PROPOSED KHAUTA SOLAR PHOTOVOLTAIC (PV) CLUSTER AND ASSOCIATED GRID CONNECTIONS DEVELOPMENT, RIEBEECKSTAD NEAR WELKOM, FREE STATE PROVINCE

SITE SENSITIVITY VERIFICATION REPORT

MAY 2022

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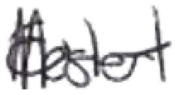
DOCUMENT CONTROL

QUALITY AND REVISION RECORD

Quality approval

	Capacity	Name	Signature	Date
Author:	Environmental Consultant Operations- and Project Manager (MSc Botany, SU 2015; EAPASA Reg.: 2019/ 1311)	Elana Mostert		12 May 2022
Reviewer:	Environmental Consultant (BSc. Hons Environmental Sciences, NWU 2010, SACNASP Reg No. 114435)	Gerhard Schoeman		16 May 2022

This report has been prepared in accordance with Enviroworks Quality Management System.

Revision record

Revision Number	Objective	Change	Date
1	Draft Report	Internal and Client review	12 May 2022
2	Draft Report	Updated based on Internal review -Minor comments and edits -Incorporated biodiversity buffer recommendations from the Avifaunal specialist	16 May 2022

DISCLAIMER

Even though every care is taken to ensure the accuracy of this report, environmental assessment studies are limited in scope, time and budget. Discussions are to some extent made on reasonable and informed assumptions built on bona fide information sources, as well as deductive reasoning. Since environmental impact studies deal with dynamic natural systems additional information may come to light at a later stage during the impact assessment phase. The author does not accept responsibility for conclusions made in good faith based on own databases or on the information provided. Although the author exercised due care and diligence in rendering services and preparing documents, the author accepts no liability, and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the authors and by the use of this document. This report should therefore be viewed and acted upon with these limitations in mind.

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1. PROJECT DESCRIPTION

WKN Windcurrent SA (Pty) Ltd (The Applicant) appointed Enviroworks, an Independent Environmental Assessment Practitioner (EAP) to undertake the required Environmental Authorisation (EA) Processes for the proposed development of three (3) 100 MW Solar Photovoltaic (PV) Energy Facilities. Each facility will be applied for separately. As there are no Eskom grid lines with the available capacity crossing the site, a separate application for a 132 kV overhead power-line grid connection of approximately 10-12 km will be required. Two route options for the 132 kV line are under consideration, connecting respectively to the Leander or Everest Substations.

The client has expressed their interest in possibly developing two (2) smaller additional facilities, just to the south of the 3 x 100 MW facilities. The development of the two smaller facilities (19.9 MW) will depend on the available suitable space. The 2 x 19.9 MW facilities will also be connected to a new separate Eskom 44 kV power-line grid connection to Riebeeckstad Substation. Each facility will be a separate application for authorisation.

The proposed developments are situated on the outskirts of Riebeeckstad near Welkom, Matjhabeng Local Municipality (Lejweleputswa District) in the Free State Province (Figure 1).

2. OBJECTIVE

The objective of this Site Sensitivity Verification (SSV) Report is to summarise the findings of various specialist studies that have been commissioned to outline the possible site sensitivities within the study area. The outcome of this SSV Report will be used to inform the Applicant in developing the project scope of works and site layout plans for the proposed developments.

The objective of the various specialist studies was to provide the following for their respective fields:

a) A brief description of the site with high-level feedback on the proposed development footprint;
b) Identify Sensitive areas;
c) Identify No-go areas;
d) Provide buffers for sensitive areas; and,
e) Provide overall spatial files and maps that outline the sensitive areas, no-go areas and possible buildable area for development.

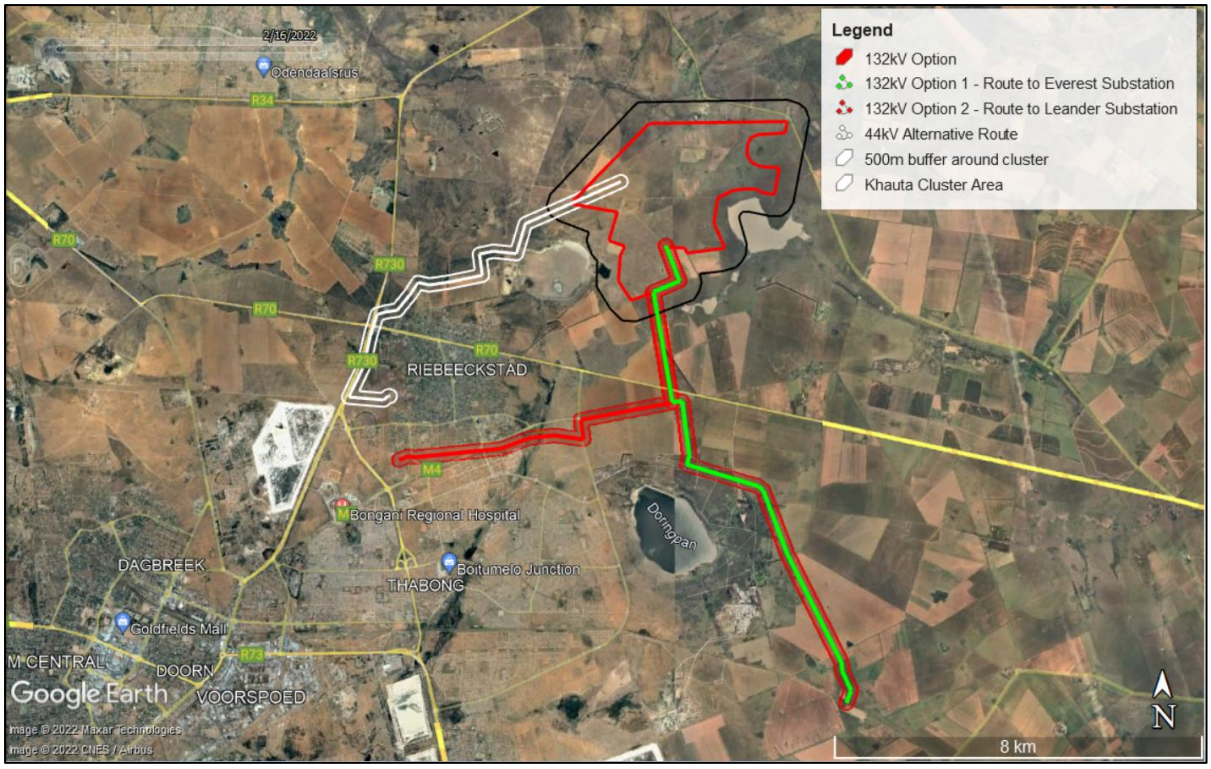


Figure 1 Map indicting the assessment area: PV Solar Cluster; Two (2) x 132 kV grid connection options, one (1) x 44 kV grid connection option, each with a 150m buffer around the power line (from Google Earth)

3. SYNOPSES OF SPECIALISTS' SITE SENSITIVITY VERIFICATION ASSESSMENTS

3.1. AVIFAUNAL ASSESSMENT

A SSV Report was compiled by Mokgatla Molepo and Shobana Makhubu from Moira Ecological Services (Pty) Ltd (May, 2022). For more information regarding the detailed approach, methodology, results and maps, please refer to Appendix A.

3.1.1. Results

The coverage of the study site was deemed adequate for the current scope of work.

From the survey, a total of 65 bird species were observed within and around the proposed site. Out of these observed species, none were classified as Red Data locally. However, there were medium to large sized species that are threatened by habitat loss and may be prone to collision.

The area has several pans that attract a variety of waterfowl, including migrants. This makes the waterbodies an important habitat that warrant protection.

Refer to Table 1 of the Avifaunal report for a list of collision prone species recorded during the survey.

Refer to Table 2 of the Avifaunal report for a list of species recorded during the survey.

The preliminary site assessment revealed that the solar panels will be located on old farmlands that consist of overgrown vegetation. In terms of 132 kV powerlines, Option 1 is the most preferred as it will run parallel to the existing powerlines until the substation. The only concerns at this stage are the alignment of the 44 kV overhead powerline and location of pans in relation to the powerlines.

Overall, the site was observed to be of low to moderate avifaunal sensitivity.

It is recommended that the developer may proceed with the Environmental Impact Assessment phase.

3.1.2. No-Go Areas

A deviation of the 44 kV line is proposed, to avoid the pan and area of high collision risk (Figure 2). The deviation will reduce the collision risk for birds flying to or away from the pan.

Figure 2 The yellow line depicts the proposed deviation in the 44 kV route to avoid an area of high collision risk (polygon depicted in red along the 300 m corridor)

3.1.3. Preferred 132 kV Route

In terms of the 132 kV powerlines, Option 1 is the most preferred as it will run parallel to the existing powerlines until the substation.

3.1.4. Recommendations and conditions

a) Waterbodies should be used as focal points throughout the duration of the study, as it is known that several bird species ecologically depend on water.
b) Conduct a preconstruction walkthrough and nest surveys to check for active nests on the proposed development footprint.
c) Collision Risk Areas will require marking using bird flight diverters.
d) Implement the suggested deviation in the 44 kV route to reduce the risk of bird collisions.
e) Light shields that direct the light downwards are recommended.
f) Perimeter fencing would require strategic marking to prevent or reduce collision, especially in areas of high collision risk.
    - Recommendations can be included during the Impact Assessment phase.

g) In terms of biodiversity buffers, the Avifaunal specialist confirmed that the following buffers can be omitted, if necessary:
    - No biodiversity buffer (from an avifaunal perspective) is recommended along the wetlands within the 132kV Option 1.
    - No biodiversity buffer (from an avifaunal perspective) is recommended for wetlands: Depression wetlands 1; Significant watercourse (no. 1- 13); and, Depression wetlands 2, on the condition that if the site establishment and construction is taking place outside of the nesting time, birds will relocate to other nearby habitats.

3.1.5. Way forward

a) Conduct an Avifaunal Impact Assessment.
b) The measures a) – d) in Section 3.1.4 will be included in the project specific Environmental Management Programme (EMPr) for implementation during all project phases.

3.2. AQUATIC ECOLOGICAL ASSESSMENT

A Site Sensitivity Verification Report was compiled by Rikus Lamprecht from EcoFocus Consulting (Pty) Ltd (May, 2022). For more information regarding the detailed approach, methodology, results and maps, please refer to Appendix B.

3.2.1. Results

3.2.1.1. Sandspruit:

The significant second-order seasonal Sandspruit flows past the assessment area, approximately 400 m - 600 m to the north and continues in a westerly direction. It then eventually discharges into the Vaal River. The Sandspruit is deemed the only significant watercourse associated with the assessment area and the proposed three transmission line route alternatives. The Sandspruit constitutes a significant tributary of the Vaal River and forms an important part of the local and broader quaternary surface water catchment- and drainage area, towards the west. The Vaal River is considered a primary national water resource; any potentially significant negative impacts on the ecological functionality and/or -services provided by the river, which could pose a potential threat to national water security, should therefore be avoided as far as practicably/reasonably possible.

A localised linear topographic highpoint/ridge apex traverses the central portion of the assessment area, which roughly lies in a south-west to north-east direction. This highpoint/ridge apex acts as a natural surface water runoff and drainage linear separation, between the portions of the assessment area situated north and south of the highpoint/ridge apex, respectively. Surface water runoff from the assessment area consequently mainly

drains either in a northerly- or southerly direction, depending on which side of the highpoint/ridge apex the area is.

The mechanical clearance associated with the proposed solar power generation facility development, will in all probability completely transform the majority of the existing surface vegetation within the PV grid-, internal access/services road- and other associated facility infrastructure footprints. The assessment area could therefore likely be prone to significant potential surface soil erosion, due to the sloping landscape together with the loosening of surface materials and clearance of vegetation (which usually binds the soil surface), caused by construction activities. Such soil erosion could potentially lead to a gradual, continual increase in sediment inputs and substantial contamination of aquatic features identified within the assessment area and subsequent downstream waterbodies, over time.

3.2.1.2. Sandspruit tributary:

A significant first-order seasonal watercourse/tributary associated with the commencement portion of the Sandspruit, flows past the assessment area, directly adjacent north and continues in a westerly direction. This watercourse discharges into the Sandspruit, approximately 400 m to the north of the assessment area. Surface water runoff from the central and northern portions of the assessment area situated north of the highpoint/ridge apex, consequently, mainly drains towards this watercourse. The watercourse forms an important part of the local and broader quaternary surface water catchment- and drainage area, towards the west.

The Ecological Importance and Sensitivity (EIS) of the watercourse is classified as Class C (moderate) as it is viewed as being ecologically important and sensitive on provincial scale. Due to the locally distinct and important nature of the aquatic and semi-aquatic habitat associated with the watercourse, the localised area is viewed as being of moderate to high conversational significance for habitat preservation and ecological functionality persistence in support of the surrounding aquatic ecosystem, the visible presence of habitat-specific waterbirds, amphibian species and aquatic invertebrates as well as the local and broader quaternary surface water catchment- and drainage area, towards the west. The presence of the Critical Biodiversity Area one (CBA 1), further substantiates the ecological importance of this area.

Buffer: A minimum of approximately 80 m water quality buffer distance is recommended to be implemented on both sides of the watercourse edges. No current or future development is allowed to take place within this buffered zone.

A biodiversity buffer of 200 m is recommended to be implemented (to be confirmed by the Avifaunal specialist).

This recommended buffer zone and associated recommendations must be implemented to attempt to maintain the hydrological and ecological functionality and -integrity of the watercourse and subsequent downstream waterbodies and their associated semi-aquatic habitats along with the Critical Biodiversity Area one (CBA 1), to

prevent any significant increase in sediment inputs and contamination and ensure the persistence/livelihood of aquatic and semi-aquatic fauna in the area.

3.2.1.3. Preferential water flow paths/drainage lines:

Three small preferential water flow paths/drainage lines are present within the central-northern portion of the assessment area. These flow paths/drainage lines traverse some old historically cultivated agricultural lands and merely assist with channelling surface water runoff from a very small portion of the assessment area, towards the significant watercourse to the north. Due to the lack of continuous water flow through the assessment area, these flow paths/drainage lines also do not possess any ecologically/conservationally significant semi-aquatic habitat. These flow paths/drainage lines therefore merely play an assisting role in the localised catchment and drainage and are not viewed as being of any conservational significance, from a hydrological or aquatic ecological perspective.

It is the opinion of the specialist that avoidance of the proposed development through these flow paths/drainage lines, is not necessarily required.

3.2.1.4. Depression pans:

The Commandants Pan constitutes a well-known significantly sized naturally occurring depression pan, which is situated approximately 150 m south-east of the assessment area. The pan is seasonally/temporarily inundated and the inflow of the pan mainly originates from a significantly sized unchanneled valley-bottom wetland, situated approximately 330 m north-east of the assessment. A broad surface water outflow is also evident on the southern side of the pan. This outflow constitutes a water drainage plain/valley-bottom wetland, which flows in a south-westerly direction. The drainage plain/valley-bottom wetland eventually flows into a second smaller depression pan, located directly adjacent south-west of the assessment area. This second pan in turn, discharges into an artificially constructed earth dam, also located directly adjacent south-west of the assessment area, which finally discharges into a significantly sized depression pan, located approximately 700 m south-west of the assessment area.

It is therefore evident that these pans, along with their associated in- and outflows, form an important part of the hydrological and aquatic ecological connectivity of the local and broader quaternary surface water catchment- and drainage area, towards the west.

