

Annexure 3 - 5: Palaeontological Assessment

PALAEONTOLOGICAL SPECIALIST STUDY

In terms of Section 38(8) of the NHRA

**Retrospective Palaeontological Impact Assessments for
the clearance of vegetation and expansion of agriculture
on Farm Tregaron no 91, Portion 10 and 14, Sundays
River Local Municipality, Eastern Cape.**



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12 August 2025

THE INDEPENDENT PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS

I, **Dewald Wilken**, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 (as amended) and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2014 (specifically in terms of regulation 13 of GN No. R. 326) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favorable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 14 of GN No. R. 326.

Signed



Name

Dewald Wilken

Date

8 August 2025

EXECUTIVE SUMMARY

A retrospective palaeontological Impact assessment was requested for the proposed vegetation clearance and expansion of agriculture on Farm Tregaron no 91, Portion 10 and 14, Sundays River Local Municipality, Eastern Cape. A retrospective palaeontological impact assessment was conducted to comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

The area is underlain by the Sundays River Formation and the Kirkwood Formation of the Uitenhage Group. The Sundays River Formation is estimated to be about 135 million years old. This Formation is well known for its marine fossils. These fossils range from a variety of invertebrate fossils like gastropods, bivalves, micro fossils like foraminifera, ostracods, and almost complete marine vertebrates like plesiosaurs. The Kirkwood Formation is well known for its silicified tree trunks as well as ferns, cycads, conifers amongst others. It is also known for its dinosaur fossils, like *Nqwebasaurus thwazi*.

This had led to these two formations being ranked as very highly sensitive. After assessing the site, it has been concluded that the expansion of agriculture in this area did not lead to the uncovering or destruction of significant fossil material. Agriculture typically does not need excavation deeper than 1 meter, and this should not penetrate solid bedrock due to the thick weathered soil layer.

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1. Introduction

1.1 Background Information on Project

A retrospective palaeontological Impact assessment was requested for the proposed clearance of vegetation and expansion of agriculture on Farm Tregaron no 91, Portion 10 and 14, Eastern. A retrospective palaeontological impact assessment was conducted to comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). The screening report for an environmental authorisation as required by the 2014 NEMA EIA regulations indicated the proposed site environmental sensitivity to be very high.

The area is located about 14km Southwest of the Town of Addo in the Eastern Cape as seen in Figure 1. The farm is underlain mostly by the Sundays River and Kirkwood Formations of the Uitenhage Group

