BAT SITE WALK-THROUGH REPORT FOR THE GUNSTFONTEIN WIND ENERGY FACILITY NEAR SUTHERLAND, NORTHERN CAPE PROVINCE

(Ref: 14/12/16/3/3/2/826)

On behalf of

SAVANNAH ENVIRONMENTAL (PTY) LTD

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1 INTRODUCTION

Gunstfontein Wind Farm (Pty) Ltd (the 'Developer') received Environmental Authorisation (EA) for the construction the Gunstfontein Wind Energy Facility (WEF) near Sutherland in the Northern Cape Province (the 'development') (Ref: 14/12/16/3/3/2/826) on 25 July 2016[1]. Following advances in technology since the issuing of the EA the Developer requested that the DFFE consider amending the project description and layout, access and turbine specifications of the Gunstfontein WEF.

Savannah Environmental Pty (Ltd) ('Savannah') were appointed by the Developer to compile the Environmental Application and Impact Assessment for the development, and thus appointed Arcus Consultancy Services (Pty) Ltd ('Arcus') to compile a Bat Addendum Report (May, 2019) as part of the amendment process. The amendment report was submitted by Savannah on 19 July 2019 and subsequently approved by the DFFE on the 5 September 2019.

The Addendum Bat Specialist Report compiled by Arcus (May, 2019) concluded by recommending that the final layout (which includes the revised turbine positions and the additional access roads) be assessed by a bat specialist during pre-construction through a site walk-through and micro-siting exercise. Consequently, this report serves to fulfil this condition by providing feedback on the various observations made by Arcus during the site visit, which includes specialist mapping and design comment based on the site walk-through findings.

1.1 Project Details

The Gunstfontein Wind Energy Facility comprises of 36 Wind Turbine Generators (WTG) with a contracted capacity of up to 200MW. To achieve this, the WTG that have been selected have rotor diameters of up to 180 m, with their hub heights being up to 150 m. Additional infrastructure includes:

- Concrete foundations to support the turbines;
- Cabling between the turbines;
- Laydown areas;
- Internal access roads;
- An on-site substation, buildings and dedicated areas for workshops, control systems, maintenance and storage with parking areas where required; and
- Temporary construction compound and temporary site offices.
- 132kV overhead powerline to connect the wind farm to the Eskom Hidden Valley Substation.

The development site is located ~20km south of Sutherland and access to the site will be via a gravel road which branches off the R354. The walkthrough considered the WEF and associated infrastructures located on the Remainder of the farm Gunstfontein 131, as well as the 132kV OHL grid connection which traverses: Remainder of Farm Boschmans Hoek 177, Remainder of Farm Wolwenhoek 182, Remainder of Farm Swanepoelshoek 184, Remainder of Farm Leeuwe Hoek 183, RE Portion 1 of Farm Orange Fontein 203, Remainder Farm Annex Orange Fontein 185 and The Farm De Hoop 202.

2 TERMS OF REFERENCE

The terms of reference for the site walk-through, as agreed on in discussion with Savannah Environmental Pty (Ltd), were to:

[1] This EA was amended and submitted to the DFFE on 13 May 2019, with an amendment motivation report submitted in 19 July 2019.

- Conduct a walk-through of the development as described in 1.1 over a period of 3-days.
- Confirm the applicability of the buffer distances recommended in the addendum report.
- Compile a report which confirms the applicability of mitigation measures recommended in the addendum report based on site observations.
- Specialist mapping.
- Specialist statement on the final design layout of the development.

It is emphasised that information, as presented in this report, only has bearing on the development site as indicated on the accompanying maps. This information cannot be applied to any other area, however similar in appearance or any other aspect, without proper investigation.

2.1 Relevant Legislation and Guidelines

The following policies and guidelines have informed the methodologies employed during the site visit and walk-through and will ensure that the Developer meets all legislative requirements regarding construction and operation of the Gunstfontein WEF.

