Appendix G

AVIFAUNA IMPACT ASSESSMENT

CONFIDENTIAL

APRIL 2025

MERAFONG SOLAR PV FACILITY

SPECIALIST CONFIRMING STATEMENT (AVIFAUNA)

(Prepared in compliance with the Norm for the Exclusion of the Development and Expansion of Solar Photovoltaic Facilities in Areas of Low or Medium Environmental Sensitivity, published on 27 March 2024, Government Gazette Nr 50388).

DRAFTED BY:
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PROFESSIONAL EXPERIENCE

Ms. Megan Diamond completed a Bachelor of Science degree in Environmental Management from the University of South Africa and has been involved in conservation for 20 years. She has 18 years' worth of experience in the field of bird interactions with electrical infrastructure and during this time has completed impact assessments for over 260 projects. During her tenure at the Endangered Wildlife Trust's Wildlife & Energy Programme and the Programme's primary project (i.e. the Eskom-EWT Strategic Partnership) from 2006 to 2013, Megan was responsible for assisting the energy industry and the national utility in minimising the negative impacts, associated with the construction and operation of electrical infrastructure, on wildlife through the provision of strategic guidance, risk and impact assessments, training and research. Megan (SACNASP Environmental Science Registration number 300022/14) currently owns and manages *Feathers Environmental Services* and is tasked with providing guidance to industry through the development of best practice procedures and avifaunal specialist studies for various developments including renewable energy facilities, powerlines, power stations and substation infrastructure in addition to railway infrastructure and residential developments within South Africa and elsewhere within Africa. Megan has attended and presented at several conferences and facilitated workshops, as a subject expert, since 2007. Megan has authored and co-authored several academic papers, research reports and energy industry related guidelines, including the *BirdLife South Africa/ Endangered Wildlife Trust best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in southern Africa* and the *Avian Wind Farm Sensitivity Map for South Africa* (2015), and played an instrumental role in facilitating the endorsement of these two products by the South African Wind Energy Association (SAWEA), IAIAsa (International Association for Impact Assessment South Africa) and Eskom. She chaired the Birds and Wind Energy Specialist Group in South Africa (2011/2012) and the IUCN/SSC Crane Specialist Group's Crane and Powerline Network (2013-2015), a working group comprised of subject matter experts from across the world, working in partnership to share lessons, develop capacity, pool resources, and accelerate collective learning towards finding innovative solutions to mitigate this impact on threatened crane populations. She is currently a member of the IUCN Stork, Ibis and Spoonbill Specialist Group and the Eskom-EWT Strategic Partnership Ludwig's Bustard Working Group.

DECLARATION OF INDEPENDENCE

I, Megan Diamond, in my capacity as a specialist consultant, hereby declare that I:

- Act as an independent specialist to *WSP Group Africa (Pty) Ltd* for this project.
- Do not have any personal or financial interest in the project except for financial compensation for specialist investigations completed in a professional capacity as specified by the Amendment to Environmental Impact Assessment Regulations, 2017.
- Will not be affected by the outcome of the environmental process, of which this report forms part of.
- Do not have any influence over the decisions made by the governing authorities.
- Do not object to or endorse the proposed development, but aim to present facts and our best scientific and professional opinion regarding the impacts of the development.
- Undertake to disclose to the relevant authorities any information that has or may have the potential to influence its decision or the objectivity of any report, plan, or document required in terms of the Amendment to Environmental Impact Assessment Regulations, 2017.

INDEMNITY

- This specialist report is based on a desktop investigation using the available information and data related to the site to be affected and a one-day, site sensitivity verification survey of the project area on 15 August 2024 and a subsequent summer survey conducted on 29-31 January 2025. No long-term investigation or monitoring has been conducted.
- The Precautionary Principle has been applied throughout this specialist report.
- The findings, results, observations, conclusions, and recommendations given in this specialist report are based on the author's best scientific and professional knowledge as well as available information at the time of study.
- Additional information may become known or available during a later stage of the process for which no allowance could have been made at the time of this specialist report.
- The specialist investigator reserves the right to modify this specialist report, recommendations and conclusions at any stage should additional information become available.
- Information, recommendations, and conclusions in this specialist report cannot be applied to any other area without proper investigation.
- This specialist report, in its entirety or any portion thereof, may not be altered in any manner or form or for any purpose without the specific and written consent of the specialist investigator as specified above.
- Acceptance of this specialist report, in any physical or digital form, serves to confirm acknowledgment of these terms and liabilities.

23 April 2025

CONFIRMING STATEMENT

This avifaunal specialist report has been compiled in accordance with the legislative requirements as described in the Norm for the Exclusion of the Development and Expansion of Solar Photovoltaic Facilities in Areas of Low or Medium Environmental Sensitivity (Government Gazette Nr 50388, 27 March 2024)

A screening report for the identified *Merafong Solar PV Facility* was compiled on 10 March 2025 by *WSP Group Africa (Pty) Ltd*. The identified proposed development area is classified as having a LOW Animal Species Theme Sensitivity. A site sensitivity verification for the proposed *Merafong Solar PV Facility* and the broader PAOI was conducted by an experienced avifaunal specialist, using a desktop analysis, and verified by personal observations made during the in-field, site sensitivity verification survey on 15 August 2024 and a subsequent summer season survey on 29-31 January 2025. The winter season site sensitivity verification survey is important because it enabled a thorough assessment of the potential presence of the African Grass Owl and African Marsh Owl. Both species are more likely to be resident during this period, due to breeding activities, rather than moving between territories. The summer season survey is considered a peak season survey in avifaunal terms, maximising the opportunity to observe seasonal migrants and summer breeders. The one-day winter site sensitivity verification survey and subsequent three-day summer season survey were deemed sufficient for this largely transformed landscape and the robust secondary datasets available for the proposed development area and broader PAOI.

The field surveys produced a combined list of 55 species. Of the 55 species recorded during field surveys, 13 of these are priority species. The most notable observation being a single Hamerkop *Scopus umbretta* observed at a small ephemeral pan adjacent to the Midas Substation. Most observations (n=37) were of passerine species, with smaller complements of near-passerines (n=4), raptors (n=1), waterbirds (n=9), waders (n=2); terrestrial species (n=2) that are common to this area. Each of these species has the potential to be displaced by the construction of proposed *Merafong Solar PV Facility* because of habitat transformation and/or disturbance. However, these species have persisted despite existing disturbance (i.e. agricultural practices, large scale mining and industry and urban activities) within the development area and PAOI. This resilience, coupled with the fact that more suitable habitat is available within the broader area, means that the displacement impact will not be of regional or national significance.

The SABAP2 atlas project provides essential data that underpins all conservation initiatives within South Africa. This robust dataset presents itself as a useful measure occurrence, particularly in this case where over 120 checklists/surveys have been completed for the pentads within which the proposed development area and PAOI occur. Species report rates (the proportion of checklists/surveys that note SCC) that are above 50% are likely to occur within the proposed development area and broader PAOI. Conversely, report rates that are less than 50% are an indication that a species is unlikely to occur within the proposed development area and PAOI.

Relevant to this project, the seven SCC are reported at rates of between 1.1% and 3.4% indicating unlikely presence.

A desktop investigation of the proposed *Merafong Solar PV Facility* development area revealed four broadly described avifaunal micro habitats i.e. stormwater channels, disturbed grassland, fallow lands, and exotic tree stands. The broader PAOI contains representative examples of these habitats in addition to ephemeral pans, commercial agricultural lands, open woodland, and built-up areas. These habitats were confirmed during the site sensitivity verification and seasonal summer surveys. Relevant to the *Merafong Solar PV Facility* development area, the most notable feature is the artificial stormwater channel line located within the solar array footprint. This habitat type is classified as MEDIUM sensitivity but is likely a man-made feature associated with the nearby mine. The *Merafong Solar PV Facility* development area is comprised of largely of disturbed grassland and fallow lands, which are assigned a LOW sensitivity.

The site sensitivity verification survey confirms the assigned LOW sensitivity for the proposed *Merafong Solar PV Facility* footprint.

Areas of MEDIUM and LOW avian potential/sensitivity occur within the proposed *Merafong Solar PV Facility* development area and broader PAOI. A preferred layout for the proposed development has been determined based on the avoidance of the environmental and social sensitivities delineated as part of the initial screening and scoping assessment processes. The proposed *Merafong Solar PV Facility* development envelope has a MEDIUM-LOW avifaunal sensitivity that is unlikely to regularly support SCC.

Twenty-renewable energy projects, in varying stages of environmental authorisation, occur within a 30km radius of the proposed *Merafong Solar PV Facility*. In addition, large-scale commercial agricultural activities, light industry operations, and residential areas dominate the landscape within this 30km radius. The proposed *Merafong Solar PV Facility* (comprised of the solar arrays and ancillary infrastructure) footprint is located on land portions that are currently largely transformed. The proposed infrastructure layout avoids areas of high sensitivity/avian potential. The proposed development footprint (solar arrays and ancillary infrastructure) is approximately 217ha in extent and will therefore contribute to a loss of habitat by a very small percentage. The contribution of the proposed solar PV facility to the cumulative displacement impact of all transformed habitat is LOW. However, the combined cumulative impact of the proposed renewable energy facilities and other transformed habitats because of mining, agriculture, and urbanisation on avifauna within a 30km radius is MODERATE. The cumulative impact is deemed acceptable after mitigation has been applied.

Relevant to the *Merafong Solar PV Facility*, the following applies:

Avoid

- There are no identified areas of VERY HIGH or HIGH sensitivity that must be avoided.
- The solar arrays and ancillary complex are to be constructed in areas of MEDIUM and LOW sensitivity.

Minimise

- The PV panels should preferably be constructed using a single or double axis tracking system.
- The 33kV powerline, connect the solar arrays to the IPP Substation should, where practically possible, be constructed below ground.
- Construction activity should be restricted to the immediate footprint of the *Merafong Solar PV Facility* and strictly managed.

Rehabilitate

Rehabilitation of avian resources is not applicable to this project

Offset

Offsets are not applicable to this project

In accordance with the baseline conditions as presented in Section 7 and the outcomes of the sensitivity mapping detailed in Section 8, it is this specialist's opinion that the construction of the proposed *Merafong Solar PV Facility* is not deemed to present unmitigable negative environmental issues or impacts subject to mitigation and management measures. Any remaining environmental impact is acceptable after avoidance and mitigation have been applied.

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1. INTRODUCTION

To demonstrate commitment to sustainable development and a pledge to move towards a cleaner energy future *Merafong Energy (Pty) Ltd* (hereafter referred to as *Merafong Energy*) proposes the construction and operation of the Merafong Solar Photovoltaic (PV) Facility and its associated ancillary infrastructure.

In order to fulfil the requirements of the bid, the *Merafong Solar PV Facility* requires detailed specialist assessment, in accordance with the *Norm for the Exclusion of the Development and Expansion of Solar Photovoltaic Facilities in Areas of Low or Medium Environmental Sensitivity (Government Gazette Nr 50388, 27 March 2024)* to describe the avifaunal community present within the proposed development area, with particular reference to Species of Conservation Concern (SCC), the delineation of areas that are avifaunally sensitive, identification of any potential impacts associated with the construction and operation of the *Merafong Solar PV Facility* and the avoidance and/or the provision of mitigation measures to manage and monitor the impacts.

2. PROJECT LOCATION

The proposed *Merafong Solar PV Facility* development area is situated approximately 10km east of Carletonville, within the jurisdiction of the Merafong City Local Municipality, in the West Rand District Municipality, Gauteng Province (FIGURE 1).

