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DESKTOP PALAEONTOLOGICAL IMPACT ASSESSMENT

New Hope Solar Park 1, 2 3 and 4 and Powerline

Specialist report by:

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EXECUTIVE SUMMARY

Bruce Rubidge was appointed by Engela Grobler of AGES Limpopo (Pty) Ltd on behalf of Apus Energy (Pty) Ltd, Lacerta Energy (Pty) Ltd, Delphinus Energy (Pty) Ltd and Equuleus Energy (Pty) Ltd to undertake a desktop palaeontological impact assessment for the proposed New Hope Solar Park 1, 2, 3 and 4 on the remaining extent of the farm N'Rougas Zuid 121, and by Mensa Energy (Pty) Ltd for distribution powerlines between the proposed solar parks and the Eskom Nieuwehoop Main Transmission Substation located 13 km to the east on Portion 3 of the Farm Gemsbok Bult 120. The study area falls under Registration division Kenhardt RD, located within the Kai !Gariep Local Municipality, ZF Mgcawu District Municipality, Northern Cape Province. This area is north of Kenhardt and situated east of the R27 road from Kenhardt to Upington.

The study area is situated in the Namaqua-Natal Metamorphic Province comprising Precambrian igneous and metamorphic rocks of the Keimoes suite and Jacomyns Pan Group which are exposed in places but are mostly overlain by Quaternary alluvial deposits of the Gordonia Formation of the Kalahari Group.

As the Precambrian Keimoes Suite is of igneous origin and the Jacomyns Pan Group, which comprises largely pelitic gneiss, are not known to host fossils, it is highly unlikely that palaeontological heritage will be affected by the proposed solar park and distribution line development. Quaternary alluvial deposits, which are covered by vegetation in the study area, are the only sedimentary deposits in the area which could possibly host fossils. As these deposits are not consolidated it is very unlikely that any fossils will be present.

If in the unlikely event that fossils are exposed in the Quaternary alluvial deposits of the Gordonia Formation by the proposed redevelopment, a qualified palaeontologist must be contacted to assess the exposure for fossils so that the necessary rescue operations are implemented (See Appendix A).

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1. Introduction and Brief

A Palaeontological Impact Assessment was requested by Engela Grobler of AGES Limpopo (Pty) Ltd on behalf of 5 energy companies (see below) Apus Energy (Pty) Ltd and Lacerta Energy (Pty) Ltd to undertake a desktop palaeontological impact assessment for the proposed New Hope Solar Park 1, 2, 3 and 4 (comprising four solar parks) on the remaining extent of the farm N'Rougas Zuid 121.

In addition, distribution powerlines will be established between the proposed solar parks and the Eskom Nieuwehoop Main Transmission Substation located 13 km to the east on Portion 3 of the Farm Gemsbok Bult 120. The powerlines (with alternatives) may cross the following properties depending on the alternative route chosen after the assessment is completed: Remaining extent of Farm Onder Rugzeer 168, and/or remaining extent of Farm Boven Rugzeer 169, and or Farm 420, and /or Portion 1 of the Farm N'Rougas Zuid 121, and/or portion of the Farm N'Rougas Zuid 121, and /or Portion 4 of the Farm N'Rougas Zuid 121, and Portion 3 of the Farm Gemsbok Bult 120.

The five companies are:

Project Name	**Company Name**	**Company Registration No**	**MW**	**Ha**
NEW HOPE 1	APUS ENERGY (PTY) LTD	2020/871095/07	100	240
NEW HOPE 2	LACERTA ENERGY (PTY) LTD	2021/354751/07	100	240
NEW HOPE 3	DELPHINUS ENERGY (PTY) LTD	2021/534197/07	100	230
NEW HOPE 4	EQUULEUS ENERGY (PTY) LTD	2021/534216/07	100	238
NEW HOPE POWER LINE	MENSA ENERGY (PTY) LTD	2021/534216/07		

The study area falls in registration division Kenhardt RD, located within the Kai !Gariep Local Municipality, ZF Mgcawu District Municipality, Northern Cape Province. It is north of Kenhardt and situated east of the R27 road from Kenhardt to Upington in Northern Cape Province (Figure 1). The proposed developed area (footprint) will be up to 948 hectares.

