Poortjies Wind Energy Facility and associated infrastructure, Northern Cape Province

Motivation for amendment of Environmental Authorisation

DFFE Ref.: 14/12/16/3/3/2/681/1/AM1

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PROJECT DETAILS

Title	:	Poortjies Wind Energy Facility and associated infrastructure, Northern Cape Province: Motivation for Amendment to the Environmental Authorisation
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Client	:	South Africa Mainstream Renewable Power Developments (Pty) Ltd
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APPENDICES:

PURPOSE OF THE REPORT

An Environmental Authorisation (EA) for the Poortjies Wind Energy Facility and associated infrastructure, in the Northern Cape Province (DFFE REF: 14/12/16/3/3/2/681) was obtained by South Africa Mainstream Renewable Power Developments (Pty) Ltd on 28 May 2015. The EA would have lapsed on 28 May 2018, an extension of Environmental Authorisation validity was granted on 06 June 2018 (DFFE REF: 14/12/16/3/3/2/681/AM1) by an additional 3 years. The project received a further extension by an additional 4 years and a re-issue of the EA (DFFE REF: 14/12/16/3/3/2/681/1) following a split of the project into two portions namely Eskom portion and an IPP portion, such that each portions has its own separate EA and Environmental Management Programme (EMPr).

The facility is proposed within the Khai-Ma Local Municipality on the following properties:

- Portion 1 of the Farm Poortjie 209
- Remainder of the Farm Poortjie 209

The project is intended to be bid into future rounds of the Department of Energy's (DoE) Renewable Energy Independent Power Producers Procurement (REIPPP) Programme, or similar programme. There have been advancements to wind turbine technology since the issuing of the EA, and the turbines authorised in the EA are therefore not considered to be the most optimised in terms of production and economic considerations. In this regard, South Africa Mainstream Renewable Power Developments (Pty) Ltd is considering an updated turbine model for the project to improve the efficiency of the facility.

The proponent is therefore applying for a substantive amendment (Part II) towards amending the EA as follows:

i. Amendment of the turbine specifications, to be as follows:
   - The increase of the hub height from 140m (authorised in 2015 and re-issued in 2021) to reflect as 'up to 200m'
   - The increase of the rotor diameter from 140m (authorised in 2015 and re-issued in 2021) to reflect as 'up to 200m'.
   - Inclusion of the Blade tip height of 'up to 300m.
   - A reduction in the authorised number of turbines from the currently authorised 50 turbines (authorised in 2015 and re-issued in 2021), to reflect as 'up to 24'.

The proposed amendments in themselves are not listed activities, and do not trigger any new listed activity as the proposed amendments are within the original authorised development footprint and do not exceed any thresholds for activities already authorised.

In terms of Condition 5 of the Environmental Authorisation and Chapter 5 of the EIA Regulations of December 2014 (as amended on 07 April 2017 and 13 July 2018), 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 South Africa Mainstream Renewable Power Developments (Pty) Ltd. This report aims to provide detail pertaining to the significance and impacts of the proposed change to the project description in order for interested and affected parties to be informed of the proposed amendments 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 F** of this report). This main report must be read together with these specialist studies in order to obtain a complete understanding of the proposed amendments and the implications thereof.

The Draft Motivation Report was made available for download at (https://savannahsa.com/public-documents/energy-generation/). to registered interested and affected parties for a 30-day period from **27 August 2021 to 27 September 2021.** The availability of the Draft Motivation Report was advertised in the Gemsbok newspaper on **25 August 2021** (refer to **Appendix H3**).

All comments received during the review period have been included within a Comments and Responses report and is submitted to the DFFE with this Final Motivation Report for decision making purposes. All changes made in this Final Motivation Report are underlined for ease of reference.

1. OVERVIEW OF THE PROJECT

Location:

The authorised Poortjies Wind Energy Farm is located approximately ~22km south-west of Pofadder which falls within the Khai-Ma local municipality in the Northern Cape Province. The Poortjies Wind Farm is to be constructed within the project site which comprises the following farm portions:

» Portion 1 of the Farm Poortje 209; and
» Remainder of the Farm Poortje.

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 impacts on birds;
» Potential impacts on bats;
» Potential ecological impact;
» Potential impacts on heritage; and
» Areas of visual impact; and
» Potential noise impact.

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

From the specialist investigations undertaken as part of the EIA for the wind energy facility, 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. However, areas of very high sensitivity were identified and avoided through micro siting of the wind turbines. Areas of sensitivity identified during the EIA process[1] include:

» **Avifauna:**

The pre-construction bird monitoring programme for the site was conducted over four seasons. The purpose of the bird pre-construction monitoring programme was to inform the findings of the avifauna impact assessment in line with the Best Practice Guidelines for bird monitoring, and to ensure that appropriate mitigation measures are recommended. This approach also aimed to ensure that the DEA has sufficient information on which to make a decision. The monitoring programme was initiated in order to collect data to characterise the bird community (baseline) at the Wind Energy Facility site and a control site. The monitoring programme was designed to include a minimum of 6 surveys across all four seasons to record data across all seasons. The baseline data from the bird monitoring programme has been considered in the avifaunal assessment to support the EIA field survey. A total of 83 species were recorded at the study area (i.e. the turbine area, control areas and immediate surroundings) from all data sources (drive transects, walk transects, VP watches, focal point counts and incidental sightings), of which 11 are priority species.

[1] The original EIA assessment DFFE Ref: 14/12/16/3/3/2/681 (which received environmental authorisation (EA) on 28 May 2015) was amended and split into two portions namely the Eskom portion (14/12/16/3/3/2/681/2) and an IPP portion (14/12/16/3/3/2/681/1) such that each portions have its own separate Environmental Authorisation (EA) and Environmental Management Programme (EMPr) and was approved and issued on 24 June 2021. The same specialist studies that were used for the original EIA assessment informed the split amendment of the Poortjies Wind Farm EA. This information is included above.

It was found that the proposed Poortjies Wind Energy Facility will have a moderate impact on avifauna which could be reduced to low through appropriate mitigation. There will however be residual impacts which cannot be entirely eliminated by the proposed mitigation. The significance of the potential mortality due to collisions with the wind turbines is rated as medium which can be reduced to low with appropriate mitigation. The significance of the potential displacement due to the habitat transformation associated with the wind turbines and associated infrastructure is rated as medium which can be reduced to low with appropriate mitigation. The priority species that could potentially be most affected by displacement due to habitat change and loss is the Ludwig's Bustard, Karoo Korhaan and to a lesser extent the Red Lark. However, due to the small footprint, displacement linked directly to habitat loss is not likely to be a major impact.

» **Bats:**

A bat monitoring strategy for the proposed development was created in accordance with best practice guidelines. The survey approach focused on the use of passive acoustic monitoring to record bats across the development. Vegetation types, landscape features important for bats (e.g. potential roosts and water), road access and the size of the site were assessed to determine the number and locations of bat detectors.

Based on over 12 months of pre-construction monitoring, bat activity is moderate relative to other sites based on the experience of the Specialist. Four species were recorded, the most active three of which are of "Least Concern" and the other of which is "Near Threatened". Activity varies across the proposed development with higher activity near the tubular met mast, considered likely to be because of proximity to potential roost sites. Lower activity was recorded at height at this mast. Activity is highest in summer at all the monitoring locations and very little activity was recorded in autumn, winter, and spring, except for at the met mast where activity persisted throughout the monitoring period. On average across a night bat activity was low and concentrated in the early evening for up to two hours. Based on these results, it is considered that design and mitigation measures would allow a wind energy facility can be developed within the development area without an unacceptable risk to bats.

» **Ecology:**

The site displays a low level of Red List species occurring on site with regards to the fauna assessed in this report. Of these species the Black-footed cat, Aardvark, Bat-eared fox, Cape fox, Shortridge's Rat, Fisk's house snake, Ludwig's Bustard, Martial Eagle, Baboon spiders, Trapdoor spiders, Girdled lizards and Tent tortoises are likely to occur on site or have been found on site. The Tent tortoises are at most risk to be impacted by vehicles and the Black-footed cat, Aarvark, Bat-eared fox and Cape fox are most at risk to be impacted upon during the construction phase by digging and earthworks. The construction of the proposed Poortjies Wind Energy Facility is considered to be ecologically acceptable as long as the areas identified as sensitive are avoided. Proposed turbines in areas of ecological sensitivity should be relocated in a micro-siting exercise during final design to lower sensitivity locations prior to any construction commencing.

Faunal disturbance during the construction phase of the project is inevitable, this impact will however be temporary and most fauna are likely to return to the area once construction has been completed. Areas of high faunal sensitivity and their buffers must be avoided by turbine placement, laydown areas and other associated infrastructure. Only access and connecting roads may intrude on high sensitivity buffers if no other alternatives exist. Areas of moderate faunal sensitivity and their buffers should preferably be avoided by the infrastructure footprint. However, in the case of infrastructure inevitably

intruding on moderate faunal sensitivity and its buffers, the proposed mitigation measures must be intensified as needed. Provided that the mitigation measures as described are implemented, the development of the site should not lead to a significant environmental impact or degradation of the receiving environment. However, it is crucial that the EMPr considers the impacts mentioned and make all efforts for the implementation of the proposed mitigation measures where practical, and any other mitigation measures recommended by the suitably qualified person implementing such mitigations.

» **Heritage:**

The main cause of impacts to archaeological sites is physical disturbance of the material itself and its context. The heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose archaeological artefacts, the artefacts are relatively meaningless once removed from the area in which they were found. In the case of the proposed activity the main source of impact is likely to be the construction of access roads, lay-down areas, and excavation of the footings the turbines and substation foundations. No sites of significant heritage potential were identified in the proposed site and broader study area and there are no protected sites or structures within the study area that require mitigation.

In terms of the information that has been collected, indications are that impacts to pre-colonial archaeological material will be limited. In terms of buried archaeological material, one can never be sure of what lies below the ground surface. However, indications are that this is extremely sparse for the study area and that impacts caused by the construction of footings and other ground disturbance are likely to be negligible. No important heritage sites occur within the development footprint of the proposed infrastructure for the Poortjies Wind Energy Facility. Impacts to heritage resources are not likely to be very significant and no "red flag" issues have been identified. It is concluded that, from a heritage perspective, the proposed wind energy facility may proceed. The current access road passes through the middle of the ruined village of Namies. This area is of concern because there are components of the village (buildings and graves) that are located very close to the roads and could be impacted by any road widening. Here depending on how the access road is designed, mitigation may be required. No alternative however is preferred.