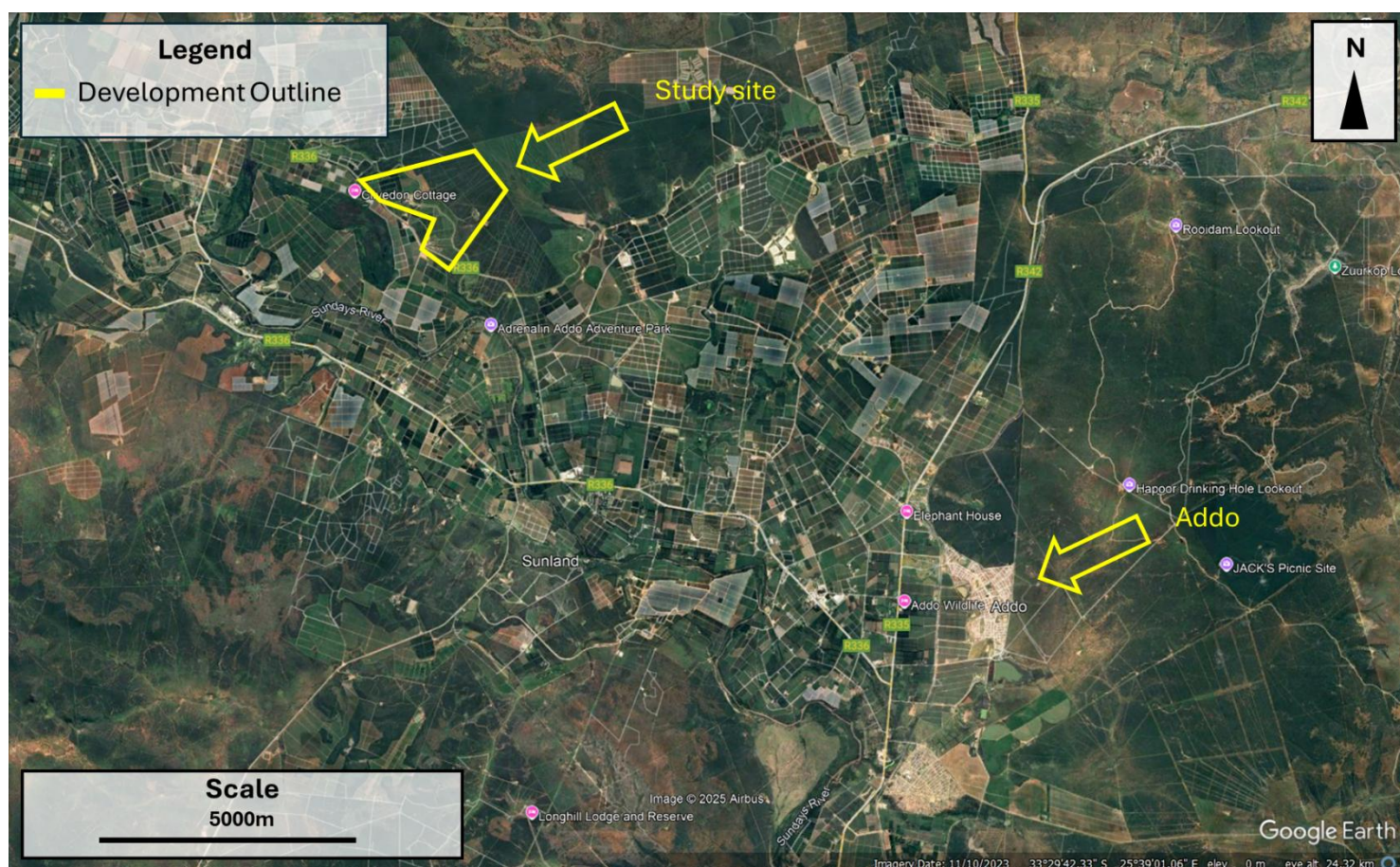


Figure 1. Google Earth© satellite image of Farm Tregaron no 92, Portion 10 and 14 where expansion of agriculture has been conducted, in relation to the town of Addo.

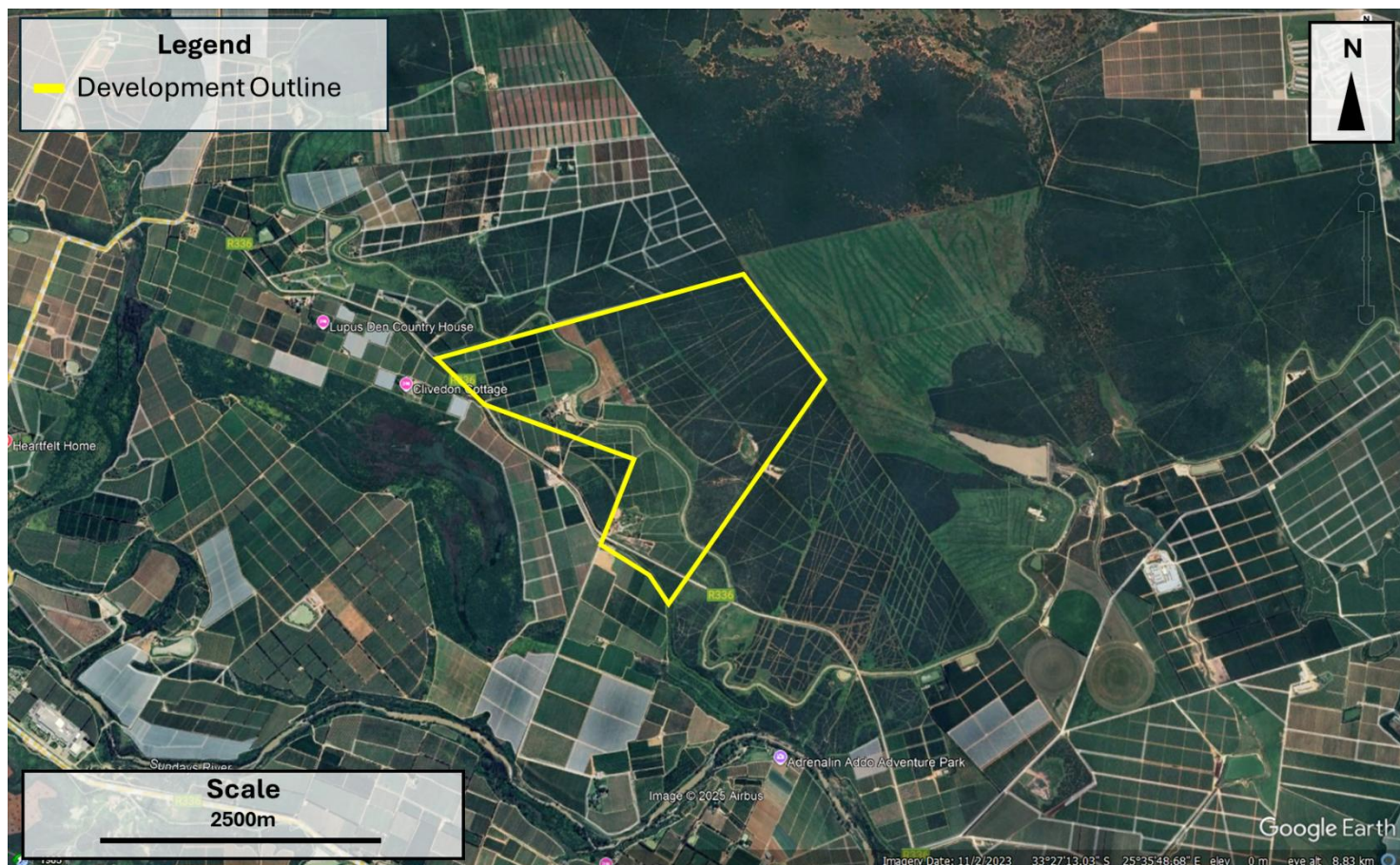


Figure 2. Google Earth© satellite image of Farm Tregaron no 92, Portion 10 and 14, where expansion of agriculture has been done.