2. Legislative framework

The Department of Environmental Affairs (DEA) through the National Environmental Management Act (NEMA Act 107 of 1998) requires that developers apply to the competent authority for approval of the proposed development as more than 1 hectare of indigenous vegetation is to be removed (Listing Notice 1 of the EIA regulations).

National Heritage is protected by the South African Heritage Resources Act (Act No 25) of 1999. Developers are required to submit development plans to SAHRA for approval.

These plans must include documentation detailing the expected impact that the development will have on national heritage.

Categories of heritage resources recognised as part of the National Estate in Section 3 of the Heritage Resources Act include:

- Geological sites of scientific or cultural significance
- Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, material, meteorites and rare geological specimens.
- Objects with the potential to contribute to understanding South Africa's natural or cultural heritage.

Accordingly, a Heritage Impact Assessment (HIA) is required to assess the possible impacts of a proposed development on archaeological and palaeontological heritage. This report addresses the palaeontological aspects of the HIA as part of the Environmental Management Plan (EMP).

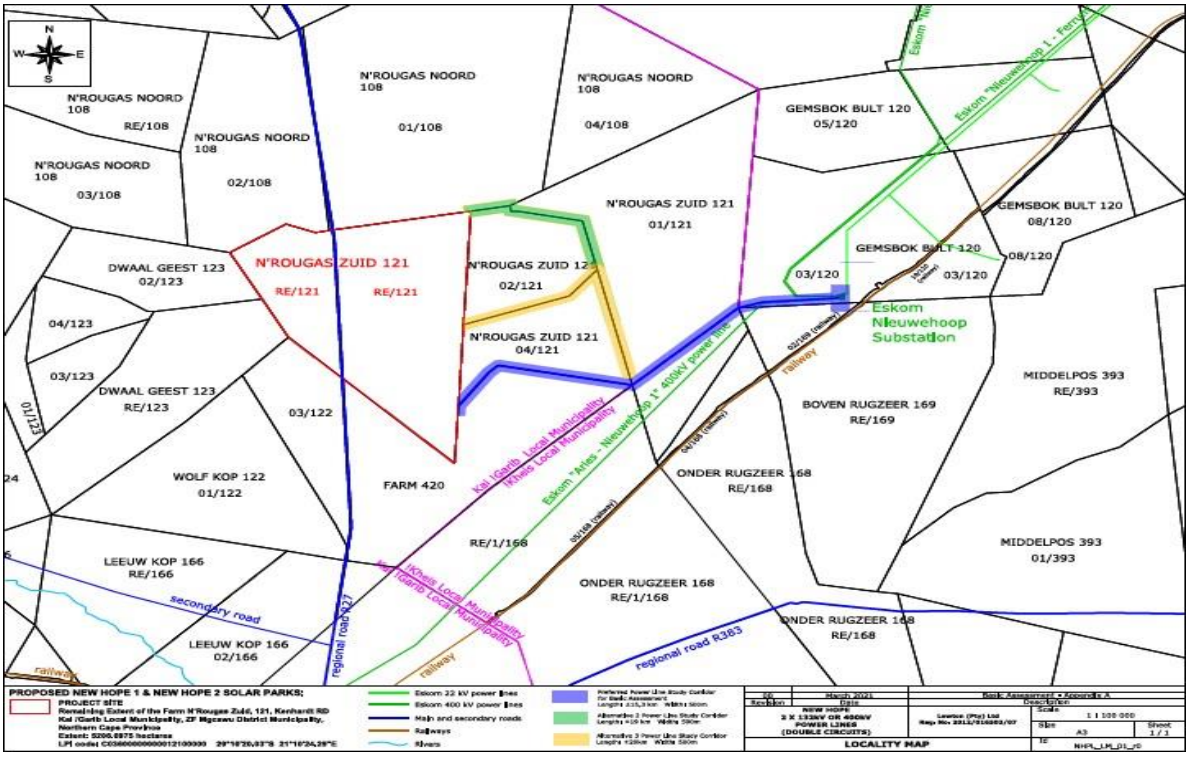

Figure 1: Locality map of the solar park project area (red outline) and alternative routes of the transmission powerline (green, yellow, blue, mauve).