» **Visual:**

The visual impact on sensitive visual receptors (i.e. users of secondary roads and residents of homesteads) in close proximity to the proposed infrastructure (i.e. within 5km) is expected to be of high significance. The visual impact on sensitive visual receptors (i.e. users of roads and residents of homesteads) within the region (i.e. beyond the 5km offset) is expected to be of moderate significance. The potential visual impact of associated on-site infrastructure on sensitive visual receptors in close proximity thereto (i.e. within 5km) is expected to be of moderate significance and may be mitigated to low. The potential visual impact of construction on sensitive visual receptors in close proximity to the proposed infrastructure is likely to be of moderate and may be mitigated to low. The anticipated visual impact of lighting at night on sensitive visual receptors within the study area is likely to be of moderate significance and may be mitigated to low. The potential visual impact on the N14 and TR8401 as tourist routes is expected to be of low significance. The anticipated visual impact on the visual character and sense of place of the study area is expected to be of high significance. The identified impacts are determined to have a post mitigation significance ranging from high to low. Anticipated visual impacts with a high residual significance include impacts on sensitive visual receptors in close proximity and within the region, and on the landscape character and sense of place within the region. Despite these high residual ratings,

these visual impacts are not considered by the specialist to be fatal flaws for this development. This conclusion is based primarily on the remote location of the study area and the very low density of visual receptors within the study area. In addition, there are no reported objections from stakeholders within the region. It is therefore recommended that the development of the Poortjies Wind Energy Facility as part of the proposed new Mainstream Renewable Energy Facility be supported from a visual perspective, subject to the implementation of the recommended mitigation measures.

» **Noise:**

With the input data as used, this assessment indicated that the potential noise impact would be of a low significance during both the construction and operational phases. Due to the low risk of a noise impact, no routine noise measurements are recommended. However, if a valid and reasonable noise complaint is registered relating to the operation of the facility, additional noise monitoring should be conducted by an acoustic consultant. Noise monitoring must be continued as long as noise complaints are registered. The developer should re-evaluate this study if the layout is changed (where any wind turbines are moved closer, if any wind turbines are added within 1 000m from any potential noise-sensitive receptor) or if the developer selects to use a different wind turbine that is louder than the turbine evaluated in this report (a higher sound power level). The findings of the noise impact study should be made available to all potentially noise-sensitive developments in the area with the contents explained to them to ensure that they understand all the potential risks that the development of a wind energy facility may have on them and their families.

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 (refer to **Figure 2.1**). No environmental fatal flaws were identified to be associated with the proposed Poortjies Wind Energy Facility. A number of issues requiring mitigation were however highlighted. Environmental specifications for the management of potential impacts were detailed within the Environmental Management Programme (EMPr) submitted as part of the split EIA.

2. DETAILS OF THE AMENDMENTS APPLIED FOR

The amendments being applied relate to the project description of the split EA (DFFE Ref: 14/12/16/3/3/2/681/1), by amending the turbine specifications, and inclusion and specifying the blade tip height which was not included in the original Environmental Authorisation. These proposed amendments are detailed further below.

1. Amendment of turbine specifications

On page 6 of the split EA dated 24 June 2021, under the technical details for the facility, the following amendments are requested:

Current wording (EA dated 24 June 2021)	Requested amendment wording (inclusion underlined)
The infrastructure associated with this facility includes: • Rotor diameter 140m. • Hub height 140m.	The infrastructure associated with this facility includes: • Rotor diameter of 'up to 200m'. • Hub height of 'up to 200m'.

On page 6 of the EA dated 24 June 2021, under the technical details for the facility, it is requested that the Blade tip height be included as follows:

Current wording (EA dated 24 June 2021)	Requested amendment wording (inclusion underlined)
No specific wording – this amendment is a novel inclusion only and not a modification of existing text.	The infrastructure associated with this facility includes: • Blade tip height of 'up to 300m'

2. Amendment of the number of turbines

The number of wind turbines are proposed to be decreased from the currently authorised 50 turbines, to 24 turbines. It is therefore requested that the project description in the EA be amended to include the revised number of turbines.

On page 5 of the EA dated 24 June 2021, under the infrastructure associated with this facility, the following amendments are requested:

Current wording (EA dated 24 June 2021)	Requested amendment wording (inclusion underlined)
The infrastructure associated with this facility includes: • 'Up to 50' wind turbines	The infrastructure associated with this facility includes: • <u>'Up to 24' wind turbines</u>

The combined sensitivity map as submitted in the Final EIA Report (2014) is provided in Figure 2.1 and the combined sensitivity map as submitted in the Split EIA Report (2021) is provided in Figure 2.2. The proposed amended layout showing 24 turbines is provided in Figure 2.3 and its associated combined sensitivity in Figure 2.4.

3. Summary of the proposed amendments and changes required

The table below provides a detailed outline of what needs to be changed in the EA, where specifically needs to be changed, what it needs to be changed to and on what page of the EA.

Table 2.1: Specific changes required

where specifically needs to be changed	**what needs to be changed in the EA**	**what it needs to be changed to**
On page 6 of the split EA dated 24 June 2021, under the technical details for the facility	Rotor diameter 140m. Hub height 140m.	Rotor diameter of 'up to 200m'. Hub height of 'up to 200m'.
On page 6 of the EA dated 24 June 2021, under the technical details for the facility,	it is requested that the Blade tip height be included, *No specific wording – this amendment is a novel inclusion only and not a modification of existing text.*	Blade tip height of 'up to 300m'
On page 5 of the EA dated 24 June 2021, under the infrastructure associated with this facility	'Up to 50' wind turbines	'Up to 24' wind turbines

On page 5-6 of the EA dated 24 June 2021, under the technical details for the facility, the following amendments (in bold) are requested:

Table 2.2 Technical details for the facility

Component	Description/Dimensions
Location of the site	~22km south west of Pofadder
Extent of the proposed development footprint	~3197Ha
SG Codes	C03600000000020900001 C03600000000020900000
Number of turbines	**24**
Details of the turbines	**Hub Height :200m** **Rotor Diameter:200m** **Blade Tip Height: 300m**
Access roads and width	33km length and 8m width
Export Capacity	100MW

Table 2.3 Site Coordinates for proposed Poortjies WEF and associated infrastructure

Alternative (preferred site)	**Latitude**	**Longitude**
The Pofadder Site (referring to the Farms Poortjies (1/209 and RE/209)	29°25'45.68" S	19°16'1.99" E
Preferred on-site substation	**Latitude**	**Longitude**

Poortjies WEF On-site Substation Centre Point Co-ordinates/BESS Location	29°26'19.144" S	19°19'32.839" E
Access road alternative 2 (preferred route alternative-Poortjies South)	**Latitude**	**Longitude**
Start	29°14.804'S	18°53.551'E
Middle	29°21.210'S	19°4.628'E
End	29°22.984'S	19°14.405'E

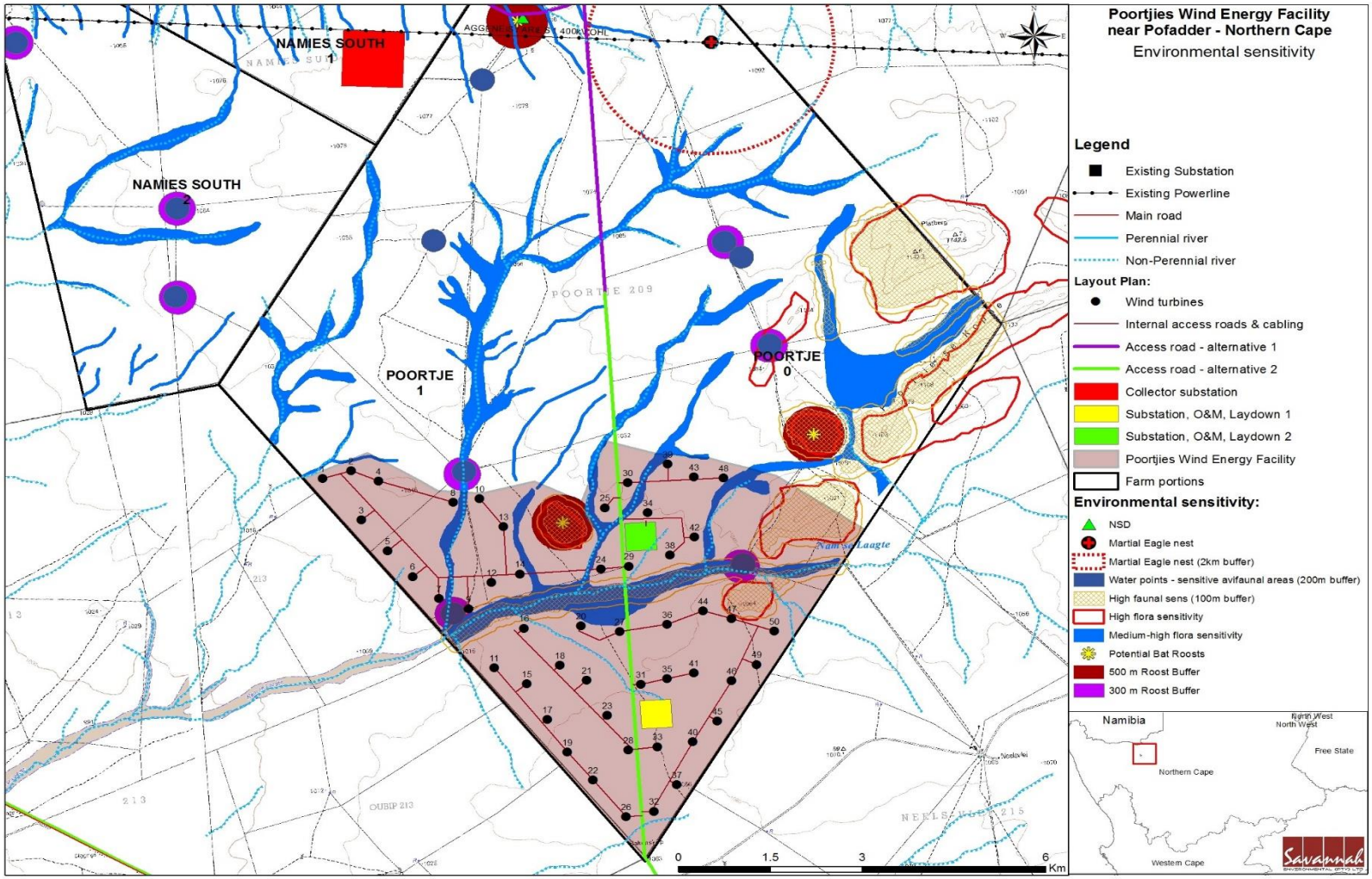

Figure 2.1: Poortjies EIA layout overlain onto the identified sensitivities (2014) showing turbine positions and associated infrastructures**) (A3 Map included in Appendix I**).