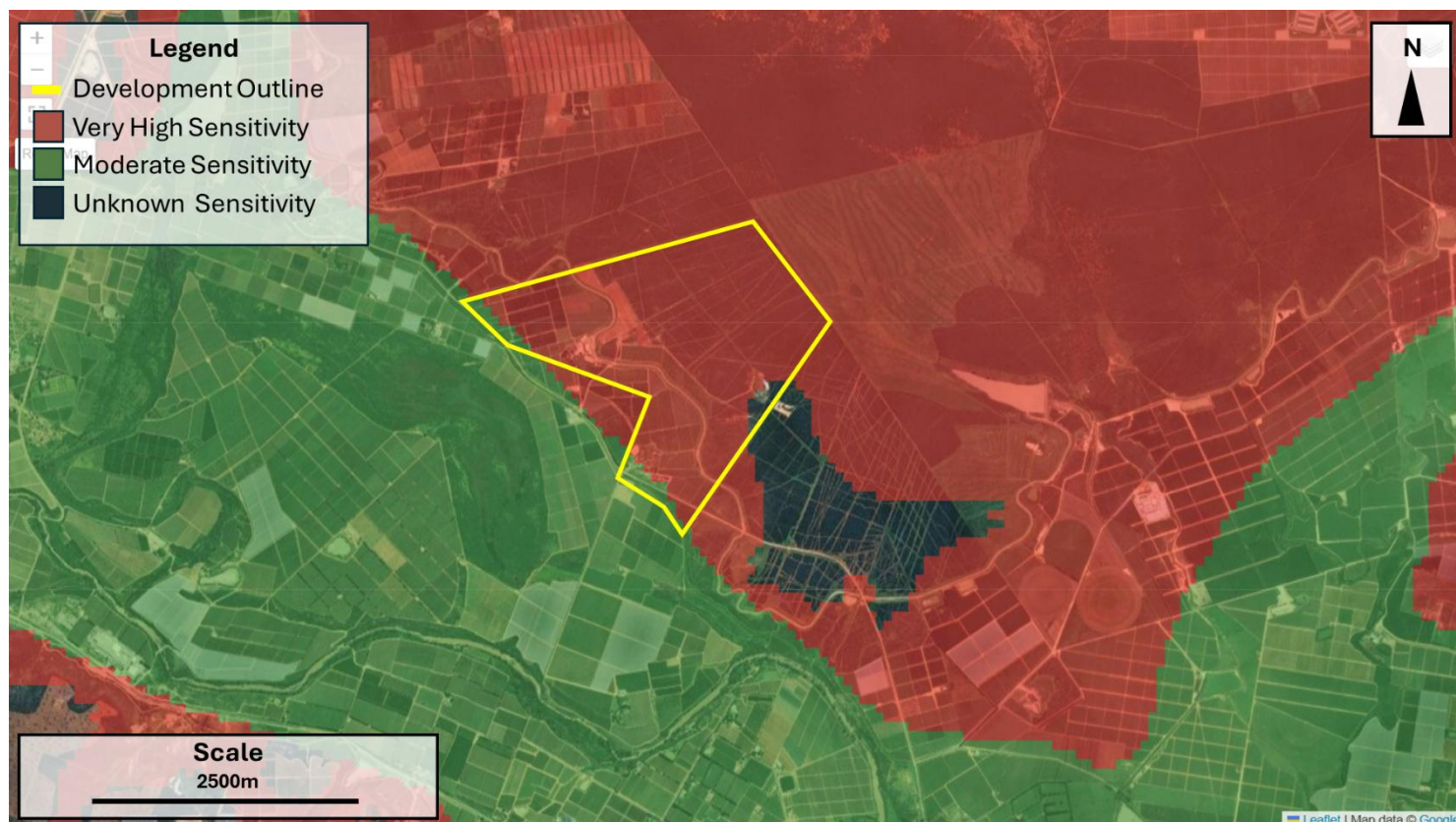


Figure 3. Palaeo-sensitivity Map. Indicating Very High Fossil sensitivity underlying the study area in the Eastern Cape.

2. Study approach

This PIA report provides a record of the inferred palaeontological heritage resources within the study area. The identified resources have been assessed to evaluate their heritage significance in terms of the grading system outlined in Section 3 of the NHRA (Act 25 of 1999). Recommendations for specialist palaeontological mitigation are made where this is considered necessary. The report is based on (1) a review of the relevant scientific literature, including previous palaeontological impact assessments in the broader study region (e.g. Almond 2013). (2) published geological maps and accompanying sheet explanations (e.g. Toerien, D.K. (1984)).

3. Geological and Paleontological background of the study area

The following section will provide a basic review of the relevant geology and palaeontology in the study area. The general geology of the site can be seen in Figure 4.