3. PROJECT DESCRIPTION

The *Merafong Solar PV Facility* is comprised of the following project components (FIGURE 2). Any reference to the *Merafong Solar PV Facility* in this report encompasses all these components:

* Solar Arrays, modules and mounting structures
* Inverters and transformers
* Battery Energy Storage System (BESS) (to be included as part of a separate norms registration process)
* Operation & Maintenance building including a gate house, ablution facilities, security building, control centre, offices, warehouses and workshops for storage and maintenance.
* Temporary and permanent laydown area
* Laydown Area
* Facility grid connection infrastructure including:
    * 33kV cabling to connect the solar arrays to the IPP Substation
    * 33kV/132kV IPP substation

* Internal service and maintenance roads
* Perimeter fencing

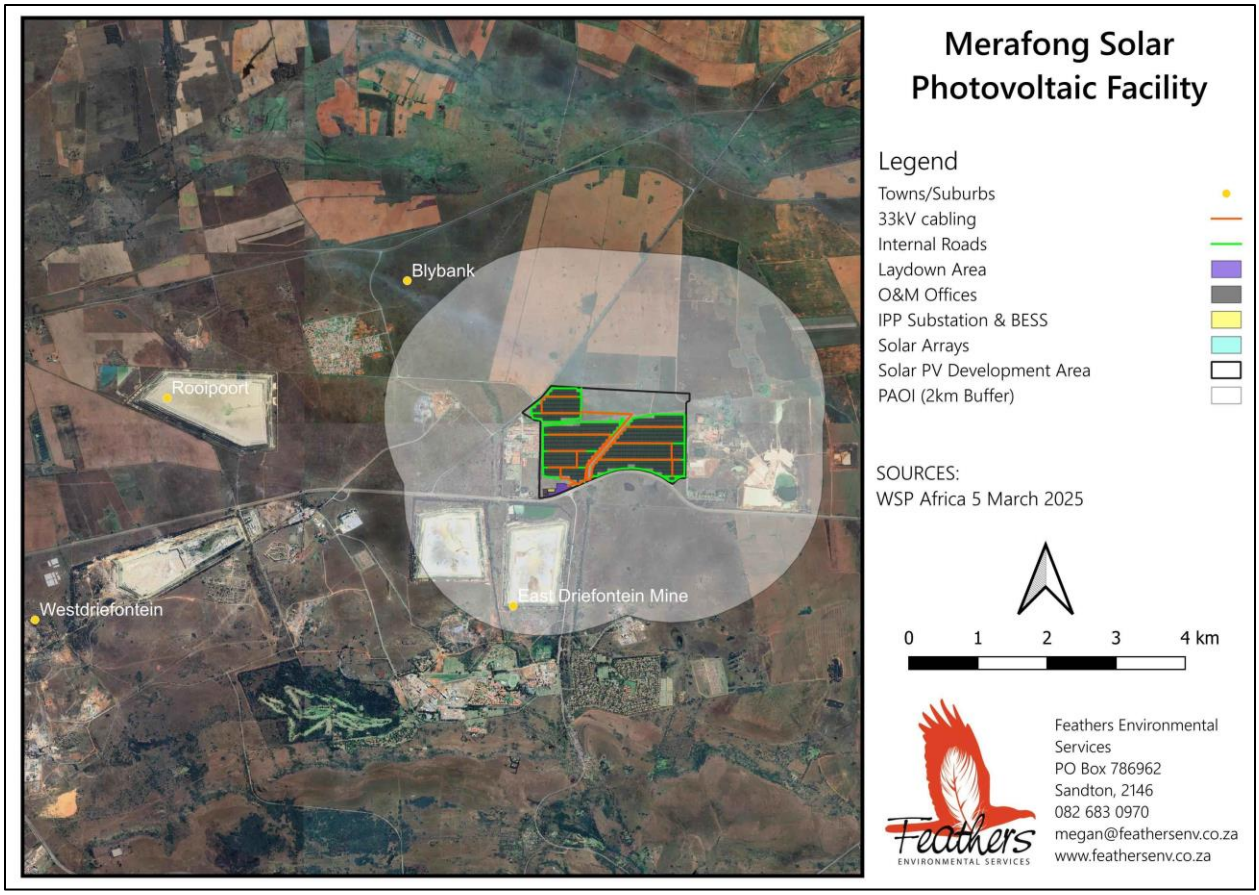


FIGURE 1: Regional map detailing the location of the proposed Merafong Solar PV Facility project PAOI near Carletonville, within the jurisdiction of the Merafong City Local Municipality, in the West Rand District Municipality, Gauteng Province

4. THIS REPORT

4.1 Scope of Work

*Feathers Environmental Services CC (*hereafter referred to as *Feathers)* was appointed by *WSP Group Africa (Pty) Ltd* (hereafter referred to as *WSP*) to conduct an avifaunal site sensitivity verification survey in addition to a summer season field survey and compile a specialist avifaunal report, that will inform the final Site Sensitivity Verification Report (SSVR) required for the registration of the proposed *Merafong Solar PV Facility*. This specialist report is based on a desktop review of various data sets and the two field surveys conducted on 15 August 2024 and 29-31 January 2025 respectively, using a set methodology and data sets to:

- Determine the sensitivity of the site, by virtue of the avian species that regularly occur within the *Merafong Solar PV Facility* footprint and the availability of bird micro habitats (i.e. avifaunal sensitive areas);
- Confirm or dispute the screening tool sensitivity rating;
- Determine the possible impacts of the proposed *Merafong Solar PV Facility* and;
- Provide recommendations for the mitigation of the anticipated impacts for inclusion in the Environmental Management Programme (EMPr).

4.2 Terms of Reference

Feathers has conducted this avifaunal specialist report according to the following terms of reference (TABLE 1) in accordance with the *Norm for the Exclusion of the Development and Expansion of Solar Photovoltaic Facilities in Areas of Low or Medium Environmental Sensitivity (Government Gazette Nr 50388, 27 March 2024)*:

Table 1: General Requirements of a SSVR in terms of the *Norm for the Exclusion of the Development and Expansion of Solar Photovoltaic Facilities in Areas of Low or Medium Environmental Sensitivity*

NO.	REQUIREMENT	CROSS REFERENCE/ COMMENT
4.1	Where possible, land which has already been modified should be considered for the location of the proposed facility and the consideration of such land for the location of the proposed facility must be discussed in the site sensitivity verification report.	Section 7.2
4.2	It is advised that a buffer is identified around the footprint to allow for slight adjustments without the need to resubmit the request for registration contemplated in this Norm,5 which buffer— 4.2.1 must be clearly indicated; 4.2.2 must envelope the footprint; and 4.2.3 must be subjected to the site sensitivity verification requirements of which the findings must confirm that it is in an area of low or medium environmental sensitivity.	Section 5.1 Section 7 Section 8
4.3	A proponent must ensure that a site sensitivity verification inspection is undertaken for the environmental themes contemplated in paragraph 2.1.2 to confirm whether or not the environmental sensitivity of the footprint and corridor is as identified by the screening tool.	Section 7
4.4	A "very high" or "high" environmental sensitivity rating may be disputed by the specialist, provided that evidence and motivation to substantiate such a change of environmental sensitivity is provided.	Not Applicable
4.5	The site sensitivity verification must be undertaken: 4.5.1 for the environmental themes contemplated in paragraph 2.1.2; 4.5.2 for the footprint as well as the proposed corridor for the linear infrastructure;	Section 5 Section 7 Appendix 3: Specialist CV

NO.	REQUIREMENT	CROSS REFERENCE/ COMMENT
	4.5.3 by specialists, registered in the field for which they are undertaking the site sensitivity verification and where relevant, with demonstrated experience in the taxonomic group of the species being considered; 4.5.4 within the season which would be most relevant to identify the specific species or vegetation of interest; and, 4.5.5 for a period of time as necessitated by the sensitivity of the proposed site and size of the proposed facility.	
4.6	The site sensitivity inspection must be a physical inspection, which must, where relevant, be supplemented by utilising any desktop information available, including any fine scale data from the provincial department responsible for the environment, provincial conservation authorities, iNaturalist records or relevant municipality, where available.	Section 5
4.7	Where additional information identified mentioned in paragraph 4.6 has been used in the verification process, this information must be identified and referenced in the Site Sensitivity Verification Report.	Section 5 Section 7
4.9	For the plant and animal species sensitivity themes, the relevant Specialist must confirm the presence, likely presence, or absence of a species of conservation concern within the footprint and corridor identified as "medium" sensitivity by the screening tool.	Section 7.2.1 Section 7.2.3
4.10	Should a species of conservation concern be found or have been confirmed to be likely present on the footprint, this exclusion does not apply and an EA should be applied for.	Not Applicable
4.11	Should a species of conservation concern be found or have been confirmed to be likely present in the corridor, this exclusion applies under the conditions contemplated in paragraph 2.2.	Not Applicable
4.12	The relevant specialists must consider the cumulative effects for the themes as mentioned in paragraph 2.1.2, and provide a discussion on possible cumulative impacts, the ability to mitigate such impacts and a statement of environmental acceptability of any cumulative impacts after mitigation in any report produced.	Section 9.1
4.13	Should the cumulative impact not be acceptable after mitigation this exclusion does not apply and an application for an EA should be submitted;	Not Applicable
4.14	The relevant specialists must consider the presence and preservation of ecological corridors and discuss the possible and preservation of such ecological corridors.	Section 7.2.5
4.15	The outcome of the relevant site sensitivity verification must be recorded by the specialist in the form of a specialist report, and collated into a final site sensitivity verification report that confirms or disputes the environmental sensitivity, as identified by the screening for each environmental theme as identified in paragraph 2.1.2.	This specialist report

NO.	REQUIREMENT	CROSS REFERENCE/ COMMENT
4.16	The specialist report must be appended to the final site sensitivity verification report and must be signed by the relevant specialist.	EAP to append Avifaunal Specialist Report to the Final Site Sensitivity Verification Report Specialist Report signed by avifaunal specialist
4.17	The final specialist report must include verifiable evidence from the specialist's site inspection, including as a minimum the following: 4.17.1 A map showing the specialist's GPS track in relation of the proposed footprint; 4.17.2 At least 4 spatially representative sample site descriptions from across the inspected area that include as a minimum, precise geographical coordinates of the sample site, one in situ photograph of the sample site and a habitat description of the sample site; and, 4.17.3 A map identifying any areas within the corridor in which development is not permitted due to environmental sensitivity, where relevant.	Section 5.2 Section 8 Appendix 3
4.18	A final site sensitivity verification report must be prepared by a registered environmental assessment practitioner or a registered environmental scientist and signed off by the relevant specialists, all of whom must meet the requirement of regulation 13(1) of the EIA Regulations, read in the context of this Norm.	Final Site Sensitivity Verification Report signed by avifaunal specialist

5. APPROACH AND METHODOLOGY

5.1 Methodology

The following methods were employed to compile this specialist avifauna report:

- The focus of this specialist report is primarily on the potential impacts of the *Merafong Solar PV Facility* on SCC as defined by the *Species Environmental Assessment Guideline: Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for environmental impact assessments in South Africa (2020)* i.e. those species listed on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered, Vulnerable, Near Threatened and Data Deficient;
- In addition, the potential impacts of the *Merafong Solar PV Facility* on priority species are also assessed. Priority species are defined as species, that are not SCC, but those species that are susceptible to facility associated impacts, based on specific morphological and/or behavioural characteristics. The non-SCC

priority species that have been considered for this assessment include korhaan, buzzards, kestrels, falcons, herons, geese, ibis, and several waterfowl;

- By virtue of their mobility, the identification of SCC and priority bird presence and abundance cannot be confined to the *Merafong Solar PV Facility* development area, therefore the Project Area of Influence (PAOI) is defined as a 2km zone around the proposed *Merafong Solar PV Facility*. Avifaunal sensitivity has been defined for this PAOI.
- The proposed *Merafong Solar PV Facility* and broader PAOI are located across four South African Bird Atlas Project 2 (SABAP2) pentad grid cells i.e. 2615_2725, 2615_2730, 2620_2725 and 2620_2730. Coverage of these pentad grid cells is sufficient with a total of 89 full protocol data cards being completed, in addition to 35 ad hoc protocol data cards. These surveys provide an accurate snapshot of the avifauna that are likely to occur within the proposed *Merafong Solar PV Facility* development area (FIGURE 2) based on habitat availability, current land use and levels of existing disturbance;
- Collected and examined various avifaunal data sets (detailed in section 5.2) at a desktop level to determine the presence of SCC and priority species, that may be vulnerable to the impacts associated with the construction and operation of the *Merafong Solar PV Facility*;
- Suitable avifaunal habitats and potential sensitive areas, within the *Merafong Solar PV Facility* development area, where impacts are likely to occur, were identified using various Geographic Information System (GIS) layers and Google Earth imagery and confirmed based on personal observations made during the site sensitivity verification survey and subsequent summer season field survey;
- Primary avifaunal diversity and occurrence data was collected during a summer season survey to the PAOI, conducted on 15 August 2024 and 29-31 January 2025. Data was collected by means of incidental counts to ground truth the information gleaned from secondary data sources;
- The potential impacts, associated with the construction of the *Merafong Solar PV Facility* on the avifaunal community were identified; and
- Practical recommendations for the management and mitigation of impacts, related to the construction of the *Merafong Solar PV Facility* are provided in Section 10 for inclusion in the draft EMPr.