The Ecological Importance and Sensitivity (EIS) of the pans is classified as Class C (moderate) as they are viewed as being ecologically important and sensitive on local and possibly provincial scale. Due to the locally distinct and important nature of the semi-aquatic habitats along with the significant size of the Commandants Pan, the localised areas are viewed as being of moderate to high conversational significance for habitat preservation and ecological functionality persistence in support of the surrounding aquatic ecosystem, the visible presence of habitat-specific waterbirds, amphibian species and aquatic invertebrates as well as the local and broader quaternary surface water catchment- and drainage area, towards the west.

The established solar power generation infrastructure will result in the emission of significantly bright glare/shine into the surrounding landscape. This along with the significant noise generated by the construction activities, will likely cause substantial disturbance and subsequently impact negatively on the ecological integrity and -functionality of the semi-aquatic habitats of the pans and the localised surrounding terrestrial grassland landscape. It is therefore recommended that the pans as well as portions of the surrounding natural undisturbed terrestrial grassland must be adequately buffered out of the proposed development footprint area.

Buffer: A minimum of approximately 80 m water quality buffer distance is therefore recommended to be implemented around the pans. No current or future development is allowed to take place within these buffered zones.

A biodiversity buffer of 250 m is recommended to be implemented around the Commandants Pan and 200 m buffer around the second pan (to be confirmed by the Avifaunal specialist).

The recommended buffer zones and associated recommendations must be implemented to attempt to maintain the hydrological and ecological functionality and -integrity of the pans and their associated semi-aquatic habitats along with the localised surrounding terrestrial grassland landscape, in order to prevent any significant increase in sediment inputs and contamination and ensure the persistence/livelihood of semi-aquatic fauna in the area.

3.2.1.5. Artificially constructed earth dam:

An artificially constructed earth dam is present directly adjacent south-west of the assessment area. The inflow of the dam mainly constitutes the depression pan, as well as the unchanneled valley-bottom wetlands. The outflow of this dam flows into the subsequent significantly sized depression pan located approximately 700 m south-west of the assessment area.

It is therefore evident that this dam, along with its associated in- and outflows, form an important part of the hydrological and aquatic ecological connectivity of the local and broader quaternary surface water catchment- and drainage area, towards the west.

The Ecological Importance and Sensitivity (EIS) of the dam is classified as Class C (moderate) as it is viewed as being ecologically important and sensitive on local scale. Due to the locally distinct and important nature of the semi-aquatic habitat, along with the dam forming an important part of the hydrological and aquatic ecological connectivity associated with the local and broader quaternary surface water catchment- and drainage area, the localised area is viewed as being of moderate conversational significance for habitat preservation and ecological functionality persistence in support of the surrounding aquatic ecosystem and the visible presence of habitat-specific waterbirds, amphibian species and aquatic invertebrates.

It is therefore recommended that the dam as well as a portion of the surrounding natural undisturbed terrestrial grassland must be adequately buffered out of the proposed development footprint area.

Buffer: A minimum of approximately 80 m water quality buffer distance is therefore recommended to be implemented around the dam. No current or future development is allowed to take place within this buffered zone.

A biodiversity buffer of 200 m is recommended to be implemented around the artificially constructed dam (to be confirmed by the Avifaunal specialist).

This recommended buffer zone and associated recommendations must be implemented to attempt to maintain the hydrological and ecological functionality and -integrity of the dam and its associated semi-aquatic habitat along with the localised surrounding terrestrial grassland landscape, in order to prevent any significant increase in sediment inputs and contamination and ensure the persistence/livelihood of semi-aquatic fauna in the area.

3.2.1.6. Unchanneled valley-bottom wetlands:

A substantial portion within the centre and south of the assessment area constitutes a broad naturally occurring unchanneled valley-bottom wetland. Surface water runoff from the central and southern portions of the assessment area situated south of the highpoint/ridge apex, consequently, mainly channels and drains through this wetland, towards the south-west.

Another naturally occurring unchanneled valley-bottom wetland flows past the assessment area directly adjacent south, while a portion of the wetland also traverses the south-western corner of the assessment area. This wetland forms part of the downstream outflow of the Commandants Pan, situated approximately 150 m south-east of the assessment area. This wetland therefore channels and drains significant volumes of surface water runoff towards the west, into the smaller depression pan.

Due to the lack of continuous water flow through the assessment area, these two wetlands do not possess any ecologically/conservationally significant semi-aquatic habitat. The wetlands are therefore not expected to be specifically utilised by any habitat-specific waterbirds, amphibian species and/or aquatic invertebrates for breeding, foraging and/or persistence purposes.

The first broad wetland gradually flows into a subsequent significantly sized naturally occurring unchanneled valley-bottom wetland, located within the southern portion of the assessment area. The localised topography flattens-out slightly in the vicinity of the subsequent wetland, which results in this subsequent wetland being seasonally/temporarily inundated. The outflow of the subsequent wetland further flows into the artificially constructed earth dam situated directly adjacent south-west of the assessment area. This dam in turn, finally discharges into the significantly sized depression pan, located approximately 700 m south-west of the assessment area.

It is therefore evident that these three unchanneled valley-bottom wetlands associated with the central and southern portions of the assessment area, form an important part of the hydrological and aquatic ecological connectivity of the local and broader quaternary surface water catchment- and drainage area, towards the west.

The Ecological Importance and Sensitivity (EIS) of the first broad wetland as well as the wetland which flows past the assessment area directly adjacent south, is classified as Class C (moderate) as they are viewed as being ecologically important and sensitive on local scale. Due to them forming an important part of the hydrological and aquatic ecological connectivity associated with the local and broader quaternary surface water catchment- and drainage area, the localised area is viewed as being of moderate conversational significance for habitat preservation and ecological functionality persistence, in support of the surrounding aquatic ecosystem.

Buffer: A minimum of approximately 80 m aquatic ecological buffer distance is therefore recommended to be implemented around the first wetland. No current or future development is allowed to take place within this buffered zone.

The subsequent wetland into which the first broad wetland gradually flows as well as the significantly sized naturally occurring unchanneled valley-bottom wetland situated approximately 330 m north-east of the assessment area, which constitutes the main inflow of the Commandants Pan, both house locally distinct and important semi-aquatic habitats, which are likely utilised by various common and habitat-specific waterbirds, amphibian species and aquatic invertebrates for breeding, foraging and/or persistence purposes. During the site assessments, a number of Marsh owl (*Asio capensis*) individuals were in fact found to be utilising the combined semi-aquatic habitats of the two wetlands as well as the surrounding terrestrial grassland landscapes.

The Ecological Importance and Sensitivity (EIS) of the subsequent wetland into which the first broad wetland gradually flows as well as the significantly sized wetland situated approximately 330 m north-east of the assessment area, is classified as Class C (moderate) as they are viewed as being ecologically important and sensitive on local and possibly provincial scale. Due to the locally distinct and important nature of the semi-aquatic habitats associated with the wetlands, the localised areas are viewed as being of moderate to high conversational significance for habitat preservation and ecological functionality persistence in support of the surrounding aquatic ecosystem and the confirmed presence of ecologically important, habitat-specific and range-limited bird species.

The established solar power generation infrastructure will result in the emission of significantly bright glare/shine into the surrounding landscape. This along with the significant noise generated by the construction activities, will likely cause substantial disturbance and subsequently impact negatively on the ecological integrity and -functionality of the semi-aquatic habitats and the localised surrounding terrestrial grassland landscape of the subsequent wetland into which the first broad wetland gradually flows as well as the significantly sized wetland situated approximately 330 m north-east of the assessment area.

It is therefore recommended that the subsequent wetland into which the first broad wetland gradually flows as well as the significantly sized wetland situated approximately 330 m north-east of the assessment area, along with portions of the surrounding natural undisturbed terrestrial grassland must be adequately buffered out of the proposed development footprint area.

Buffer: It is therefore recommended that the subsequent wetland into which the first broad wetland gradually flows as well as the significantly sized wetland situated approximately 330 m north-east of the assessment area, along with portions of the surrounding natural undisturbed terrestrial grassland must be adequately buffered out of the proposed development footprint area.

A biodiversity buffer of 300m is recommended for the two wetlands (to be confirmed by the Avifaunal specialist).

These recommended buffer zones and associated recommendations must be implemented to attempt to maintain the hydrological and ecological functionality and -integrity of the wetlands and subsequent downstream waterbodies and their associated semi-aquatic habitats along with the localised surrounding terrestrial grassland landscapes, in order to prevent any significant increase in sediment inputs and contamination and ensure the persistence/livelihood of semi-aquatic fauna in the area.

3.2.1.7. Depression wetlands:

One naturally occurring depression wetland is present within the central portion of the assessment area, while a further two naturally occurring depression wetlands are present within the approximate 500 m zone of influence surrounding the assessment area. The latter two wetlands are situated approximately 200 m east and 160 m west of the assessment area, respectively. The centrally- and easterly located two wetlands are situated north of the highpoint/ridge apex and their landscapes therefore mainly slope towards the north, while the westerly located wetland is rather situated south of the highpoint/ridge apex and its landscape therefore slopes towards the south.

The wetlands are seasonally/temporarily inundated and no distinct surface water flow paths into or out of the wetlands are evident as they rather constitute slight surface depressions within the local landscapes. The wetlands therefore collect general surface waterflow from limited upstream catchment areas, as well as rainwater.

The Ecological Importance and Sensitivity (EIS) of the wetlands is classified as Class C (moderate) as they are viewed as being ecologically important and sensitive on local and possibly provincial scale. Due to the locally distinct and important nature of the semi-aquatic habitat associated with the wetlands, the localised areas are viewed as being of moderate to high conversational significance for habitat preservation and ecological functionality persistence in support of the surrounding aquatic ecosystem and the likely presence of ecologically important, habitat-specific and range-limited bird species. The presence of the Critical Biodiversity Area one (CBA 1) associated with centrally- and westerly located two wetlands, further substantiates the ecological importance of these areas.

The established solar power generation facility infrastructure will result in the emission of significantly bright glare/shine into the surrounding landscape. This, along with the significant noise generated by the construction activities, will likely cause substantial disturbance and subsequently impact negatively on the ecological integrity

and -functionality of the semi-aquatic habitats of the wetlands and the localised surrounding terrestrial grassland landscapes.

It is therefore recommended that the three depression wetlands as well as portions of the surrounding natural undisturbed terrestrial grassland must be adequately buffered out of the proposed development footprint area.

Buffer: A minimum of approximately 80 m water quality buffer distance is therefore recommended to be implemented around the wetlands. No current or future development is allowed to take place within these buffered zones.

A biodiversity buffer of 200 m is recommended for the wetlands (to be confirmed by the Avifaunal specialist).

These recommended buffer zones and associated recommendations must be implemented to attempt to maintain the hydrological and ecological functionality and -integrity of the wetlands and their associated semi-aquatic habitats along with the localised surrounding terrestrial grassland landscapes and Critical Biodiversity Area one (CBA 1), to prevent any significant increase in sediment inputs and contamination and ensure the persistence/livelihood of semi-aquatic fauna in those areas.

3.2.1.8. Transmission line route option 1 - 132 kV

The direct footprint impact of the proposed transmission line is very low relative to the proposed solar power generation facility footprint. The direct footprint impact will mainly be limited to the physical footprints of the pylons to be constructed as well as the narrow linear corridor associated with the access/service road.

A. Unchanneled valley-bottom wetland:

The commencement portion of the proposed route traverses the unchanneled valley-bottom wetland, which flows past the assessment area.

It is recommended that the pylons be constructed as far apart as practicably/reasonably possible and that as few as practicably/reasonably possible pylons may be constructed through this portion. The design layouts of the transmission line and access/service road must also allow for continued water flow through this portion, in order to maintain the ecological functionality and -integrity of the wetland, over time.

B. Depression wetland:

A naturally occurring depression wetland is present along the proposed route directly south of the split between the Transmission line route options 1 & 2. The wetland is situated within an old historically cultivated agricultural land. Although this is the case, the wetland still houses semi-aquatic habitat within its basin and around its edges. The wetland is seasonally/temporarily inundated and no distinct surface water flow paths into or out of the wetland are evident as it rather constitutes a slight surface depression within the local landscape. The wetland therefore collects general surface waterflow from a limited upstream catchment area, as well as rainwater.

The Ecological Importance and Sensitivity (EIS) of the wetland is classified as Class C (moderate) as it is viewed as being ecologically important and sensitive on local scale. Due to the locally distinct and important nature of the semi-aquatic habitat associated with the wetland, the localised area is viewed as being of moderate conversational significance for habitat preservation and ecological functionality persistence in support of the surrounding aquatic ecosystem and the likely presence of ecologically important, habitat-specific and range-limited bird species.

Although the established transmission line should not result in any significant disturbance or impact negatively on the ecological integrity and -functionality of the semi-aquatic habitat associated with the wetland and the localised surrounding terrestrial grassland landscape, it still poses a collision and mortality risk to the relevant owl species that possibly utilise the area.

Buffer: A minimum of approximately 40 m water quality buffer distance is therefore recommended to be implemented around the wetland. No current or future development is allowed to take place within this buffered zone.

A biodiversity buffer of 100m is recommended for the wetland (to be confirmed by the Avifaunal specialist).

It is also recommended that the pylons be constructed as far apart as practicably/reasonably possible and that as few as practicably/reasonably possible pylons may be constructed through this portion.

Areas disturbed by construction activities must also be adequately concurrently rehabilitated as soon as practicably/reasonably possible after construction. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist**.**

This recommended buffer zone and associated recommendations must be implemented to attempt to maintain the hydrological and ecological functionality and -integrity of the wetland and its associated semi-aquatic habitat, to prevent any significant increase in sediment inputs and contamination and ensure the persistence/livelihood of semi-aquatic fauna in the area.

C. Inaccessible areas

Due to the inaccessibility of various portions of the assessment areas because of the abnormally high rainfall received during that time period as well as strict access control, the southern portion of the proposed Transmission line route option 1 - 132 kV could not be fully assessed.

In accordance with the initial desktop aquatic assessment, two watercourses traverse the southern portion of the proposed route, while a cluster of depression wetlands are also present approximately 2.5 km north of the finishing point. This could however not be verified on site, due to inaccessibility.

From the desktop information it can be deduced that the two watercourses appear to merely constitute very small first-order preferential water flow paths/drainage lines. These flow paths/drainage lines merely assist with

channelling surface water runoff towards the south-west. It is assumed that these flow paths/drainage lines therefore merely play an assisting role in the localised catchment and drainage and are not viewed as being of any conservational significance, from a hydrological or aquatic ecological perspective.

It is however still recommended that the pylons be constructed as far apart as practicably/reasonably possible through these two portions. No pylons may be constructed inside- or within 20 m of these two watercourse crossings. The design layouts of the transmission line and access/service road must also allow for continued water flow through these two portions, to maintain their ecological functionality and -integrity over time.

Buffer: A 100m biodiversity buffer is recommended for the wetland cluster, and 20m buffer for the two watercourse crossings.

3.2.1.9. Transmission line route option 2 - 132 kV

The proposed Transmission line route option 2 - 132 kV is approximately 10.6 km in length. The direct footprint impact of the proposed transmission line is very low relative to the proposed solar power generation facility footprints. The direct footprint impact will mainly be limited to the physical footprints of the pylons to be constructed as well as the narrow linear corridor associated with the access/service road.

A. Unchanneled- and channelled valley-bottom wetlands

As is the case for the proposed Transmission line route option 1 - 132 kV, the commencement portion of the proposed route traverses the unchanneled valley-bottom wetland.

The central portion of the proposed route traverses two adjacently located first-order seasonal watercourses and associated small, channelled valley-bottom wetlands. These wetlands have however been historically fragmented by the construction of the M4 provincial road as well as a small artificially constructed earth dam directly adjacent south of the road. Numerous existing high voltage transmission lines also already traverse the wetlands in the same area. The wetlands are therefore in a moderately disturbed and transformed state and the construction of an additional transmission line crossing should not result in any significant additional negative impacts on the wetlands.