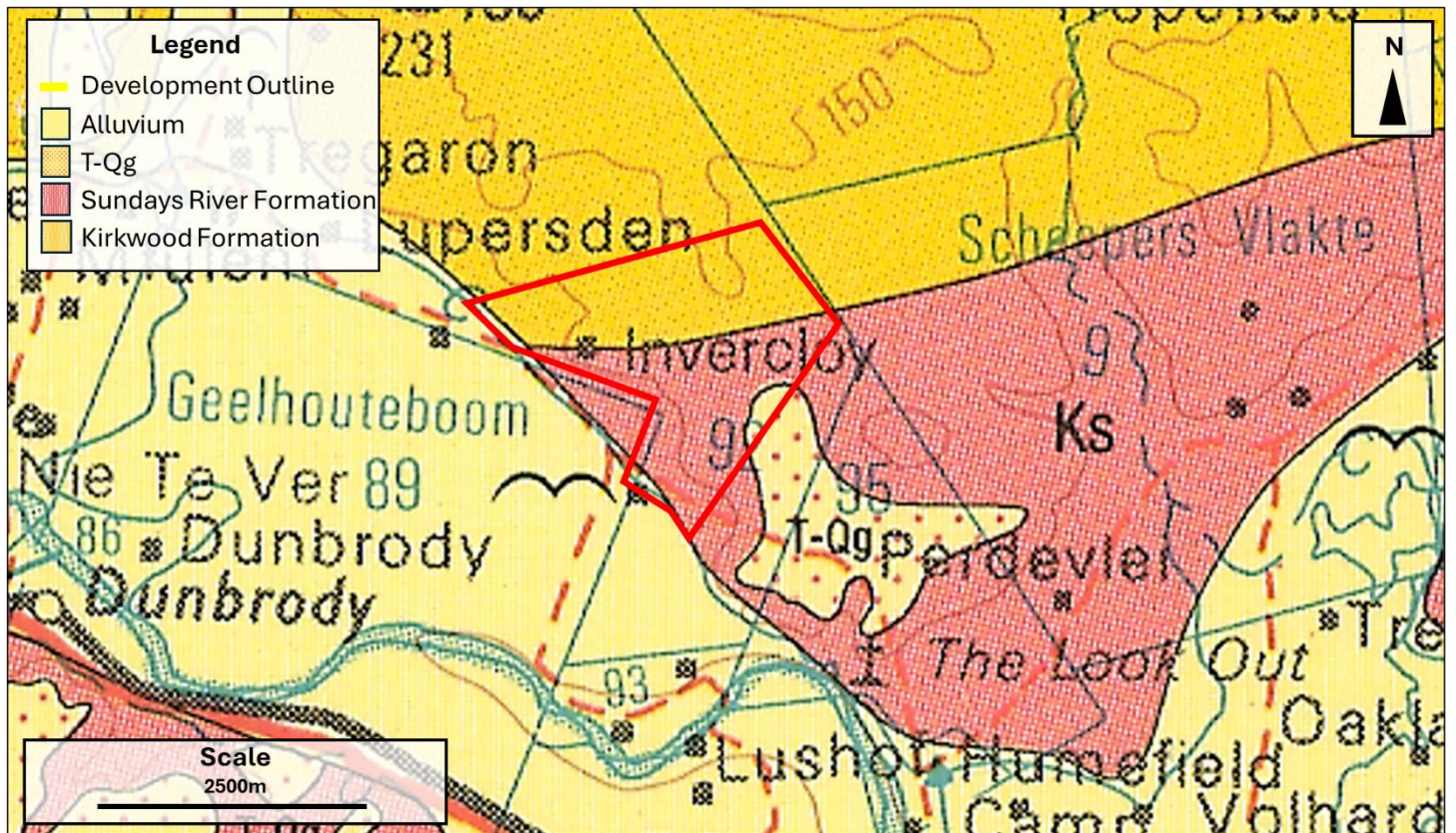


Figure 4. Geologic map of Farm Tregaron no 92, Portion 10 and 14, where agricultural expansion has been done. The area is mostly underlain by the Sundays River Formation and the Kirkwood Formation, the area also overlay small areas of alluvium and T-Qg. (Extracted from Toerien, (1984) – 3324 Port Elizabeth)

3.1. Uitenhage Group.

The area to be developed is underlain by the Sundays River and Kirkwood Formation of the Uitenhage Group. The Algoa basin is one of a few half-graben type basins on the southern coast of South Africa which formed during the breakup of Gondwana. The Algoa basin is filled with the Uitenhage Group which provides it with the most diverse fill of these basins. Adjacent to the Commanda Kraal Fault, the Addo trough preserves more than 3500m of sediment. The Algoa basin is more complex than the other half-graben as it contains full graben structures, horst blocks and diagonal faults cutting the horsts. This can be seen in Figure 5.