- Chapter 1 of the National Environmental Management Act (NEMA) Act 107 of 1998.
- Convention on the Conservation of Migratory Species of Wild Animals (1979)
- Convention on Biological Diversity (1993)
- Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)
- National Environmental Management Act, 1998 (NEMA, Act No. 107 of 1998)
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
- Northern Cape Nature Conservation Act, 2009 (Act No. 9 of 2009)
- The Equator Principles (2013)
- The Red List of Mammals of South Africa, Swaziland and Lesotho (2016)
- National Biodiversity Strategy and Action Plan (2005)
- South African Best Practice Guidelines for Pre-construction Monitoring of Bats at Wind Energy Facilities - ed 5. South African Bat Assessment Association of June 2020.
- South African Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy Facilities – ed 2. South African Bat Assessment Association of June 2020.

3 AMENDMENT REPORT FINDINGS

Based on the pre-construction monitoring data captured by Bioinsight during the original EIA (2015), bat activity at the site was considered low, with an average below 2 passes per hour. The activity data across all the detectors showed that bat activity is higher in summer, spring and autumn, with almost no activity during winter. Most bat activity was detected at ground level and only 36 % of the overall bat activity was detected at 80 m.

Based on bat activity levels as assessed from pre-construction monitoring data, impacts to bats are likely to be of a medium significance before mitigation and low after mitigation. Cumulative mortality impacts after mitigation would also increase. Cumulative impacts are likely to be of a high significance before mitigation and medium after mitigation. The magnitude of bat impacts may differ based on the exact dimensions of the turbines chosen. Turbines with longer blades that reach lower to the ground would likely have a greater impact by putting a greater diversity of species, and greater magnitude of individual bats, at risk. Longer blades will also extend higher into the air and place open air species such as free-tailed bats at greater risk. Therefore, it was recommended maximising the ground clearance and minimising the tip height (i.e. the distance between the ground and the blade tip at its highest point) as much as possible.

At the time of compiling the addendum, the exact combination of turbine dimensions to be selected was unknown but depending on the size of the turbines selected, Arcus recommended that several turbines will need to be micro-sited to prevent the blade tips intruding into bat buffers. In terms of buffers, the original assessment (Bioinsight, 2015) stipulated a buffer of 500 m for all confirmed bat roosts, permanent water bodies, water lines where high activity was recorded, and around the upper ridge line. A 200 m buffer was stipulated for all potential roosting sites, permanent water bodies and water lines (unless high activity was recorded), temporary water bodies, and linear features with potential to be used by bats for commuting. In addition, the EA (25 July 2016) stated that a 500 m buffer must be applied for all potential and confirmed bat roosting sites.

It was recommended that the final layout (which includes revised turbine positions and an additional access road) be assessed by a bat specialist to ensure this is adhered to once the turbines are chosen. It was recommended that this be undertaken by means of a pre-construction specialist walk-through and micro-siting process which is to include the specialist mapping the final layout to determine if all turbine blades are outside bat buffers. Arcus further stated that any turbine micro-siting will need to be done before construction and residual impacts that occur must be evaluated during the operation phase using carcass searches to monitor actual impacts.

4 SITE VISIT AIM

To conduct a site walk-through and micro-siting process to ground truth important bat features and to ensure that all turbine blades and other infrastructure are positioned outside of their respective bat sensitivity buffers.