5.2 Data sources used

The following data sources and reports were used in varying levels of detail for this study:

- Procedures for the Assessment and Minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of NEMA when applying for Environmental Authorisation (Gazetted October 2020);
- Guidelines for the Implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for EIAs in South Africa produced by the South African National Biodiversity Institute on behalf of the Department of Environment, Forestry and Fisheries (2022) were consulted to determine the applicable protocol to be used;

- Department of Forest, Fisheries, and the Environment (DFFE) Screening Report for an Environmental Authorisation as required by the 2014 EIA Regulations - Proposed Site Environmental Sensitivity: Merafong, compiled by *WSP* on 23 August 2024;
- Bird distribution data of the South African Bird Atlas 2 (SABAP 2) (Animal Demography Unit, accessed 19 March 2025);
- The Important Bird & Biodiversity Areas (IBAs) report (Marnewick et al. 2015);
- Co-ordinated Waterbird Count Database (CWAC) (Animal Demography Unit accessed 19 March 2025);
- Coordinated Avifaunal Roadcount project database (CAR) (Animal Demography Unit accessed 19 March 2025);
- iNaturalist database (accessed 19 March 2025);
- Endangered Wildlife Trust (EWT): Threatened Species No Go Mapping Tool (accessed 19 March 2025);
- EWT: African Crane Sightings Data Set (accessed 19 March 2025);
- EWT: African Crane Breeding Sites Data Set (accessed 19 March 2025);
- The global and regional conservation status and endemism information of all bird species (Taylor et al. 2015) and the latest (2024-2) IUCN Red List of Threatened Species (accessed 19 March 2025);
- Vulture breeding, colony, and restaurant location data, received from Vulpro May, 2021;
- The latest vegetation classification described in the Vegetation Map of South Africa (South African National Biodiversity Institute, 2012 and supplemented by Mucina & Rutherford, 2006);
- High-resolution Google Earth ©2025 imagery was used to examine the micro habitats within the PAOI;
- KMZ. shapefiles detailing the location and layout of the *Merafong Solar PV Facility* provided by *WSP* on 5 March 2025; and
- In-field surveys of the *Merafong Solar PV Facility* and broader PAOI conducted on 15 August 2024 and 29-31 January 2025 respectively to form a first-hand impression of avifaunal species presence and micro-habitat occurring within the PAOI (FIGURE 4).

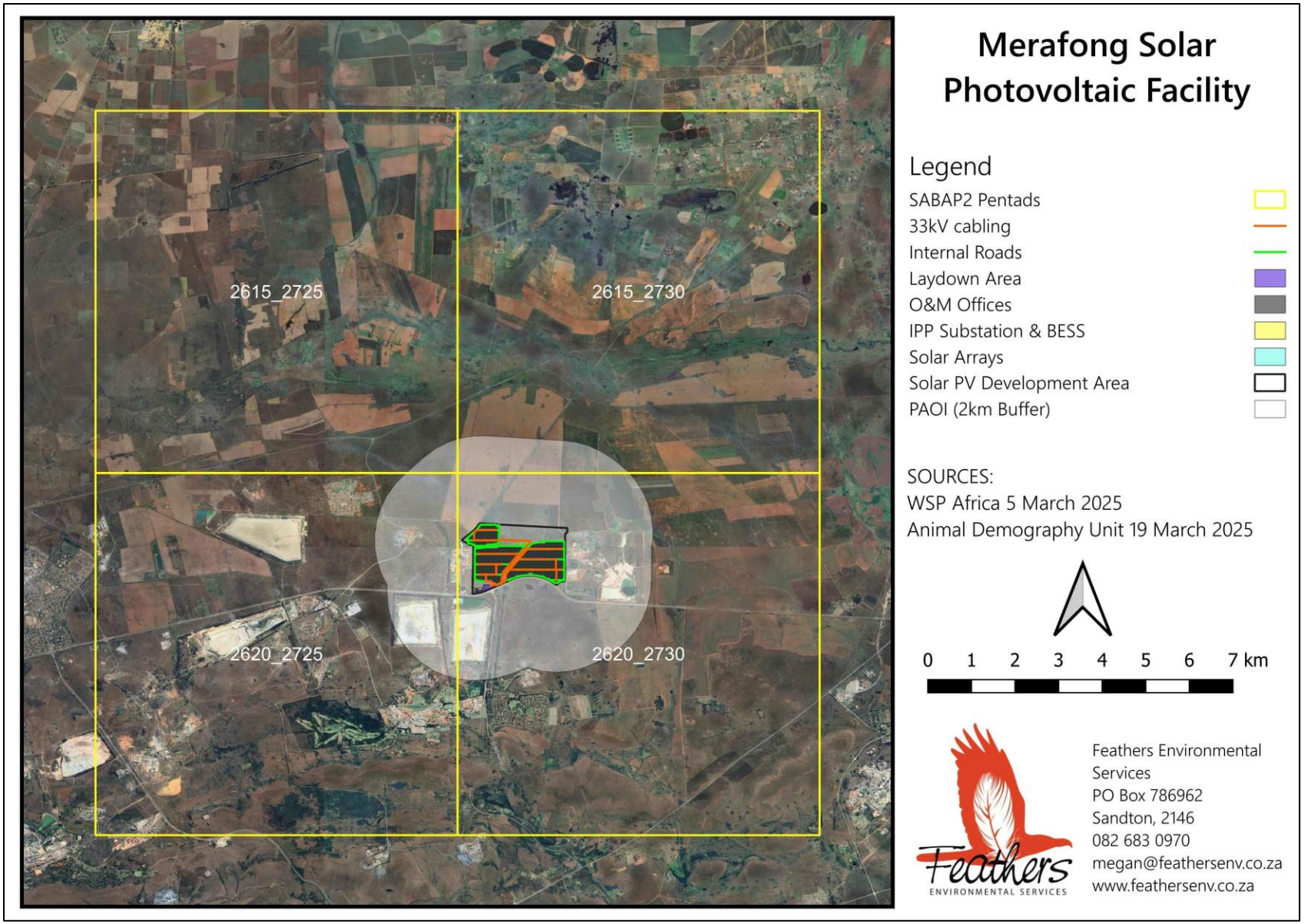


FIGURE 2: Location of the South African Bird Atlas Project 2 (SABAP2) pentad grid cells that were considered for the Merafong Solar PV Facility and broader PAOI

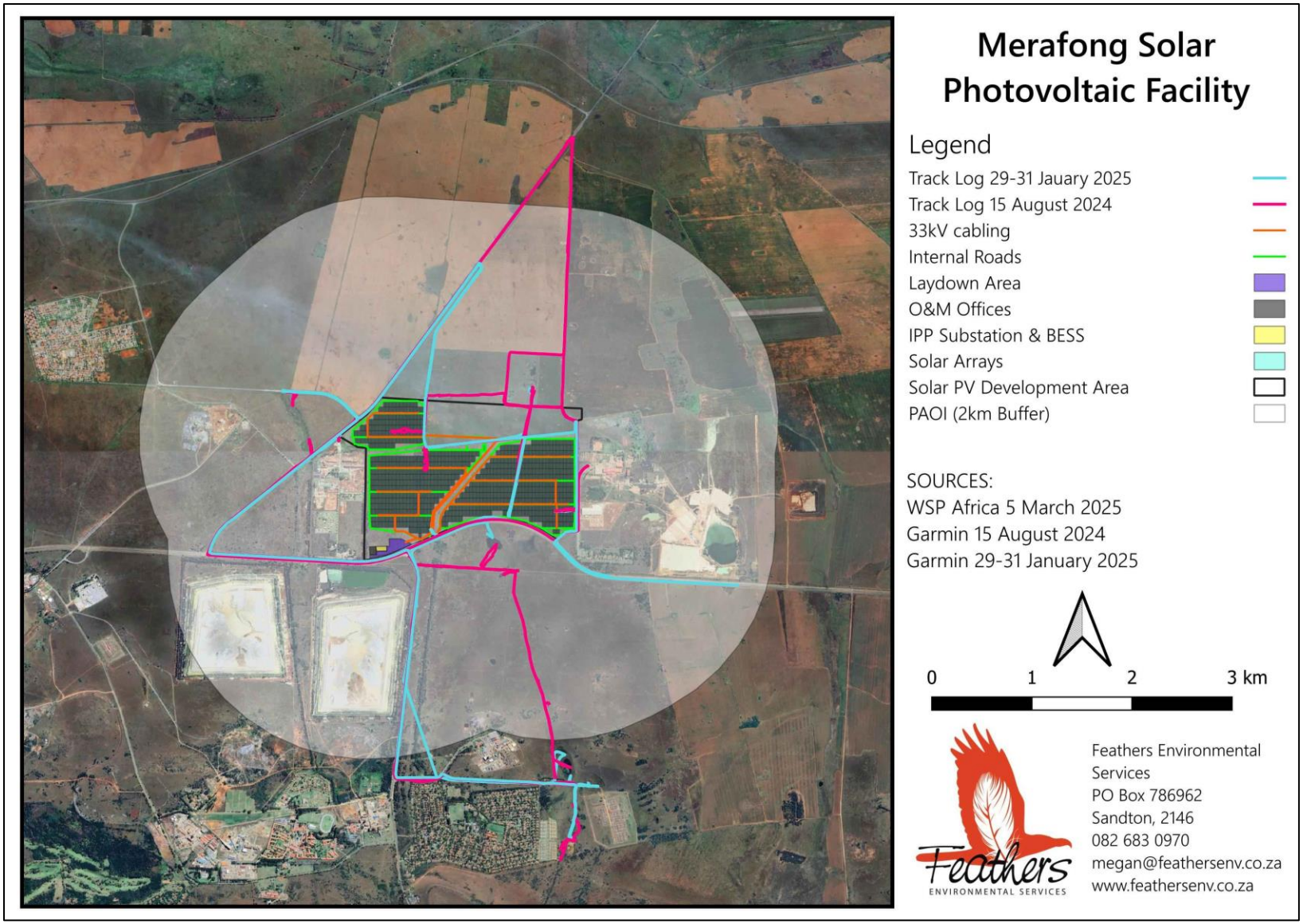


FIGURE 3: Regional map detailing the areas surveyed during the site sensitivity verification and summer seasonal surveys of the Merafong Solar PV Facility and broader PAOI, conducted on 15 August 2024 and 29-31 January 2025 respectively

6. APPLICABLE LEGISLATION, POLICIES AND GUIDELINES

The following pieces of legislation are applicable to this specialist avifauna report:

6.1 Agreements and Conventions

South Africa is party to various agreements and conventions which are relevant to the conservation of avifauna (BirdLife International, 2022), these include:

* African-Eurasian Waterbird Agreement (AEWA) – Regional
* Convention on Biological Diversity (CBD), Nairobi, 1992 – Global
* Convention on the Conservation of Migratory Species of Wild Animals, (CMS), Bonn, 1979 – Global
* Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES), Washington DC, 1973 – Global
* Ramsar Convention on Wetlands of International Importance, Ramsar, 1971 – Global
* Memorandum of Understanding on the Conservation of Migratory Birds of Prey in Africa and Eurasia – Regional

6.2 National & Provincial Legislation

The following pieces of national and provincial legislation are applicable to this assessment:

* The National Environmental Management Act 107 of 1998 (NEMA) – National
* The National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA) and the Threatened or Protected Species Regulations, February 2007 (TOPS Regulations) – National
* The National Environmental Management: Protected Areas Act 57 of 2003 – National
* The National Environmental Management Act 107 of 1998 (NEMA) Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal and or Avifaunal Species – National
* Species Environmental Assessment Guideline: Guidelines for the implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for environmental impact assessments in South Africa – National
* Norm for the Exclusion of the Development and Expansion of Solar Photovoltaic Facilities in Areas of Low or Medium Environmental Sensitivity, published on 27 March 2024, Government Gazette Nr 50388 - National
* The Gauteng Biodiversity Conservation Plan, Version 3.3 – Provincial
* Gauteng Department of Agriculture & Rural Development (GDARD) Requirements for Biodiversity Assessments version 3 March 2014 – Provincial

7. SITE SENSITIVITY VERIFICATION

7.1 Department of Forestry, Fisheries, and the Environment (DFFE) Screening Tool

A screening report for the identified *Merafong Solar PV Facility* was compiled on 23 August 2024 by *WSP*. The identified proposed development area is classified as having a LOW Animal Species Theme Sensitivity.

