environment. There are no disadvantages of the amended layout as compared to original layout. No high sensitivity areas were impacted by the amended layout, and as a result no new impacts were identified.
5. **Area occupied:** The facility layout has 10 turbines less than the previously authorised layout, and no turbines are located to the east of the R44, which included more sensitive environments such as natural and semi-natural areas, elevated terrain, and irrigated centre pivots.
6. **Sensitive Areas Avoidance:** An essential aspect of the revised layout is the careful avoidance of all identified sensitive areas. By ensuring that turbines are not placed in ecologically significant regions, habitats of endangered species, or heritage sites, the project demonstrates a commitment to environmental preservation and compliance with Regulations.
7. **Operational Efficiency:** The layout's optimisation also involves analysing terrain conditions and potential obstructions. By placing turbines strategically in areas with favourable wind resources and minimal

obstructions, the wind farm can operate more efficiently, increasing its overall energy production and reducing downtime.

By combining these approaches, the wind farm project achieves a balanced solution that maximises energy yield, minimises environmental impacts, and contributes to sustainable and effective utilisation of wind energy resources.

The Specialist verification studies indicate that the site baseline conditions remain unchanged since the original assessments. The impact ratings that were provided in the original assessment remain valid, and the mitigation measures provided in the initial assessment are still applicable. Additional mitigation measures have been recommended by the Bats and Birds, Aquatics and Noise specialists only, which have been included within the Revision 1 of the project EMPr (refer to **Appendix K**).

The specialist verification studies indicated that the impacts associated with the updated layout are of low significance, and the updated layout is considered acceptable. A revision to the facility layout was undertaken, and an optimised layout was provided, which addressed the need to relocate the turbines and the associated infrastructure. The result is that the optimised facility layout has repositioned turbines as well as the associated infrastructure outside of the sensitive areas and features. The project will also utilise combined construction infrastructure (temporary facilities, laydown areas, batch plants) to further reduce the overall impacts of the project and the adjacent Bergriver Wind Farm. Both the Bergriver and the Zen Wind Farm projects are designed to share infrastructure to optimise construction expenses and timeline.

Given the conclusions of the specialist verification studies undertaken for this amendment application, Zen Wind Farm's layout has been amended to optimise efficiency, and the most recent layout has been designed considering the latest technology available for implementation on this site. It is concluded that these amendments are considered acceptable from an environmental perspective. The Specialists have confirmed the acceptability of the amended facility layout (for submission to and approval by DFFE) and stated where additions/changes to the Environmental Management Programme (EMPr) are required.

The amended layout considering these amendments is illustrated in **Figure 2.1**. The amended Zen Wind Farm facility layout and sensitivity map is presented in **Figure 2.2** (map ref: Zen Wind Farm Amended Layout & Sens Rev2 July'23). The following is included on the amended facility layout map/s:

1. Reduction in the number of turbines from 27 to 17;
2. Increase turbine capacity from 6 MW to up to 7.5 MW per turbine;
3. Increase the internal roads width from 6m to ~ 8m;
4. Optimise turbine/facility layout based on the energy yield, and revise the layout as required based on the revised turbine numbers and turbine specification; and
5. Optimise internal underground cabling (33kV) to enable a consolidated point of grid connection for the Zen/Bergriver wind farm cluster on the Bergriver site and remove the on-site substation and overhead power line connection from the project description.

The Applicant will finalise the layout following the review period, and the Final Facility layout will be submitted to the DFFE for approval (in accordance with Condition 13 of the EA) together with the Final Motivation report, as well as the revised EMPr (in accordance with Condition 15 of the EA).

The EMPr is a dynamic document, which must be revised to include any additional specifications as and when required. The EMPr for the project was submitted as part of the EIAr 2015 and was not approved. In terms of Condition 15 of the EA (dated 3 November 2015) and Chapter 5 of the EIA regulations of December 2014 (as amended), changes to the EMPr must be submitted to the Competent Authority for approval. The EMPr must be revised to include any additional mitigation measures recommended by the specialists as part of the EA amendment process to ensure appropriate management of impacts.

## 10. COMPLIANCE WITH CONDITIONS OF THE EA

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### 10.1. Amended Facility Layout for the Zen Wind Farm

As per Condition 13 of the Environmental Authorisation (EA) for the Zen Wind Farm project, the final layout will be made available to all the registered Interested and Affected Party and they will be given an opportunity to submit comments on layout map. Comments received will be included in the Final motivation report.

The amended layout considering these amendments is illustrated in **Figure 2.1**. The amended Zen Wind Farm facility layout and sensitivity map is presented in **Figure 2.2** (map ref: Zen Wind Farm Amended Layout & Sens Rev2 Jul'23).

As per condition 13 of the Environmental Authorisation, all available biodiversity information has been used in the finalisation of the layout plan. Existing infrastructure (e.g. roads) has also been used as far as possible.

The final facility layout indicates the following:

1. 17 turbine locations are clearly indicated as a larger area which include the rotor swept area.
2. The location of all associated infrastructure is included and clearly annotated. This includes existing roads (dark brown) and the new planned roads (light brown). Cabling is proposed to be along road routes.
3. All features of sensitivity (together with the sensitivity rating) are provided on the map and explained in the map legend.
4. All no-go areas as well as any buffer areas are clearly indicated on the map and explained in the map legend.