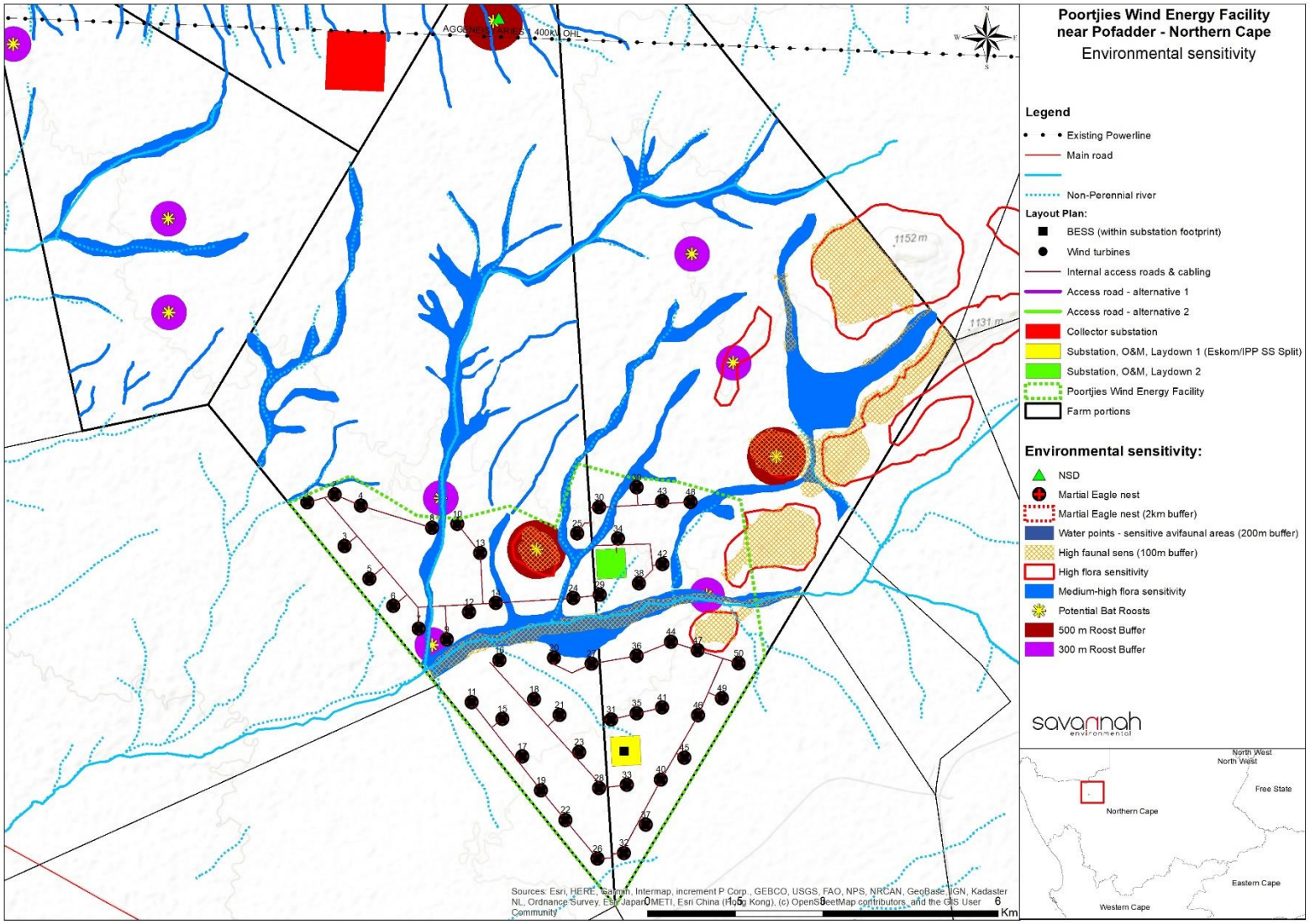

Figure 2.2: Poortjies Split EIA layout overlain onto the identified sensitivities (2021) showing turbine positions, BESS and associated infrastructures**) (A3 Map included in Appendix I**).

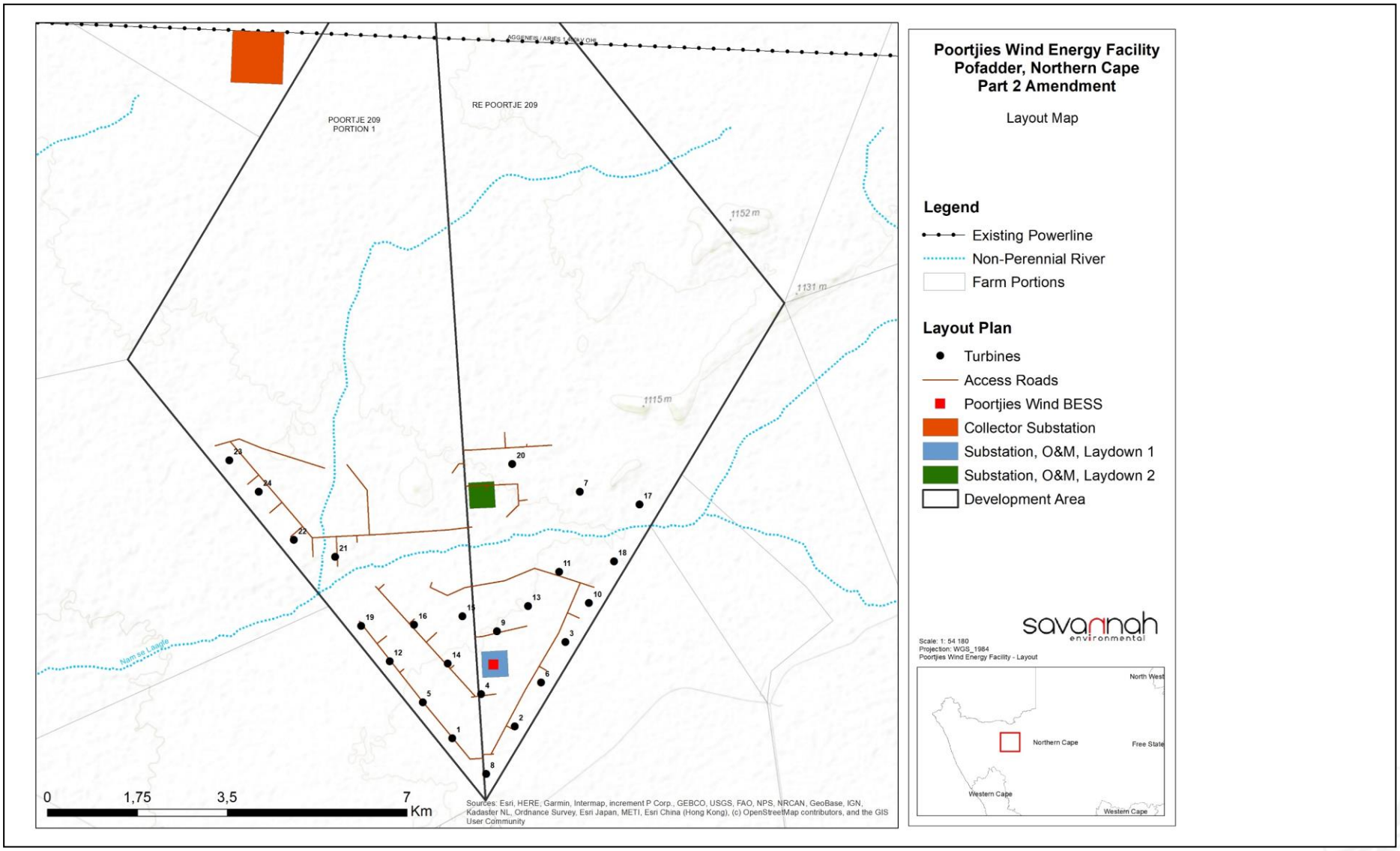

Figure 2.3: Poortjies proposed amendment (2021) showing turbine positions and associated infrastructures**) (A3 Map included in Appendix I**).

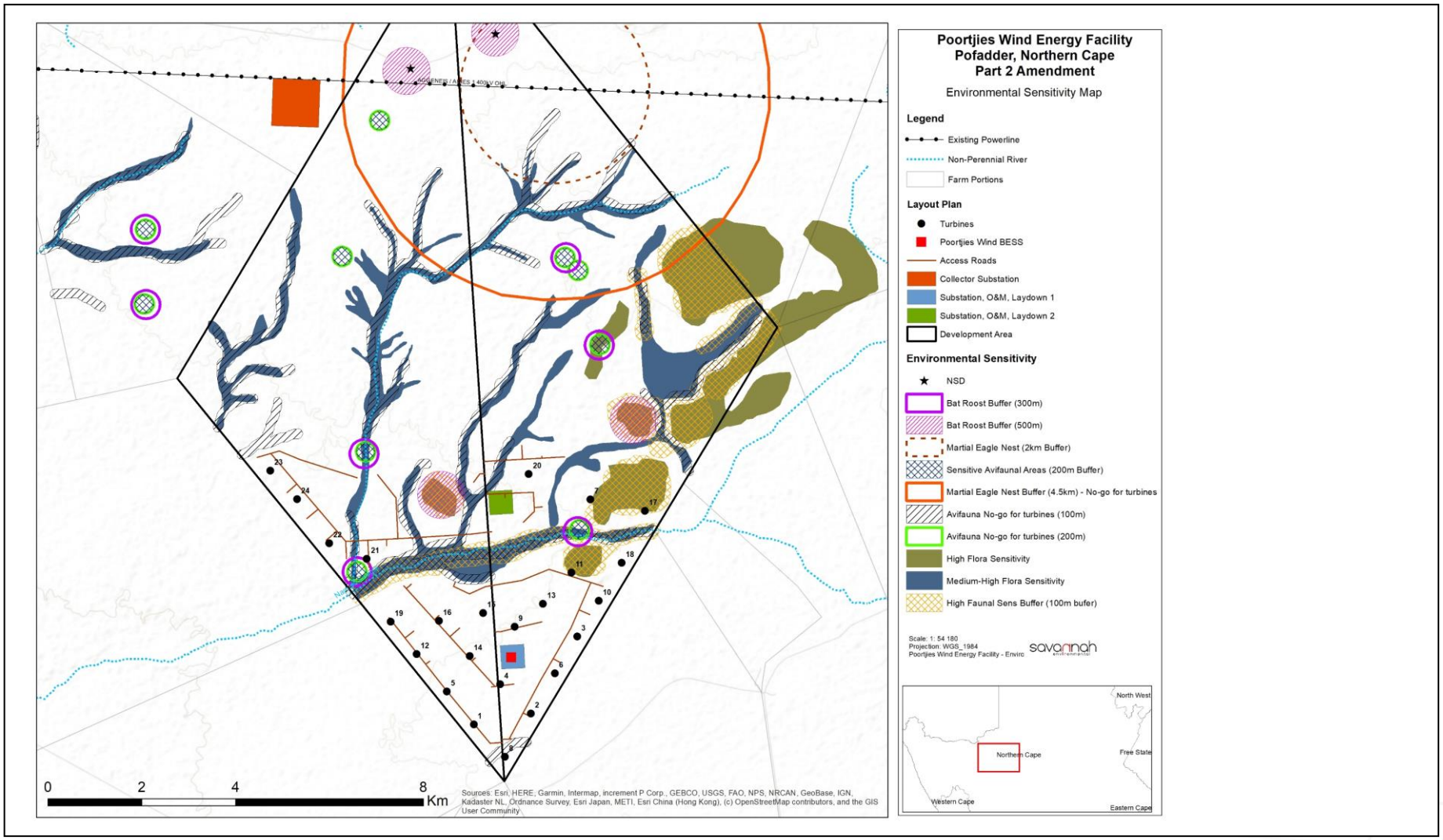

Figure 2.4: Poortjies proposed amendment layout overlain onto the identified sensitivities (2021) showing turbine positions and associated infrastructures**) (A3 Map included in Appendix I**).