7.2 Description of the Baseline Conditions

A site sensitivity verification for the proposed *Merafong Solar PV Facility* and the broader PAOI was conducted by an experienced avifaunal specialist, using a desktop analysis, and verified by personal observations made during the in-field, site sensitivity verification survey on 15 August 2024 and a subsequent summer season survey on 29-31 January 2025. The winter season site sensitivity verification survey is important because it enabled a thorough assessment of the potential presence of the African Grass Owl and African Marsh Owl. Both species are more likely to be resident during this period, due to breeding activities, rather than moving between territories. The summer season survey is considered a peak season survey in avifaunal terms, maximising the opportunity to observe seasonal migrants and summer breeders. The one-day winter site sensitivity verification survey and subsequent three-day summer season survey were deemed sufficient for this largely transformed landscape and the robust secondary datasets available for the proposed development area and broader PAOI.

7.2.1 Desktop Analysis of Relevant Bird Populations

The following bird population datasets (TABLE 2 & FIGURE 4) were considered to verify the site sensitivity classification. The table provides a description of each avifaunal feature; the location of the feature either within the proposed development area or the broader PAOI; the assigned sensitivity according to the DFFE screening tool; SCC and priority species complements; and the site sensitivity verification rating.

TABLE 2: Avifaunal datasets considered for the desktop verification of the site sensitivity of the proposed development area

FEATURE	SOURCE	DESCRIPTION	SENSITIVITY: NATIONAL SCREENING TOOL	LOCATION RELATIVE TO DEVELOPMENT AREA/PAOI	FEATURE ID WITHIN DEVELOPMENT AREA/PAOI	SPECIES OF CONSERVATION CONCERN	SITE SENSITIVITY VERIFICATION RATING	SITE SENSITIVITY VERIFICATION RATING JUSTIFICATION
Protected Areas	South Africa Protected and Conservation Areas Database 4th Quarter, 2021	Protected and conservation areas include national parks, public nature reserves and private nature reserves and are intended for the conservation of flora and fauna.	**Very High** - These areas are potentially unsuitable for development owing to the presence of critical habitat (utilised for breeding, roosting, and foraging) and the confirmed presence of priority species vulnerable to development	27km south east of development area	Tweefontein Private Nature Reserve	**DFFE Screening Tool** No species information availability to confirm identified SCC presence **Other** No SCC information available for the protected area	**LOW**	The development area and PAOI do not occur within the protected areas
Important Bird Areas (IBA)	BirdLife South Africa Marnewick, 2015	Areas that are globally important for the conservation of bird populations based on species abundance and the complements they hold. These areas provide an indication of the species that are likely to occur in similar habitat types within the identified area.	**Very High** - These areas are potentially unsuitable for development owing to the presence of critical habitat (utilised for breeding, roosting, and foraging) and the confirmed presence of priority species vulnerable to development	Over 30km north of the proposed development area	Magaliesberg (SA025) IBA	**DFFE Screening Tool** African Grass Owl African Marsh Harrier White-bellied Korhaan **Other** Cape Vulture White-backed Vulture Lappet-faced Vulture Lanner Falcon Verreaux's Eagle Secretarybird Black Stork	**LOW**	Regular occurrence of SCC within the development area and PAOI is unlikely
Co-ordinated Waterbird Count Sites (CWAC)	Animal Demography Unit, last accessed on 12 December 2024 Harrison et al, 2004	Any body of water which supports a significant number (approx. 500 individuals) of birds which use the site for foraging, breeding, and roosting. These areas provide an indication of the waterbird species that are likely to occur in various waterbody/wetland habitats within the identified area.	**High** - Confirmed occurrences of rare and threatened species. Habitat likely to be of importance to priority bird species sensitive to developments.	15km north of development area	De Pan	**DFFE Screening Tool** None **Other** Greater Flamingo and a diversity of non-SCC priority species i.e. ducks, geese, ibis, egrets, and herons	**LOW**	The development area and PAOI are not located within proximity of a CWAC site. No natural permanent, and disturbance free waterbodies occur within the development area. Ephemral waterbodies may attract common ibis, geese, heron, and lapwing but are

FEATURE	SOURCE	DESCRIPTION	SENSITIVITY: NATIONAL SCREENING TOOL	LOCATION RELATIVE TO DEVELOPMENT AREA/PAOI	FEATURE ID WITHIN DEVELOPMENT AREA/PAOI	SPECIES OF CONSERVATION CONCERN	SITE SENSITIVITY VERIFICATION RATING	SITE SENSITIVITY VERIFICATION RATING JUSTIFICATION
								unlikely to regularly support SCC.
Co-ordinated Avifaunal Roadcount Routes (CAR)	Animal Demography Unit, last accessed on 19 March 2025 Young et al, 2003	Cranes, bustards, storks, and other large terrestrial birds spend most of their time on the ground, need open spaces & are not restricted to protected areas. This project monitors 36 species of large terrestrial birds, gamebirds, raptors, and corvids in agricultural habitats which are used extensively for feeding, roosting, and breeding.	**High** - Confirmed occurrences of rare and threatened species. Habitat likely to be of importance to priority bird species sensitive to developments.	CAR routes located within a 20km radius of the development area	GC01 GC02 GC03 GC04 GC05	**DFFE Screening Tool** White-bellied Korhaan African Marsh Harrier **Other** Secretarybird Black Harrier Yellow-billed Stork Abdim's Stork	**LOW**	Regular occurrence of SCC within the development area and PAOI is unlikely
Southern African Bird Atlas Project 2 (SABAP2)	Animal Demography Unit, accessed on 19 March 2025	The Southern African Bird Atlas Project 2 maps the distribution of birds, based on records of bird species observed during >2hour surveys within a geographical pentad (approx. 8 × 7.6 km in size).	**High** - Confirmed occurrences of SCC.	The proposed development area and PAOI are located across four SABAP2 pentad grid cells	2615_2725 2615_2730 2620_2725 2620_2730 Between 2007 and 2025, a total of 89 full protocol (and 33 ad hoc) bird surveys have been completed. A total of 222 species have been observed during the survey period Of the 222 species seven are SCC with very low report rates (<5 observations)	**DFFE Screening Tool** African Marsh Harrier **Others** Abdim's Stork Black-winged Pratincole Cape Vulture Secretarybird Lanner Falcon Maccoa Duck	**LOW**	Regular occurrence of SCC within the development area and PAOI is unlikely

FEATURE	SOURCE	DESCRIPTION	SENSITIVITY: NATIONAL SCREENING TOOL	LOCATION RELATIVE TO DEVELOPMENT AREA/PAOI	FEATURE ID WITHIN DEVELOPMENT AREA/PAOI	SPECIES OF CONSERVATION CONCERN	SITE SENSITIVITY VERIFICATION RATING	SITE SENSITIVITY VERIFICATION RATING JUSTIFICATION
iNaturalist Biodiversity Data	iNaturalist, last accessed 19 March 2025	An online, crowdsourced species identification system and an organism occurrence recording tool containing 221,316,598 global observation records for 499,983 species.	**High** - Confirmed occurrences of SCC.	None	N/A	N/A	**LOW**	There are no documented observations of screening tool SCC within the development area and PAOI
African Grass Owl Breeding Data	EWT, Threatened Species No Go Mapping Tool, 2024	Confirmed breeding locations of African Grass Owl from 2009 to 2014.	**Very High** - These areas are potentially unsuitable for development owing to the presence of critical habitat (utilised for breeding, roosting, and foraging) and the confirmed presence of priority species vulnerable to development	None	N/A	N/A	**LOW**	There are no documented nests within the development area and PAOI
Hooded Vulture	EWT, Threatened Species No Go Mapping Tool, 2024	Confirmed breeding locations of Hooded Vulture	**Very High** - These areas are potentially unsuitable for development owing to the presence of critical habitat (utilised for breeding, roosting, and foraging) and the confirmed presence of priority species vulnerable to development	None	N/A	**DFFE Screening Tool** None	**LOW**	There are no documented nests within the development area and PAOI
White-backed Vulture Nests	VulPro January, 2020	Nesting in loose colonies of 2 to 13 birds, situated in the crown or fork of a large tree.	**Very High** - These areas are potentially unsuitable for development owing to the presence of critical habitat (utilised for breeding, roosting, and foraging) and the confirmed presence of priority species vulnerable to development	None	N/A	N/A	**LOW**	There are no documented nests within the development area and PAOI
Cape Vulture Colonies Cape Vulture Roosts	VulPro January, 2020	Colonies of several hundred birds on high cliffs. Areas where Cape Vultures will rest overnight. This can be on cliffs or on electricity poles/towers.	**Very High** - These areas are potentially unsuitable for development owing to the presence of critical habitat (utilised for breeding, roosting, and foraging) and the confirmed presence of priority species vulnerable to development	Over 50km north of the proposed development area	N/A	**DFFE Screening Tool** None **Others** Cape Vulture	**LOW**	There are no documented colonies within the development area and PAOI

FEATURE	SOURCE	DESCRIPTION	SENSITIVITY: NATIONAL SCREENING TOOL	LOCATION RELATIVE TO DEVELOPMENT AREA/PAOI	FEATURE ID WITHIN DEVELOPMENT AREA/PAOI	SPECIES OF CONSERVATION CONCERN	SITE SENSITIVITY VERIFICATION RATING	SITE SENSITIVITY VERIFICATION RATING JUSTIFICATION
Vulture Restaurants	VulPro January, 2020	To promote the survival of vultures, the practice of supplemental feeding in so called vulture restaurants, was initiated and today there are 236 documented vulture restaurants scattered throughout South Africa.	**High** - Confirmed occurrences of rare and threatened species.	Active restaurant 40km north of the proposed development area	N/A	**DFFE Screening Tool** None **Others** Cape Vulture African White-backed Vulture Lappet Vulture	**LOW**	There are no documented restaurants within the development area and PAOI