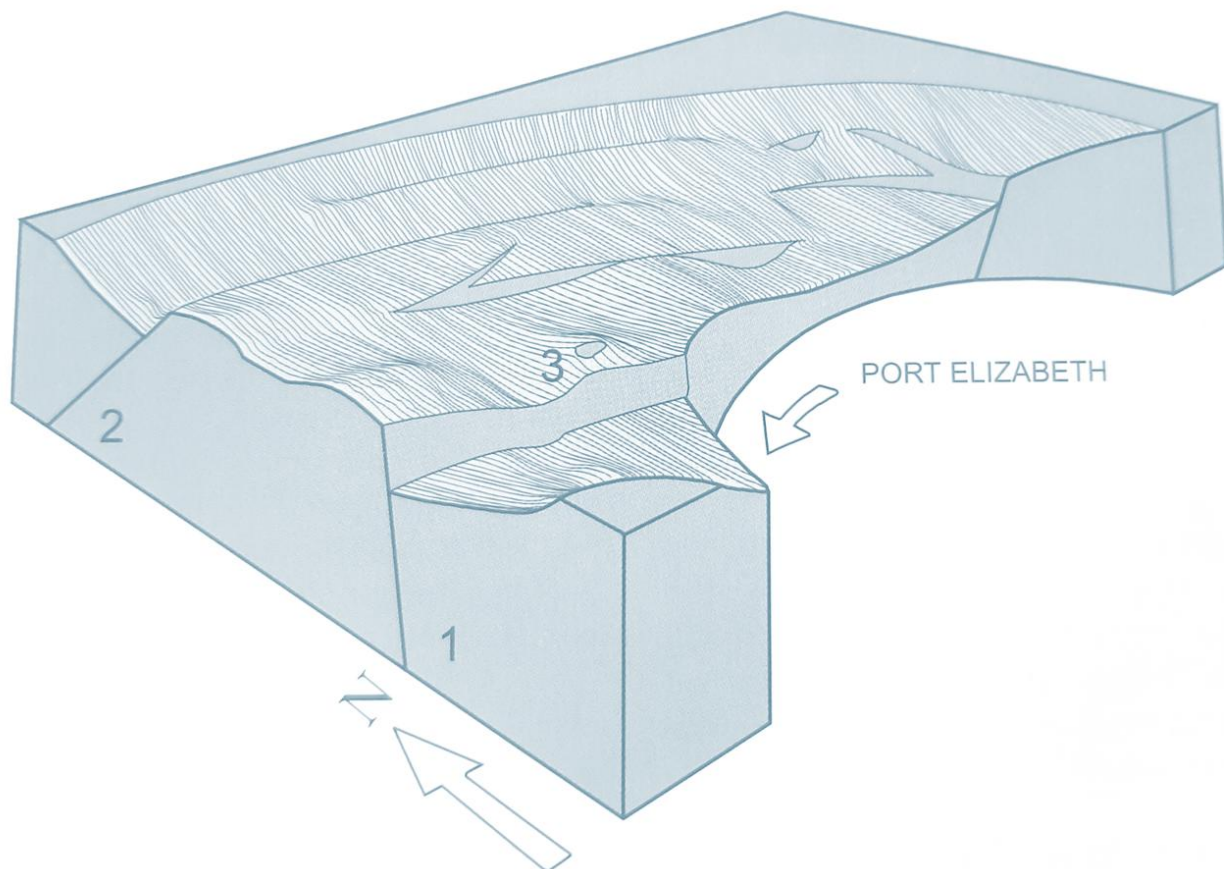


Figure 5. Simplified block diagram of the Algoa basin showing the floor of the basin, with Cretaceous and younger sediment removed. 1 -Coega Fault, 2- Commanda Kraal Fault, 3- Coega Kop, After Shone (1976) based on reflection-seismic data from Soekor. (Thomas & Johnson 2006)

Although the trough of some of these faults are in excess of 2000m this does not translate to the Uitenhage Group deposits. The lack of Mesozoic debris or scree at the fault indicates that the subsidence of the faults kept pace with the deposition of the Uitenhage Group

The Uitenhage Group is divided into the Enon, the Kirkwood, and the Sundays River Formations. For this project only the Sundays River and Kirkwood Formations is of interest.

3.1.1. Sundays River Formation (Very High Palaeo-Sensitivity)

The Sundays River Formation, which reaches a thickness of about 2000m in areas of the Algoa Basin, overlies and appears to grade laterally into parts of the Kirkwood Formation. It consists of thin grey sandstones, siltstones, and mudrock. The sandstones are fine – medium grained litharenites which is less porous and permeable than those of the Kirkwood formation. These sandstones often contain shell fragments with carbonate cement. Small-scale trough and planar crossbedding occur in the sandstones. Interbedded sandstone and mudrock units show wavy, flaser and lenticular bedding. Wave bedding and load structures are common.

The fossil content of the Sundays River Formations is exceptionally high, and coquina sandstones crammed with invertebrate shells cemented with calcite often form prominent layers in the less resistant outcrops. Plant remains, vertebrate fragments and microfossils like ostracods and foraminifera are common. Some vertebrate fossils are almost complete, with the most notable a skeleton of a marine plesiosaur recovered from the Sundays River formation near Redhouse.

Trace fossils are common. These include gastropod “ploughing” tracks, and a few silt-filled borrows. Ammonite body fossils found and have been used to date the deposit to Valanginian (Early Cretaceous ~135Ma)

Figure 6 shows some of the common invertebrates found.