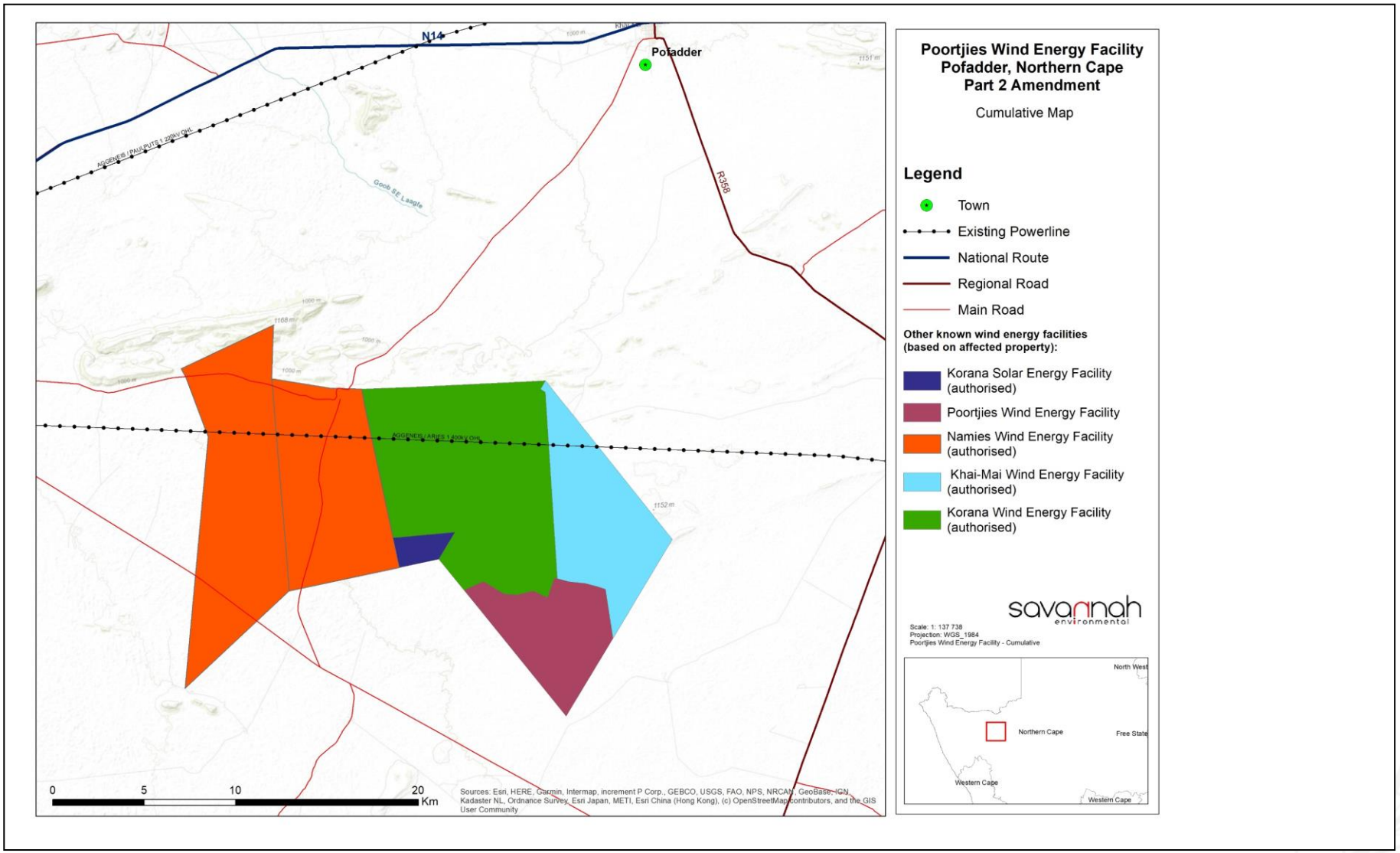

Figure 2.5: Cumulative map which shows neighbouring renewable energy developments. **(A3 Map included in Appendix I)**.

3. REASONS FOR THE PROPOSED AMENDMENTS

3.1. Amendment of the turbine specifications

Wind turbine generators are constantly under development to increase the potential energy output capacity per wind turbine. The more energy one turbine can produce, the fewer turbines are required to generate the authorised contracted capacity of the project.

The proposed project is intended to be bid into future rounds of the Department of Mineral Resources and Energy (DMRE) Renewable Energy Independent Power Producers Procurement (REIPPP) Programme or similar programmes under the promulgated IRP 2010–2030. Following the issuing of the EA for the project there have been advancements to wind turbine technology with newer turbines becoming larger and more powerful. The turbines authorised in the EA are therefore not considered to be the most suitable in terms of production and economic considerations. Based on the technologies now available and the additional wind data collected onsite, it has been concluded by the applicant that improved turbines should be utilised for the facility to ensure optimisation of generation. In doing so the project will be:

i. **Optimising the generation efficiency** of the facility. Utilising the latest turbine technology ensures the facility is optimised from a generation perspective and uses the most efficient turbines possible.
ii. **Optimising the financial competitiveness** and longevity of the facility. Utilising the latest turbines ensures that the facility is able to effectively compete in the REIPPP programme and improves the facility's financial performance during operation. This contributes to the competitive nature and success of the REIPPPP indirectly and therefore promotes the objectives of the REIPPPP. In addition, this will increase the overall competitiveness of the Project in the REIPPPP and will allow the applicant to charge a lower tariff for the energy produced by the Project – which would be for the benefit of all electricity consumers in SA.
iii. **Optimising the layout and reducing turbine numbers**. Depending on the final turbine model selected for the project, the number of turbines could be reduced with the changes in turbine specifications, thereby reducing the development footprint and associated environmental footprint.

The proposed amendments to the turbine specifications will therefore optimise generation and economic competitiveness while allowing for the avoidance of sensitivities on site and a reduction in the disturbance footprint. The amendment to the wind turbine specifications is not a listed activity and it will not trigger any new listed activities as the proposed amendment will fall within the originally authorised footprint and capacity of the facility.

3.2. Reduction in the authorised number of turbines

In addition to the turbine specification amendment detailed above, the applicant is submitting an amendment request to reduce the number of authorised turbines as per the revised layout. Should the turbine specification amendment above be approved, the turbines utilised by the facility will have an increased generating capacity compared to what was available at the time of the initial EIA assessment. Larger turbines require adjustments to turbine positions to cater for the minimum spacing that needs to be maintained between turbines for safety reasons and to ensure optimal operations. In order to not exceed the approved generating capacity of the facility, and to optimise the cost and disturbance footprint of the turbines by using less turbines, a reduced number is requested for approval which in turn requires an updated

layout. This layout is therefore submitted as part of the amendment to reflect 24 revised turbine positions for the proposed facility.

It should be noted that the decrease in number of authorised wind turbines is not a listed activity and will not trigger any new listed activities as the proposed amendment will fall within the originally authorised footprint of the facility. It must be noted that this amendment request is not for final approval of the facility layout as per the facility EA conditions. This will be undertaken following the detailed design for the project in accordance with the requirements of Condition 15 of the Split EA (dated 24 June 2021).

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

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.

In this instance, the amended turbine specifications were not considered in the initial 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).

Savannah Environmental has been appointed as independent consultants to undertake the application for amendment on behalf of South Africa Mainstream Renewable Power Developments (Pty) Ltd. This Draft Motivation Report has been prepared in support of this amendment application and aims to provide detail pertaining to the significance and impacts of the proposed change to the project description in order for interested and affected parties to be informed of the proposed amendments 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 F** of this report). This main report must be read together with these specialist studies in order to obtain a complete understanding of the proposed amendments and the implications thereof.

Neither Savannah Environmental nor any of its specialists are subsidiaries of, or are affiliated to South Africa Mainstream Renewable Power Developments (Pty) Ltd. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

Savannah Environmental is a specialist environmental consulting company providing a holistic environmental management service, including environmental assessment and planning to ensure compliance and evaluate the risk of development, and the development and implementation of environmental management tools. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team.

The Savannah Environmental team have considerable experience in basic assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects throughout South Africa, including those associated with electricity generation.

- Rendani Rasivhetshele is a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA), and she holds a Bachelor of Science Honours in Environmental Management. She has over 4 years of experience in conducting Environmental Impact Assessments, public participation, and Environmental Management Programmes for residential developments, commercial developments, industrial upgrades, bulk services, and renewable energy projects (solar and wind). She is responsible for the overall compilation of the report, this includes specialists engagements, reviewing specialists reports and incorporating specialist studies into the Environmental Impact Assessment report and its associated Environmental Management Programme.
- *Jo*-Anne *Thomas* is a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA) and is the registered EAP for this project. She provides technical input for projects in the environmental management field, specialising in Strategic Environmental Advice, Environmental Impact Assessment studies, environmental auditing and monitoring, environmental permitting, public participation, Environmental Management Plans and Programmes, environmental policy, strategy and guideline formulation, and integrated environmental management. Her key focus is on integration of the specialist environmental studies and findings into larger engineering-based projects, strategic assessment, and providing practical and achievable environmental management solutions and mitigation measures. Responsibilities for environmental studies include project management (including client and authority liaison and management of specialist teams); review and manipulation of data; identification and assessment of potential negative environmental impacts and benefits; review of specialist studies; and the identification of mitigation measures. She has managed the EIA processes for more than 100 renewable energy projects (including wind, solar and hydro) across South Africa.

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

This application is considered to be a Part 2 amendment as contemplated in terms of Regulation 31 of the EIA Regulations (2014), as amended. In terms of Regulation 32(1)(a)(i), the following section provides an assessment of the impacts related to the proposed change. 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 birds;
- Impacts on bats;
- Ecological Impacts;
- Heritage Impacts;
- Visual impacts; and
- Noise impacts.

The increase in hub height and rotor diameter, inclusion of the blade tip height are expected to have **no effect** on the findings of the Socio-economic Assessment undertaken as part of the EIA process. Therefore, no Socio-economic Specialist Report has been included. 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 addendum letters and reports (as applicable) contained in **Appendix A-F.** Where additional mitigation measures are proposed as a result of the amendments, these have been underlined for ease of reference. This section of the main report must be read together with the specialist reports contained in **Appendix A - F** in order for the reader to obtain a complete understanding of the proposed amendments and the implications thereof.