The Ecological Importance and Sensitivity (EIS) of the wetlands is classified as Class D (low/marginal) as they are not viewed as being ecologically important and/or sensitive on any scale. The localised area is therefore merely viewed as being of low conversational significance for habitat preservation and ecological functionality persistence in support of the surrounding aquatic ecosystem as well as the local and broader quaternary surface water catchment- and drainage area, towards the west.

Due to the presence of numerous existing high voltage transmission lines in the same area, the newly established transmission line should not result in any significant additional disturbance or impact negatively on the ecological integrity and -functionality of the aquatic and semi-aquatic habitat associated with the wetlands and the localised surrounding terrestrial grassland landscape.

It is recommended that the pylons be constructed as far apart as practicably/reasonably possible and that as few as practicably/reasonably possible pylons may be constructed through these portions. The design layouts of the transmission line and access/service road must also allow for continued water flow through these portions, in order to maintain the ecological functionality and -integrity of the wetlands, over time.

Areas disturbed by construction activities must also be adequately concurrently rehabilitated as soon as practicably/reasonably possible after construction. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist.

A Water Use License Application (WULA) must also be submitted to the Department of Water and Sanitation (DWS), to request authorisation for the proposed development at these wetland crossings, in accordance with the National Water Act (Act 36 of 1998).

The western portion of the proposed route which runs through the existing township, also traverses a small remaining portion of what likely used to form part of a valley-bottom wetland. The assumed historic wetland has however virtually been completely fragmented and transformed by the presence of the township. The small remaining wetland portion is isolated and completely degraded and is therefore not viewed as being of any conversational significance for habitat preservation and ecological functionality persistence in support of the surrounding aquatic ecosystem or the local and broader quaternary surface water catchment- and drainage area, towards the west.

B. Depression wetland

A naturally occurring depression wetland is present along the proposed route directly west of the split between the Transmission line route options 1 & 2. The wetland is situated within an old historically cultivated agricultural land.

No distinct surface water flow paths into or out of the wetland are evident as it rather constitutes a slight surface depression within the local landscape. The wetland therefore collects general surface waterflow from a limited upstream catchment area, as well as rainwater.

As opposed to the other depression wetlands which have been discussed in this report, this wetland does not house any locally distinct or important semi-aquatic habitat within its basin or around its edges. It rather houses a similar terrestrial grassland vegetation composition and -structure, relative to the surrounding landscape with merely slight variations in species representation. The wetland is therefore not expected to be specifically utilised by any habitat-specific waterbirds, amphibian species and/or aquatic invertebrates for breeding, foraging and/or persistence purposes.

The Ecological Importance and Sensitivity (EIS) of the wetland is classified as Class D (low/marginal) as it is not viewed as being ecologically important and/or sensitive on any scale. The localised area is therefore not viewed as being of any conservational significance, from a hydrological or aquatic ecological perspective.

It is the opinion of the specialist that it is not necessary to buffer the wetland out of the proposed development area.

3.2.1.10. Transmission line route – 44 kV

The proposed Transmission line route - 44 kV is approximately 9.95 km in length. The direct footprint impact of the proposed transmission line is very low relative to the proposed solar power generation facility footprints. The direct footprint impact will mainly be limited to the physical footprints of the pylons to be constructed as well as the narrow linear corridor associated with the access/service road.

A. Depression pan

The significantly sized naturally occurring depression pan, which is located approximately 700 m south-west of the assessment area, is situated to the east of a very small section of the proposed route.

The pan is seasonally/temporarily inundated and the inflow of the pan mainly constitutes the artificially constructed earth dam. It is therefore evident that the pan along with its associated inflow, form an important part of the hydrological and aquatic ecological connectivity of the local and broader quaternary surface water catchment- and drainage area, towards the west.

The Ecological Importance and Sensitivity (EIS) of the pan is classified as Class C (moderate) as it is viewed as being ecologically important and sensitive on provincial scale. Due to the locally distinct and important nature of the semi-aquatic habitat along with the significant size of the pan, the localised area is viewed as being of moderate to high conversational significance for habitat preservation and ecological functionality persistence in support of the surrounding aquatic ecosystem, the visible presence of habitat-specific waterbirds, amphibian species and aquatic invertebrates as well as the local and broader quaternary surface water catchment- and drainage area, towards the west. The presence of the Critical Biodiversity Area one (CBA 1), further substantiates the ecological importance of this area.

Although the established transmission line should not result in any significant disturbance or impact negatively on the ecological integrity and -functionality of the semi-aquatic habitat and the localised surrounding terrestrial grassland landscape associated with the very small applicable section of the pan, it still poses a slight collision and mortality risk to the relevant habitat-specific waterbirds that visibly utilise the area.

Buffer: A minimum of approximately 40 m water quality buffer distance is therefore recommended to be implemented around the very small applicable section of the pan. No current or future development is allowed to take place within this buffered zone.

A biodiversity buffer of 150m is recommended for the pan (to be confirmed by the Avifaunal specialist).

Recommended buffer zones and basic initial mitigation measures are provided in this report, to assist and guide the applicant with initial design layout planning. A distinction is made between calculated water quality buffers,

which are deemed sufficient in preventing significant flow impediment and/or contamination of the identified aquatic features, and recommended biodiversity buffers, which are deemed necessary to preserve the aquatic ecological integrity and -functionality of identified locally distinct and important aquatic and semi-aquatic habitats.

It is the opinion of the specialist, by application of the National Environmental Management Act (Act No. 107 of 1998) Mitigation Hierarchy, that all potentially significant aquatic ecological impacts associated with the proposed developments, can be suitably reduced and mitigated to within acceptable residual levels, by implementation of the recommended buffer zones and comprehensive mitigation measures to be provided in the full Aquatic Ecological Assessment Reports. It is therefore not anticipated that the proposed solar power generation facilities will necessarily add any significant residual cumulative aquatic ecological impacts to the surrounding aquatic environment, if all recommended buffer zones and mitigation measures as per this report and the full Aquatic Ecological Assessment Reports are adequately implemented and managed, for both the construction- and operational phases of the proposed developments. All necessary authorisations, permits and licenses must also be obtained prior to the commencement of any construction.

3.2.2. No-Go Areas

The site sensitivity map below (Figure 3) illustrate the approximate delineations of the identified significant watercourses, wetlands and pans which are present throughout the assessment area and along the proposed three transmission line route alternatives. The recommended buffer zones to be implemented around the various aquatic features, are also illustrated.

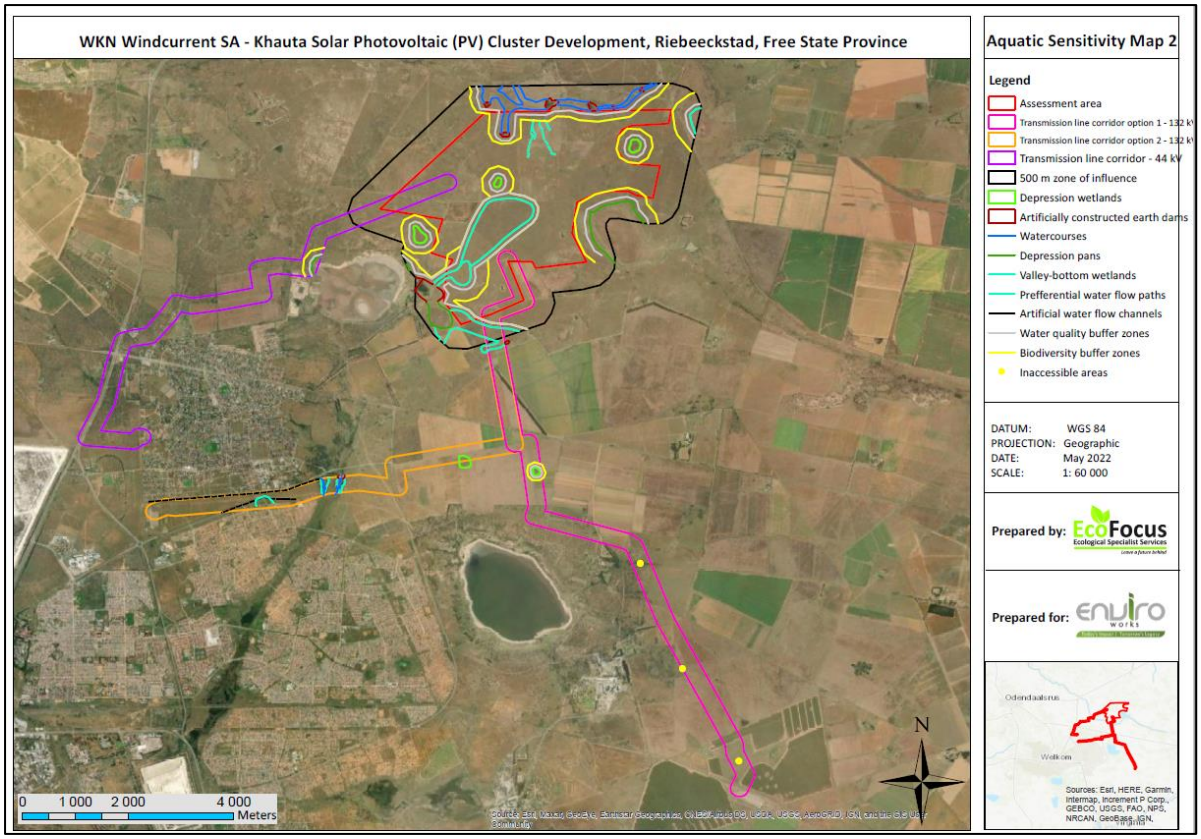


Figure 3 Aquatic site sensitivity map illustrating the approximate delineations of the identified significant watercourses, wetlands and pans which are present throughout the assessment area; the recommended buffer zones to be implemented around the various watercourses are also illustrated.

3.2.3. Preferred 132 kV Route

It is recommended that Transmission line route option 2 - 132 kV be considered for the proposed development as opposed to the proposed Transmission line route option 1 - 132 kV. This will result in less transformation of natural undisturbed vegetation and subsequent lower negative impact from an aquatic ecological perspective.

3.2.4. Recommendations and conditions

It is essential that the collective flow regime associated with surface water drainage of the local and broader landscape, not be significantly impeded, contaminated or otherwise negatively impacted upon by the proposed development, as this could subsequently pose a substantial risk to the hydrological and aquatic ecological integrity and -functionality of the area. Natural surface water runoff and flow must be allowed to adequately continue unimpededly through the local and broader landscape and may also not be significantly contaminated by potentially increased sediment inputs and/or other anthropogenically generated pollutants, which could arise mainly from substantial vegetation clearance.

Through this, the aquatic ecological integrity and -functionality of identified locally distinct and important aquatic and semi-aquatic habitats throughout the local and broader landscape, must also be adequately preserved, in order to ensure the persistence/livelihood of important, habitat-specific and therefore often range-limited aquatic and semi-aquatic fauna in the area.

a) Vegetation clearance should be avoided or minimised as far as practicably/reasonably possible and should only occur within the PV grid-, internal access/services road- and other associated facility infrastructure footprints, if required.

b) Existing vegetation in- between the main physical footprint areas, should not be cleared or damaged at all and should be left intact and adequately preserved, as far as practicably/reasonably possible. This must be done to sufficiently manage and prevent any significant soil erosion from occurring in and around the assessment area, which could potentially lead to an increase in sediment inputs and contamination of identified aquatic features and subsequent downstream waterbodies, over time.

c) It is recommended that sufficient continued stormwater runoff within- and through the assessment area towards the north, must be ensured and sufficiently managed. An adequate Stormwater and Erosion Management Plan must be implemented during the construction- and operational phases of the proposed development, to assist with this and allow for continued flow within the localised catchment. This must be done to attempt to maintain the ecological functionality and -integrity of the local and broader quaternary surface water catchment- and drainage area, towards the west.

d) It is recommended that no bright light from any spotlights or perimeter lights should be emitted into the surrounding landscape towards the pans during nighttime.

e) A WULA must also be submitted to the DWS, to request authorisation for the proposed development through the flow paths/drainage lines, in accordance with the National Water Act (Act 36 of 1998).

f) For 132 kV Transmission line route – option 1

   i. It is recommended that the pylons be constructed as far apart as practicably/reasonably possible at watercourse crossings and that as few as practicably/reasonably possible pylons may be constructed through watercourse crossings and their buffers.

   ii. The design layouts of the transmission line and access/service road must also allow for continued water flow through watercourse crossings and their buffers, to maintain the ecological functionality and -integrity of the wetland, over time.

   iii. Areas disturbed by construction activities must be adequately concurrently rehabilitated as soon as practicably/reasonably possible after construction. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist for watercourse crossings and their buffers.

   iv. A WULA must also be submitted to the DWS, to request authorisation for the proposed development through watercourse crossings, in accordance with the National Water Act (Act 36 of 1998).

   v. No pylons may be constructed inside- or within 20 m of the two very small first-order preferential water flow paths/drainage lines watercourse crossings.

g) For 132 kV Transmission line route – option 2

   i. It is recommended that the pylons be constructed as far apart as practicably/reasonably possible at watercourse crossings and that as few as practicably/reasonably possible pylons may be constructed through watercourse crossings and their buffers.

ii. The design layouts of the transmission line and access/service road must also allow for continued water flow through watercourse crossings and their buffers, to maintain the ecological functionality and -integrity of the wetland, over time.

iii. Areas disturbed by construction activities must be adequately concurrently rehabilitated as soon as practicably/reasonably possible after construction. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist for watercourse crossings and their buffers.

iv. A WULA must also be submitted to the DWS, to request authorisation for the proposed development at this wetland crossing, in accordance with the National Water Act (Act 36 of 1998).

h) All necessary authorisations, permits and licenses must also be obtained prior to the commencement of any construction.

i) A distinction is made between calculated water quality buffers, which are deemed sufficient in preventing significant flow impediment and/or contamination of the identified aquatic features, and recommended biodiversity buffers, which are deemed necessary to preserve the aquatic ecological integrity and -functionality of identified locally distinct and important aquatic and semi-aquatic habitats.

j) All recommended buffer zones and mitigation measures as per this report and the full Aquatic Ecological Assessment Reports should be adequately implemented and managed, for both the construction- and operational phases of the proposed developments.

k) It is recommended that the appointed Avifaunal Specialist must provide final recommendations on suitable aquatic avifaunal species- and habitat buffer zones, after completion of his/her assessment.

l) The full Aquatic Ecological Assessment Reports will, furthermore, also provide more detailed recommendations regarding comprehensive mitigation measures.

3.2.5. Way forward

a) Measures a) – k) in Section 3.2.4 will be included in the project specific EMPr for implementation during all project phases.

b) A WULA will be submitted to the DWS, to request authorisation for the proposed development through the flow paths/drainage lines, in accordance with the National Water Act (Act 36 of 1998).

   a. A Stormwater Management Plan is recommended to be compiled and submitted as part of the WULA.

   b. A Rehabilitation Management Plan is recommended to be compiled by a suitably qualified and experienced ecologist for watercourse crossings and their buffers.

   c. An adequate Stormwater and Erosion Management Plan is recommended to be developed and implemented during the construction- and operational phases of the proposed development

c) The Avifaunal specialist will provide final recommendations on suitable aquatic avifaunal species- and habitat buffer zones.

d) A Full aquatic Assessment to be done during the Environmental Authorisation (EA) application phase.

e) Watercourses should be verified in the southern portion of Transmission line route option 1 - 132 kV, should Transmission line route option 1 - 132 kV be the preferred alternative.