3. Details of the study area

The study area of the proposed New Hope Solar Park and transmission line development is located within the Kai !Garib Local Municipality, ZF Mgcawu District Municipality, Northern Cape Province (Figure 1). The affected area will cover an area of about 800 hectares.

The main infrastructure is associated with the establishment of renewable energy generation facilities which will be Photovoltaic (PV) Power Plants with a maximum generation capacity up to 300 MW at the point of connection (*Export Capacity*). The

names of the facilities will be NEW HOPE 1 SOLAR PARK and NEW HOPE 2 SOLAR PARK. In addition, distribution powerlines (132kV or 400kV) will extend between the proposed solar parks and the Eskom Nieuwehoop Main Transmission Substation (MTS). The Eskom Nieuwehoop Main Transmission Substation (MTS) is located 13 km East of the project site, on Portion 3 of the Farm Gemsbok Bult 120 (Figure 1).

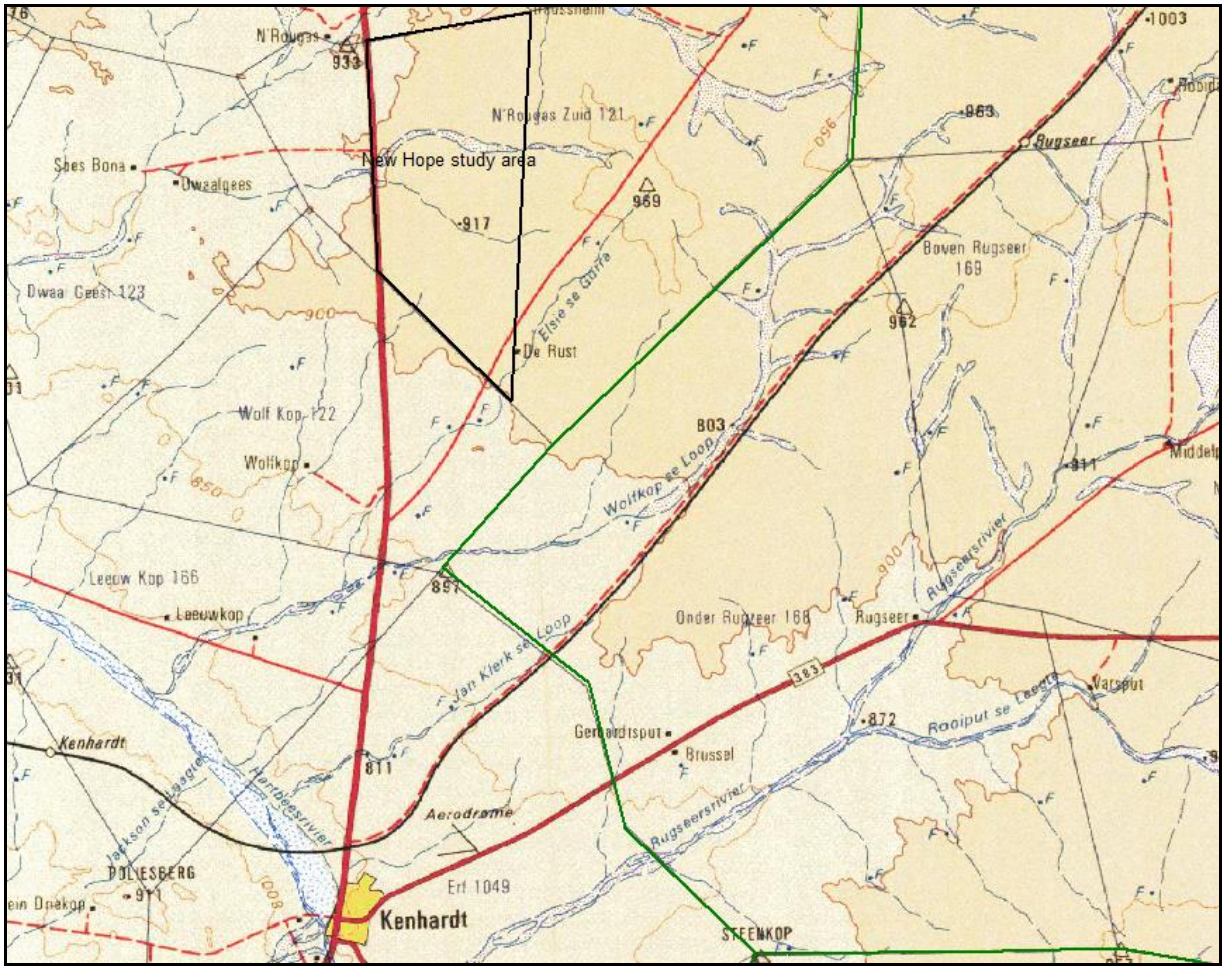

Figure 2: Topographic map (Sheet 2920), the proposed New Hope solar park development area is outlined in black.