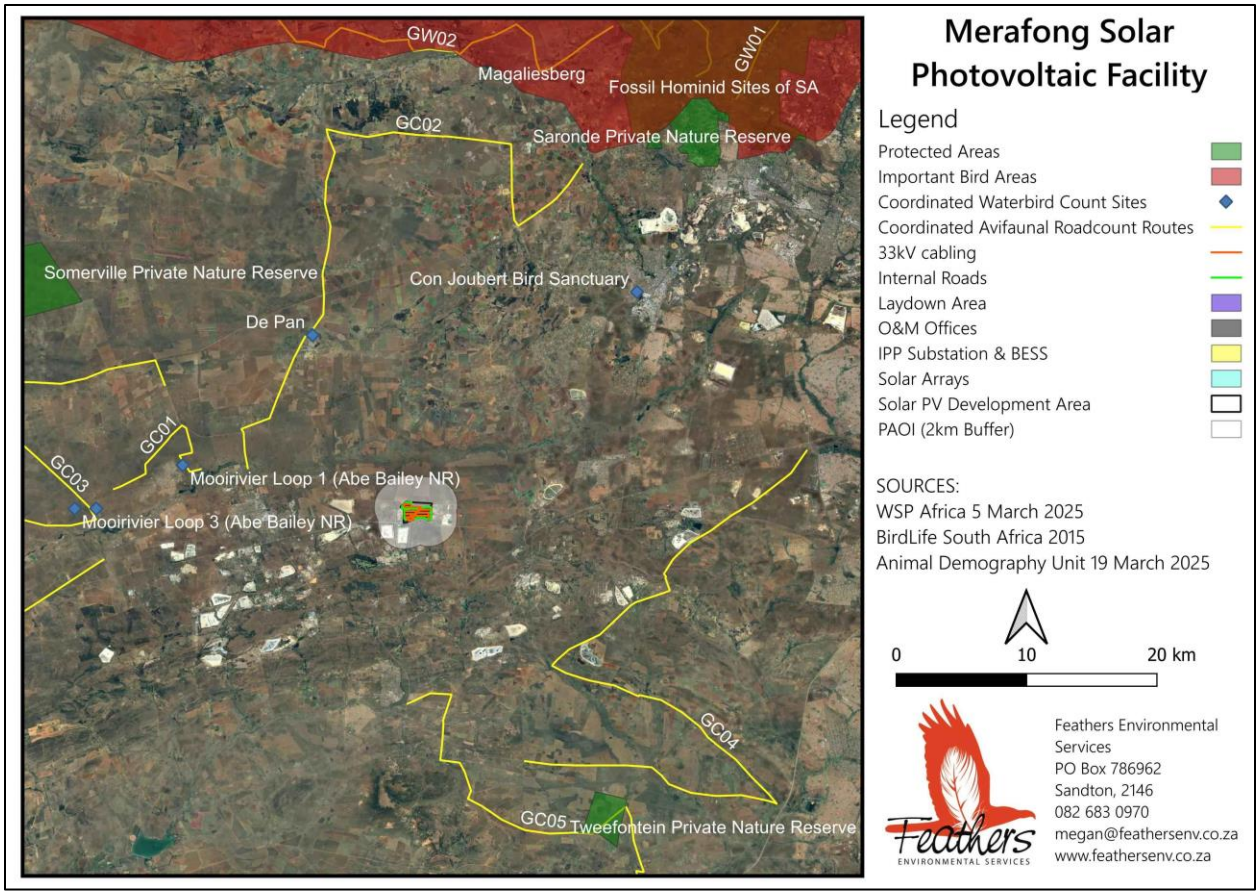


FIGURE 4: Regional map detailing the location of the proposed Merafong Solar PV Facility and broader PAOI in relation to Protected Areas, Important Bird Areas, Coordinated Avifaunal Roadcount routes and Coordinated Waterbird Count sites.

7.2.2 Survey Observations (Primary Data)

A one-day site sensitivity verification survey and a three-day summer season field survey were conducted with a focused effort on the areas within the proposed *Merafong Solar PV Facility* development area and the broader PAOI. To describe the avifaunal community present, a concerted effort was made to sample the avifauna in all the primary habitats that were available within the development area and broader PAOI. All species encountered (observed and heard) during the site survey were noted.

No SCC were observed during either of the two field surveys. The field surveys produced a combined list of 55 species (APPENDIX 2). Of the 55 species recorded during field surveys, 13 of these are priority species. The most notable observation being a single Hamerkop *Scopus umbretta* observed at a small pan adjacent to the Midas Substation. Most observations (n=37) were of passerine species, with smaller complements of near-passerines (n=4), raptors (n=1), waterbirds (n=9), waders (n=2); terrestrial species (n=2) that are common to this area. Each of these species has the potential to be displaced by the construction of proposed *Merafong Solar PV Facility* because of habitat transformation and/or disturbance. However, these species have persisted despite existing disturbance (i.e. agricultural practices, large scale mining and industry and urban activities)

within the development area and PAOI. This resilience, coupled with the fact that more suitable habitat is available within the broader area, means that the displacement impact will not be of regional or national significance.

7.2.3 Species of Conservation Concern (SCC)

One of the key objectives of this assessment is to determine the likelihood of SCC occurrence within the *Merafong Solar PV Facility* development area and PAOI. Statistically, an unlikely event is an event that has a probability of occurring that is close to zero i.e. less than half. The SABAP2 atlas project provides essential data that underpins all conservation initiatives within South Africa. This robust dataset presents itself as a useful measure occurrence, particularly in this case where over 124 checklists/surveys have been completed collectively for the pentads within which the proposed development area and PAOI occur. Species report rates (the proportion of checklists/surveys that note SCC) that are above 50% are likely to occur within the proposed development area and broader PAOI. Conversely, report rates that are less than 50% are an indication that a species is unlikely to occur within the proposed development area and PAOI. Relevant to this project, the seven SCC are reported at rates of between 1.1% and 3.4% indicating unlikely presence.

7.2.4 Desktop Analysis of Avifaunal Habitats

Vegetation is one of the primary factors determining bird species distribution and abundance in an area. It is widely accepted within ornithological circles that vegetation structure is more important in determining which bird species will occur there. The PAOI is located within one vegetation division namely the Grassland Biome, specifically the Vaal-Vet Sandy Grassland (South African National Biodiversity Institute, 2012 and Mucina & Rutherford, 2006). Whilst much of the distribution and abundance of bird species can be attributed to the broad vegetation types present in an area, it is the smaller micro habitats that are determined by factors other than vegetation, such as topography, land use, food availability, and various anthropogenic factors all of which will either attract or deter birds. Micro habitats are critically important in mapping the site in terms of avifaunal sensitivity and ultimately informing mitigation requirements.

A desktop investigation of the proposed *Merafong Solar PV Facility* development area revealed four broadly described avifaunal micro habitats i.e. stormwater channels, disturbed grassland, fallow lands, and exotic tree stands. The broader PAOI contains representative examples of these habitats in addition to ephemeral pans, commercial agricultural lands, open woodland, and built-up areas. These habitats were confirmed during the site sensitivity verification and seasonal summer surveys.

Relevant to the *Merafong Solar PV Facility* development area, the most notable feature is the artificial stormwater channel located within the solar array footprint. This habitat type is classified as MEDIUM sensitivity but is likely a man-made feature associated with the nearby mine. The *Merafong Solar PV Facility* development area is comprised of largely of disturbed grassland and fallow lands, which are assigned a LOW sensitivity.

The proposed *Merafong Solar PV Facility* development area and the larger PAOI have experienced a substantial degree of transformation, because of commercial agriculture, mining and varying degrees of settlement and urbanisation. The fragmented nature of the natural habitat and the levels of existing disturbance within the proposed *Merafong Solar PV Facility* development area preclude the regular occurrence of SCC species. The lack of expansive natural habitat and the high levels of disturbance within the study area are evident from the low reporting rates of most of the priority species recorded during the SABAP2 survey period to date.

7.2.5 Ecological Corridors

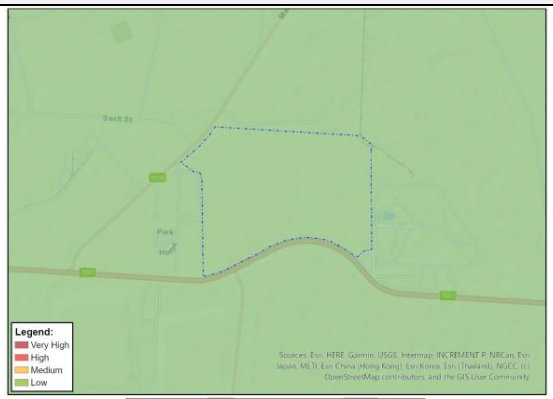
The natural habitat within the *Merafong Solar PV Facility* development area and PAOI is highly fragmented. There are no identifiable avian ecological corridors within the development area and larger PAOI.

7.3 Specialist Sensitivity Rating

The transformed nature of the habitat within the *Merafong Solar PV Facility* development area and PAOI, absence of observed SCC and breeding locations during the field survey, overall low SCC abundances and existing levels of disturbance are key factors that have been considered in determining the site sensitivity and the potential impacts of the proposed *Merafong Solar PV Facility* on the resident avifaunal community.

The site sensitivity verification survey confirms the assigned LOW sensitivity for the proposed *Merafong Solar PV Facility* footprint (TABLE 3).

TABLE 3: Specialist Avifaunal Sensitivity disputing the assigned Screening Tool Sensitivity

Environmental Theme	Screening tool map and rating	Specialist sensitivity rating Confirming/disputing the screening tool rating
Avifauna	 **Sensitivity** / **Feature(s)** Low / Low Sensitivity	 Screening tool rating of LOW is confirmed based on the transformed nature of the habitat, absence of observed SCC during the field surveys, overall low SCC abundances and existing levels of disturbance.

8. AVIFAUNAL SENSITIVITY

8.1 Sensitivity Mapping

Areas of MEDIUM and LOW avian potential/sensitivity occur within the proposed *Merafong Solar PV Facility* development area and broader PAOI. A preferred layout for the proposed development has been determined based on the avoidance of the environmental and social sensitivities delineated as part of the initial screening and scoping assessment processes. The proposed *Merafong Solar PV Facility* development envelope has a MEDIUM-LOW avifaunal sensitivity that is unlikely to regularly support SCC (FIGURE 5).

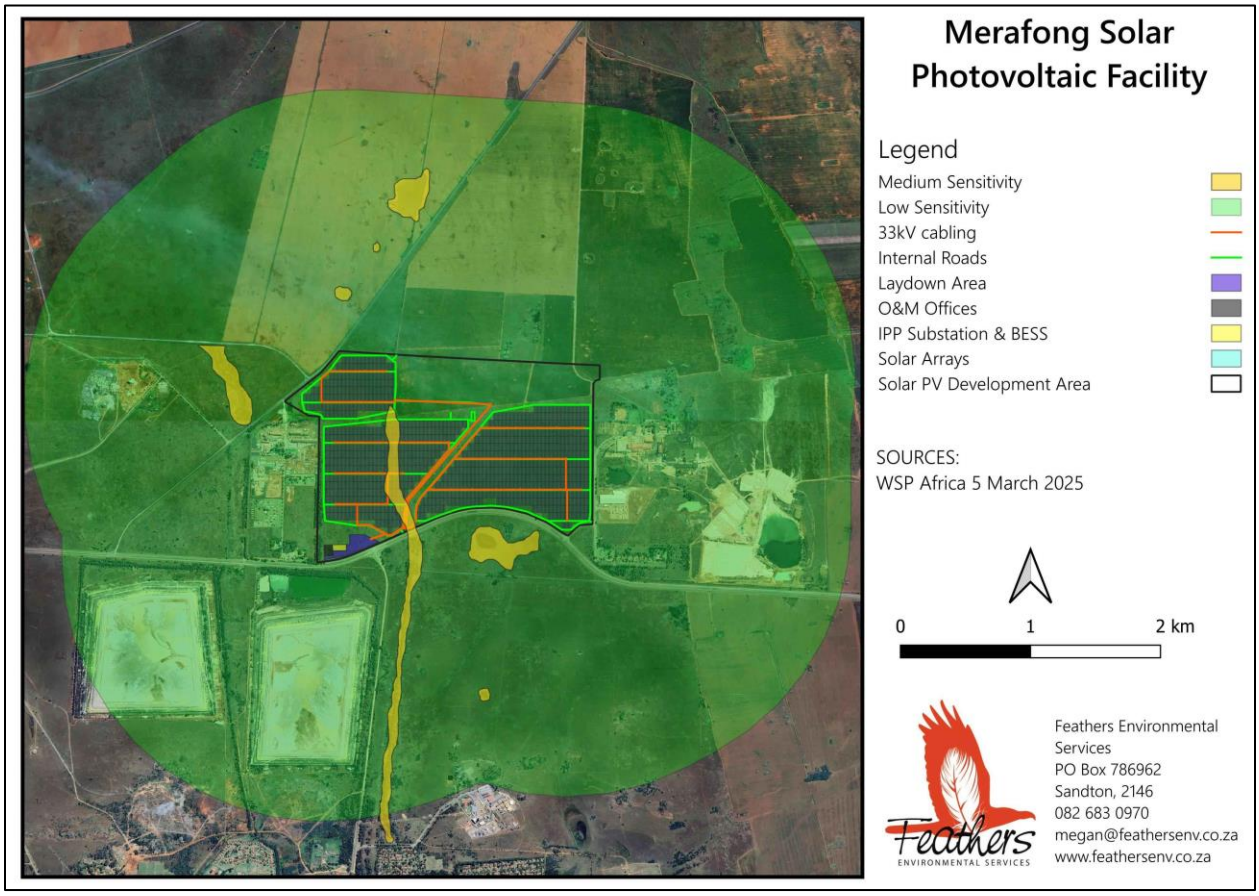


FIGURE 5: Avifaunal sensitivities within the Merafong Solar PV Facility development area and broader PAOI

9. IDENTIFICATION OF IMPACTS

Poorly sited or designed facilities and infrastructure can negatively impact not only vulnerable species and habitats, but also entire ecological processes. The effects of any development on birds are highly variable and depend on a wide range of factors including the specification of the development, the topography of the surrounding land, the habitats affected and the diversity and abundance of species present.