3.3. AGRICULTURAL ASSESSMENT

A Site Sensitivity Verification Report was compiled by Dr Johann Lanz (May, 2022). For more information regarding the detailed approach, methodology, results and maps, please refer to Appendix C.

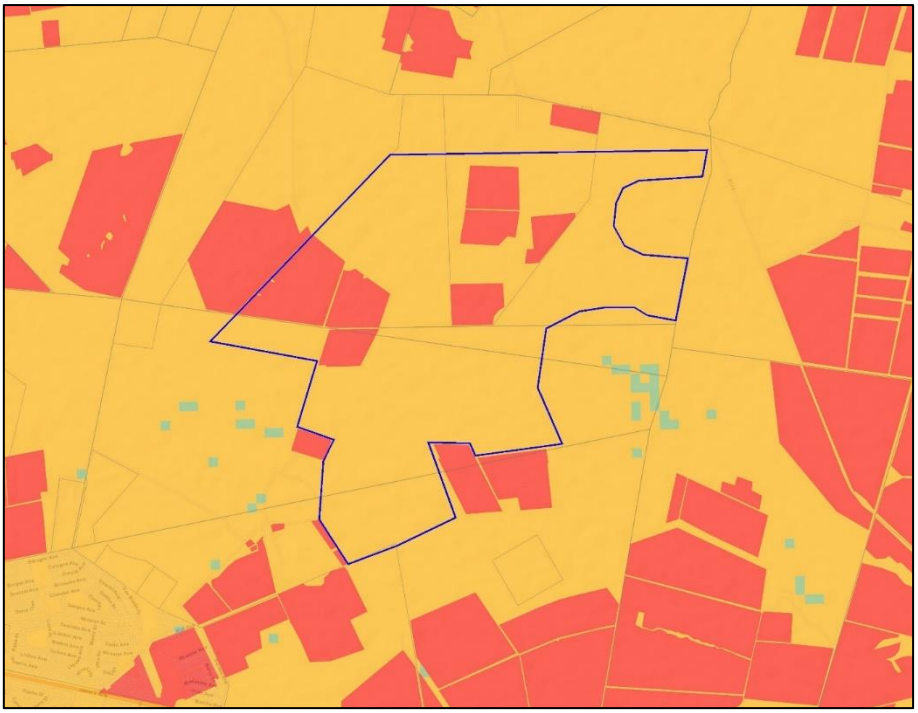
3.3.1. Results

The screening tool classifies agricultural sensitivity according to only two independent criteria – the land capability rating and whether the land is used for cropland or not. All cropland is classified as at least high sensitivity, based on the logic that if it is under crop production, it is indeed suitable for it, irrespective of its land capability rating.

The screening tool sensitivity categories in terms of land capability are based upon the Department of Agriculture's updated and refined, country-wide land capability mapping, released in 2016. The data is generated by GIS modelling. Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land, based on its soil, climate and terrain. The higher land capability values (≥8 to 15) are likely to be suitable as arable land for crop production, while lower values are only likely to be suitable as non-arable grazing land.

The allocation of high sensitivity to parts of the site (depicted in red in Figure 4) is because the land is classified as cropland in the data set used by the screening tool. However, that data set is outdated. The lands indicated as cropland on the screening tool are no longer under crops and have not been, according to the historical imagery on Google Earth, for at least 7 years. All the lands across the project area are now used only for grazing. These lands are likely to have been cropped with economic viability in the past, but they have been abandoned as cropland because they were found to be too marginal for viable crop production as the agricultural economy became more challenging, particularly in terms of high input costs. These lands should therefore no longer be classified as cropland or allocated high sensitivity because of it.

Figure 4 The proposed development site overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high).



The site sensitivity verification has confirmed that the entire site has limitations that make the land non-viable for sustainable crop production and it is therefore within a category of land that should receive agricultural approval for solar development.

The cropping potential of the soils across the site is constrained. The land type across the site has a high proportion of shallow, clay-rich soils of the Sterkspruit and Valsrivier soil forms that are unsuitable for crop production. The on-site soil investigation confirmed the dominance of these shallow, clay-rich soils across the site. Although there are pockets of better soil on the site, these are too small and occur between unsuitable soils, making this combination unviable for cropping. The cropping potential is constrained by the shallow depth above the limiting, dense clay horizon in the subsoil. In the relatively low rainfall of the site (491 to 500 mm per annum), the shallow soils have too little potential root volume and moisture reservoir to support viable cropping. This land is therefore only suitable for grazing.

Because of the lack of cropping potential, a high agricultural sensitivity or a land capability of more than 7 is not therefore justified for this site. The high agricultural sensitivity attributed to parts of the site by the screening tool as a result of cropping status is therefore disputed by this assessment.

This site sensitivity verification has found the entire site to be of medium agricultural sensitivity with a land capability of 7, due predominantly to soil constraints in combination with the climate that make the site too marginal for crop production. The site is not suitable for viable and sustainable crop production and is used only for grazing. The allowable development limits of the agricultural protocol on such land fall into the most lenient category of 2.5 hectares per megawatt and allow for solar development anywhere on the PV site.

3.3.2. No-Go Areas

There are no agricultural no-go areas across the entire site. Agricultural impact considerations will therefore have no effect on the design and layout of the facilities.

3.3.3. Preferred 132 kV Route

Grid connection infrastructure is a non-issue in terms of agricultural impact because it has negligible impact, regardless of the agricultural sensitivity of the site. This is because its direct, permanent, physical footprint that has any potential to interfere with or exclude agriculture, is insignificantly small. All agricultural activities can continue completely unhindered underneath transmission lines. Therefore, there are no preferred grid connection alternatives, and all are acceptable from an agricultural impact point of view. There should be no problem with achieving agricultural approval for the grid connections.

3.3.4. Recommendations and conditions

The site sensitivity verification has confirmed that the entire site has limitations that make the land non-viable for sustainable crop production and it is therefore within a category of land that should receive agricultural approval for solar development.

3.3.5. Way forward

Practically and legislatively the agricultural aspects come down to getting agricultural approval from the Department of Agriculture, Land Reform and Rural Development (DALRRD) through rezoning and Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA) approval.

A renewable energy facility requires approval from the National DALRRD if the facility is on agriculturally zoned land. There are two approvals that apply. The first is a 'No Objection Letter' for the change in land use issued by the Deputy Director General (Agricultural Production, Health and Food Safety, Natural Resources and Disaster Management). This letter is one of the requirements for receiving municipal rezoning. It is advisable to apply for this as early in the renewable development process as possible because not receiving this DALRRD approval is a fatal flaw for a project. Note that a positive EA does not assure DALRRD's approval of this. This application requires a motivation backed by good evidence that the development will not significantly compromise the future agricultural production potential of the development site.

The second required approval is a consent for long-term lease in terms of the SALA. If DALRRD approval for the development has already been obtained in the form of the 'No Objection letter', then SALA approval should be easy and not present any difficulties. Note that SALA approval is not required if the lease is over the entire farm portion. SALA approval (if required) can only be applied for once the Municipal Rezoning Certificate and EA is in hand.

The land use committee of DALRRD, who are responsible for decision making for agricultural approval, seem to somewhat inconsistently apply their so called 10% 'rule' to their decisions. This 'rule' states that a renewable energy facility may not result in the exclusion from agricultural use of more than 10% of a farm portion. If they did apply this rule in the Khauta decision, it would mean that the project would not get approval. The risk of not achieving agricultural approval for the Khauta Solar PV Cluster is assessed as low. However, it must be noted that approval is subject to the unpredictability of DALRRD decision making. In addition, their 10% rule does pose some risk to the project, although it is unlikely that they will impose the 10% rule in this environment.

3.4. HERTITAGE AND ARCHAEOLOGICAL ASSESSMENT

A Site Sensitivity Verification Report was compiled by Jonathan Kaplan from Agency for Cultural Resource Management (ACRM) (May, 2022). For more information regarding the detailed approach, methodology, results and maps, please refer to Appendix D.

3.4.1. Results

Despite the limitations and constraints mentioned in Section 4 of the Heritage and Archaeological Site Sensitivity Verification Report, it did not significantly affect the results of the study. The level of confidence is high in the results and recommendations made therefrom.

3.4.1.1. Stone Age tools:

- A Middle Stone Age[1] (MSA) quartzite core (Point 0016) was recorded alongside the proposed 44 kV powerline corridor, on the Farm Kopje Alleen 81 (Figure 5).
- There is barely any surface stone covering the proposed solar PV site.
- There are no significant landscape features such as rocky outcrops or kopjes, on the site.
- The isolated context in which it was found, means that remains have been graded as having *low* (3IV) archaeological significance.

[1] A term referring to the period between 200 000 and 40 000 years ago

Figure 5 MSA core (Point 0016). Scale is in cm

3.4.1.2. Graveyard:

- A graveyard (Point 0026) was recorded on the Farm Commandants Pan 382/9, ± 500 m east of the edge of the pan (Figure 6).
- Approximately 40-50 barely visible graves were counted in an area measuring about 30 x 40 m in extent.
- The majority of graves comprise of low mounds of clay and stones without headstones or footstones. Several graves with headstones were also identified, including a grave that has been fenced off and slightly apart from the others (Figure 6).

Figure 6 Graveyard (Point 0026) on the Farm Commandants Pan 382/9. View facing south east. Arrow indicates fenced off grave

3.4.1.3. Graves:

- Two graves (Point 0096) were recorded in the proposed 44 kV route option on the farm Klein Koppie Aleen 182/1 (Figure 7).
- Both graves contain headstones but are barely visible in the long grass.
- According to the farm owner, Mr Chris Gouws (pers. comm. April 2022), there were previously three graves identified, but the remains of one of the deceased was removed more than 10 years ago and buried elsewhere in Riebeekstad or Welkom.
    - Graves and graveyards are rated as having high (3B) significance because of their social value.

Figure 7 Graves (Point 0096). Arrows indicates the 2 headstones on the Farm Klein Koppie Aleen 182/1

3.4.1.4. Outspan:

- An Outspan was identified on the Farm Commandants Pan 382/9, about 200 m east of the graveyard (Point 0036) (Figure 8).
- The Outspan was pointed out to the heritage specialist by Mr Johan van Merwe who currently leases the farm from the landowner. Three large trees on the flat hilltop `mark' the site.
- The following narrative was, recounted by Mr van der Merwe, and has apparently been passed down through generations and appears to be fairly widely known. The account, however, could not be verified. According to Mr van der Merwe (pers. comm. April 2022), Boers fleeing from the British (date unknown) outspanned on Commandants Pan and watered their cattle at the pan. A scout spotted the British coming over the hill in the distance and the Boers (men, women & children) retreated to the `Koppie' which is on the edge of the town of Riebeekstad. But not before the women were told to bury `the treasure' (apparently Kruger Rands). The Boers fought valiantly but were eventually all killed defending the Koppie.
- Mr Chris Gouws (pers. comm. April 2022) of the Farm Klein Koppie Aleen 182/1 recounted a similar narrative, but according to Mr Gouws, no one was killed on the Koppie.
- According to Mr Louis Venter of the War Museum in Bloemfontein (pers. comm. May 2022), there are no reference to any Anglo Boer War skirmishes in the area.
- The area surrounding the Outspan was searched where the base of a rusted potjie pot was noted. No other remains were found.

Figure 8 Outspan (Point 0036) on the Farm Commandants Pan 382/9. View facing north east.

3.4.1.5. Iron Age[2]:

No evidence of any Late Iron Age archaeological heritage was noted during the field assessment, which appears to be absent from the study area.

3.4.1.6. Anglo Boer War:

- No evidence of any Anglo-Boer War battlefield sites, war graves or memorials were encountered during the field study.
- According to Mr Louis Venter of the War Museum in Bloemfontein (pers. comm. November 2021), there are no references to Commandants Pan or Kommandantspan in the *Times History.*
- As indicated above, there are no reference to any skirmishes in the area either (Louis Venter pers. comm).

Indications are that the site for the proposed Khauta Solar PV Project in Riebeekstad, near Welkom is not a sensitive, vulnerable or threatened heritage landscape. This includes both proposed 2 x line route options for a new 132kV powerline, and x 1 proposed 44kV powerline route option.

The overall impact of the proposed Khauta Solar PV Cluster on heritage resources is rated as being Low. Therefore, there are no objections, on heritage grounds, to the project proceeding.

3.4.2. No-Go Areas

Recommendations have been made to protect sensitive areas contained in the Verification Report (Section 3.4.4 below). Buffer areas were identified around significant heritage resources, and these buffers should be maintained, and no development should take place within these areas.

[2] A term referring to the history of Black Farming communities in southern Africa during the last 1000 years

3.4.3. Preferred 132 kV Route

There is no preference for either route options.

3.4.4. Recommendations and conditions

a) It is not needed to preserve the MSA Core.
b) The graveyard (Point 0026) on the Farm Commandants Pan 382/9 must be avoided. A 50 m buffer around the graveyard is proposed. The site must be fenced off and protected throughout the Construction, Operational and Decommissioning Phase of the development.
    i. The applicant must try and establish `ownership' of the graves and consult with surviving family members.
c) The Outspan (Point 0036) on the Farm Commandants Pan 382/9 must be avoided. A 150 m wide buffer is proposed. The site (at the highest elevation on the farm) commands a `Sense of Place' in the surrounding Cultural Landscape.
d) Graves (Point 0096) in the proposed 44 kV powerline route option on the Farm Klein Koppie Aleen 182/1 must be avoided. A 25 – 50m buffer would be acceptable.
    i. Graves are protected by various legislation, including the National Heritage Resources Act (Act 25 of 1999).
    ii. The best option is *in-situ* preservation of grave sites.
    iii. Should this not be possible, a standard grave relocation process including a detailed social consultation process with former or present residents, must be undertaken.
    iv. Graves will have to be removed under a permit issued by the South African Heritage Resources Agency (SAHRA), following the social consultation process.
e) The `Koppie' on the edge of the town of Riebeekstad, overlooking the Farm Klein Koppie Aleen 182/1, may potentially have cultural, spiritual or social significance. This should be explored further in the Public Participation Process.
    i. As a precautionary approach, it is recommended to exclude the 'Koppie' from the layout plans – a 50 m buffer (from the 'Koppie' top) has been applied in this regard; but the base of the 'Koppie' should be delineated in the field. Should the Public Participation Process reveal contrary cultural, spiritual or social significance of the 'Koppie'; the need to avoid it can be reconsidered.

3.4.5. Way forward

a) It will be requested from the Social Facilitators to pay special attention to finding out from the key identified Interested and Affected Parties (I&AP's) whether the 'Koppie' has any cultural, spiritual or social significance to them.
b) The recommendations b) – e) (Section 3.4.4) above will be included in the project specific EMPr, to ensure the measures are implemented during all phases of the proposed project.

3.5. PALAEONTOLOGICAL ASSESSMENT

A Site Sensitivity Verification Report was compiled by Dr John Almond from Natura Viva cc (May, 2022). For more information regarding the detailed approach, methodology, results and maps, please refer to Appendix E.

3.5.1. Results

The combined Khauta Solar PV Cluster and associated grid connection project area near Welkom is largely underlain by basinal marine mudrocks of the Permian Volksrust Formation (Ecca Group) with small outcrop areas assigned to the continental Adelaide Subgroup (Lower Beaufort Group). According to the SAHRIS palaeosensitivity map as well as Department of Forestry, Fisheries and Environment (DFFE) Screening Tool mapping the combined project area is of Medium to Very High palaeosensitivity, with the exception of areas intruded by dolerite. However, desktop information as well as a short site visit show that these Karoo Supergroup sediments are only very rarely exposed in the region (*e.g.* occasional borrow pits, brick fields) due to pervasive sandy soil and dense vegetation cover, they are deeply weathered near-surface and are extensively intruded by dolerite. The purported Adelaide Subgroup bedrocks might actually belong to the deltaic/paralic Waterford Formation (Ecca Group) that is of only moderate palaeosenstivity. Furthermore, the combined project area is largely disturbed at the surface by agricultural activities and urban sprawl.