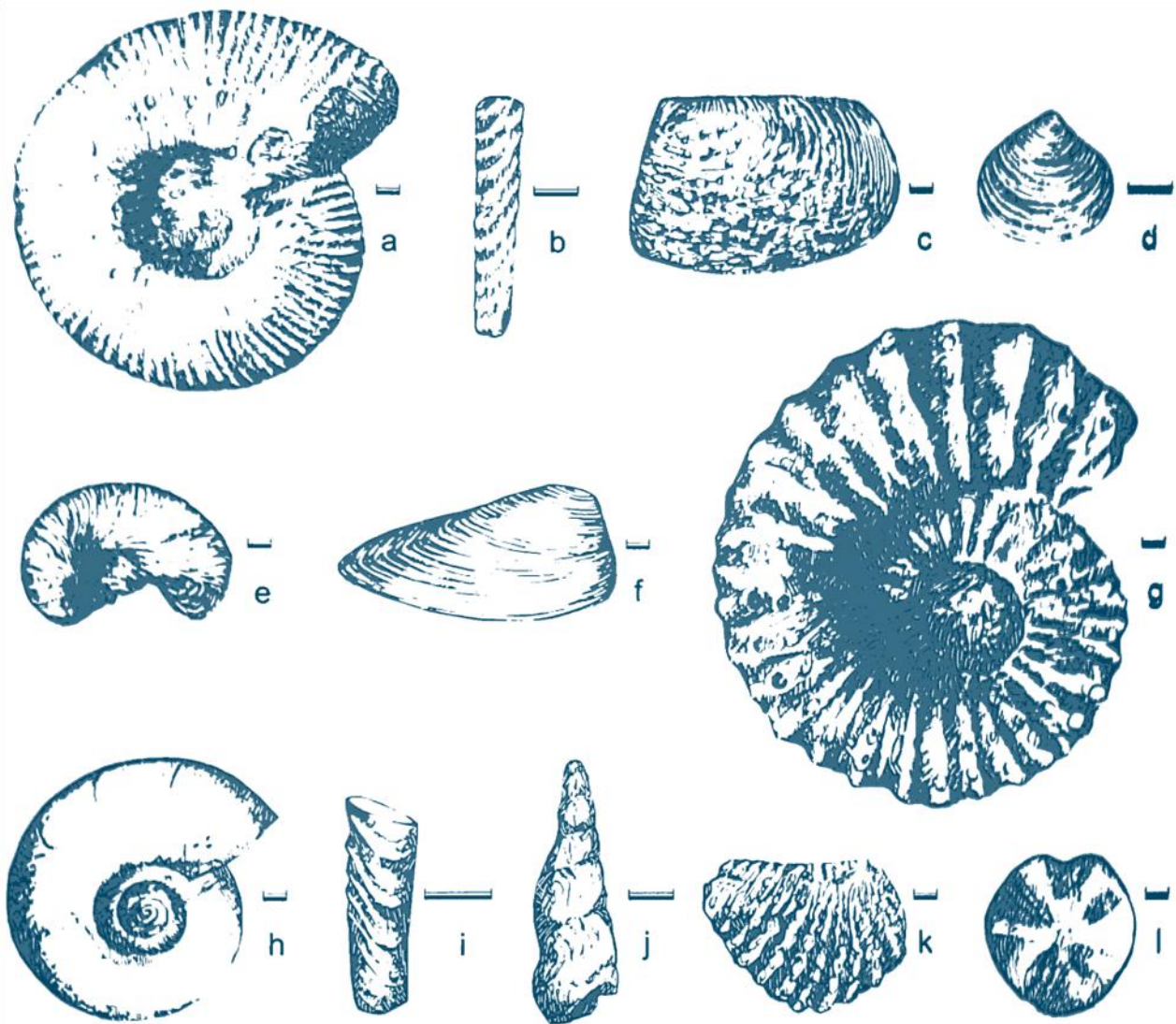


Figure 6. Some common marine invertebrate fossils from the South African Cretaceous. a-f: Sunday River Formation, Early Cretaceous (Valanginian); g-l Mzamba Formation and Zululand Group, Late Cretaceous (Santonian to Campanian) (a) *Olcostephanus*, an "ammonite"; *Bochianites*, an "ammonite"; (c) *Steinmannella*, a bivalve; *Herzogina*, a bivalve; (e) *Aetostreon*, an oyster from the Subfamily Exogyrinae; (f) *Seebachia*, a bivalve; (g) *Texanites*, an ammonite; (h) *Hauericeras*, an "ammonite"; (i) *Baculites*, an ammonite; (j) *Pseudomelania*, a gastropod; (k) *Acanthotrignia*, a bivalve; (l) *Hemiaster*, an irregular echinoid. The bar-scale next to each drawing is about 1cm long. (Thomas & Johnson 2006)

The type of fossils found in the Sundays River Formation indicates a shallow marine depositional environment, consisting of estuarine, lagoonal and shallow shelf settings. This fits with the sparse palaeo-current data and the various sedimentary structures pointing to a tidal environment.

On land the Sundays River Formation has been eroded resulting in an angular unconformity separating the Formation from the much younger Alexandria Formation.

3.1.2. The Kirkwood Formation (Very High Palaeo-Sensitivity)

The Kirkwood Formation was shaped by fluvial sedimentation, with point-bar sand deposits, overbank mud accumulation, and subaerial exposure of the most recent sediments.

The Kirkwood Formation consists mostly of coarse- to medium- grained buff to olive coloured lithic sandstone (up to 2000m thick) and is often interbedded with thick grey-green siltstones and mud rock (often more than 30 m thick). These sandstones contain trough and planar crossbedding. The Kirkwood Formation is well known for its fossilised wood, that can range from smaller pieces to whole charred, silicified tree trunks as well as ferns, cycads, and conifers.

Fresh water bivalves, and vertebrate remains have also been recorded. The siltstones in this formation are colour-mottled which indicates sub areal exposure and/or root zone bioturbation. The mudrock is generally barren, although some plant and vertebrate remains have been found.

Kirkwood Formation

The Kirkwood Formation is of high importance for palaeontology. It is one of the few fossil bearing beds of the Early Cretaceous and might fill a gap in the terrestrial Mesozoic fossil record. It is very well known for the “Wood Beds” containing large amounts of fossil flora such as conifers, cycads, and ferns. It has provided evidence of four taxonomically distinct groups of sauropods as seen in Figure 7.