The principal areas of concern for SCC and non-SCC priority species are (impact significance with mitigation also indicated):

* Displacement due to habitat loss in the physical *Merafong Solar PV Facility* (low significance);
* Displacement due to disturbance associated with the construction of the proposed *Merafong Solar PV Facility* development (medium significance, but temporary);
* Mortality due to collisions with the solar panels (low significance);
* Mortality due to electrocution on the IPP substation infrastructure (low significance); and
* Entrapment and entanglement in perimeter fencing (low significance).

9.1 Cumulative Impact

Twenty-renewable energy projects, in varying stages of environmental authorisation, occur within a 30km radius of the proposed *Merafong Solar PV Facility*. In addition, large-scale commercial agricultural activities, light industry operations, and residential areas dominate the landscape within this 30km radius.

The proposed *Merafong Solar PV Facility* (comprised of the solar arrays and ancillary infrastructure) footprint is located on land portions that are currently largely transformed. The proposed infrastructure layout avoids areas of high sensitivity/avian potential. The proposed development footprint (solar arrays and ancillary infrastructure) is approximately 205ha in extent and will therefore contribute to a loss of habitat by a very small percentage. The contribution of the proposed solar PV facility to the cumulative displacement impact of all transformed habitat is LOW. However, the combined cumulative impact of the proposed renewable energy facilities and other transformed habitats because of mining, agriculture, and urbanisation on avifauna within a 30km radius is MODERATE. The cumulative impact is deemed acceptable after mitigation has been applied.

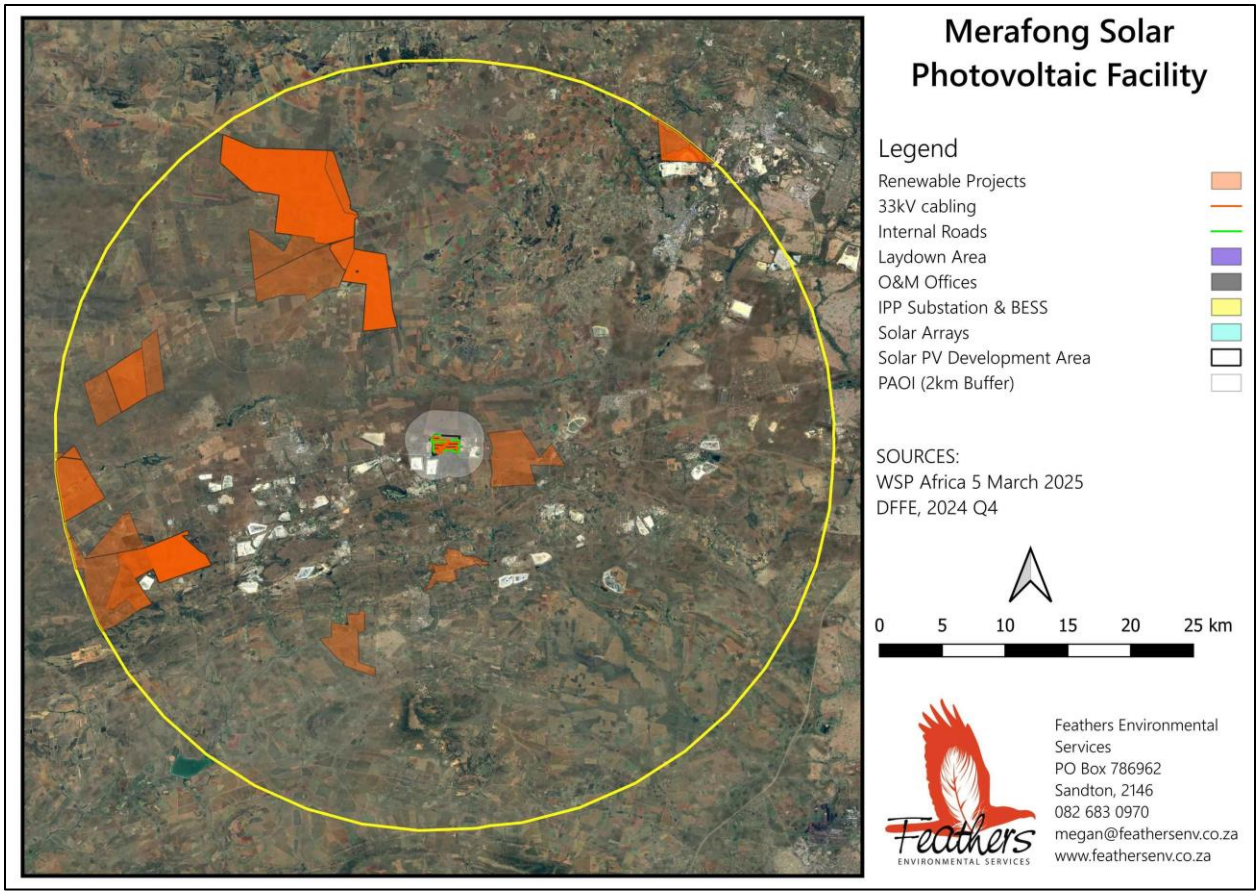


FIGURE 6: Renewable energy applications within a 30km radius of the proposed Merafong Solar PV Facility

10. IMPACT MITIGATION

Mitigation hierarchy includes the following steps in the order of decreasing desirability: Avoid, Minimise, Rehabilitate, and Offset. Relevant to the *Merafong Solar PV Facility*, the following applies:

Avoid

- There are no identified areas of VERY HIGH or HIGH sensitivity that must be avoided.
- The solar arrays and ancillary complex are to be constructed in areas of MEDIUM and LOW sensitivity.

Minimise

- The PV panels should preferably be constructed using a single or double axis tracking system.
- The 33kV powerline, connect the solar arrays to the IPP Substation should, where practically possible, be constructed below ground.
- Construction activity should be restricted to the immediate footprint of the *Merafong Solar PV Facility* and strictly managed.

Rehabilitate

Rehabilitation of avian resources is not applicable to this project

Offset

Offsets are not applicable to this project

10. IMPACT MITIGATION TABLES FOR EMPR

Based on the anticipated impacts described above, the following recommendations are provided regarding practical mitigation measures (TABLE 4) for potentially significant impacts to be included in the EMPr.

TABLE 4: Recommendations for the anticipated impacts associated with the construction of the solar arrays, IPP substation, BESS, O&M Buildings and laydown area within the *Merafong Solar PV Facility* development area

SOLAR ENERGY FACILITY (INCL. ANCILLARY INFRASTRUCTURE), ACCESS ROAD & PERIMETER FENCE				
Impact Management Actions	Implementation			
	Responsible person	Method of implementation	Timeframe for implementation	Evidence of compliance
The PV panels should preferably be constructed using a single or double axis tracking system to minimise the collision impact	EA Holder, Design Engineer, Construction Manager	The design engineer must select an appropriate solar array system	Prior to construction	PV Solar Panel Design
The recommendations of the aquatic and botanical studies must be strictly implemented especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.	EA Holder, Design Engineer, Construction Manager, Environmental Control Officer	Construction activities to remain with the road access footprint	From the commencement of construction of the road access to the completion of construction.	Habitat loss is confined to access road footprints Rehabilitation results in the extent of habitat present at the start of construction remains intact at end of construction phase.

SOLAR ENERGY FACILITY (INCL. ANCILLARY INFRASTRUCTURE), ACCESS ROAD & PERIMETER FENCE				
Impact Management Actions	Implementation			
	Responsible person	Method of implementation	Timeframe for implementation	Evidence of compliance
Construction activity should be restricted to the immediate footprint of the Solar PV Facility infrastructure (including ancillary infrastructure).	EA Holder, Construction Manager, Environmental Control Officer	Construction activities to remain with the development footprint	From the commencement of construction (inclusive of all project components to the completion of construction.	Habitat loss is confined to the SPP and access road footprints
All construction activities should be strictly managed according to generally accepted environmental best practice standards, to avoid any unnecessary impact on the receiving environment.	EA Holder, Construction Manager, Environmental Control Officer	Construction activities to remain with the development footprint	From the commencement of construction (inclusive of all project components to the completion of construction.	Habitat loss is confined to the SPP and access road footprints
All temporary disturbed areas should be rehabilitated according to the site's rehabilitation plan, following construction.	EA Holder, Construction Manager, Environmental Control Officer	Adherence to the rehabilitation plan as detailed by the vegetation specialist	From the commencement of construction (inclusive of all project components to the completion of construction.	Rehabilitation results in the extent of habitat present at the start of construction remains intact at end of construction phase.
Measures to control noise should be applied according to current best practice in the industry.	EA Holder, Construction Manager, Environmental Control Officer	Implement industry standard measures to limit noise levels particularly during the early morning and late afternoon	From the commencement of construction (inclusive of all project components to the completion of construction.	Minimal displacement of resident avifauna

SOLAR ENERGY FACILITY (INCL. ANCILLARY INFRASTRUCTURE), ACCESS ROAD & PERIMETER FENCE				
Impact Management Actions	Implementation			
	Responsible person	Method of implementation	Timeframe for implementation	Evidence of compliance
Construction of a single perimeter fence is recommended	EA Holder, Construction Manager, Environmental Control Officer	The PV facility engineer must select an appropriate fence installation	From the commencement of perimeter fence construction to the completion of construction.	Perimeter Fence Design
33kV POWERLINES & IPP SUBSTATION				
Impact Management Actions	Implementation			
	Responsible person	Method of implementation	Timeframe for implementation	Evidence of compliance
The 33kV powerline should, where practically possible, be constructed below ground to eliminate the electrocution impact. If this is not feasible, the powerline must be constructed using a bird friendly structure (e.g. an inverted Delta-T structure, with the two outer phases suspended below the cross arm).	EA Holder, Design Engineer,	The design engineer must select an appropriate bird friendly structure for use	Prior to construction	Pole Design
Electrocutions within the IPP substation to be mitigated reactively using site-specific recommendations, by an avifaunal specialist, if they occur.	EA Holder SPP Manager	No proactive construction mitigation required	N/A	Installation of required mitigation measures reduces number of electrocutions within the substation and/or switching station

11. ENVIRONMENTAL IMPACT STATEMENT

11.1 Specialist Opinion

In accordance with the baseline conditions as presented in Section 7 and the outcomes of the sensitivity mapping detailed in Section 8, it is this specialist's opinion that the construction of the proposed *Merafong Solar PV Facility* is not deemed to present unmitigable negative environmental issues or impacts subject to mitigation and management measures. Any remaining environmental impact is acceptable after avoidance and mitigation have been applied.

12. ASSUMPTIONS, UNCERTAINTIES & GAPS IN KNOWLEDGE

The specialist report assumed that the sources of information used for this assessment are reliable. However, it must be noted that there are limiting factors and these may potentially detract from the accuracy of the predicted results.

- The report is the result of a short-term study and is based on two field surveys of the development area and broader PAOI. No long-term, seasonal monitoring was conducted by the avifaunal specialist. This assessment relies upon secondary data sources with regards to bird occurrence and abundance such as the SABAP2 project. These comprehensive datasets provide a valuable baseline against which any changes in species presence, abundance, and distribution can be monitored. However, primary information on bird habitat and avifaunal species occurrence collected during the site sensitivity and field survey and together with professional judgement, based on extensive field experience since 2006, was used directly in determining which species of conservation importance are likely to occur within suitable avifaunal habitat types within the development area and broader PAOI. Based on these findings, the specialist was able to identify and assess the anticipated impacts and provide recommendations for mitigation; and
- Predictions in this study are based on experience of these and similar species in different parts of South Africa, through the authors' experience working in the avifaunal specialist field since 2006. However, bird behaviour cannot be reduced to formulas that will hold true under all circumstances. It must also be noted that, it is often not possible to eliminate the risk of the disturbance and displacement impacts associated with the construction and operational activities. Our best possible efforts can probably not ensure zero impact on birds. Assessments such as this attempt to minimise the risk as far as possible, and although the displacement impacts, associated with the construction of the *Merafong Solar PV Facility* will be unavoidable, they are likely to be temporary.

The above limitations need to be stated as part of this assessment so that the reader fully understands the complexities. However, they do not detract from the confidence that this author has in the findings of this specialist avifauna report and subsequent recommendations for this project.