4. Geological Setting

The study area is situated in the Namaqua-Natal Metamorphic Province comprising Precambrian igneous and metamorphic rocks of the Keimoes suite and Jacomyns Pan Group. These rocks are exposed in places (Figure 3) but are mostly overlain by Quaternary alluvial deposits of the Gordonia Formation of the Kalahari Group.

The Keimoes Suite comprises plutonic igneous bodies ranging in composition from granodiorite to alkali granite. The Jacomyans Pan Group comprises largely pelitic gneiss, which is characteristically banded and migmatitic. These Precambrian units are mostly overlain by unsolidated Quaternary deposits of the Gordonia Formation (Kalahari Group) which consists of red aeolian sand (Figure 3).

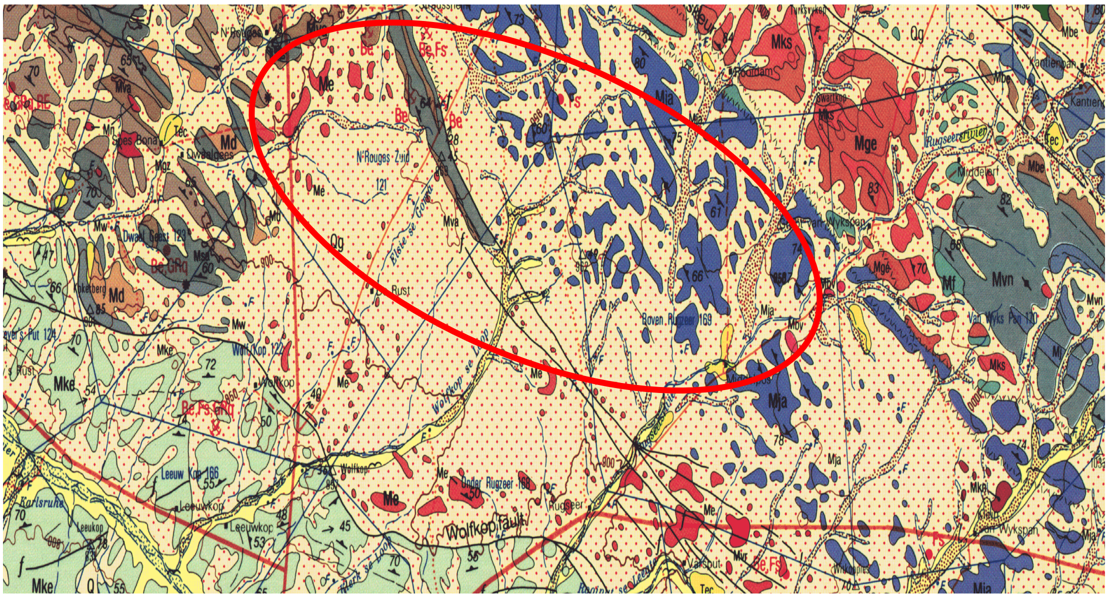

Figure 3: Geological map (2920 Kenhardt) showing the position of the study locality (outlined in red) in relation to the regional geology. Keimos Suite (red, brown & grey), Jacomyns Pan Group (blue), Kalahari Group (yellow).