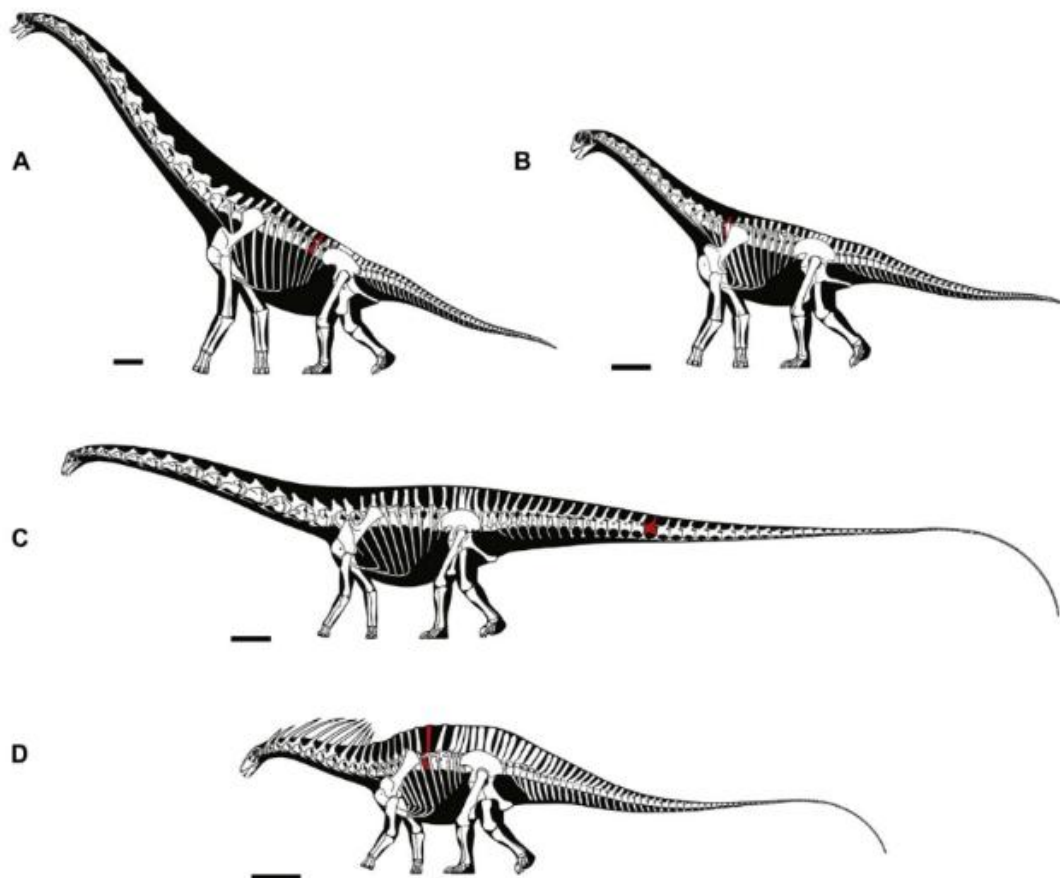


Figure 7 Sauropod diversity present within the Kirkwood Formation. A - after Giraffatitan; B - after Camarasaurus, C - after Diplodocus; and D – after Amargasaurus.

The Kirkwood Formation has yielded animals like Theropods, Ornithopods, frogs, turtles, Sphenodontids, crocodiles and some mammalian bones.

Plant fossils have also been found these include *Araucaria* sp. (Figure 8, Figure 9), Ferns (Figure 10 and Figure 11), Cycads (Figure 12), *Benettitales* (Figure 13), and mosses.



Figure 8. A small fossil branch of *Araucaria* sp.



Figure 9. Small fossil cone possibly from an *Araucaria* or other conifer.



Figure 10. Fossil fern collected on site.



Figure 11. Fossil Fern collected on site.



Figure 12. Fossil Cycad leaf.



Figure 13. Fossil *Benettiales* leaf.

3.2. Alluvium and T-qg

Two other layers are seen on the map, underlying the study site. These layers are an alluvium layer and an unnamed layer marked as T-qg on the map. Both these layers are of quaternary age and most likely not fossil bearing.

4. Assessment of the Impact of the Development

As seen in the photographs below (Figure 14, Figure 15, Figure 16) the area is covered in lush vegetation and a thick soil cover.



Figure 14. The View over the southeastern portion of the farm, covered in dense thicket.



Figure 15. a 1 meter deep trench dug in the site shows a thick layer of soil and highly weathered rock underlying the area.



Figure 16. The thick soil cover exposed in an area where some soil was removed.



Figure 17. View to the southwest of the site, showing more thick, thicket cover in the area.

The area is underlain by the Sundays River and Kirkwood Formation of the Uitenhage Group. The Sundays River Formation is well known for its invertebrate and vertebrate marine fossils. The Kirkwood Formation is known for freshwater bivalves, plant material, various dinosaurs, frogs, turtles and charcoal. Because of these fossils assemblages these formations are marked as very highly sensitive from a palaeontological point of view. The area is completely covered a thick soil layer. It is unlikely that any significant fossils have been damaged, destroyed, or lost, during the expansion of agriculture.

Table 1. Impact Assessment Criteria pre and post Mitigation

	Pre-Mitigation		Post-Mitigation	
Criteria	Category	Explanation	Category	Explanation
Overall Nature	<i>Slightly Negative</i>	Fossil find is highly unlikely	<i>Slightly Negative</i>	Fossil find is highly unlikely
Type	<i>Direct</i>	The development will directly impact these resources	<i>Direct</i>	The development will directly impact these resources
Extent	<i>Site</i>	Impact is limited to the site footprint	<i>Site</i>	Impact is limited to the site footprint
Duration	<i>Short term</i>	During planting	<i>Short term</i>	During planting
Severity	<i>Negative</i>	Fossil find is highly unlikely	<i>Negative</i>	Fossil find is highly unlikely
Reversibility	<i>Completely reversable</i>	If Fossil Find procedure is followed in case of fossil find.	<i>Completely reversable</i>	If Fossil Find procedure is followed in case of fossil find.
Irreplaceable Loss	<i>Resources may be partially destroyed.</i>	Fossil find is highly unlikely. Impact will remain negligible if the Chance Fossil Find Procedure is followed in the case of any fossil finds.	<i>Resources may be partially destroyed.</i>	Fossil find is highly unlikely. Impact will remain negligible if the Chance Fossil Find Procedure is followed in the case of any fossil finds.
Probability	<i>Unlikely</i>	Fossil find is highly unlikely	<i>Unlikely</i>	Fossil find is highly unlikely
Mitigation Potential	<i>High</i>	If the Chance Fossil Find Procedure is followed in the case of any fossil finds.	<i>High</i>	If the Chance Fossil Find Procedure is followed in the case of any fossil finds.
Impact Significance	<i>Negligible</i>	Fossil find is highly unlikely	<i>Negligible</i>	Fossil find is highly unlikely
Overall significance	<i>Low</i>		<i>Low</i>	

Table 2. Assessment criteria on the NO GO option.