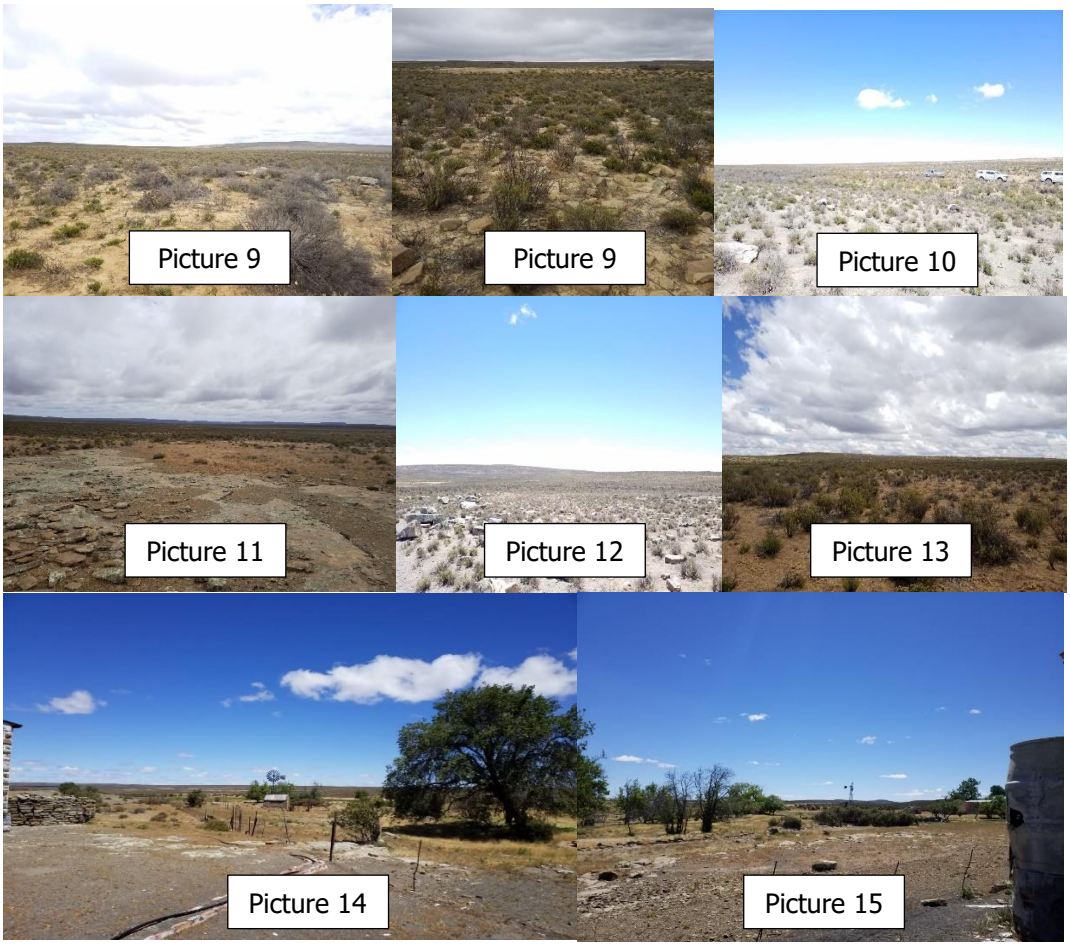
5 METHODOLOGY

The site walk-through visit took place from 17 November to 19 November 2020. Important bat features, sensitivities and final layouts were loaded onto the ArcCollector app to ground truth the features and update the sensitivities accordingly. The positions of the turbines, powerlines, roads, substation and O&M building were prioritised. Additionally, habitats with roosting potential were identified beforehand and inspected for possible bat roosts which included rocky outcrops, cliffs, buildings and trees. The areas covered are displayed on Figure 1.

6 ON-SITE OBSERVATIONS

The powerline extension corridor (Figure 1) is located on flat to undulating hills with negligible roosting potential for bats (Picture 1-2). After the extension corridor, the powerline traverses down the valley (Picture 3) heading north and up the escarpment to connect to the WEF (Picture 4). This section has rocky outcrops and small cliffs with Low to Moderate roosting potential. These rocky outcrops and cliffs were scanned, although no evidence of roosting bats were found (examples: Picture 5-7). A few abandoned buildings were found at the bottom of the valley. At the time of the visit, no bats were found to be roosting, however, the site is deemed as having a high roosting potential. During pre-construction monitoring, evidence of bats (droppings and a dead bat) were found in the attic of one of these buildings. Although old bat droppings were found, there were no signs of recent bat use (Picture 8).