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APPENDIX 1: ANOTATED LIST OF SABAP2 REGIONAL SCC & PRIORITY SPECIES RECORDED WITHIN THE BROADER MERAFONG SOLAR PV FACILITY DEVELOPMENT AREA

Species name	Scientific name	Report Rate Full Protocol	Red List Regional	Solar Priority	Recorded during surveys	Artificial Stormwater	Grassland	Fallow Land	Exotic Tree Stands	PAOI: Ephemeral Pans	PAOI: Agricultural Lands	PAOI: Open Woodland	PAOI: Built-Up Areas	Solar: Collisions with solar panels	Solar: Displacement Disturbance	Solar: Displacement Habitat transformation	Solar: Fence entanglement
Abdim's Stork	Ciconia abdimii	1.1	NT	x	-	-	x	x	-	x	x	x	-	x	-	x	-
African Black Duck	Anas sparsa	1.1	-	x	-	-	-	-	-	-	-	-	-	x	-	-	-
African Darter	Anhinga rufa	2.2	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
African Fish Eagle	Haliaeetus vocifer	1.1	-	x	-	-	-	-	x	-	-		-	-	-	-	-
African Marsh Harrier	Circus ranivorus	1.1	EN	x	-	-	wet	-	-	x	-	-	-	-	-	x	-
African Rail	Rallus caerulescens	1.1	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
African Sacred Ibis	Threskiornis aethiopicus	28.1	-	x	-	x	x	x	x	x	x	x	x	x	-	x	-
African Snipe	Gallinago nigripennis	1.1	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
African Spoonbill	Platalea alba	1.1	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
African Swamphen	Porphyrio madagascariensis	5.6	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Amur Falcon	Falco amurensis	5.6	-	x	-	-	x	x	x	-	x	x	-	x	-	x	-
Black Crake	Zapornia flavirostra	1.1	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Black Sparrowhawk	Accipiter melanoleucus	4.5	-	x	-	-	-	-	x	-	-	x	x	x	x	x	-
Black-headed Heron	Ardea melanocephala	47.2	-	x	x	x	x	x	x	x	-	-	-	x	-	x	-
Blacksmith Lapwing	Vanellus armatus	76.4	-	x	x	-	x	x	-	x	-	x	x	x	-	x	-
Black-winged Kite	Elanus caeruleus	61.8	-	x	x	-	x	x	x	-	x	x	x	-	x	x	-
Black-winged Pratincole	Glareola nordmanni	1.1	NT	x	-	-	wet	x	-	x	x	-	-	-	-	-	-
Black-winged Stilt	Himantopus himantopus	2.2	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Blue-billed Teal	Spatula hottentota	1.1	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Brown Snake Eagle	Circaetus cinereus	2.2	-	x	-	-	x	x	x	-	-	x	-	-	-	x	-
Cape Shoveler	Spatula smithii	2.2	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Cape Vulture	Gyps coprotheres	1.1	EN	x	-	-	forage	-	-	-	-	forage	-	-	-	-	-
Cape Weaver	Ploceus capensis	3.4	-	x	x	-	x	x	-	-	-	x	x	x	-	x	-
Cape White-eye	Zosterops virens	43.8	-	x	x	-	-	-	x	-	-	x	x	x	x	x	-
Cloud Cisticola	Cisticola textrix	43.8	-	x	-	-	x	x	-	-	-	-	-	x	x	x	-

Species name	Scientific name	Report Rate Full Protocol	Red List Regional	Solar Priority	Recorded during surveys	Artificial Stormwater	Grassland	Fallow Land	Exotic Tree Stands	PAOI: Ephemeral Pans	PAOI: Agricultural Lands	PAOI: Open Woodland	PAOI: Built-Up Areas	Solar: Collisions with solar panels	Solar: Displacement Disturbance	Solar: Displacement Habitat transformation	Solar: Fence entanglement
Common Buzzard	Buteo buteo	6.7	-	x	-	-	x	x	x	-	-	x	x	-	-	x	-
Common Greenshank	Tringa nebularia	3.4	-	x	-	-	wet	-	-	x	-	-	-	x	-	-	-
Common Moorhen	Gallinula chloropus	10.1	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Common Sandpiper	Actitis hypoleucos	1.1	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Curlew Sandpiper	Calidris ferruginea	1.1	LC	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Eastern Long-billed Lark	Certhilauda semitorquata	1.1	-	x	-	-	x	x	-	-	-	-	-	x	x	x	-
Egyptian Goose	Alopochen aegyptiaca	38.2	-	x	x	-	-	-	x	x	x	-	-	x	-	-	-
Fairy Flycatcher	Stenostira scita	2.2	-	x	-	-	x	x	-	-	-	x	-	x	x	x	-
Fiscal Flycatcher	Melaenornis silens	30.3	-	x	-	-	x	x	x	-	-	x	x	x	x	x	-
Fulvous Whistling Duck	Dendrocygna bicolor	2.2	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Giant Kingfisher	Megaceryle maxima	0.0	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Glossy Ibis	Plegadis falcinellus	20.2	-	x	-	-	wet	-	-	x	-	-	-	x	-	x	-
Goliath Heron	Ardea goliath	1.1	-	x	-	-	-	-	-	-	-	-	-	x	-	-	-
Great Crested Grebe	Podiceps cristatus	1.1	-	x	-	-	-	-	-	-	-	-	-	x	-	-	-
Great Egret	Ardea alba	4.5	-	x	-	-	wet	-	-	x	-	-	-	x	-	-	-
Greater Double-collared Sunbird	Cinnyris afer	1.1	-	x	-	-	-	-	-	-	-	x	x	x	-	x	-
Greater Kestrel	Falco rupicoloides	3.4	-	x	-	-	x	x	x	-	x	x	-	-	x	x	-
Grey Heron	Ardea cinerea	18.0	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Grey-headed Gull	Chroicocephalus cirrocephalus	2.2	-	x	-	-	-	-	-	x	-	-	-	-	-	-	-
Hamerkop	Scopus umbretta	1.1	-	x	x	-	-	-	-	x	-	-	-	x	-	-	-
Intermediate Egret	Ardea intermedia	1.1	-	x	-	-	wet	-	-	x	-	-	-	x	-	-	-
Karoo Thrush	Turdus smithi	14.6	-	x	-	x	-	-	-	-	-	x	x	x	x	x	-
Knob-billed Duck	Sarkidiornis melanotos	1.1	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Lanner Falcon	Falco biarmicus	2.2	VU	x	-	-	x	x	-	-	x	x	x	x	-	x	-
Lesser Kestrel	Falco naumanni	2.2	-	x	-	-	x	x	x	-	x	x	-	x	-	x	-
Little Egret	Egretta garzetta	5.6	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Little Grebe	Tachybaptus ruficollis	21.3	-	x	x	-	-	-	-	x	-	-	-	x	-	-	-
Little Sparrowhawk	Accipiter minullus	1.1	-	x	-	-	-	-	x	-	-	x	x	x	x	x	-

Species name	Scientific name	Report Rate Full Protocol	Red List Regional	Solar Priority	Recorded during surveys	Artificial Stormwater	Grassland	Fallow Land	Exotic Tree Stands	PAOI: Ephemeral Pans	PAOI: Agricultural Lands	PAOI: Open Woodland	PAOI: Built-Up Areas	Solar: Collisions with solar panels	Solar: Displacement Disturbance	Solar: Displacement Habitat transformation	Solar: Fence entanglement
Maccoa Duck	Oxyura maccoa	3.4	NT	x	-	-	-	-	-	-	-	-	-	x	-	-	-
Marsh Owl	Asio capensis	1.1	-	x	-	-	x	-	-	-	-	x	-	x	x	x	x
Marsh Sandpiper	Tringa stagnatilis	1.1	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Melodious Lark	Mirafra cheniana	3.4	-	x	-	-	x	x	-	-	-	-	-	x	x	x	-
Ovambo Sparrowhawk	Accipiter ovampensis	2.2	-	x	-	-	-	-	x	-	-	x	x	x	x	x	-
Pied Avocet	Recurvirostra avosetta	1.1	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Pied Kingfisher	Ceryle rudis	3.4	-	x	-	-	-	-	-	x	-	-	-	-	-	-	-
Pied Starling	Lamprotornis bicolor	34.8	-	x	-	-	-	-	-	-	x	-	x	x	x	-	-
Purple Heron	Ardea purpurea	4.5	-	x	-	-	-	-	-	-	-	-	-	x	-	-	-
Red-billed Teal	Anas erythrorhyncha	19.1	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Red-knobbed Coot	Fulica cristata	28.1	-	x	x	-	-	-	-	x	-	-	-	x	-	-	-
Reed Cormorant	Microcarbo africanus	21.3	-	x	-	-	-	-	-	-	-	-	-	x	-	-	-
Rock Kestrel	Falco rupicolus	1.1	-	x	-	-	x	x	-	-	-	-	x	-	x	x	-
Ruff	Calidris pugnax	2.2	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Secretarybird	Sagittarius serpentarius	2.2	VU	x	-	-	x	x	-	-	-	x	-	-	-	x	x
Sentinel Rock Thrush	Monticola explorator	1.1	LC	x	-	-	x	-	-	-	-	-	-	x	-	x	-
South African Cliff Swallow	Petrochelidon spilodera	9.0	-	x	x	-	x	x	-	-	-	x	-	x	-	x	-
South African Shelduck	Tadorna cana	9.0	-	x	x	-	-	-	-	x	-	-	-	x	-	-	-
Southern Pochard	Netta erythrophthalma	4.5	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Spotted Eagle-Owl	Bubo africanus	2.2	-	x	-	x	x	x	x	-	x	x	x	x	x	x	x
Spur-winged Goose	Plectropterus gambensis	32.6	-	x	x	-	x	x	-	x	x	-	-	x	-	x	-
Squacco Heron	Ardeola ralloides	1.1	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Three-banded Plover	Charadrius tricollaris	13.5	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Western Cattle Egret	Bubulcus ibis	61.8	-	x	x	-	x	x	x	-	x	x	-	x	-	x	-
Whiskered Tern	Chlidonias hybrida	6.7	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
White Stork	Ciconia ciconia	2.2	-	x	-	-	x	x	-	x	x	x	-	-	-	x	-
White-backed Duck	Thalassornis leuconotus	3.4	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
White-breasted Cormorant	Phalacrocorax lucidus	7.9	-	x	-	-	-	-	-	-	-	-	-	x	-	-	-

Species name	Scientific name	Report Rate Full Protocol	Red List Regional	Solar Priority	Recorded during surveys	Artificial Stormwater	Grassland	Fallow Land	Exotic Tree Stands	PAOI: Ephemeral Pans	PAOI: Agricultural Lands	PAOI: Open Woodland	PAOI: Built-Up Areas	Solar: Collisions with solar panels	Solar: Displacement Disturbance	Solar: Displacement Habitat transformation	Solar: Fence entanglement
White-faced Whistling Duck	Dendrocygna viduata	16.9	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Wood Sandpiper	Tringa glareola	5.6	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-
Yellow-billed Duck	Anas undulata	24.7	-	x	-	-	-	-	-	x	-	-	-	x	-	-	-

APPENDIX 2: AVIFAUNAL SPECIES OBSERVED DURING THE WINTER & SUMMER SURVEYS WITHIN THE MERAFONG SOLAR PV FACILITY AND BROADER PAOI