No fossil remains of any kind were recorded from the Permian bedrocks and Late Caenozoic superficial sediments during the site visit and no palaeontological High Sensitivity or 'No-Go' areas were identified. It is concluded that the site is in practice of Low to Very Low palaeosensitivity and the DFFE Screening Tool mapping is therefore *contested*. This analysis applies equally to all the solar PV sites and grid connection corridors under consideration; there are therefore no preferences for either 132 kV or 44 kV grid connection route option.

The proposed Khauta renewable energy developments are not fatally flawed. Pending the potential (but unlikely) discovery of significant new fossil finds (*e.g.* vertebrate remains, petrified wood) within the project footprint before or during construction, no further specialist palaeontological studies, monitoring or mitigation are recommended for these renewable developments. Provided that the Chance Fossil Finds Protocol tabulated in Appendix 1 is incorporated into the EMPr and fully implemented during the construction phase of the Khauta Solar PV Cluster and associated grid connection developments, there are no objections on palaeontological heritage grounds to their authorisation.

3.5.2. No-Go Areas

The proposed Khauta Solar PV Cluster and associated grid connections are not fatally flawed from a paleontological perspective; thus no 'No-Go' Areas have been identified.

3.5.3. Preferred 132 kV Route

There is no preference from a paleontological perspective; the one (1) 44 kV and two (2) 132 kV grid connection option corridors under consideration are all similar Low Palaeosensitivity, with no preference between alternative options on palaeontological heritage grounds.

3.5.4. Recommendations and conditions

a) Pending the potential (but unlikely) discovery of significant new fossil finds (*e.g.* vertebrate remains, petrified wood) within the project footprint before or during construction, no further specialist palaeontological studies, monitoring or mitigation are recommended for these renewable developments.
b) Provided that the Chance Fossil Finds Protocol tabulated in Appendix 1 is incorporated into the EMPr and fully implemented during the construction phase of the Khauta Solar PV Cluster and associated grid connection developments, there are no objections on palaeontological heritage grounds to their authorisation.

3.5.5. Way forward

The Chance Fossil Finds Protocol tabulated in Appendix 1 will be incorporated into the EMPr of the Khauta Solar PV Cluster and associated grid connection developments to ensure the protocol is fully implemented during the construction phase of the proposed developments.

3.6. SOCIAL ASSESSMENT

No Social Site Sensitivity Verification was undertaken, as requested by WKN Windcurrent (Pty) Ltd.

The Social- and Public Participation specialists will begin preliminary consultation with key Organs of State and I&AP's from 12 May 2022 to 27 May 2022. During this consultation, they will attempt to establish ownership of the family members at the graves (Point 0096) and elicit whether the 'Koppie' has any cultural, spiritual or social significance, has as recommended by the Heritage specialist.

During the process to arrange site access for specialists, a game farmer and owner of the Farm Dankbaarheid No. 244, Quartus Meyer (082 651 028) expressed that he is opposed to the proposed project, as he thinks the solar facility will negatively impact his game farming. His concerns will however be considered during the EA application process, and he will be included in the Public Participation Process. The potential impacts of the proposed development on the game farm will be taken into account and assessed as part of the Impact Assessment Process.

Whether he was serious or not, he mentioned that should the project proceed, he could be inclined to sell his property. This is brought to the attention of WKN Windcurrent SA (Pty) Ltd, should they want to consider acquiring the property.

3.7. ECONOMIC ASSESSMENT

No Economic Site Sensitivity Verification was undertaken, as request by WKN Windcurrent SA (Pty) Ltd.

3.8. VISUAL ASSESSMENT

No Visual Site Sensitivity Verification was undertaken, as request by WKN Windcurrent SA (Pty) Ltd.

3.9. TERRESTRIAL BIODIVERSITY, PLANT- AND ANIMAL SPECIES ASSESSMENT

For more information regarding the detailed approach, methodology, results and maps, please refer to Appendix E.

3.9.1. Results

3.9.1.1. (3) x 100MW PV Solar Installation and (2) x 19.9 MW PV Solar Installation

Based on the site inspection, the sites can be verified to be a mixture of mostly natural terrestrial areas interspersed with old lands and areas associated with wetlands on a mostly flat topography with slightly undulating hills (Figure 9). Based on satellite imagery, the old lands were left to passively rehabilitate less than 10 years ago. The properties are currently being used for cattle and game farming. However, grazing intensity is expected to be low based on the high diversity of indigenous plants observed.

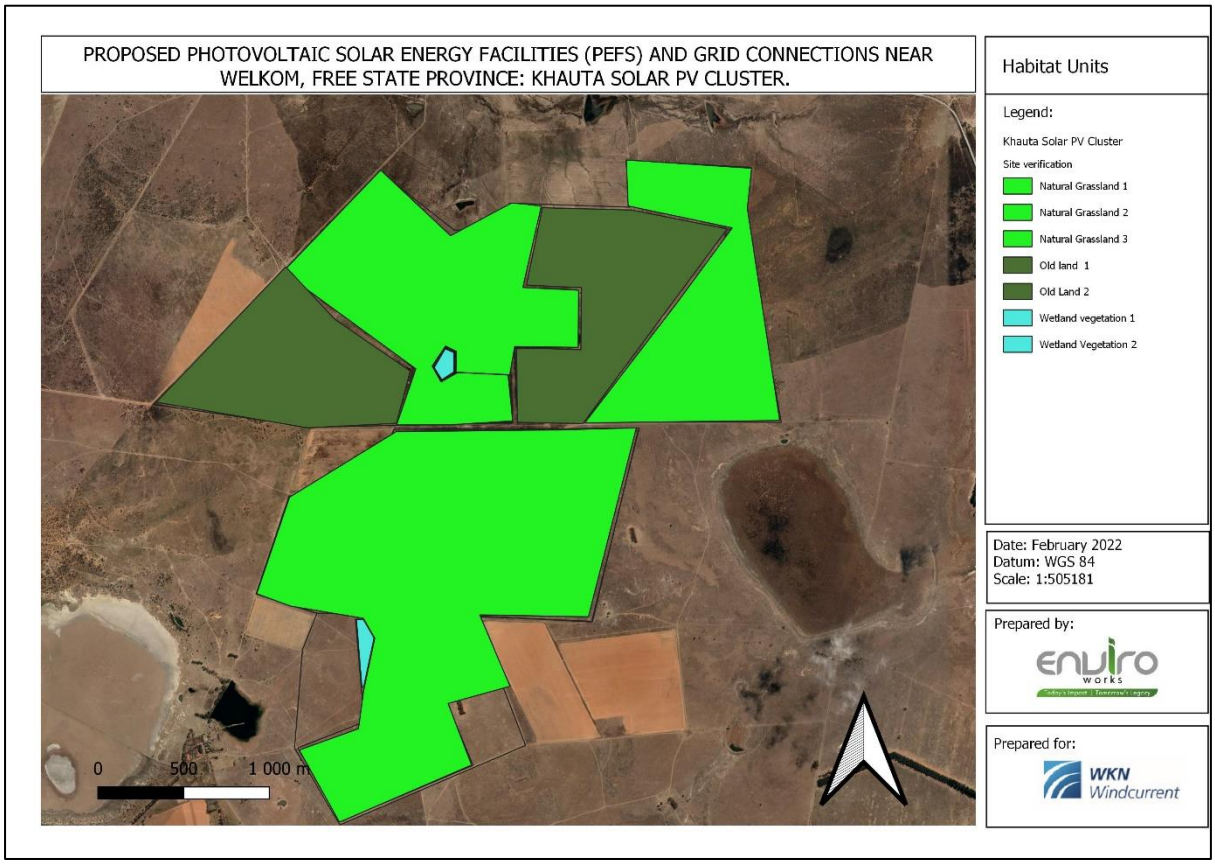


Figure 9 Habitat Units within the solar PV development footprints (3 x 100MW and 2 x19.9 MW).

A. Habitat 1: Natural grasslands

These areas are dominated by indigenous species such as *Themeda triandra, Cymbopogon sp., Panicum coloratum, Cynodon* sp. Although the development footprint is mapped within the Highveld Alluvial Vegetation type, the vegetation found on site is more botanically representative of Western Free State Clay Grassland or Central Free State Grassland[3] [4](both classified as Least Threatened), due to soil's high clay content (confirmed by the Aquatic Biodiversity Specialist) and the dominance of *Themeda triandra* and *Cymbopogon* sp., and the low abundance of trees. There are, however, areas that have a high abundance of *Vachelia karoo* which is most likely a result of increased moisture in the soil or clay. The description of the vegetation on site was confirmed by consultation with a Grassland specialist (G Bredenkamp, pers. comm) and the Aquatic Biodiversity Specialist.

Areas mapped as natural and are located in sensitive areas (i.e., Critical Biodiverse Areas (CBA), Other Natural Areas, and Ecological Support Areas (ESA); see Figure 10 below) are considered to be ecologically significant. These areas provide a habitat to a high diversity of faunal and floral taxa and support important ecological processes and ecosystem services. It is recommended that these areas are not disturbed as far as practically possible or at least very minimally disturbed.

Areas classified as an ESA 1 or 2 have been classified based on the presence of wetland clusters (as per the Free State Biodiversity Plan, 2015). Therefore, by preserving areas verified to be watercourses (as per the Aquatic Biodiversity Verification Report, EcoFocus, 2022) and the associated water quality buffers, the main function of the ESA 1 and 2 are preserved. Based on the aforementioned, ESA 1 and 2 areas can be reduced to areas delineated as watercourses and their associated buffers.

In terms of threatened fauna, suitable habitat and the presence of *Smaug giganteus* (classified as Vulnerable [5]and is provincially protected by the Free State Nature Conservation Ordinance (8 of 1969)) was confirmed by a taxon specialist (Figure 11). The specialist noted only two sites that inhabited burrows that are in current use. These burrows are outside of development (see demarcated areas in green in Figure 11). Surrounding these confirmed burrows is suitable habitat for the species of approximately 70 hectares in size (in total) (although more area is most likely available).

The CBA 1 areas within the development footprint have been mapped primarily due to the presence of suitable habitat for *Smaug giganteus* (as per the Free State Biodiversity Plan, 2015). Given that suitable habitat has been demarcated to areas outside the mapped CBA1, it is now noted that there is a mismatch in the verified environmental conditions and the desktop assessment. Based on the aforementioned, areas classified as

[3] Nacelle Collins, "Free State Biodiversity Plan" (Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs., 2016).
[4] L Mucina and M.C Rutherford, *The Vegetation of South Africa, Lesotho and Swaziland*, Strelizia 19 (Pretoria: South African National Biodiversity Institute, 2006).
[5] "IUCN 2020."

suitable habitat can be motivated to be considered to have a similar status as CBA1 areas within the development footprint.

No sightings or burrows in current use were recorded in areas demarcated as suitable habitat within the development footprint itself (Figure 11). Because these areas do not currently inhabit *Smaug giganteus*, the probability of any individuals inhabiting the area in the future is low.

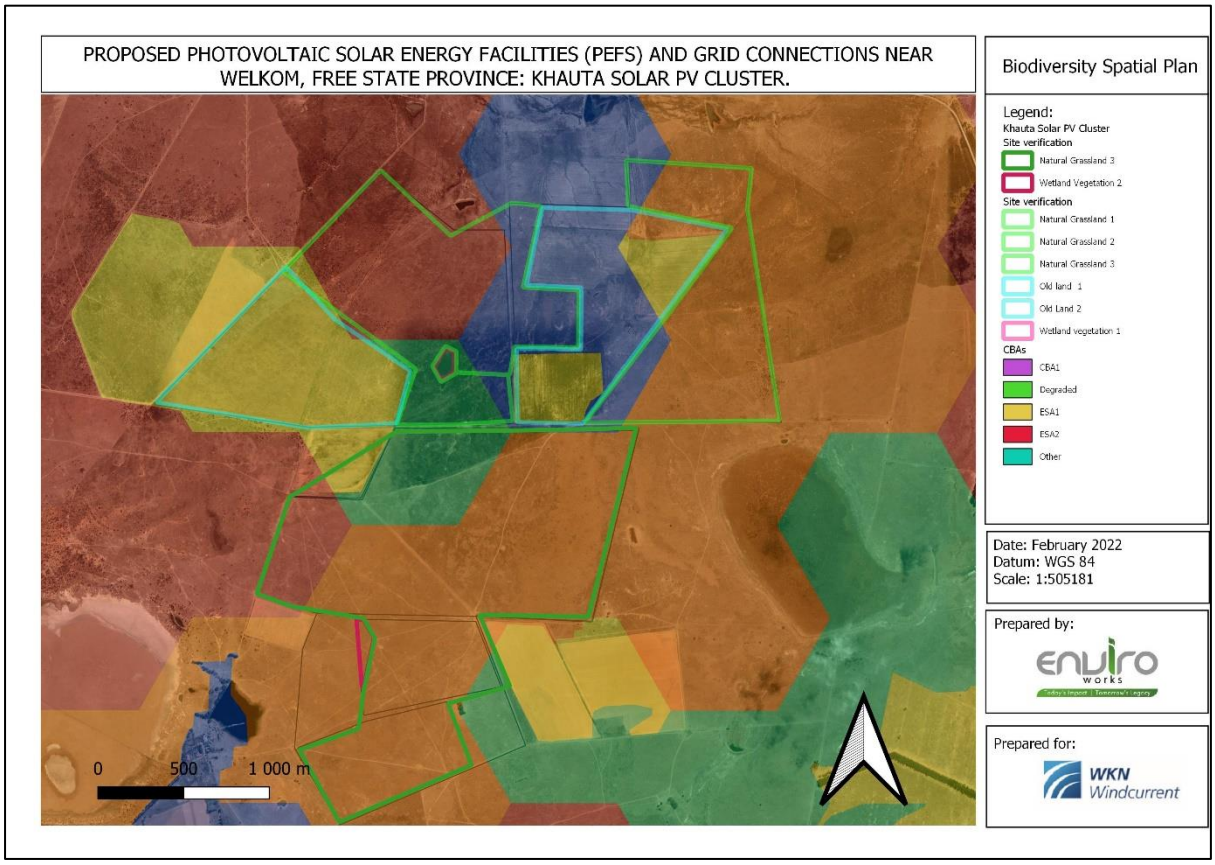


Figure 10 Biodiversity Spatial Plan for various habitat units identified in the Solar Photovoltaic development footprints

From a Botanical perspective, no threatened species were recorded within Habitat Unit 1. However, several provincially protected plant species, as per the Free State Nature Conservation Ordinance (8 of 1969), were recorded including *Gladiolus permeabilis, Brunsvigia sp.,* and *Helichrysum sp.*

In terms of general fauna, a variety of fauna were recorded on site including *Stigmochelys pardalis*, *Danus chrysippusa*, *Amietia delalandii* and *Hystrix* sp. From the fauna that were recorded on site, *Stigmochelys pardalis* is listed as provincially protected as per the Free State Nature Conservation Ordinance (8 of 1969). One individual of *Stigmochelys pardalis* was located in the CBA as mapped in Figure 10.