Above the escarpment (where the WEF is located) (Figure 2), the landscape is flat with negligible roosting potential at the turbine positions (Picture 9-13). According to the pre-construction monitoring results, bat activity is also lower in this area compared to below the escarpment. The five buildings located at Gunstfontein, which includes the land owners house, guesthouse and some sheds, have high roosting potential but did not contain any signs of roosting bats. There are also more trees, shrubs and plenty of water in the vicinity of the buildings (Picture 14-15). These buildings are more than 3 km away from the turbine locations.



The bat sensitive areas are mostly around watercourses and drainage lines with established riparian vegetation, wetlands, dams, water reservoirs and buildings, and were buffered accordingly (Figure 2).

7 RECCOMMNDATIONS AND CONCLUSION

The original bat No Go buffers suggested by the pre-construction monitoring report were 500 m. Additional 200 m and 100 m buffers were suggested in the addendum report and site walk-through. These buffers are to blade tip. To get the distance to the turbine base, to assist with placement of the turbines, the following formula was used (Mitchell-Jones and Carlin 2014):

$$b = \sqrt{(bd + bl)^2 - (hh - fh)^2}$$

Where: bd = buffer distance, bl = blade length, hh = hub height and fh = feature height (zero in this instance)

The bat sensitivity buffers were updated according to the exact turbine dimensions being applied for which is a hub height of up to 150 and a rotor diameter of up to 180 m, which resulted in buffers of 583 m, 276 m and 167 m to turbine base respectively. The observations made on site confirm that the buffers are sufficient and no turbine blades are located within bat No Go buffers and adheres to the updated sensitivity map (Figure 2).

The only No Go buffers that are applicable for the construction of powerlines and access roads are the potential roost buffer of 200 m (Figure 3), with the aim to limit roost disturbance during construction. No infrastructure is located within this buffer.

All mitigation measures and findings proposed by Bioinsight (2015), Savannah (2016) and in the addendum report remain valid and the impact of turbines on bats remains low.