5. Palaeontological Heritage

As the Precambrian Keimoes Suite is of igneous origin and the Jacomyns Pan Group, which comprises largely pelitic gneiss, are not known to host fossils, it is highly unlikely that palaeontological heritage will be affected by the proposed solar park and distribution line development. Quaternary alluvial deposits of the Gordonia Formation, which are covered by vegetation in the study area, are the only sedimentary deposits in the area which could possibly host fossils. As these deposits are not consolidated it is very unlikely that any fossils will be present.

6. Methodology

Because the study area is underlain by Precambrian rocks of low palaeontological sensitivity a desktop Palaeontological Impact Assessment was undertaken to identify possible sensitive fossil occurrences, assess the significance of possible fossil occurrences, comment on the impact of the proposed development, and to make mitigating recommendations.

7. Recommendations

From the documentation supplied regarding the development it is extremely unlikely that the proposed development will have any effect on palaeontological heritage. However, if fossils are exposed in the Quaternary overburden, it will create a unique opportunity to explore the area for fossils. It is thus recommended that, in the unlikely event that fossils are exposed through construction activities, a qualified palaeontologist must be contacted to assess the exposure for fossils before further development takes place so that the necessary rescue operations are implemented (See Appendix A).

Depending on the nature of the fossils discovered this could entail excavation and removal to a registered palaeontological museum collection. A list of professional palaeontologists is available from South African Heritage Resources Agency (SAHRA).

8. Conclusion

The proposed New Hope Solar Park 1, 2, 3 4 and transmission line development is situated in the Namaqua-Natal Metamorphic Province comprising Precambrian igneous and metamorphic rocks of the Keimoes suite and Jacomyns Pan Group which are exposed in places but are mostly overlain by Quaternary alluvial deposits of the Gordonia Formation of the Kalahari Group. It is extremely unlikely that fossils will be exposed as a result of the development. From a palaeontological perspective, the proposed solar park and transmission line development should proceed but, if fossils are uncovered in the unconsolidated deposits of the Gordonia Formation in the course of construction activities, the developer must immediately call in a qualified palaeontologist to assess the situation and, if necessary, undertake excavation of the fossils.

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APPENDIX A – CHANCE FIND PROTOCOL (CFP)

It is noted that following the findings of this desktop Palaeontological Impact Assessment it is unlikely that fossils will be recovered as a result of the proposed development. The following procedure is required if fossils are noticed on the surface of rocky exposures and/or exposed by excavations.

1. If rocks are exposed by excavation they must be inspected by the environmental officer or designated person.
2. If fossils are noted in the rock outcrop or in the unsolidated sands of the Kalahari Formation (includes bones, insects or plants) a suitably qualified palaeontologist must be approached for a verdict.
3. Fossil material displaced by excavation should be placed in a protected area, in this way development activities will not be held up.
4. Appropriate photographs of the fossils which have been noted should be sent to a qualified palaeontologist for a verdict on how to proceed. This may require a site inspection and excavation by the palaeontologist.
5. Fossils that are deemed to be of good quality or of scientific importance by the palaeontologist must be removed and curated in a recognised palaeontological museum collection where they can be made available for further study.
6. Before fossils are removed from the site a collecting permit must be obtained from SAHRA, and the required permitting procedures and requirements must be followed.
7. If the fossil material is deemed by the registered palaeontologist (as a result of photographic evidence or a site visit) to not be worthy of excavation and curation in a museum collection, the material will not be removed.
8. Mitigation will involve an attempt to capture all rare fossils and systematic collection of all fossils discovered by a registered palaeontologist. This will require routine collecting protocols involving descriptive, diagrammatic and photographic recording of fossils and exposures. The fossils and appropriate contextual samples will be processed to create an archive collection.
9. Should a major *in situ* occurrence be exposed, excavation will immediately cease in that area so that the discovery is not disturbed or altered in any way until the appointed palaeontologist has investigated the find.
10. Should no fossils be discovered in the process of development and excavations have been completed, no further monitoring will be required.
11. Any site visits by a registered palaeontologist and/or excavation of fossil material required, will be undertaken at the cost of the developer.