5.1. Impacts on avifauna

Consideration of the change in impact on avifauna associated with the proposed amendments was undertaken by Chris van Rooyen (refer to **Appendix A**). Most of the studies to date have found turbine dimensions to play a relatively unimportant role in the magnitude of the collision risk relative to other factors such as topography, turbine location, morphology, behaviour and a species' inherent ability to avoid the turbines. Turbine dimensions may only be relevant in combination with other factors, particularly wind strength and topography (see Howell 1997, Barrios & Rodriguez 2004; Barclay *et al.* 2007, Krijgsveld *et al.* 2009, Smallwood 2013; Everaert 2014). Three (3) studies found a correlation between hub height and mortality (De Lucas *et al.* 2008; Loss *et al.* 2013 and Thaxter *et al*. 2017).

In the most recent paper on the subject by Thaxter *et al*. (2017), the authors conducted a systematic literature review of recorded collisions between birds and wind turbines within developed countries. They related collision rate to species-level traits and turbine characteristics to quantify the potential vulnerability of 9 538 bird species globally. For birds, larger turbine capacity (megawatts) increased collision rates; however, deploying a smaller number of large turbines with greater energy output reduced total collision risk per unit energy output. In other words, although there was a positive relationship between wind turbine capacity and collision rate per turbine, the strength of this relationship was insufficient to offset the reduced number of turbines required per unit energy generation with larger turbines. *Therefore, to minimize bird*

collisions, wind farm electricity generation capacity should be met through deploying fewer, large turbines, rather than many, smaller ones.

The authorised rotor diameter of 140m for the Poortjies WEF translates into a rotor swept area of approximately 15 393m². An increase of the rotor diameter to 200m will result in a rotor swept area of approximately 31 415m² (utilising the same number of turbines as approved). This amounts to an increase of 104% in the rotor swept area per turbine. However, the applicant proposes to reduce the number of turbines from the approved 50 turbines to a maximum of 24 turbines. That amounts to a 2% reduction in total rotor swept area and a reduction of 52% in the number of turbines.

5.1.1. Comparative Assessment

In light of the proposed changes to the turbine specifications, a re-assessment of the potential collision impact was carried out for the proposed amendment, in order to establish if the original pre-mitigation assessment by Van Rooyen et al. (2014) should be revised. The increase of 104% in rotor swept area per turbine is significant. However, the planned reduction in the number of turbines means that the total rotor swept area remains essentially unchanged. Furthermore, the planned reduction of 52% in the number of turbines is significant, given the fact that the number of turbines is a more important factor in determining the risk than the dimensions of the individual turbines (as detailed above), the collision rating therefore remains unchanged.

Nature of impact:
Collisions of priority avifauna with the wind turbines.

	Authorised		**Proposed amendment**	
	Without mitigation	**With mitigation**	**Without mitigation**	**With mitigation**
Extent	Low (2)	Low (2)	Low (2)	Low (2)
Duration	Long-term (4)	Long-term (4)	Long-term (4)	Long-term (4)
Magnitude	Moderate (6)	Low (4)	Moderate (6)	Low (4)
Probability	Probable (3)	Improbable (2)	Probable (3)	Improbable (2)
Significance	**36 (Medium)**	**20 (Low)**	**36 (Medium)**	**20 (Low)**
Status (positive or negative)	Negative	Negative	Negative	Negative
Reversibility	Low	High	Low	High
Irreplaceable loss of resources?	No	No	No	No
Can impacts be mitigated?	Yes		Yes	

Mitigation measures due to the proposed amendment:

- No additional mitigation measures are required as a result of the proposed amendment.

Mitigation measures as per the original EIA

- A 200m no-go buffer is proposed around water points as they serve as focal points for raptor activity.
- Formal monitoring should be resumed once the turbines have been constructed, as per the most recent edition of the best practice guidelines (Jenkins *et al.* 2011). The exact scope and nature of the post-construction monitoring will be informed on an ongoing basis by the results of the monitoring through a process of adaptive management. The purpose of this would be (a) to establish if and to what extent displacement of priority species has occurred through the altering of flight patterns post-construction, and (b) to search for carcasses at turbines.
- As an absolute minimum, post-construction monitoring should be undertaken for the first two (preferably three) years of operation, and then repeated in year 5, and again every five years thereafter. The exact scope and nature of the post-construction monitoring will be informed on an ongoing basis by the results of the monitoring through a process of adaptive management.

- The environmental management plan should provide for the on-going inputs of a suitable experienced ornithological consultant to oversee the post-construction monitoring and assist with the on-going management of bird impacts that may emerge as the post-construction monitoring programme progresses.
- Depending on the results of the carcass searches, a range of mitigation measures will have to be considered if mortality levels turn out to be significant, including selective curtailment of problem turbines during high-risk periods.
- If turbines are to be lit at night, lighting should be kept to a minimum and should preferably not be white light. Flashing strobe-like lights should be used where possible (provided this complies with Civil Aviation Authority regulations).
- Lighting of the wind farm (for example security lights) should be kept to a minimum. Lights should be directed downwards (provided this complies with Civil Aviation Authority regulations).

i. Consideration of Monitoring Results and need to revised mitigation measures

The "Best Practice Guidelines for Avian Monitoring and Impact Mitigation at Proposed Wind Energy Development Sites in Southern Africa", (Jenkins *et al*. 2011) revised in 2015, require that either all, or part of the pre-construction monitoring is repeated if there is a period of three (3) years or more between the data collection and the construction of the wind farm. This re-assessment is necessary to take cognisance of any changes in the environment which may affect the risk to avifauna, and to incorporate the latest available knowledge into the assessment of the risks. To give effect to this requirement, nest searches on the Aggeneys – Aries 400kV were repeated in July 2019 and again in July 2020 to determine the presence of Martial Eagle nests.

The nest searches conducted in July 2019 and July 2020 confirmed the presence of a Martial Eagle nest on Tower 147 of the Aries – Aggeneys 400kV 1 transmission line, which runs north of the project area. The average territory size of a large eagle represents an important area which can contribute to conservation planning and should be considered the absolute minimum area for conservation (Ralston-Patton 2017). Global Positioning System (GPS) tracking of Martial Eagles in the Kruger National Park indicates average territory sizes of 110km² (Percy Fitzpatrick Institute 2015), which equates to a 6km circular zone around the nest. Given the proven vulnerability of the species to wind turbine collisions which is now firmly established, 5 - 6km should ideally be taken as the desired turbine-free buffer zone around a Martial Eagle nest[2]. The nest is approximately 7.5km from the nearest authorised turbine position, therefore the authorised lay-out will not be impacted by the required 5-6km buffer zone around the nest.

No additional mitigation measures are required as a result of the proposed amendments.

5.1.2. Conclusion

Given the potential changes to the turbine specifications, a re-assessment of the potential turbine collision impact was carried out in light of the proposed amendment, in order to establish if the original pre-mitigation assessment by Van Rooyen *et al*. (2014) should be revised and if the original mitigation measures need to be changed or added to. Given the fact that the number of turbines is a more important factor in determining the risk than the dimensions of the individual turbines (as evidenced by the existing literature), the collision rating associated with the proposed amendments remains unchanged. The proposed amendments would be advantageous from a bird impact perspective due to the reduction in the turbines

[2] It should be recognised that Martial Eagle territories in an arid environment like Bushmanland are likely to be much larger than in the mesic Lowveld of the Kruger National Park, therefore a 5-6km turbine free buffer should be seen as an absolute minimum.

and overall rotor swept area. No additional mitigation measures are recommended as a result of this amendments.

5.2. Impacts on bats

Consideration of the change in impact on bats associated with the proposed amendments was undertaken by Jonathan Aronson of Camissa (refer to **Appendix B**). The relationship between bat fatality and both turbine and wind farm size is equivocal, making it challenging to assess the impact of changes to turbine and wind farm size on risk to bats. This suggests that assessments should be relevant to local bat species as much as possible. Limited published data are available on the relationship between turbine and wind farm size and bat fatality in South African. This report is therefore based on unpublished local data and the specialist's local knowledge and experience, supplemented with findings from international research. To assess the impact of the proposed amendment, it is assumed that the hub height and rotor diameter of the turbines ultimately selected will range between 140 m (approved) and 200 m (proposed), and that any combination of hub height and rotor diameter between these lower and upper bounds could be used. However, turbines within these bounds may have differential impacts to bats since bat fatality varies with turbine size. Therefore, the worst-case scenario is assessed, assuming that the worst-case would be the turbine with blades sweeping the closest to the ground. The rationale for this assumption is that bat activity recorded at the met mast during the pre-construction monitoring was higher at the lower microphone (12 m) compared to the upper microphone (65 m). This aligns with data from other arid regions in South Africa. Thus, turbine blade tips extending into lower airspaces might increase risk to bats. The worst-case scenario (defined as a turbine with lowest hub height and longest blades) would be a turbine with a hub height of 140m and a rotor diameter of 200m which would result in the blades extending down to 40m above the ground.

5.2.1. Comparative Assessment

This assessment evaluates to what degree the proposed amendments change the predicted impacts to bats assessed during the EIA in December 2014. Directs impacts considered during the original EIA were roost destruction, roost disturbance and bat mortality (during commuting/foraging or migration). Indirect impacts were habitat modification, light pollution, habitat creation in high-risk areas, light pollution, and loss of ecosystem services. Since bat mortality during commuting/foraging poses the major direct impact associated with the proposed Poortjies WEF, only this impact is assessed in this report. All other identified impacts are unlikely to be affected by the proposed changes. The original EIA predicted risk of bat mortality during commuting/foraging to have a medium significance. The worst-case scenario would increase risk to bats, but the overall significance of the impact would remain medium with mitigation based on the amendments.