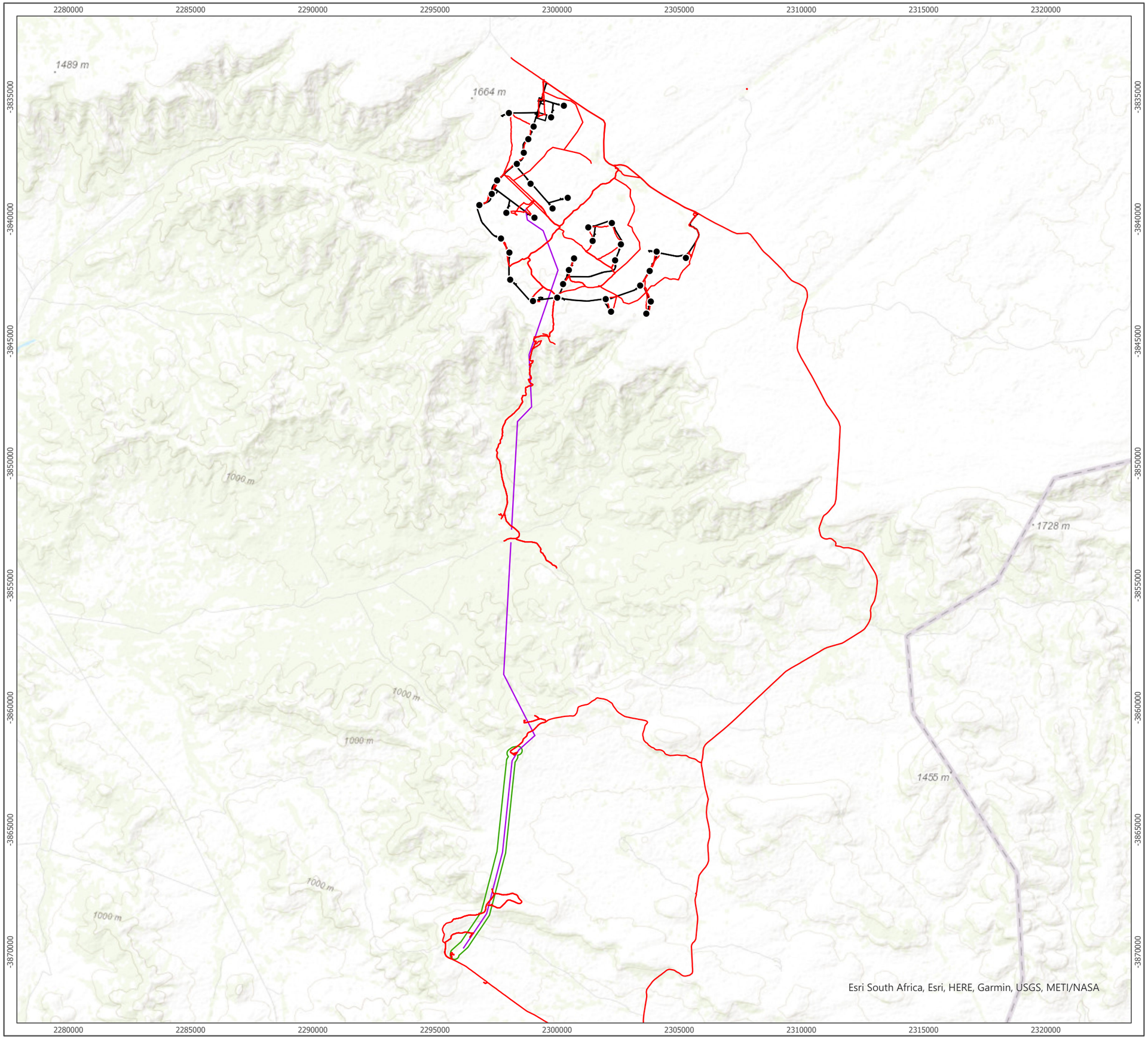
8 REFERENCES

Bioinsight, 2015. Gunstfontein Wind Energy Facility. Bat Pre-construction Monitoring and Specialist Impact Assessment Report.

MacEwan, K., Sowler, S., Aronson, J., and Lötter, C. 2020. South African Best Practice Guidelines for Pre-construction Monitoring of Bats at Wind Energy Facilities - ed 5. South African Bat Assessment Association.

Mitchell-Jones, T., Carlin, C., 2014. Bats and Onshore Wind Turbines Interim Guidance, In Natural England Technical Information Note TIN051. Natural England.

FIGURES



ARCUS

- Proposed Turbines
- Area Covered During Site Visit
- Proposed Roads and Hardstands
- Proposed Powerline
- Extention Corridor