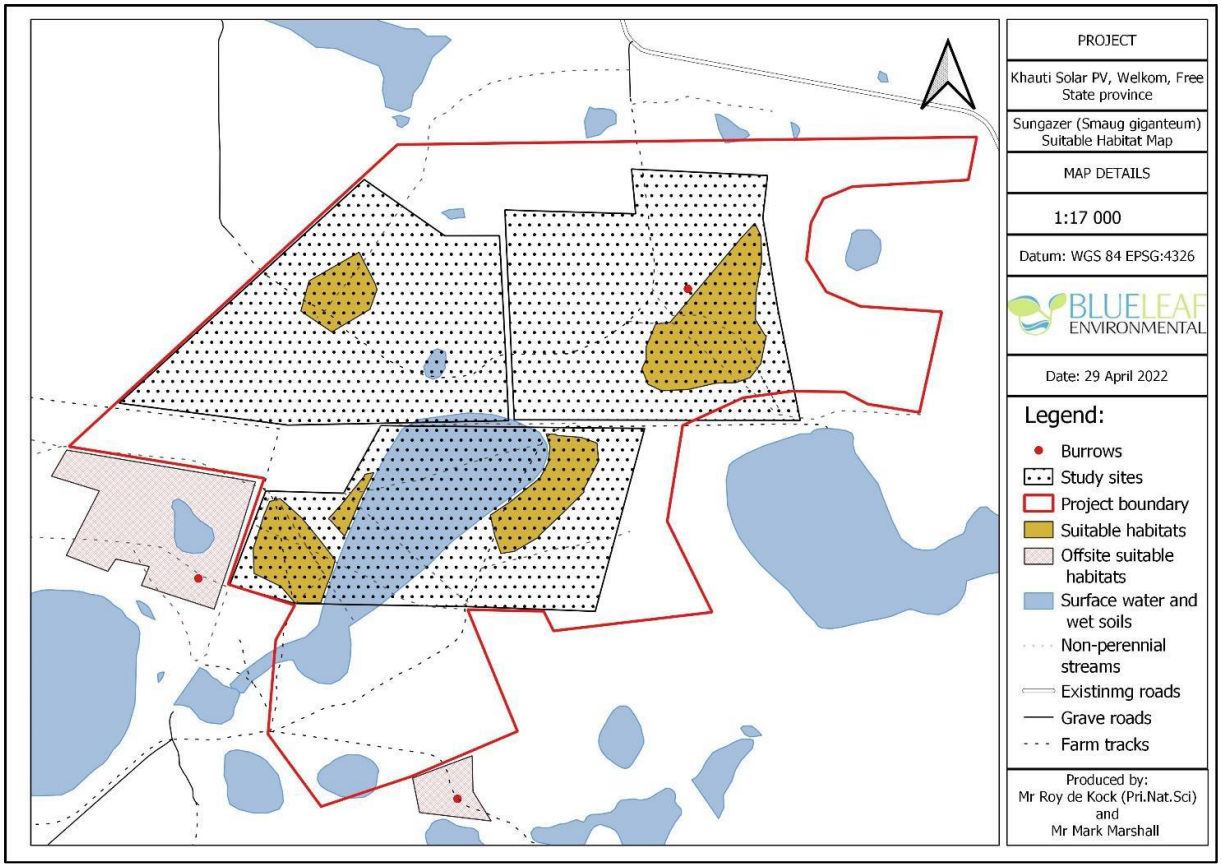


Figure 11 Confirmed evidence (i.e., burrows) of Smaug giganteus *and confirmed suitable habitat for the species. Burrows in currently in use are demarcated in green.*

B. Habitat Unit 2: Old lands

The old lands were verified to be rehabilitated grassland that are less than 10 years old. Although these areas are not considered "natural vegetation" as per the National Environmental Management Act (Act 107 of 1998), these areas are similar in species composition to Habitat Unit 1 (Figure 9) and are expected to function in a similar manner. Therefore, old lands are considered to be successfully rehabilitating and are likely to support a variety of faunal and floral species and contribute to the overall ecological significance of the area. No threatened or protected species were recorded within these old lands.

C. Habitat Unit 3: Wetland areas (now considered to be areas classified as ESA 1 and 2)

Various areas have been delineated as wetlands, as per the Aquatic Biodiversity verification report. Given that the most of these areas are only seasonally/periodically wet, much of these areas do not differ in vegetation from Habitat Unit 1 (this does not negate their ecological importance). From a botanical perspective, the wetland areas are different to Habitat Unit 1 and thus, have been discussed in this section. Habitat Unit 3 is dominated by *Panicum coloratum, Eragrostis curvula, Berkheya rigida, Gomphocarpus* sp., and especially species often associated with wetlands including *Carex* sp. and *Cyperus echinatus*. Although these areas mostly inhabit common, non-threatened species, one provincially protected species (as per the Free State Nature Conservation Ordinance (8 of 1969)) was recorded, *Ammocharis coranica*.

In terms of fauna, the delineated wetlands within the footprint are likely habitats and food resources for a variety of reptiles, insects, amphibians, avifauna and small mammals. During the site visit, *Tyto capensis, Pyxicephalus adspersus*, and a variety of insects, including Dragonflies, were recorded during the site survey. The presence of amphibians and Dragonflies indicate that the delineated wetlands are in a natural/near natural state and thus, it is expected that these ecosystems are highly productive and will be integral components to the overall ecological functioning of the area. Moreover, wetlands delineated within CBAs or ESAs are of particular importance because they are located in areas that are ecologically and biologically sensitive.

As mentioned in the above sections, the areas mapped as ESA 1 and 2 have been delineated based on the presence wetland clusters. Therefore, to retain the functions of the ESAs, the wetlands/watercourses and buffers must be conserved. Based on the aforementioned, ESA 1 and 2 areas can be represented by areas delineated as watercourses and their associated buffers (refer to Section 3.2.1).

3.9.1.2. Line route options for the 132kV and 44 kV transmission lines

Based on the site inspection, the areas within all the route options (Figure 12) have been verified to be overall a mixture of mostly degraded or completely transformed areas (via cultivation or roads) and/or are adjacent to roadsides and residential areas. However, there are areas that are natural/near natural which are usually also associated with wetlands as delineated by the Aquatic Biodiversity Specialist.

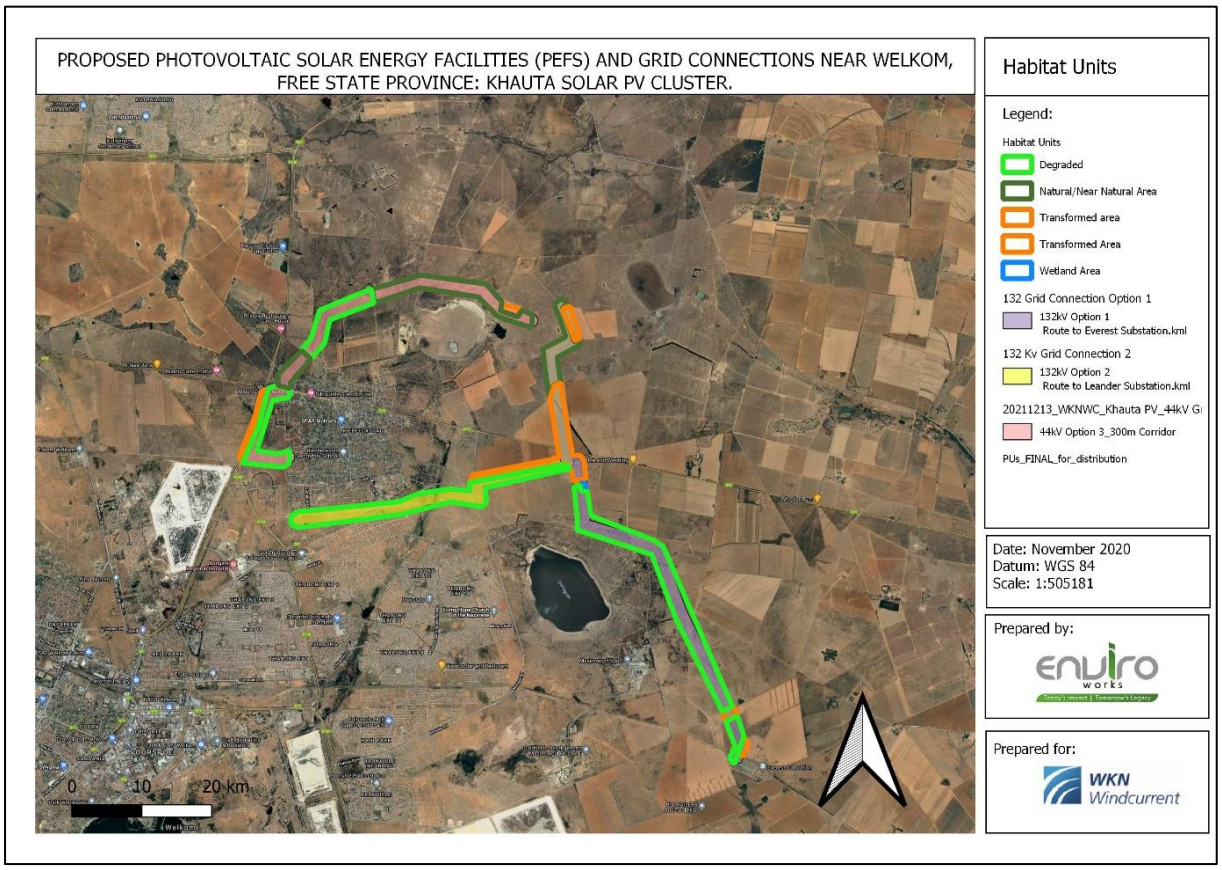


Figure 12 Habitat Units identified within the proposed transmission line (2 x 132 kV and 1 x 44 kV) route options and 300 m buffer area

A. Habitat Unit 1: Degraded Areas

Areas that are degraded show signs of disturbance mostly via the dominance of *Cynodon dactylon, Erigeron canadensis*, and *Helichrysum arenarium* and the presence of alien invasive species including *Cirsium vulgare* (Category 1b). However, other indigenous plant species were recorded including *Panicum coloratum* and *Eragrostis curvula.* In the northern most degraded area, disturbance is illustrated via bush encroachment and the dominance of *Vachelia karoo, Asparagus* sp., and *Tagetes minuta,* in addition to the aforementioned species. Within the degraded areas, it is expected that limited faunal activity takes place and thus, the areas are expected to support some ecological processes, but not enough to warrant them ecologically significant. Although these areas inhabit some indigenous species, the composition of these species are not representative of the indigenous vegetation types, Vaal-Vet Sandy Grassland or Alluvial Highveld Alluvial Vegetation. It must be noted that one provincially protected species was recorded in these areas, *Helichrysum arenarium.* No threatened species were recorded within the degraded areas.

B. Habitat Unit 2: Transformed Areas

Areas identified as transformed have no natural ecosystems or vegetation as a result of cultivation or infrastructure such as roads. These areas contain little to no vegetation or fauna and are not representative of the indigenous vegetation type and has no ecological value.

C. Habitat Unit 3: Natural/ near natural areas

Natural/near natural areas within the western section of the proposed transmission route options are dominated by indigenous species such as *Vachelia karoo, Panicum coloratum, Searsia sp., Eragrostis curvula, Cynodon* sp*.* Given the high abundance of *Vachelia karoo* and proximity to watercourse, it is likely that the vegetation could be representative of Highveld Alluvial Vegetation. There is also a section that includes a koppie, which is expected to provide essential habitat for a variety of reptiles, insects, and birds. In the eastern sections of the proposed transmission route options, the area is dominated by *Themeda triandra* and is botanically and pedologically (mostly that it is high in clay content) similar to Habitat Unit 1. Therefore, this area is likely to support western Free State Clay Grassland or Central Free State Grassland (both classified as Least Threatened).

Importantly, both the eastern and western sections of the transmission line route options are classified as a Critical Biodiverse Area 1 (CBA1) (in the eastern section) and Ecological Support Area 1 (ESA 1) (in the western section) and thus have high conservation value (Figure 13). Both eastern and western sections' areas are likely to support a high diversity of indigenous faunal and floral species. No threatened plant species were observed on site, but one protected species was recorded, *Brunsvigia* sp. Therefore, Habitat Unit 3 holds significant ecological value and is likely to provide essential ecosystem services.

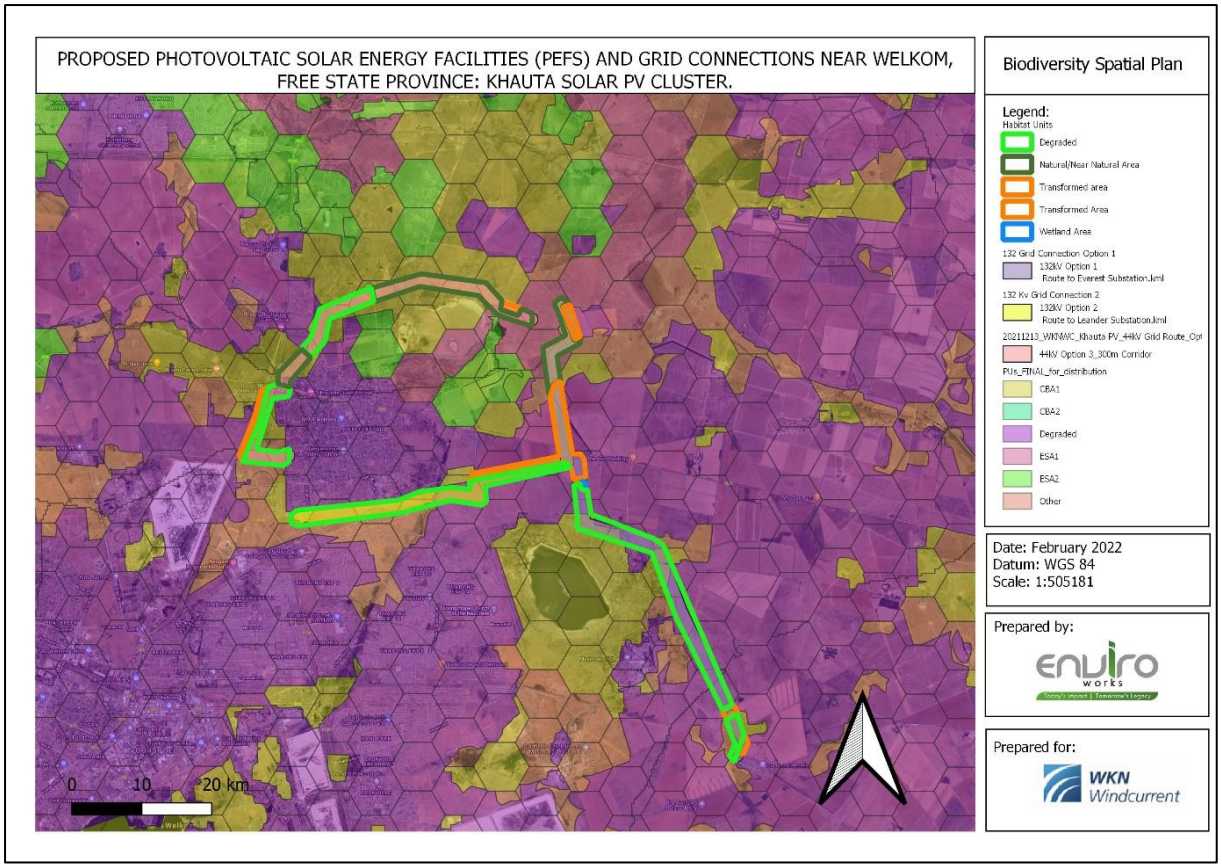


Figure 13 Biodiversity Spatial Plan for the proposed transmission line routes (2 x 134 kV and 1 x 44kV lines).