The facility layout has been designed to optimise the energy yield and considers the latest technology. The new layout also takes into consideration the ideal wind turbine, and this allows for the reduction in the number of turbines (reduction of 10 turbines) through the increase in the turbine capacity (with no changes to the authorised specifications).

The project will utilise a point of connection to the grid at the 132kV Bergriver facility substation, as well as the combined construction infrastructure (temporary facilities, laydown areas, batch plants to further reduce the overall impacts of the project. These are therefore removed from the layout.

The repositioning of turbines, coupled with infrastructure adjustments, ensures that the wind farm layout is optimised to both maximise operational efficiency and remain outside of identified sensitive areas. This comprehensive approach allows for a more sustainable and effective utilisation of the wind energy resources while minimising the potential for environmental impacts.

The Applicant will finalise the layout following the review period, and the Final Facility layout will be submitted to the DFFE for approval (in accordance with Condition 13 of the EA) together with the Final Motivation report, as well as the revised EMPr (in accordance with Condition 15 of the EA).

### 10.2. Revision of the Zen Wind Farm EMPr (Revision 1)



The EMPr is a dynamic document, which must be revised to include any additional specifications as and when required. The EMPr for the project was submitted as part of the EIAr dated 3 November 2016 and was not approved. In terms of Condition 15 of the EA (dated 3 November 2016) and Chapter 5 of the EIA regulations of December 2014 (as amended), changes to the EMPr must be submitted to the Competent Authority for approval. The EMPr must be revised to include any additional mitigation measures recommended by the specialists as part of the EA amendment process to ensure appropriate management of impacts.

Specialist studies have been undertaken and minor additional mitigation measures recommended by the specialists as part of the EA amendment process must also be included within the EMPr revision to ensure appropriate management of impacts.

The revised EMPr is included in **Appendix K**. The changes made to the EMPr have been underlined for ease of reference. This EMPr will be made available to registered Interested and Affected Parties under a parallel public participation process taken for the amendment of the Facility Layout. Comments received will be included in the Final motivation Report submitted to DFFE for decision-making.

The revised EMPr includes the following (as per EA Condition 15):

<p><b>An alien invasive management plan</b> to be implemented during construction and operation of the facility. The plan must include mitigation measures to reduce the invasion of alien species and ensure that the continuous monitoring and removal of alien species is undertaken.</p>	<p>Included as Annexure <b>B</b> of the EMPr Revision 1</p>
<p><b>A plant rescue and protection plan</b> which allows for the maximum transplant of conservation important species from areas to be transformed. This plan must be compiled by a vegetation specialist familiar with the site in consultation with the ECO and be implemented prior to commencement of the construction phase.</p>	<p>The site consists of highly contrasting ecological sensitivity, with transformed areas being of low sensitivity and the intact remnants of Swartland Alluvium Fynbos and Swartland Shale Renosterveld being of very high sensitivity. The vast majority of the development area is however transformed and retains very little biodiversity. Fynbos ecosystems are particularly vulnerable to alien invasion.</p>
<p><b>A re-vegetation and habitat rehabilitation plan</b> to be implemented during the construction and operation of the facility. Restoration must be undertaken as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.</p>	<p>Included as Annexure <b>C</b> of the EMPr Revision 1</p>
<p><b>A traffic management plan</b> for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan must include measures to minimize impacts on local commuters e.g. limiting construction vehicles travelling on public roadways during the morning and late afternoon commute time and avoid using roads through densely populated built-up areas so as not to disturb existing retail and commercial operations.</p>	<p>Included as Appendix <b>G</b> of the EMPr Revision 1</p>
<p><b>A storm water management plan</b> to be implemented during the construction and operation of the facility. The plan must ensure compliance with applicable regulations and prevent off-site migration of contaminated storm</p>	<p>Included as Appendix <b>D</b> of the EMPr Revision 1</p>

<p>water or increased soil erosion. The plan must include the construction of appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures must promote the dissipation of storm water run-off.</p>	
<p><b>An erosion management plan</b> for monitoring and rehabilitating erosion events associated with the facility. Appropriate erosion mitigation must form part of this plan to prevent and reduce the risk of any potential erosion.</p>	<p>Included as Appendix <b>D</b> of the EMPr Revision 1</p>
<p>An <b>effective monitoring system to detect any leakage or spillage</b> of all hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems.</p>	<p>Included as Appendix <b>D, E &amp; I</b> of the EMPr Revision 1</p>
<p>A <b>fire management plan</b> to be implemented during the construction and operational phases.</p>	<p>Included as Appendix <b>I</b> of the EMPr Revision 1</p>
<p>Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments, and other environmental sensitive areas from construction impacts including the direct or indirect spillage of pollutants.</p>	<p>Included as Appendix <b>D</b> of the EMPr Revision 1</p>
<p>An environmental sensitivity map indicating environmental sensitive areas and features identified during the EIA process.</p>	<p>Included as Appendix <b>A</b> of the EMPr Revision 1</p>
<p>A map combining the final layout map superimposed (overlain) on the environmental sensitivity map. This map must reflect the proposed location of the turbine as stated in the EIAR and this authorisation.</p>	<p>Included as Appendix <b>A</b> of the EMPr Revision 1</p>