1:150,000 Scale @ A3

0 3.5 7 km

NORTH

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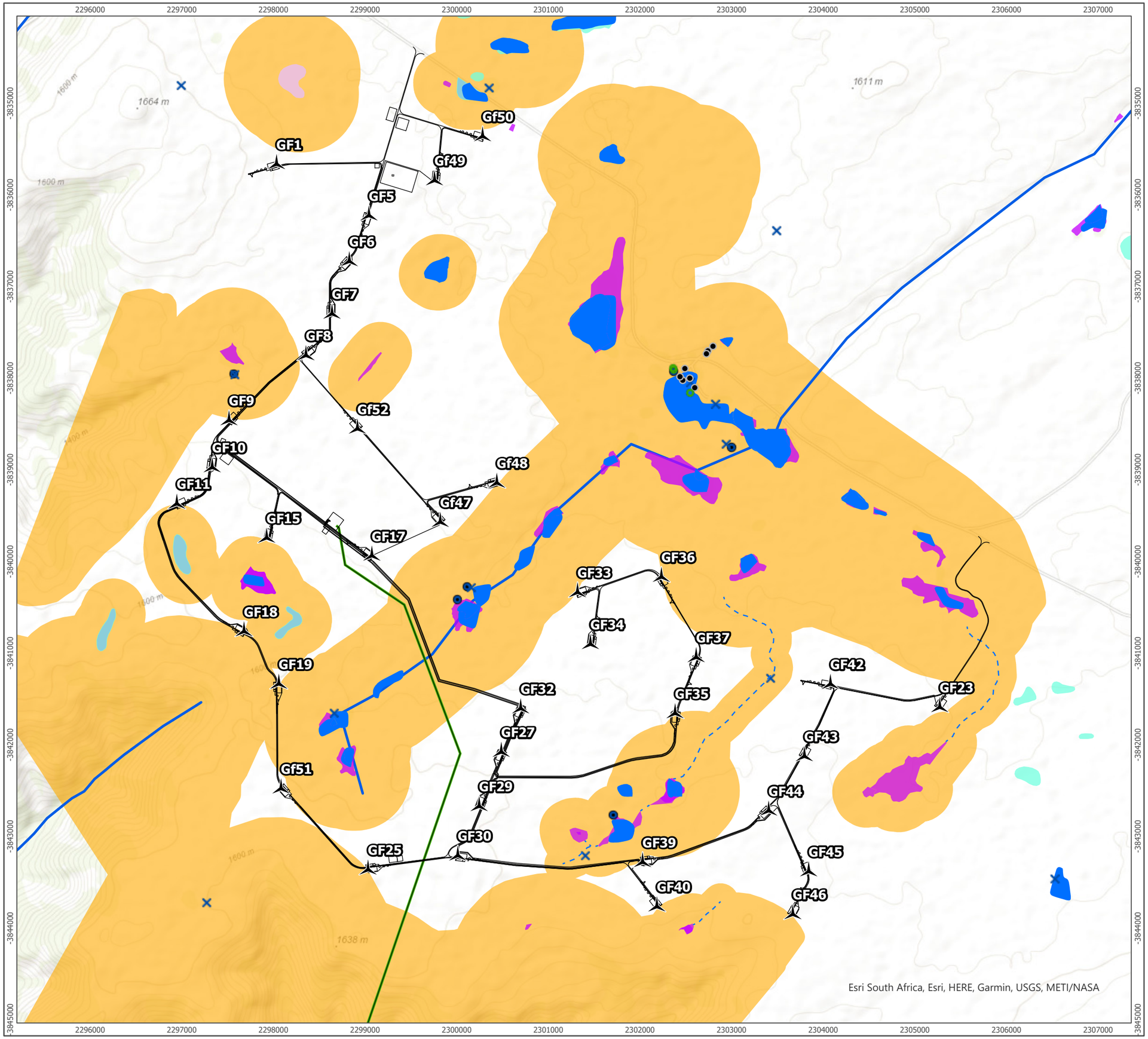
Site Walkthrough
Figure 1

Gunstfontein WEF
Bat Site Walk-Through Report

C:\Users\Adriaan\Desktop\Arcus\4052 Gunsfontein\South Africa Web Layer Set Up\South Africa Web Layer Set Up.aprx\4052-REP-001 Fig 1 Site Walkthrough



ARCUS

- Proposed Turbines
- Roads and Hardstands
- Proposed Powerline
- Bat No Go Area for Turbines (other infrastructure permitted)

Important Bat Features

- Water Reservoir
- Wind Pump
- House
- Tree
- Important Drainage Lines
- NFEPA Rivers
- NFEPA Wetlands
- Other Wetlands and Dams
- Dry Pan
- Non-perennial pan