Species name	Scientific name	Report Rate Full Protocol	Report Rate Ad hoc Protocol	Red List Global	Red List Regional	Solar Priority	Powerline priority
African Pipit	Anthus cinnamomeus	60.7	5.7	-	-		
African Stonechat	Saxicola torquatus	71.9	8.6	-	-		
Ant-eating Chat	Myrmecocichla formicivora	12.4	0.0	-	-		
Barn Swallow	Hirundo rustica	52.8	8.6	-	-		
Black-chested Prinia	Prinia flavicans	65.2	8.6	-	-		
Black-headed Heron	Ardea melanocephala	47.2	2.9	-	-	x	x
Blacksmith Lapwing	Vanellus armatus	76.4	2.9	-	-	x	
Black-winged Kite	Elanus caeruleus	61.8	14.3	-	-	x	x
Bokmakierie	Telophorus zeylonus	68.5	0.0	-	-		
Cape Longclaw	Macronyx capensis	53.9	5.7	-	-		
Cape Robin-Chat	Cossypha caffra	46.1	0.0	-	-		
Cape Sparrow	Passer melanurus	83.1	5.7	-	-		
Cape Starling	Lamprotornis nitens	49.4	2.9	-	-		
Cape Turtle Dove	Streptopelia capicola	95.5	8.6	-	-		
Cape White-eye	Zosterops virens	43.8	0.0	-	-	x	
Capped Wheatear	Oenanthe pileata	29.2	2.9	-	-		
Common Myna	Acridotheres tristis	76.4	5.7	-	-		
Crested Barbet	Trachyphonus vaillantii	56.2	2.9	-	-		
Crimson-breasted Shrike	Laniarius atrococcineus	1.1	0.0	-	-		
Crowned Lapwing	Vanellus coronatus	76.4	11.4	-	-		
Dark-capped Bulbul	Pycnonotus tricolor	64.0	5.7	-	-		
Desert Cisticola	Cisticola aridulus	12.4	0.0	-	-		
Eastern Clapper Lark	Mirafra fasciolata	34.8	0.0	-	-		
Egyptian Goose	Alopochen aegyptiaca	38.2	0.0	-	-	x	x
Green Wood Hoopoe	Phoeniculus purpureus	20.2	0.0	-	-		
Hadada Ibis	Bostrychia hagedash	71.9	2.9	-	-		x
Hamerkop	Scopus umbretta	1.1	0.0	-	-	x	x
Helmeted Guineafowl	Numida meleagris	83.1	22.9	-	-		x
Laughing Dove	Spilopelia senegalensis	88.8	22.9	-	-		
Levaillant's Cisticola	Cisticola tinniens	36.0	2.9	-	-		
Little Grebe	Tachybaptus ruficollis	21.3	0.0	-	-	x	x
Long-tailed Widowbird	Euplectes progne	64.0	14.3	-	-		
Neddicky	Cisticola fulvicapilla	71.9	2.9	-	-		
Northern Black Korhaan	Afrotis afraoides	51.7	2.9	-	-		x
Pied Crow	Corvus albus	46.1	17.1	-	-		x
Red-billed Quelea	Quelea quelea	51.7	5.7	-	-		
Red-collared Widowbird	Euplectes ardens	28.1	2.9	-	-		
Red-faced Mousebird	Urocolius indicus	61.8	0.0	-	-		
Red-knobbed Coot	Fulica cristata	28.1	0.0	-	-	x	x
Rufous-naped Lark	Mirafra africana	71.9	5.7	-	-		
South African Cliff Swallow	Petrochelidon spilodera	9.0	0.0	-	-	x	
South African Shelduck	Tadorna cana	9.0	0.0	-	-	x	x
Southern Fiscal	Lanius collaris	93.3	5.7	-	-		

Species name	Scientific name	Report Rate Full Protocol	Report Rate Ad hoc Protocol	Red List Global	Red List Regional	Solar Priority	Powerline priority
Southern Masked Weaver	Ploceus velatus	100.0	17.1	-	-		
Southern Red Bishop	Euplectes orix	71.9	20.0	-	-		
Speckled Mousebird	Colius striatus	20.2	2.9	-	-		
Speckled Pigeon	Columba guinea	58.4	5.7	-	-		
Spur-winged Goose	Plectropterus gambensis	32.6	0.0	-	-	x	x
Tawny-flanked Prinia	Prinia subflava	21.3	2.9	-	-		
Village Indigobird	Vidua chalybeata	1.1	0.0	-	-		
Western Cattle Egret	Bubulcus ibis	61.8	2.9	-	-	x	x
White-browed Sparrow-Weaver	Plocepasser mahali	93.3	8.6	-	-		
White-winged Widowbird	Euplectes albonotatus	34.8	2.9	-	-		
Yellow-crowned Bishop	Euplectes afer	19.1	5.7	-	-		
Zitting Cisticola	Cisticola juncidis	49.4	2.9	-	-		

APPENDIX 3: AVIFAUNAL HABITAT OBSERVED WITHIN THE MERAFONG SOLAR PV FACILITY AND BROADER PAOI

FIGURE 1: Degraded grassland (low sensitivity)

FIGURE 2: Fallow land (low sensitivity)

FIGURE 3: Cultivated land (low sensitivity)

FIGURE 4: Artificial stormwater channel (medium sensitivity)

FIGURE 5: Exotic tree stands (low sensitivity)

FIGURE 6: Ephemeral pan

FIGURE 7: Built-up residential areas (low sensitivity)

APPENDIX 4: CURRICULUM VITAE

MEGAN DIAMOND

PERSONAL DETAILS

Date of Birth | *7 December 1978*
Driver's License | *Code A and B*
Home Language | *English*
Other Languages | *Afrikaans*

EDUCATION

BSc Environmental Management | *University of South Africa (UNISA)* 2002 – 2009

ACCREDITATION

South African Council for Natural Scientific Professions | *Environmental Science*
Registration Number: 300022/14

EXPERIENCE

Owner & Avifaunal Specialist | *Feathers Environmental Services*
July 2013 – Present

- Perform specialist avifaunal assessment studies to minimise the impact of industrial infrastructure on birds and their habitats;
- Provide strategic guidance to industry through the development of best practice procedures and guidelines;
- Review and comment on methodologies, specialist studies and EIA reports for Renewable Energy projects;
- Provide input into renewable energy and power line developments elsewhere in Africa and across the globe;
- Manage the collection and collation of relevant and complete desktop and/or field datasets;
- Manage pre- and post-construction avifaunal monitoring data collected at wind and solar energy facilities;
- Site assessments, either as part of the project team or independently;
- Preparation of reports according to project deadlines, including the use of Geographic Information Systems (GIS) to portray data;
- Attendance of specialist integration meetings; and
- Liaison with stakeholders where necessary.

Wildlife & Energy Programme Manager | *Endangered Wildlife Trust*
October 2006 – June 2013

Programme management

- Annually review the Programme's conservation and research strategic objectives and update in accordance with the Endangered Wildlife Trust's (EWT) and Programme's vision and mission including work plans for staff etc.;
- Ensure timeous, professional delivery on all aspects of Wildlife & Energy Programme activities;
- Formulate, prioritize, and approve relevant research and conservation projects;
- Ensure acceptable quality of all research projects and their outputs;
- Participate in international network liaison as and when required;
- Produce regular popular articles & media releases on the Wildlife & Energy Programme projects and outputs & contribute to the EWT publications;
- Establish & maintain a network with relevant national & international stakeholders;
- Deliver presentations at relevant meetings, functions, workshops & conferences on behalf of the programme;
- Assist with compilation of newsletters, updating of webpage, compilation of press articles, any advocacy issues;
- Identify & establish partnerships to achieve Wildlife & Energy Programme conservation goals.

Eskom –EWT Strategic Partnership

- Ensure that this partnership is managed effectively and sustainably against its goals. Manage staff in this division;
- Develop and maintain relationships with Eskom;
- Negotiate the terms of reference for the annual service level agreements between EWT and Eskom, to ensure the sustainability of the relationship;
- Compile annual report to Eskom Corporate Environment and Sustainability;
- Produce monthly reports to Eskom's regional grids on the status of incident follow-up;
- Attend applicable forums to interact with Eskom stakeholders;
- Participate in international network liaison as and when required;
- Maintain a network with all relevant local and regional level stakeholders (meetings, forums, workshops, etc.);
- Identify research needs relating to the management of wildlife interaction with power lines;
- Conduct research projects on wildlife and power line interaction and present the results at national and international conferences and workshops;
- Development and implementation of training for Eskom field services staff (at various levels) in the management of wildlife interactions; and
- Conduct special investigations on power lines relating to wildlife induced faulting.

Environmental Impact Assessment Division

- Ensure that this division always operates effectively and efficiently and manage staff in this division; and

- Conduct specialist avifaunal studies for new power lines developments including: tendering/quoting for the projects, conducting field work, preparing reports, presenting results & negotiating the acceptance of recommendations, final "walk through" as part of Environmental Management Plans; general project management, all liaison with clients, Eskom, authorities, Interested and Affected Parties etc.

Management and administration

- Ensure all programme staff have relevant terms of reference;
- Ensure that all programme staff are performance appraised against their terms of reference;
- Compile and manage programme budgets, monthly reports, work plans and strategy;
- Monitor expenditure and take corrective action if necessary; and
- Ensure timely delivery on all projects to all stakeholders.

CONFERENCE ATTENDANCE

- *Society for Conservation Biology 21st Annual Meeting (1-5 July 2007)*
- *The 6th TAWIRI Scientific Conference (3 – 6 December 2007) Presented a paper titled "*Co-operative management of wildlife and power line conflicts: an African solution"
- Pan-African Ornithological Congress (7-12 September 2008)
- International Conference on Overhead Lines, Design, Construction, Inspection & Maintenance, Fort Collins Colorado USA. (29 March – 1 April 2010) Presented a paper titled "Bird's eye view: how birds see is key to avoiding power line collision"
- Windaba 2011 – Implementing South African Wind Energy (27-29 September 2011)
- Pan African Vulture Summit (16-20 April 2012) Presented a paper titled "Electrification in Africa – Are our vultures being strung along"
- 4th Wind Power Africa Conference & Renewable Energy Exhibition (28-30 May 2012) Presented a paper titled "Wind Energy in Africa – what does this really mean for our continent's birds"
- 13th Pan-African Ornithological Congress (14-21 October 2012) Presented a paper titled "Stringing South Africa's Terrestrial Birds Along - Monitoring of Bird Interactions with Power Line and Experimental Testing of Bird Collision Mitigation at the Karoo Long Term Monitoring Site"
- AEWA Single Species Action-Planning Workshop for the Conservation of the Grey Crowned Crane (10-13 September 2013) Presented and participated in the workshop as a subject expert (energy and bird interactions)

AUTHORED & CO-AUTHORED PAPERS

Jenkins, A.R., Smallie, J. & Diamond, M. 2009. Balls, flashers, flappers and coils: South African perspectives on a global search for ways to prevent avian collisions with overhead lines. In: Harebottle, D.M., Craig, A.J.F.K., Anderson, M.D., Rakatomonana, H. & Muchai, M. (eds). Proceedings of the 12th Pan-African Ornithological Congress, 2008. Cape Town, Animal Demography Unit.

Smallie, J., Diamond, M. & Jenkins, A. 2009. Lighting up the African continent – what does it mean for our birds? pp. 38–43. In: Harebottle, D.M., Craig, A.J.F.K., Anderson, M.D., Rakotomanana, H. & Muchai. (eds). *Proceedings of the 12th Pan-African Ornithological Congress, 2008.* Cape Town, Animal Demography Unit.

Jenkins, A. R., Smallie, J.J and Diamond, M. 2010 Avian collisions with power lines: a global review of causes and mitigation with a South African perspective. Bird Conservation International, page1 of16.

Retief, E.F., Diamond, M., Anderson, M.D., Smit, H.A., Jenkins, A.R., Brooks, M. 2011. Avian Wind Farm Sensitivity Map for South Africa.

Jenkins, A.R., Van Rooyen, C.S., Smallie, J.J., Harrison, J.A., Diamond, M. And Smit, H.A. 2012. BirdLife South Africa / Endangered Wildlife Trust best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in southern Africa.

Jenkins, A.R., De Goede, K.H., Sebele, L. and Diamond, M. 2013. Brokering a settlement between eagles and industry: sustainable management of large raptors nesting on power infrastructure. Bird Conservation International (2013) 23:232 – 246.

Diamond, M., Harris, J., Mirande, C. and Austin, J. 2014. People of a feather flock together: A global initiative to address crane and power line interactions. 13th North American Crane Workshop Summary. Lafayette, Louisiana.

Page-Nicholson, S., Tate, G., Hoogstad, C., Murison, M., Diamond, M., Blofield, A., Pretorius, M., Michael, M.D. 2018. Mitigating the Impact of Large Mammals on Wooden Electrical Distribution Poles in the Kruger National Park, South Africa. African Journal of Wildlife Research.

Diamond, M. and Hoogstad, C. (in press) Collisions and habitat loss associated with utility lines and wind turbines. IUCN SSC Crane Specialist Group – Crane Conservation Strategy.