D. Habitat Unit 4: Wetland Areas

It is noted that various watercourses have been delineated on the proposed development footprints. The watercourses do provide essential habitat to various faunal species but are mostly isolated resulting in fragmented habitats and are often the only habitat refuge for faunal species. This makes the preservation of the watercourses important. From a botanical and faunal perspective, these watercourses are unlikely to support threatened or protected species, but still do provide essential ecosystem services. The demarcated wetlands are located in an ESA and thus, are expected to form an integral part of the overall ecological importance of the area. This wetland is in a natural state and thus, supports a host of fauna and flora and provides essential ecosystem services such as habitat to fauna in the wider area.

3.9.1.3. Taxon specialist input: Smaug giganteus (Sungazers)

Faunal specialist, Roy de Kock from Blueleaf Environmental (May 2022) with assistance from taxon specialist Mark Marshall did a survey for the *Smaug giganteus*. For more information regarding the detailed approach, methodology, results and maps, please refer to Appendix E.

The sungazer (*Smaug giganteus*, syn. *Cordylus giganteus*), also known as the giant girdled lizard, giant dragon lizard, or giant zonure (Moton; 2014) is the largest species of the Cordylidae, a family of lizards from sub-Saharan

Africa (Branch; 1998). This threatened species is endemic to Highveld grasslands in the interior of South Africa (Branch; 1998).

Sungazers, unlike other girdled lizards which live on rocks, make shallow burrows in open grassland. They are diurnal (active during the day) and are often seen basking on the ground near the burrow or, less often, on a termite mound. They live in colonies and dig burrows into the sandy loamy soils of *Themeda* (red grass/rooigras) grassland in South Africa. They hibernate (dormant state like sleep) during the winter and are rarely seen at all between May and mid-August.

Sungazers only reproduce every other year, and only produce one or two offspring. They are viviparous, meaning they give birth to live young. The population is thought to be in decline due to habitat destruction through the conversion of grassland to farmland (maize, sunflower, and other crop farming), illegal collecting for the pet trade, as well as collection for the muti (traditional medicine) industry. Conversion/transformation (especially ploughing) of native grassland is the biggest threat to the species. It has been recorded that sungazers do not seem to return to previously ploughed land.

The sungazer is endemic (only found in one country or geographic area) to South Africa. It is found in the highland grasslands of the north-eastern Free State as well as a small population in southwestern Mpumalanga province. The population status is unknown but thought to be declining. Globally and nationally the Giant Girdled Lizard is classified as Vulnerable (IUCN Red List).

The main reason for their small distribution is that they are extremely habitat specific. They are only found in high lying grassland areas dominated by *red grass* on sandy loams soils that are not too wet. Grasses must be kept short (20-30cm in height) by grazers to allow the sungazers to spot natural predators while waiting just outside their borrows for prey. They feed on small insects like grasshoppers and bugs. Juveniles feed on ants mostly.

Suitable habitats were identified based on the following criteria:

- If there were evidence of recent ploughing (within the last 10 years) the area was excluded.
- Areas covered by *Themeda* grasses (red grass) were included.
- Areas where compacted sandy loam soils occur with little to no rocks were included.
- Short grasses (less that 30-40 cm in length) were included.
- Wet soils were excluded.

A. Land parcel 1

Land parcel 1 did not contain any visible sungazer habitats. Grasses throughout the site were very tall (1 m and higher) with no grazing occurring on site. There were small patches of shorter grasses (not *Themeda*) interspersed between the taller grasses (*Themeda*) that may have been suitable habitats, but they were searched, and no burrows, specimens, or traces (tracks and scales) were found. The area identified as high

potential sungazer habitat 1 was intensively searched with no results. As a result, this area was still identified as a potential habitat but with no occurrence.

B. Land parcel 2

Suitable habitats were observed and mapped with no occurrence of any specimens. A single burrow was found at (GPS coordinate: S 27° 52.844'; E 26° 52.173') but the burrow was old with no recent proof of occupation.

C. Land parcel 3

As with land parcel 2, suitable habitats were observed and mapped in land parcel 3. No burrows and no live specimens were found within the study site, but 2 areas were mapped outside the study site containing active burrows. Sungazers were not noted in these areas but, because of the cold day, were probably hiding inside their burrows. The landowner and various farmworkers however confirmed observing live specimens in these 2 areas.

D. Habitat mapping

Based on all the above-mentioned evidence, a map was created of the study site (Figure 11). The map shows the extend of all suitable habitats within the study site as well as all burrows and live specimen found within and surrounding the study site. Please note that no live specimens were found and are therefore not mapped.

Even though most of the study site conformed to most of the habitat requirements, most grasslands were too long (more that 20-30 cm high) to be considered suitable sungazer habitats with some minor areas waterlogged. The map in Figure 11 shows areas where suitable habitats do occur but with no live specimen of burrow occurrence. One unused burrow was found on land parcel 2 (GPS coordinate: S 27° 52.844'; E 26° 52.173'), but the burrow was old and unused.

Sungazers are opportunistic hunters sitting in one place near the entrance of their burrows waiting for small prey like bugs and other insects to venture close while at the same time needing to look out for natural predators, so they do not prefer long grasses. Multi grass layers of different ages, older than 1 year, and approximately 1 m tall were observed on land parcel 1 so the chances of sungazers occurring on the property is extremely low. A small area in between trees contained small open patches of short grasses between longer grasses but with no burrows. This small patch aligns with the Free State CBA1 map indicating that sungazers may have occurred historically here (called High potential sungazer habitat 1 in this report). No evidence of sungazere or even old burrows were found.

Land parcel 2 had a suitable habitat in its eastern section while land parcel 3 was the most promising section with large suitable habitat parcels throughout the site. However, no specimens or burrows were found. Land parcel 3 also had a high potential sungazer area (called High potential sungazer habitat 2) on its western boundary. Habitats were suitable, but no specimens or burrows were found.

Even though numerous areas within the study site were identified as suitable sungazer habitats, no live specimens and no burrows were found. Development of the proposed Khauti Solar PV facility may proceed provided all conditions mentioned in this report is included into the site EMPr and adhered to.

It is the opinion of the specialists that these sungazers may even return during operations of the proposed new solar PV facility. All solar panels will be mounted on aboveground steel frames lifting these panels off the ground surface. This means that the ground footprint of the solar PV facility will be relatively small. The Developer will also have to keep the grass underneath these panels short, creating potential safe habitats for sungazers. The only negative factor will be the panels blocking the sun underneath them, but habitats will be suitable, especially around the PV cluster fringes where more sunlight reaches the ground. It may be a good option to conduct academic studies on this occurrence.

Taking into consideration the sensitivity of the development footprint, sensitive features verified during the site inspection, the results from the baseline biodiversity and ecosystem of the site, it can be concluded that most of the proposed development sites have some ecological sensitivity (Animal Species, Plant Species or Terrestrial Biodiversity). Nevertheless, the preliminary 'no-go' areas identified are regarded as sufficient in preserving the ecological importance of the habitat units within the proposed development footprints (this pending further assessments to determine the full extent of the impact of the proposed developments).

3.9.2. No-Go Areas

The two areas where active borrow were found should be considered 'no-go' areas; as well as the recommended connectivity corridors. The suggested corridors between the wetland are more than 300 m (Figure 14); but it is recommended that only a minimum corridor width of 300 m should be maintained; thus there is some flexibility in the layout of the corridors.

3.9.3. Preferred 132 kV Route

In terms of the two 132 kV line route options both routes are expected to have similar impact on Terrestrial Biodiversity, Faunal- and Plant Species. However, given that Option 2 will traverse through more vegetated areas (surrounding the Doringpan), it is recommended that Option 1 be developed. Should Option 2 be developed outside of the vegetated areas, either route option will be acceptable in terms of Terrestrial Biodiversity, Faunal Species and Plant Species impacts.

It must be noted that areas within the proposed 132 kV line routes that have also been earmarked as potential off set sites, should be avoided. Although the powerline is expected to have minimal impact on the suitable habitat of *Smaug giganteus*, these areas are expected to be conserved in their entirety.

Should a different route/avoidance of the offset areas not be feasible, additional offset areas must be determined to ensure enough suitable habitat for *Smaug giganteus* is available.

3.9.4. Recommendations and conditions

3.9.4.1. (3) x 100 MW PV Solar Installation and (2) x 19.9 MW PV Solar Installation

Ideally the Ecological Support Areas (ESA 1), wetlands, and Critical; Biodiverse Area (CBA 1) would be avoided completely (Figure 10). However, should the need and desirability of the development be significant enough to warrant the clearance of the areas of conservation value, the following would be preliminary recommended:

- All delineated watercourses, considered to be ecologically significant in the Aquatic Biodiversity Assessment Report, and their buffer areas are identified as no-go areas. This would be especially significant in all areas delineated as ESA1 and 2. Given that the ESA1 and 2 have been delineated to preserve the NFEPA wetland clusters, any areas that would prevent sedimentation (i.e., reduction of water quality) into the wetlands must be preserved. This will retain the functionality of the ESAs.
    - To ensure connectivity between watercourses, corridors have been recommended. These corridors are recommended to be at least 300 m to ensure the movement of fauna, seed dispersal and that edge effects are considered.
        - The 300 m corridor is justified given that:
            - It is the migration of only plants, reptiles, insects, and small mammals that need be accounted [6]for (note that avifauna have not been considered at this stage) because the footprints no longer inhabit natural populations of large mammals.
            - Edge effects have been taken into account[7].
            - It is strongly recommended that areas between solar panels be kept as natural as possible.
            - There are large natural areas adjacent to the corridors that would act as suitable habitat for any species that may be displaced.
    - It must be noted that where corridors can be negotiated within other properties, it may change the corridor routes for some areas within the proposed development footprint.
- Based on input from the provincial Department's Biodiversity Specialist, it is not recommended that the area demarcated as CBA1 be developed because it is potential habitat for *Smaug giganteus* (and is irreplaceable). Based on the taxon specialist's results, new CBA1 areas have been demarcated based on suitable habitat for *Smaug giganteus* (Figure 11).
    - Areas within the development footprint that have been earmarked as potential habitat for *Smaug giganteus,* are recommended to be surveyed prior to construction.
    - Should individuals be utilising these areas of suitable habitat, it is then recommended that the individuals be located to outside of the footprint (in consultation with a Faunal Specialist). Data on

[6] Andrew Bennet, "Habitat Corridors and the Conservation of Small Mammals in a Fragmented Forest Environment," *Landscape Ecology* 4 (1990).
[7] David Holway, "Edge Effects of an Invasive Species across a Natural Ecological Boundary," *Biological Conservation*, 2005.

the translocation success of the species are limited, but studies[8] show that translocations are generally unsuccessful. However, these studies primarily relocated individuals to artificial burrows. Therefore, suggesting that relocation to suitable, undisturbed, and wild habitat could result in successful translocation.

- Based on the above, it is recommended that funding be allocated towards developing a successful translocation protocol for the proposed development. This will then involve translocation individuals to suitable habitat outside of the development footprint as indicated in Figure 11.

- Areas of suitable habitat for *Smaug giganteus* (and are now considered CBA1 areas) within the development footprint have been recommended by the taxon specialist not to be excluded from the development footprint. Therefore, some suitable habitat for *Smaug giganteus* will be lost within the development footprint. The aforementioned has been deemed acceptable for the following reasons:
  - No sightings or burrows in current use were recorded in areas demarcated as suitable habitat within the development footprint.
  - Suitable habitat outside of the development footprint and outside of the mapped CBA1 area is recommended to be conserved by the landowners. These areas will then be considered offsets as the function of the CBA1 will be retained, but in an area outside of a mapped CBA1 area (verified to not function according to its intended purpose as suitable habitat for *Smaug giganteus*).
  - Although approximately 90 hectares of CBA 1 areas will potentially be lost by the development, this will then be offset by the approximately 70 hectares of suitable habitat outside of the development footprint (and thus retaining the function of the mapped CBA 1 areas that will be lost by the proposed development).
  - It is in the professional opinion of the taxon specialist, that individuals of the *Smaug giganteus* may inhabit areas underneath or in between the solar panel during operations.
    - All solar panels will be mounted on aboveground steel frames lifting these panels off the ground surface. This means that the ground footprint of the solar PV facility will be relatively small.
    - The Applicant will then have to keep the grass underneath these panels short, creating potential safe habitats for *Smaug giganteus*.
  - Furthermore, the areas mapped as a suitable habitat on the development footprint is completely isolated and thus, resulting in fragmented habitats. Fragmented habitats are usually vulnerable to edge effects, population inbreeding, and potential reduced prey. Overall, the probability of negative impacts on the potential colonies (should any be found on the areas of suitable habitat on the development footprint) is high. Conserving an island of potential habitat within the current development footprint would, therefore, not practically retain the function of the CBA1.

[8] G.H Groenewald, "The Relocation of Cordylus Giganteus in the Orange Free State, South Africa: Pitfalls and Their Possible Prevention" (The Journal of the Herpetological Association of Africa, 1992).

- Based on input from the provincial Department's Biodiversity Specialist, it is not recommended that the area demarcated as CBA1 be developed because it is potential habitat for *Smaug giganteus*. By confirming the locations *Smaug giganteus*, the developable area can be refined to include a portion of areas classified as CBA1.
    - A taxon specialist has confirmed two locations of active *Smaug giganteus* burrows. These locations have been included in the no-go areas/ecological corridors as shown in Figure 14.
    - A taxon specialist has also noted potential suitable habitat for *Smaug giganteus* within the CBA1. However, no evidence of the species was found within this area. Given that the CBA1 has been mapped primarily for suitable habitat of *Smaug giganteus*, it is recommended that areas with confirmed burrows outside of the development be conserved. These areas would allow for the primary function of the CBA1 to be retained.
    - Furthermore, the area mapped as a suitable habitat in Figure 11 is completely isolated and thus, the probability of any individuals using the area after construction is low. Conserving an island of potential habitat would, therefore, not retain the function of the CBA1.
        - The above mentioned is expected to sufficient motivation for the development of the area that is mapped as a CBA1.
- All suitable habits for *Smaug giganteus* (as per Figure 11) must undergo a micro-siting exercise before commencement of any construction related activity onsite. This is to confirm the absence of *Smaug giganteus*. Should individuals be utilising these areas of suitable habitat, it is then recommended that the individuals be located to outside of the footprint (in consultation with a Faunal Specialist). Data on the translocation success of the species are limited, but studies[9] show that translocations are generally unsuccessful. However, these studies primarily relocated individuals to artificial burrows. Therefore, suggesting that relocation to suitable, undisturbed habitat could result in successful translocation.
    - Based on the above, areas of suitable habitat for *Smaug giganteus* are not considered 'no-go' areas given that they have no recorded evidence of *Smaug giganteus* habitation. It must be noted that because these areas do not currently inhabit *Smaug giganteus*, the probability of any individuals inhabiting the area is low.
- In order to determine the impact that the proposed development will have on the areas of conservation concern, a full botanical, faunal, and terrestrial impact assessment is required.
- All recommendations from the Avifaunal Specialist site verification report must be implemented. The development footprints are ideal habitats for a variety of indigenous birds, some of which may be threatened or protected. During the site visit, individuals of *Tyto capensis* and *Sagittarius serpentarius* (classified as Vulnerable[10]) were recorded.

[9] G.H Groenewald, "The Relocation of Cordylus Giganteus in the Orange Free State, South Africa: Pitfalls and Their Possible Prevention" (The Journal of the Herpetological Association of Africa, 1992).
[10] "IUCN 2020."