1:40 000 Scale @ A3

0 1 2 km

NORTH

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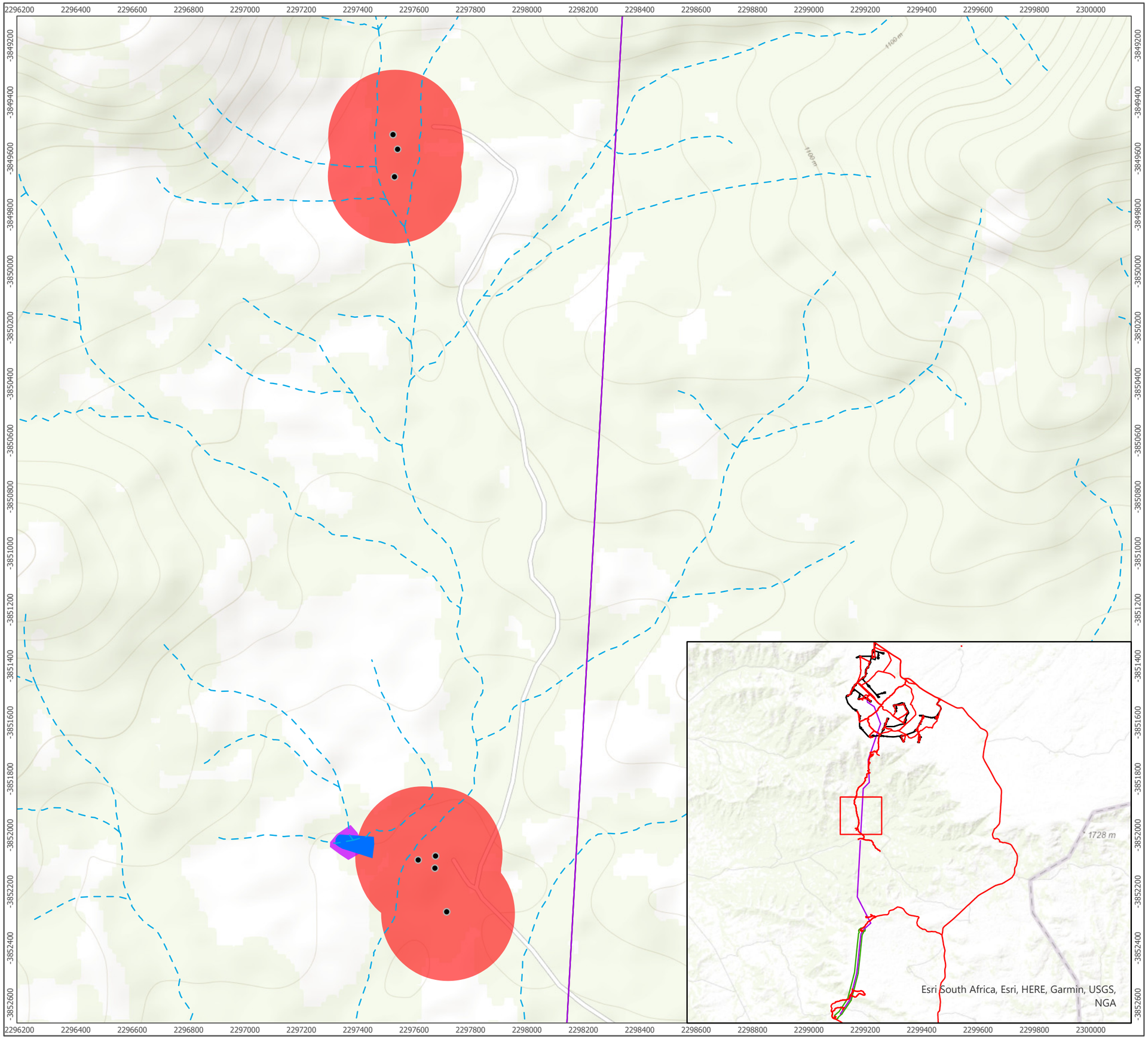
Bat Sensitivity Map
Figure 2

Gunstfontein WEF
Bat Site Walk-Through Report

S:\GIS\Projects\4052 Gunsfontein\South Africa Web Layer Set Up\South Africa Web Layer Set Up.aprx\4052-REP-002 Fig 2 Bat Sensitivity Map



ARCUS

- Road and Hardstand Layout
- Proposed Powerline
- Extention Corridor
- No Go for Powerline and Access Roads

Important Bat Features

- House

1:13,000 Scale @ A3

0 0.25 0.5 km

NORTH

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Bat Sensitivity Map
Figure 3

Gunstfontein WEF
Bat Site Walk-Through Report

C:\Users\Adriaan\Desktop\Arcus\4052 Gunsfontein\South Africa Web Layer Set Up\South Africa Web Layer Set Up.aprx\4052-REP-003 Fig 3 Powerline Sensitivities