Nature of impact: Mortality due to collision with wind turbine blades and/or barotrauma during commuting an/or foraging.				
	Authorised		**Proposed amendment**	
	Without mitigation	**With mitigation**	**Without mitigation**	**With mitigation**
Extent	Regional (3)	Regional (2)	Regional (3)	Regional (2)
Duration	Long-term (4)	Long-term (4)	Long-term (4)	Long-term (4)
Magnitude	Moderate (8)	Low (5)	Moderate (7)	Moderate (6)
Probability	Highly Probable (4)	Probable (3)	Highly probable (4)	Probable (3)
Significance	**56 (Medium)**	**33 (Medium)**	**56 (Medium)**	**36 (Medium)**
Status (positive or negative)	Negative	Negative	Negative	Negative

Reversibility	Impossible	Impossible	Impossible	Impossible
Irreplaceable loss of resources?	Yes	Yes	Yes	Yes
Can impacts be mitigated?	Yes		Yes	Yes

The current mitigation measures include using buffers to spatially segregate areas important for bats from wind turbines. At the proposed site, these areas are potential bat roosts that were identified, mapped, and buffered during the pre-construction monitoring. The remaining mitigation measures are implemented during the operation of the facility and include using, if fatality occurs, ultrasonic deterrents, raising the cut-in speeds of turbines, turbine blade feathering and using targeted curtailment. The proposed amendments do not require the implementation of any additional mitigation measures. Therefore, the mitigation measures described in the pre-construction bat monitoring report and final EIA report must be adhered to, Furthermore Objective 7 in the Draft EMPr must be updated to reflect the following:

Objective: Reduction in bat mortality if mortality occurs beyond acceptable levels.	
Project component/s	The operational activities of the Development.
Potential Impact	Without effective mitigation, the potential impact is the possible decline over time in the populations of affected species and possible ecosystem level consequences depending on the severity of the impacts.
Activity/risk source	The operational activities of the Development and non-compliance with the Environmental Management Programme will have a direct impact on meeting this objective.
Mitigation: Target/Objective	Reduction in bat mortality to a level to be determined by a suitably qualified bat specialist after consideration of pre-construction monitoring data, mortality data from operational monitoring at the Development and any relevant guidance available at the time.

Mitigation Action/Control	**Responsibility**	**Timeframe**
An operational monitoring study to search for bat carcasses (and to record bats using acoustic monitoring, especially at height) must be implemented. This should be undertaken according to the Best Practice Guidelines for bats available at the time.	Developer/WEF operator and suitably qualified bat specialist.	According to best practice (i.e., when turbine blades begin spinning and for two years).
If, according to a suitably qualified bat specialist and available guidance, levels of mortality are unacceptable, the following actions apply: • Extending the operational monitoring study. • Testing and using ultrasonic deterrent devices to prevent bats entering the airspace of the Development. • Turbine blade feathering to reduce the rotation of turbine blades below the candidate turbine cut-in speed, without increasing the cut-in speed. • Increasing the cut-in speed of turbines contributing to mortality (as shown by operational bat monitoring data) to wind speeds	Developer/WEF operator.	Duration of operational phase.

when the majority of bat species are not active. For example, approximately 60% of the bat activity in summer occurred below 6 m/s. The determination of these exact wind speeds will require detailed analysis of the pre-construction and operational acoustic monitoring data and must be discussed with the WEF operator. • Applying curtailment to turbines contributing to mortality (as shown by operational bat monitoring data) during specific time period and seasons. For example, reducing turbine operation when bats are most active (e.g., between 20:00 and 22:00 in January, February and December). The above approaches should be used in an adaptive manner, adjusting the degree of mitigation (i.e., curtailment) applied based on mortality data and the success/failure of each type of mitigation. These mitigation measures should not be implemented without first consulting a bat specialist.		
Performance indicator	A reduction in bat fatalities to acceptable levels (based on specialist expertise and available guidance) as a result of mitigation is the major performance indicator.	
Monitoring	The analysis of bat fatality data should be undertaken regularly (i.e., as data are collected) by a suitably qualified bat specialist to determine the levels of bat mortality and to ensure this objective is met. The operational mitigation plan should be continuously reviewed based on the results.	

5.2.2. Advantages and disadvantages

An advantage of the proposed amendments is the reduction in the number of turbines from 50 to 24. The hypothesis is that by using fewer turbine, bats will be less likely to encounter a given wind turbine and hence overall fatality should decrease. However, evidence from the United Kingdom[3] suggests that while the risk to bats increases with the number of turbines, risk also increases with larger rotor sizes, with each additional increase in blade length predicted to increase mortality by 18 % per metre. Thus, reducing the number of turbines might not automatically reduce risk especially if larger turbines are used instead. Published evidence from Germany[7] and the United States[2], and unpublished data from South Africa, suggests that for some bat species, the number of turbines at a wind farm does not influence risk. Nonetheless, because of this uncertainty, it is assumed that having fewer turbines would present a potential advantage of the amendments.

Following from the above, a disadvantage of the proposed amendments is the larger rotor diameter which will create a larger rotor swept area (RSA) hence increasing the probability that a bat could encounter risky airspace. The blade tips would also extend closer to the ground and reach higher up into the air. Currently the RSA extends from 70 m above ground level up to 210 m. Based on the worst-case scenario, this would

[3] Mathews, F., Richardson, S., Lintott, P., & Hosken, D. (2016). Understanding the Risk of European Protected Species (Bats) at Onshore Wind Turbine Sites to Inform Risk Management. Report by University of Exeter. pp 127. [7] Rydell, J., L. Bach, M.-J. Dubourg-Savage, M. Green, L. Rodrigues, and A. Hedenström. 2010. Bat mortality at wind turbines in northwestern Europe. Acta Chiropterologica 12:261-274.

change to 40 m above ground level up to 240 m. This change may increase risk to bats compared to the previous impact assessment and is therefore a disadvantage of the proposed amendments.
The increased hub height may be an advantage of this amendment because it facilitates elevating the rotor blades further from ground level where risk to bats is lower. However, this would be counteracted with increases to the blade length especially if these extend closer to ground level as in the worst-case scenario. Based on unpublished data from South Africa the minimum blade sweep is an important factor to consider when assessing risk, with risk increasing with decreases in the minimum blade sweep height. The advantage of the increased hub height may therefore only be realised in conjunction with relatively shorter blades that avoid lower, riskier airspaces.

5.2.3. Conclusion

The proposed amendments would increase the magnitude of impact to bats but overall, the significance of this impact remains as medium provided mitigation measures are implemented. The mitigation measures described above must be implemented according to the Environmental Management Programme in the pre-construction monitoring report. The basis of this plan is to implement a programme to search for bat carcasses and depending on the magnitude of bat mortality, several adaptive management actions must be used. No additional management actions would be required based on the amendment, however objective 7 in Draft EMPr (Savannah, 2015) must be updated to reflect that in the bat assessment.

5.3. Ecological Impact

An assessment was undertaken to evaluate the ecological impacts associated with the proposed amendments. This further included a comparison with those impacts that were predicted in the Poortjies EIA. The findings of the assessment are detailed below, including the advantages and disadvantages, and the measures to ensure avoidance, management, and mitigation. The assessment was undertaken by Simon Todd of 3Foxes Consulting (Appendix C).

5.3.1. Comparative Assessment

The revised layout is similar to the original layout in terms of the location of access roads and turbine locations. In addition, the change in turbine specifications would not increase the overall footprint of the development as compared to that already authorised. In addition, there are not likely to be any new or novel impacts on terrestrial ecology associated with the change in turbine specifications. As such, there would not be any changes to the impacts as originally assessed. Therefore, no impact tables are presented here.

i. Advantages and disadvantages associated with the proposed change

The changes to the layout would not entail any significant ecological advantages or disadvantages for the development. The lower number of turbines would be advantageous in some respects, but this would be largely offset by the increase in their footprint, with the result that these two changes are likely to largely cancel one another out, with little net overall change in impact. Consequently, there are no significant advantages or disadvantages of the changes that would affect the impacts of the development as assessed.

ii. Measures to ensure avoidance, management and mitigation of impacts

The changes to the layout are within the original assessed development footprint and would not result in any new, novel or increased impacts. As such, there are no additional changes to the mitigation and avoidance measures that were recommended and in the original study. In addition, the cumulative impacts associated with the amendment are considered to be the same as those as assessed and thus there would no changes to the overall cumulative impacts associated with the changes. All of the mitigation and avoidance measures as recommended in the EIA are held up by the current study and should be applicable to the amendment as well.

iii. Changes to the EMPr

There are no recommended changes to the EMPr, and all of the mitigation and avoidance measures as recommended in the EIA are applicable to the amendment layouts.

5.3.2. Conclusion

The change to the layout and turbine specifications for the Poortjies Wind Energy Facility would not generate novel impacts or increase the severity of existing impacts associated with the Poortjies WEF. 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 and it can therefore be supported from an ecological point of view.

5.4. Impacts on heritage resources

Consideration of the change in impact on heritage resources associated with the proposed amendments was undertaken by ACO Associates (refer to **Appendix D**). The heritage impact assessment (HIA) produced by ACO Associates as part of the Environmental Impact Assessment process in 2014 (Hart *et al* 2014c) considered archaeological heritage resources, the historical built environment, cultural landscapes and scenic routes and sense of place in the proposed WEF footprint. The requirement for a palaeontological assessment as part of the HIA was scoped out at the Scoping Report stage of the project.

The Poortjies WEF HIA assessed the proposed facility layout and found the following:

- Archaeology: No clearly definable archaeological sites were recorded. The typical pre-colonial archaeology of the site is limited to a diffuse litter of stone artefacts across the landscape
- Built environment: No elements of the historical built environment were encountered on the Poortjies site.
- Cultural landscape: Given the results of the archaeological survey, the fact that the farm was only granted in the early 20th century and that all the structures date to this time and later, there are few, if any, cultural landscape elements of concern.
- Sense of place and visual impacts: The site is very remote and has a distinct sense of place. The vast open spaces of Bushmanland mean that visual impacts will be high, but due to the remoteness of the area, there are very few visual receptors.

The N14 lies some 15 km to the north of the WEF site and is the only route that can be regarded as a significant scenic route through the area. To the north the site is completely screened from the N14 by the intervening

low mountains and from the west it is too distant from the N14 to result in an impact. The R358 is has scenic qualities but being a gravel road, carries far less traffic than the N14. It lies some 13 km to the east of the WEF.

The HIA made the following assessment of impacts on heritage resources:

» The study area is not archaeologically sensitive and rescue excavations of archaeological material will not be necessary for any development of the site, along the power line routes or at the proposed substation site. Generally, the impact of the proposed activity on archaeological material is expected to be very low.
» No colonial period heritage – i.e. buildings and historical sites of significance - was identified within the boundaries of the study area.

The only area of concern, which is outside of the boundary of the WEF, was the proposed access road from the N14 which passes through the old Namies Village area. Impacts to this site can, however, be avoided by the proposed diversion of the road to the south or by using either of the alternative routes into the WEF from the south.

» Cultural landscapes are highly sensitive to large scale development activities that change the character and public memory of a place and the cumulative impacts of these. In terms of the National Heritage Resources Act, a cultural landscape may also include a natural landscape of high rarity value, aesthetic, and scientific significance. The construction of a large facility such as a WEF can result in profound changes to the overall sense of place of a locality, if not a region.

  Given the fact that this particular landscape is of limited aesthetic value, not particularly rare and extremely isolated, the significance of the landscape impact is moderated and was assessed to be medium negative.