- It is recommended that areas between the rows of solar panels be kept as natural, were possible, as possible to ensure that as much ecological significant land can be preserved. An operation management plan should be developed for the areas to ensure the areas are managed in a way that preserves their ecology.
- Plant removal permits must be obtained from the Free State Department of Economic Development, Tourism, and Environmental Affairs for protected species that will be removed.

3.9.4.2. Line route options for the 132kV and 44 kV transmission lines

- Overall, the loss in biodiversity and ecological significant areas would be moderate given that limited areas are usually disturbed during the installation and operations of transmission lines.
- Nevertheless, areas classified as an ESA or CBA and are natural/near natural should ideally be avoided as far as practically possible. This is especially important given the large areas of CBAs/ESAs that will be cleared during the installation of the solar PV farms.
- However, should areas within the ESA1 need to be developed, all delineated watercourses and their respective buffer areas must remain 'no-go' areas. This will preserve the functioning of the ESA since it has been delineated due the presence of NFEPA[11] wetlands.
- Should areas within the CBA be required for the development of transmission lines, it is likely that the impact of these areas be minimal and the loss in vegetation is expected to be acceptable. The aforementioned is to be confirmed via a full Faunal, Botanical and Terrestrial Biodiversity Impact Assessment.
- All recommendations within the Aquatic Biodiversity verification report must be adhered to.
- All recommendations within the Avifaunal verification report must be adhered to.
- Plant removal permits must be obtained from the Free State Department of Economic Development, Tourism, and Environmental Affairs for protected species that will be removed.

[11] "Council for Scientific and Industrial Research. NFEPA River FEPAs 2011 [Vector Geospatial Dataset]," 2011.

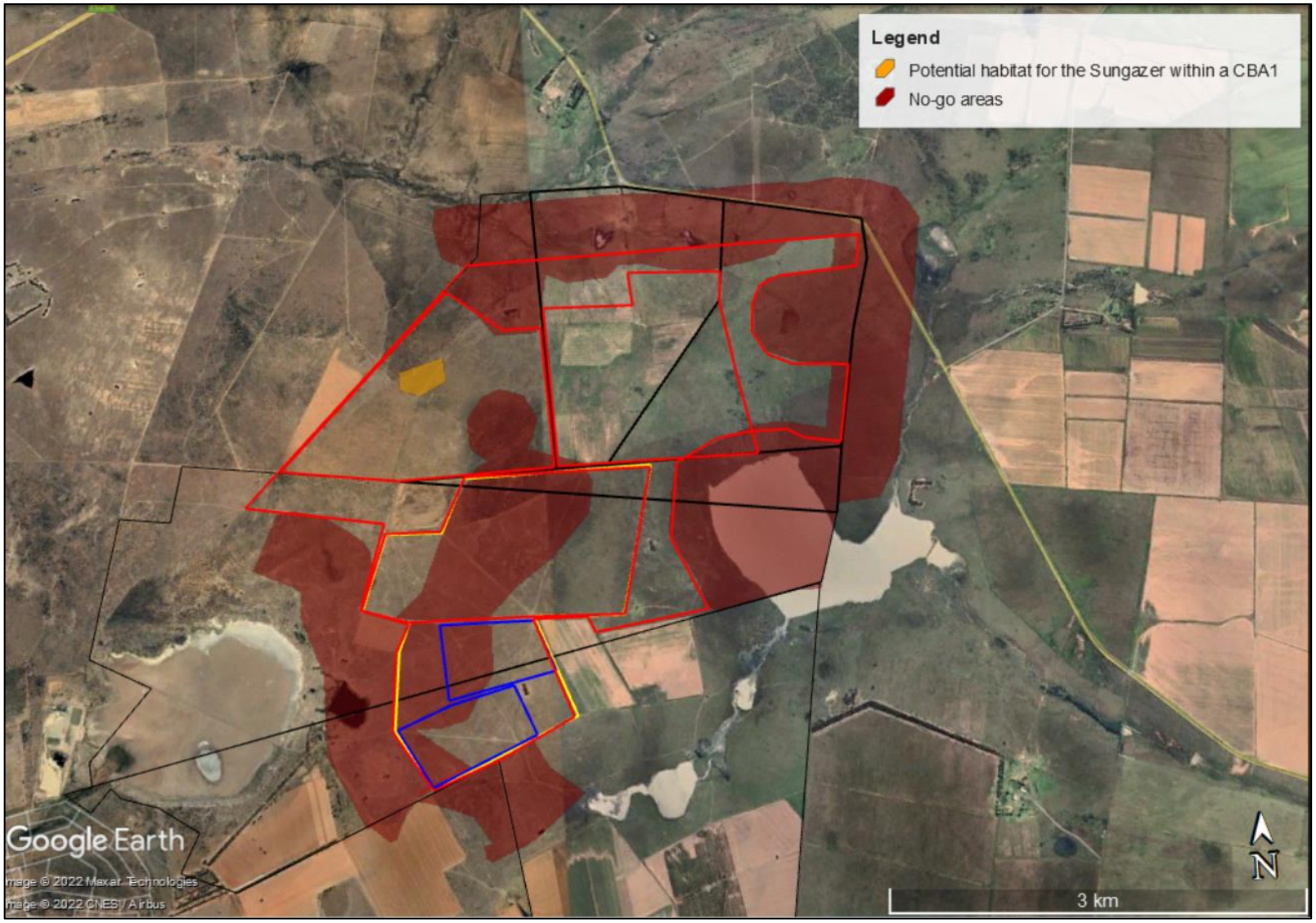


Figure 14 Recommended no-go areas (demarcated in red) within the solar PV farm development footprints (2 x 100 MW (red line) (this includes additional development footprints considered by the Applicant) and 2 x 19.9 MW (blue lines). Black polygons represent the landowner properties.

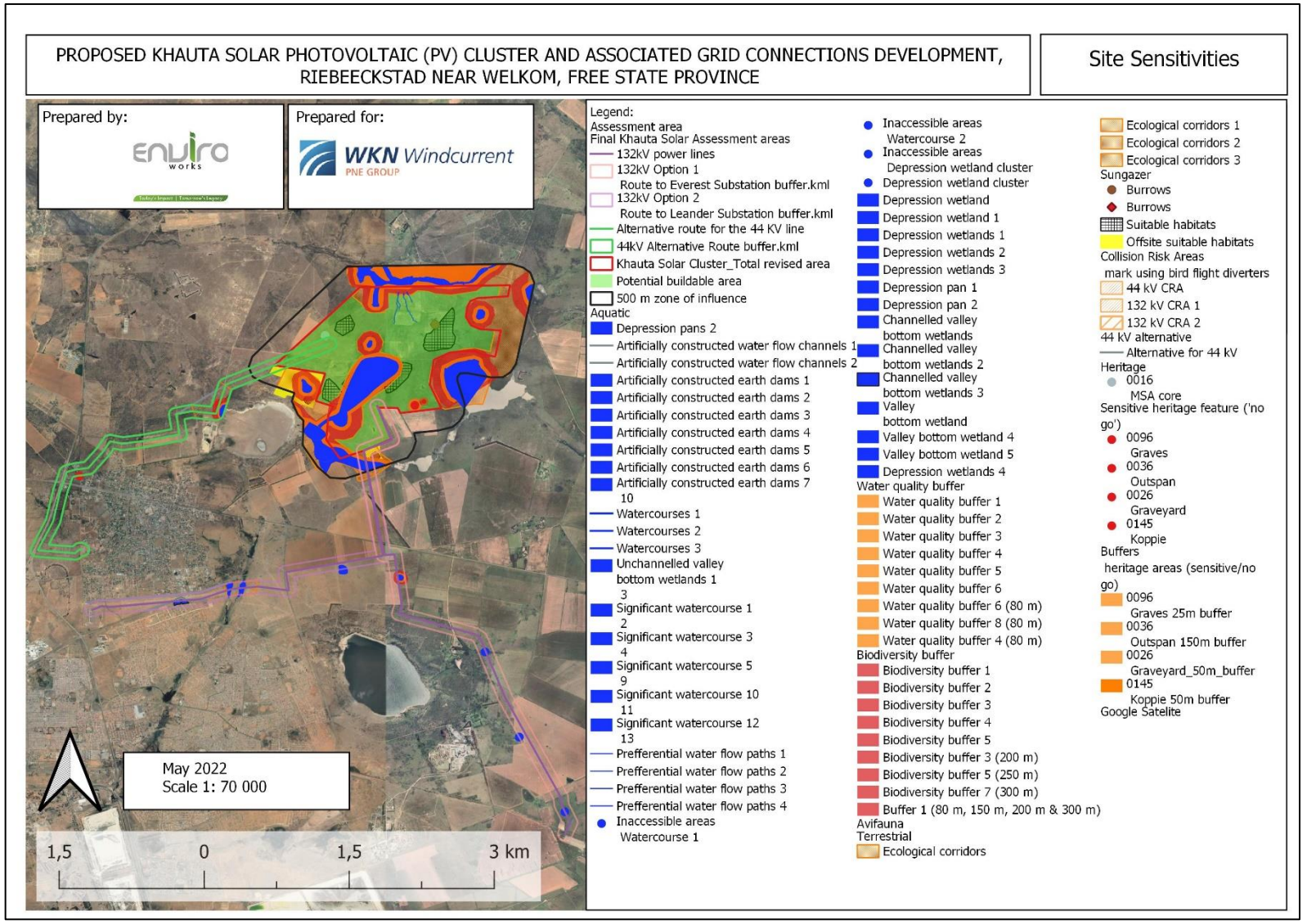


Figure 15 Features, Sensitive- and 'No-go' areas and buffers identified during the Site Sensitivity Verification assessment for the proposed solar PV cluster and associated transmission powerlines

3.9.4.3. Smaug giganteus

a) Other than the two 'no-go' sites identified outside the study area, there are no exclusion sites within the study site.
b) All suitable habits (Figure 11) must undergo a micro-siting exercise to confirm the absence of burrows before commencement of any construction related activity onsite.
c) The solar PV site must be monitored regularly (possibly monthly) throughout its operational life for *Smaug giganteus* occurrence and distribution.
d) It is recommended that the developer promote academic studies on the occurrence that solar panels can block the sun underneath them, but habitats could be suitable for *Smaug giganteus* and provide opportunity for habitation during the operational phase, especially around the PV cluster fringes where more sunlight reaches the ground; additionally, or alternatively, it is recommended that funding be allocated towards developing a successful translocation protocol for the proposed development. This will then involve translocation individuals to suitable habitat outside of the development footprint.

3.9.5. Way forward

a) The recommendations from Section 3.9.4 above will be included in the project specific EMPr, to ensure the measures are implemented during all phases of the proposed project.
b) A full botanical, faunal, and terrestrial impact assessment must be conducted.
c) An operation management plan should be developed for the areas to ensure the areas are managed in a way that preserves their ecology.
d) Plant removal permits must be obtained from the Free State Department of Economic Development, Tourism, and Environmental Affairs for protected species that will be removed.

4. CONCLUSION

The aim of this report was to provide a Site Sensitivity Verification (SSV) Report that summarises the findings of various specialist studies that were commissioned to outline the possible site sensitivities within the study area of the proposed development.

The spatial sensitivities (including 'no-go'-, sensitive areas and their buffers) of this SSV Report can be used to inform the Applicant in developing the project scope of works and site layout plans for the proposed developments.

For each specialist field, the report summarises the following aspects of the SSV investigations:

f) A brief site description with high-level feedback on the proposed development footprint;
g) Identify Sensitive areas;
h) Identify No-go areas;
i) Provide buffers for 'no-go'- and sensitive areas; and,

j) Provide overall spatial files and maps that outline the sensitive areas, 'no-go' areas and possible buildable area for development.

Of the preliminary ~980 ha of the cluster area that was assessed (via this SSV process, that was preceded by a desktop assessment), ~ 690 ha has been identified as suitable for development, considering the specialist fields mentioned in this report (Figure 15). The final area can still be refined during the planning and design phase. Some adjustments to the area might be made, pending the finalisation of ecological corridors.

Option 1 for the 132 kV Transmission powerline was the most preferred option; with some specialists not having a preference between either options due to low site sensitivities.

It is recommended that feasibility and practicality around conserving corridors and suitable habitat for *Smaug giganteus* be discussed with landowners. Enviroworks can assist with these discussions.

Furthermore, it is recommended to apply for the 'No Objection Letter' for the change in land use issued by the Deputy Director General (Agricultural Production, Health and Food Safety, Natural Resources and Disaster Management) as possible because not receiving this DALRRD approval is a fatal flaw for a project.

Game farmer and owner of the Farm Dankbaarheid No. 244, Quartus Meyer (082 651 028) expressed that should the project proceed, he could be inclined to sell his property. This is brought to the attention of WKN Windcurrent SA (Pty) Ltd, should they want to consider exploring the opportunity of acquiring the property.

5. LIST OF APPENDICES

Appendix 1 – Chance Fossil Finds Protocol

Appendix A - Avifaunal Assessment

Appendix B – Aquatic Biodiversity Assessment

Appendix C – Agricultural Assessment

Appendix D – Heritage and Archaeological Assessment

Appendix E – Paleontological Assessment

Appendix F - Terrestrial Biodiversity, Plant- and Animal Species Assessment

APPENDIX 1: CHANCE FOSSIL FINDS PROTOCOL

<table>
<tr><th colspan="3">APPENDIX 1: Chance Fossil Finds Protocol – Khauta Solar PV Cluster and associated grid connections near Welkom</th></tr>
<tr><td>Province & region:</td><td colspan="2">Free State: Matjhabeng Local Municipality (Lejweleputswa District)</td></tr>
<tr><td>Responsible Heritage Resources Agency</td><td colspan="2">SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za).</td></tr>
<tr><td>Rock unit(s)</td><td colspan="2">Middle Permian Volksrust Formation (Ecca Group)
Late Permian Adelaide Subgroup (Lower Beaufort Group, Karoo Supergroup) (equivocal - possibly Waterford Fm of Ecca Group)
Late Caenozoic alluvium, sandy soils, surface gravels, calcretes</td></tr>
<tr><td>Potential fossils</td><td colspan="2">Petrified wood, invertebrate trace fossils, rare bivalves and vertebrate (amphibian / fish) remains in Volksrust Fm.
Vertebrate skeletal remains and burrows, invertebrate trace fossils, plant fossils (e.g. petrified wood, plant compressions) within the Beaufort Group.
Mammalian and other vertebrate bones, teeth and horncores, freshwater molluscs, calcretised trace fossils (e.g. termitaria), subfossil plant material within superficial sediments.</td></tr>
<tr><td rowspan="5">ECO protocol</td><td colspan="2">1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (N.B. safety first!), safeguard site with security tape / fence / sand bags if necessary.</td></tr>
<tr><td colspan="2">2. Record key data while fossil remains are still in situ:
Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo
Context – describe position of fossils within stratigraphy (rock layering), depth below surface
Photograph fossil(s) in situ with scale, from different angles, including images showing context (e.g. rock layering)</td></tr>
<tr><td>3. If feasible to leave fossils in situ:
Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation
Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume</td><td>3. If not feasible to leave fossils in situ (emergency procedure only):
Carefully remove fossils, as far as possible still enclosed within the original sedimentary matrix (e.g entire block of fossiliferous rock)
Photograph fossils against a plain, level background, with scale
Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags
Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist
Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation</td></tr>
<tr><td colspan="2">4. If required by Heritage Resources Agency, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.</td></tr>
<tr><td colspan="2">5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Agency</td></tr>
<tr><td>Specialist palaeontologist</td><td colspan="2">Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository (e.g. museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Agency. Adhere to best international practice for palaeontological fieldwork and Heritage Resources Agency minimum standards.</td></tr>
</table>