The following heritage mitigation measures were proposed in the Poortjies HIA:

» Archaeological heritage: There is no surface archaeological material that requires any form of mitigation prior to construction work.
» Built environment and colonial period sites: There are no protected sites or structures within the study area that require mitigation. The access road which passes through the site of the village of Namies will result in impacts if widened. The diversion of the route to the south as proposed is supported, as is the use of the alternative or second alternative access road.
» Cultural landscape: No mitigation measures are suggested

Human remains can occur at any place on the landscape are protected by a range of legislation including the National Heritage Resources Act (Act No 25 of 1999). In the event of human bones being found during construction activities, SAHRA must be informed immediately, and the remains removed under an emergency permit. This process will incur some expense as removal of human remains is at the cost of the developer. Time delays may result while application is made to the authorities and an archaeologist is appointed to do the work.

5.4.1. Comparative Assessment

The EA amendment application for the Poortjies WEF is for an increase in turbine hub height and blade diameter, both to a maximum of 200 m as well as for a reduction in the number of turbines to be installed.

The larger WTGs mean an increase in the turbine footprint and foundation size, but this will be small and will result in no change to the assessed impacts on archaeological heritage.

The larger turbines will also be a more prominent visual element in the landscape with potentially increased impacts on the cultural landscape and sense of place. Based on the impact assessment in the HIA, which found that this particular landscape is of limited aesthetic value, not particularly rare and extremely isolated, it is likely that the significance of the landscape impact will no increase if the larger turbines are installed. It therefore remains as medium negative. Therefore, no impact tables are presented here. No advantages or disadvantages were identified.

5.4.2. Conclusion

It is our reasoned opinion that the increase in turbine specification and reduction in turbine numbers proposed in this EA amendment application is tolerable, generally of low significance and will occasion no changes to the identified impacts of the Poortjies WEF on heritage resources, provided the relevant mitigation measures recommended in the HIA are implemented.

From a heritage resources perspective, therefore, the proposed amendments to the environmental authorisation for the Poortjies WEF are considered acceptable.

5.5. Visual impact

This visual assessment addendum letter compiled by LOGIS **(Appendix E)** includes a comparative viewshed analysis in order to determine the visual exposure (visibility) of the original (authorised) turbine dimensions compared to the potential (additional) exposure of the increased (proposed) turbine dimensions. The viewshed analysis focuses on a radius of 20km from the proposed amended turbine layout (development footprint) and potential visual receptors located within this zone. The original VIA report determined that receptors, where visible, within this zone may experience ***high*** to ***moderate*** visual impacts of the proposed infrastructure.

Potential sensitive visual receptors include observers residing at homesteads (farm residences and dwellings) within the study area, and observers travelling along the arterial or secondary roads traversing near the proposed development site.

5.5.1. Comparative Assessment

A viewshed analysis was undertaken (**Figure 5.1**) from each of the authorised wind turbine positions (50 in total) at an offset of 210m (maximum tip height) above ground level. The result of this analysis represents the potential total visual exposure of the original and authorised turbine dimensions (indicated in green on **Figure 5.1**). The viewshed analysis was repeated at an offset of 300m to indicate the visual exposure (shown in red) of the increased turbine dimensions (24 in total) proposed as part of the amendment. The results of the viewshed analyses are displayed on **Figure 5.1** overleaf.

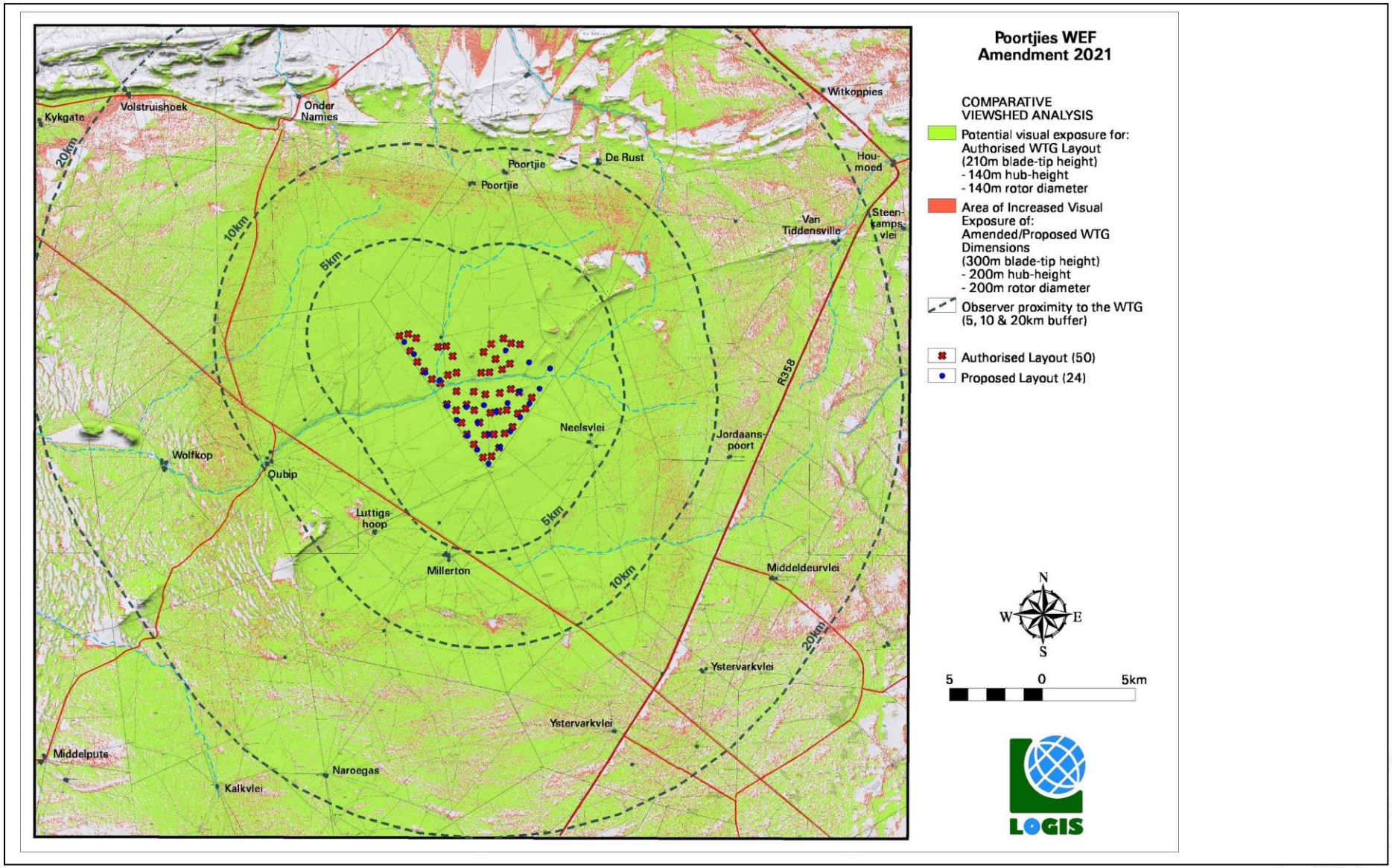

Figure 5.1: Comparative Viewshed Analysis for Poortjies Wind Farm

The analysis indicated that with the proposed amendments, approximately 30% increase in turbine dimensions, would have a relatively small influence on the overall visual exposure of the wind farm, due to the already tall turbine structures previously authorised and the predominantly flat topography of the surrounding landscape. The surface area (within the study area) of the original turbine exposure is 1,264km^2, compared to the 1,467km^2 of the increased dimensions of the wind turbine exposure. This is an increase of 203km^2, or alternatively, an increase of 16% in the potential visual exposure.

There are no additional sensitive visual receptors located within the area of increased visual exposure that will be affected by the amended turbine dimensions and layout. Potential sensitive visual receptors within an approximately 20km radius (identified during the EIA phase) include:

- **< 5km**
  - Neelsvlei
  - A section of the secondary road traversing south-west of the facility

- **5 – 10km**
  - Millerton
  - Luttingshoop
  - Oubip
  - Poortjie 1 & 2

- **10 – 20km**
  - Naroegas
  - Wolfkop
  - De Rust
  - Van Tiddensville
  - Jordaanspoort
  - Middeldeurvlei
  - Ystervarkvlei 1 & 2
  - A section of the R358 arterial road traversing south-east of the facility

Note:
Where homesteads are derelict or deserted, the visual impact will be non-existent, until such time that they are inhabited again.

In spite of the increase in the turbine dimensions it is expected that the wind turbine structures, both the original dimensions and the proposed increased dimensions would be equally visible and noticeable from both the roads and homesteads identified above. This signifies a negligible change to the potential visual impact with the implementation of the amended turbine dimensions. Therefore, no impact tables are presented here.

It is worth noting that the Poortjies WEF is located immediately south of the approved Korana and Khai Ma WEFs, potentially contributing to the cumulative visual impact of wind turbine structures within the landscape. It is however still preferable to consolidate and concentrate wind energy facilities within this zone rather than to spread it further afield. The location of the WEFs is also generally remote and there are a limited number of potential sensitive visual receptors within the region. The cumulative visual impact is therefore deemed to be of an acceptable level.

5.5.2. Conclusion

The proposed increase in the dimensions of the wind turbine structures is **not expected to significantly alter** the influence of the Poortjies Wind Energy Facility on *areas of higher viewer incidence* (observers traveling along the arterial or secondary roads within the region) or *potential sensitive visual receptors* (residents of homesteads in close proximity to the wind farm).

The proposed increase in turbine dimensions is consequently **not expected to significantly 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 20km from the structures.

From a visual perspective, the proposed changes to the turbine dimensions will therefore require no (zero) changes to the significance ratings of the impacts identified 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. No advantages or disadvantages associated with the proposed amendments were identified.

It is suggested that the proposed amendment to the turbine dimensions and layout be supported, subject to the conditions and recommendations as stipulated in the Environmental Authorisation, and according to the Environmental Management Programme and suggested mitigation measures, as provided in the original Visual Impact Assessment report.

5.6. Noise impact

Consideration of the change in noise impact associated with the proposed amendments was undertaken by Enviro Acoustic Research (refer to **Appendix F**). An Environmental Noise Impact Assessment (ENIA) was conducted by Enviro Acoustic Research in 2014 for the EIA process for Poortjies WEF. With the input data used the assessment indicated that the proposed project would have a noise impact of a ***low significance*** on all Noise Sensitive Developments (NSDs) in the area during both the construction and operational phases using the Vestas V117 3.3MW wind turbine for all wind speeds. This wind turbine has a maximum sound power generation level of 107.0 dBA. The projected maximum noise levels would be less than 35 dBA at the closest NSD.

5.6.1. Comparative Assessment

The wind energy market is fast changing and adapting to new technologies as well as site specific constraints. Optimizing the technical specifications can add value through, for example, minimizing environmental impact and maximizing energy yield. As such the developer has been evaluating several turbine models, however the selection will only be finalized at a later stage once the most optimal wind turbine is identified (factors such as meteorological data, price and financing options, guarantees and maintenance costs, etc. must be considered).

Because of the availability of more optimal or efficient wind turbines, the developer of the WEF is considering changing the wind turbine specifications. As the specifications of the final selection are not yet defined, this

review evaluates a potential worst-case scenario, with a wind turbine with a sound power emission level of 109 dBA.

All of the proposed wind turbines are further than 2,000m from any potential noise-sensitive receptors (closest receptors around 9 km away) and even with the higher potential sound power emission level (worst-case of 109 dBA), the maximum projected noise level will be less than 35 dBA at the closest NSD. There will be no change in the impact predicted in the EIA and therefore no impact tables are presented here. No additional mitigation measures are required, and no advantages or disadvantages have been identified.

5.6.2. Conclusion

Considering the location of the wind turbines and the potential noise impact, it is specialist opinion that the change will not increase the significance of the noise impact. A full noise impact assessment with new modelling will not be required and the findings and recommendations as contained in the previous document (report SE-MPWEF/ENIA/201411-Rev 0) will still be valid.

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.

Advantages of the amendment	Disadvantages of the amendment
General	
The increase in rotor diameter will increase the efficiency of the facility and consequently the economic viability thereof. Increased efficiency of a facility is considered to be beneficial to the environment as this will reduce the need for additional facilities to generate additional electricity. It is also beneficial from a macroeconomic perspective as it results in the lower cost per unit of energy, ultimately benefiting the South African public.	None
The number of wind turbines are proposed to be reduced from the currently authorised 50 wind turbines to the proposed 24 wind turbines. This would result in a reduced footprint and lower impacts on the environment.	
Avifauna	
The proposed amendment to the turbine model increases the per-turbine collision risk window but this is offset by the reduced number of turbines. Given the fact that the number of turbines is a more important factor in determining the risk than the dimension of the individual turbines, the collision rating therefore remains unchanged.	Potential increase in rotor swept area – increasing collision mortality risk. This is however offset by the reduced number of turbines
Bats	
The increased hub height may be advantageous because it facilitates elevating the rotor blades further from ground level where risk to bats is lower. Reduction in the number of turbines from 50 to 24 reduces the potential for habitat loss.	Larger rotor diameter which will create a larger rotor swept area hence increasing the probability that bats could encounter risky airspace.
Ecology	
None	None
Heritage	
None	None
Visual	
Fewer wind turbines in the landscape.	Marginally increased extent of potential visual exposure. There are however no sensitive visual receptors located within the area of increased visual exposure that will be affected by the amended turbine dimensions and layout
Noise	
All of the proposed wind turbines are further than 2,000m from any potential noise-sensitive receptors (closest receptors around 9 km away) and even with the higher	None

Advantages of the amendment	Disadvantages of the amendment
potential sound power emission level (worst-case of 109 dBA), the maximum projected noise level will be less than 35 dBA at the closest NSD.	

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

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. No additional mitigation measures are provided by the specialists, However the Bat specialist recommended that objective 7 (Reduction in bat mortality if mortality occurs beyond acceptable levels) in the Draft EMPr (Savannah, 2015) must be updated as per the bat assessment. The recommendations made by the Bat specialist have been included within the EMPr (**Appendix G**) to be submitted as part of the amendment application, to ensure they are made binding on the developer and contractors. A final EMPr will still be submitted for approval prior to construction as per the condition 16 of the Split EA.

8. PUBLIC PARTICIPATION

A public participation process has been conducted in support of a Part 2 application for amendment of the Environmental Authorisation for the Poortjies Wind Energy Facility in the Northern Cape Province.

A full Interested and Affected Party (I&AP) database is included in **Appendix H1**. It must be noted that the project is to be developed on the same farm portions as originally authorised, all of which, are privately owned. The landowners were informed of the part 2 amendment process, and they gave consent as required by the DFFE. The amendment to the Environmental Authorisation will not result in impacts on any additional interested and affected parties.

The public participation for the proposed amendment process included:

- The Draft Motivation Report was made available for a public review period on www.savannahsa.com from **Friday, 27 August 2021 until the Monday, 27 September 2021.**
- Written notification to registered I&APs including landowners (refer to **Appendix H2**) and Organs of State (refer to **Appendix H3**) regarding the availability of the Draft Motivation Report were sent on **Friday, 27 August 2021**.
- Advertisements were placed in the **Gemsbok newspaper** on **Wednesday, 25 August 2021** (refer to **Appendix H4**).
- Site notices were placed at the site on **Wednesday, 11 August 2021 (**refer to **Appendix H4)**.

Comments received during the public review period are included in this final submission to the DFFE for consideration in the decision-making process. Comments are included and responded to in the Comments and Responses Report included in this final Motivation Report submission (refer to **Appendix H6**).

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[4] Contact details of I&APS are not included due to POPIA requirements.

9. CONCLUSION

Based on the specialist findings, it is concluded that the proposed amendments to the turbine specifications, and the reduction in the number of turbines are not expected to result in an increase to the significance ratings for the identified potential impacts. Specific findings were issued by the respective specialists, summarised below:

- The **Avifaunal** specialist found that the increase of the rotor diameter to 200m will result in a rotor swept area of approximately 31 415m² per turbine. This amounts to an increase of 104% in the rotor swept area per turbine, which is significant. However, the applicant proposes to reduce the number of turbines from the approved 50 to a maximum of 24 turbines. That amounts to a 2% reduction in total rotor swept area, and a reduction of 52% in the number of turbines. The reduction of turbine numbers means that the total rotor swept area remains unchanged. Furthermore, given the fact that the number of turbines is a more important factor in determining the risk than the dimension of the individual turbines, the collision rating therefore remains unchanged. The proposed amendments would be advantageous from a bird impact perspective due to the reduce numbers. No additional mitigation measures are required for the proposed amendments.
- The **Bat** specialist considered bat mortality during commuting /foraging as posing the major direct impact associated with the proposed Poortjies WEF amendment, and therefore only this impact was further assessed. The original EIA predicted risk of bat mortality during commuting/foraging to have a medium significance. The worst case scenario (i.e. increased turbine specifications with the current layout of 50 turbines) would increase risk to bats, but the overall signifIcance of the impact would remain medium with mitigation based on the amendments. No additional management actions would be required based on the amendments, however it was recommended that Objective 3 (reduction in bat mortality if mortality occurs beyond acceptable levels) of Chapter 7 in the EMPr should be updated to indicate adaptive management actions (refer Appendix G of this motivation report).
- The **Ecological** specialist found out that the changes to the layout are within the original assessed development footprint and would not result in any new, novel or increased impacts. As such, there are no additional changes to the mitigation and avoidance measures that were recommended and in the original study. In addition, the cumulative impacts associated with the amendment are considered to be the same as those as assessed and thus there would no changes to the overall cumulative impacts associated with the changes. All of the mitigation and avoidance measures as recommended in the EIA are held up by the current study and should be applicable to the amendment as well.
- The **Heritage** specialist found that, the proposed larger WTGs mean an increase in the turbine footprint and foundation size, but this will be small and will result in no change to the assessed impacts on archaeological heritage. The larger turbines will also be a more prominent visual element in the landscape with potentially increased impacts on the cultural landscape and sense of place. Based on the impact assessment in the HIA, which found that this particular landscape is of limited aesthetic value, not particularly rare and extremely isolated, it is likely that the significance of the landscape impact will not increase if the larger turbines are installed. The impact rating therefore remains as medium negative significance. It has been concluded that the proposed amendment application is tolerable, generally of low significance and will result in no changes to the identified impacts of the Poortjies WEF on heritage resources, provided the relevant mitigation measures recommended in the HIA are implemented.
- The **Visual** specialist indicated that, the proposed changes will have 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. It is suggested that the

proposed amendment to the turbine dimensions and layout be supported, subject to the conditions and recommendations as stipulated in the original Environmental Authorisation, and according to the Environmental Management Programme and suggested mitigation measures, as provided in the original Visual Impact Assessment report.

» The **Noise** specialist found that all of the proposed wind turbines are further than 2 000m from any potential noise-sensitive receptors (closest receptors around 9km away) and even with the higher potential sound emission level (worst-case of 109 dBa), the maximum projected noise level will be less than 35 dBA at the closest NSD.

All specialists therefore concluded that the amendments proposed are considered acceptable from their respective specialisation and that the proposed amendments to the turbine specifications and the reduction in the turbine number be supported subject to the conditions and recommendations as stipulated in the Environmental Authorisation and according to the Environmental Management Programme and suggested mitigation measures, as provided in the original specialist's assessments reports.

9.1. Overall Conclusion and Recommendations

The amendment in itself does not constitute a listed activity. The mitigation measures described in the original EIA document are adequate to manage the expected impacts for the project. The Bat specialist recommended that objective 7 of the Draft EMPr (Savannah, 2015) be updated as per the bat assessment undertaken for the proposed amendments. The recommendations as per the specialist have been included within the project EMPr (**Appendix G**) to be submitted as part of this amendment application.

Given the above, South Africa Mainstream Renewable Power Developments (Pty) Ltd requests the following amendments as part of this application:

i. Amendment of the turbine specifications, to be as follows:
   - » The increase of the hub height from 140m (authorised in 2015 and re-issued in 2021) to reflect as 'up to 200m'
   - » The increase of the rotor diameter from 140m (authorised in 2015 and re-issued in 2021) to reflect as 'up to 200m'.
   - » Inclusion of the Blade tip height of 'up to 300m.

ii. A reduction in the authorised number of turbines from the currently authorised 50 turbines (authorised in 2015 and re-issued in 2021), to reflect as 'up to 24'.

As required in terms of Condition 15 of the EA, the final layout will be submitted to the DFFE for review and approval once a turbine supplier has been selected for the project during the final design process. A final EMPr will still be submitted for approval prior to construction as per the condition 16 of the Split EA.

Taking into consideration the conclusions of the studies undertaken for the proposed amendments (as detailed in (**Appendix A–F**), it is the opinion of the EAP that these amendments are considered acceptable from an environmental perspective, provided that the original and additional mitigation measures stipulated herein are implemented.

APPENDIX A:
AVIFAUNAL SPECIALIST ADDENDUM REPORT

APPENDIX B:
BAT SPECIALIST ADDENDUM REPORT

APPENDIX C:
ECOLOGY SPECIALIST COMMENT LETTER

APPENDIX D:
HERITAGE SPECIALIST ADDENDUM REPORT

APPENDIX E:
VISUAL SPECIALIST ADDENDUM REPORT

APPENDIX F:
NOISE SPECIALIST COMMENT LETTER

APPENDIX G:
UPDATED EMPr

APPENDIX H:
PUBLIC PARTICIPATION DOCUMENTATION

APPENDIX I:
A3 MAPS

APPENDIX J:
EAP DECLARATION AND AFFIRMATION

APPENDIX K:
SPECIALISTS DECLARATIONS

APPENDIX L:
CONSULTANTS CV