	No Go	
Criteria	Category	Explanation
Overall Nature	<i>Negative</i>	No fossils will be found if no excavation is done.
Type	<i>Direct</i>	No fossils will be found if no excavation is done.
Extent	<i>Site</i>	Impact will be site specific.
Duration	<i>Very long term</i>	No fossils will be found if no excavation is done, and any fossils will eventually weather and be lost.
Severity	<i>Low</i>	No fossils will be found if no excavation is done. However, no fossils will be lost.
Reversibility	<i>Completely reversible</i>	Impact is reversible if the excavation is done, and the chance fossil find procedures are followed in case of any finds.
Irreplaceable Loss	<i>Low</i>	No fossils will be found if no excavation is done.
Probability	<i>definite</i>	Fossil find is highly unlikely
Mitigation Potential	<i>High</i>	Impact is reversible if the excavation is done, and the chance fossil find procedures are followed in case of any finds.
Impact Significance	<i>High</i>	No development negates the possibility of finding Fossils.

5. Assumptions and Uncertainties

Based on the palaeontological record and the geology of the area, it is known that the Sundays River and Kirkwood Formation are rich in fossils. The area under investigation is covered by a thick red terra-rosa soil layer. Therefore, the chance of finding significant fossils without deep excavation is unlikely.

“The key assumption for these scoping studies is that the existing geological maps and datasets used to assess site sensitivity are correct and reliable. However, the geological maps used were not intended for fine scale planning work and are largely based on aerial photographs alone, without ground-truthing. When ground-truthing is done work is often hampered by sediment and vegetation cover. There is also an inadequate database for fossil heritage for much of the RSA, due to the small number of professional paleontologists carrying out fieldwork in RSA. Most development study areas have never been surveyed by a palaeontologist.

These factors may have a major influence on the assessment of the fossil heritage significance of a given development and without supporting field assessments may lead to either:

- an underestimation of the palaeontological significance of a given study area due to ignorance of significant recorded or unrecorded fossils preserved there, or
- an overestimation of the palaeontological sensitivity of a study area, for example when originally rich fossil assemblages inferred from geological maps have in fact been destroyed by weathering or are buried beneath a thick mantle of un-fossiliferous “drift” (soil, alluvium etc.).” Groenewald (2016)

It is important to note that field assessments are often hampered by vegetation and thick sediment cover, and it is often the case that fossil material is only uncovered and discovered during excavation.

6. Conclusion and Recommendations

The area is underlain by the Sundays River Formation and the Kirkwood Formation of the Uitenhage Group. The Sundays River Formation is estimated to be about 135 million years old. This Formation is well known for its marine fossils. These fossils range from a variety of invertebrate fossils like gastropods, bivalves, micro fossils like foraminifera, ostracods, and almost complete marine vertebrates like plesiosaurs. The Kirkwood Formation is well known for its silicified tree trunks as well as ferns, cycads, conifers amongst others. It is also known for its dinosaur fossils, like *Algoa Saurus*, and *Nqwebasaurus thwazi*.

This had led to these two formations being ranked as very highly sensitive. After assessing the site, it has been concluded that the expansion of agriculture in this area did not run a high risk of uncovering or destroying significant fossil material. Agriculture typically does not need excavation deeper than 1 meter, and this should not penetrate solid bedrock due to the thick weathered soil layer.

Should important new fossil remains be found the finder should alert ECPHRA (*i.e.* The Eastern Cape Provincial Heritage Resources Authority). Contact details: Ms. Ayanda MaMncwabe Mama 74 Alexander Road, King Williams Town 5600; ayanda.mncwabe-mama@ecsrac.gov.za / lungiswam@ecphra.gov.za as soon as possible. This is so that appropriate action can be taken in good time by a professional palaeontologist at the developer's expense. Palaeontological mitigation would normally involve the scientific recording and judicious sampling or collection of fossil material as well as associated geological data (*e.g.* stratigraphy, sedimentology, taphonomy). The palaeontologist concerned with mitigation work will need a valid fossil collection permit from ECPHRA and any material collected would have to be curated in an approved depository (*e.g.* museum or university collection). All palaeontological specialist work should conform to international best practice for palaeontological fieldwork and the study (*e.g.* data recording fossil collection and curation, final report) should adhere as far as possible to the minimum standards for Phase 2 palaeontological studies recently developed by SAHRA (2013). These recommendations are summarised in tabular form in Appendix 1 (Chance Fossil Finds Procedure) and should be incorporated into the Environmental Management Programme (EMPr) for the proposed development.

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Appendix 1

Chance Fossil Finds Procedure

(Adopted from the HWC Chance Fossils Finds Procedure: June 2016)

Introduction

This document is aimed to inform workmen and foremen working on a construction and/or mining site. It describes the procedure to follow in instances of accidental discovery of palaeontological material (please see attached poster with descriptions of palaeontological material) during construction/mining activities. This protocol does not apply to resources already identified under an assessment undertaken under s. 38 of the National Heritage Resources Act (no 25 of 1999).

Fossils are rare and irreplaceable. Fossils tell us about the environmental conditions that existed in a specific geographical area millions of years ago. As heritage resources that inform us of the history of a place, fossils are public property that the State is required to manage and conserve on behalf of all the citizens of South Africa. Fossils are therefore protected by the National Heritage Resources Act and are the property of the State. Ideally, a qualified person should be responsible for the recovery of fossils noticed during construction/mining to ensure that all relevant contextual information is recorded.

Heritage Authorities often rely on workmen and foremen to report finds, and thereby contribute to our knowledge of South Africa's past and contribute to its conservation for future generations.

Training

Workmen and foremen need to be trained in the procedure to follow in instances of accidental discovery of fossil material, in a similar way to the Health and Safety protocol. A brief introduction to the process to follow in the event of possible accidental discovery of fossils should be conducted by the designated Environmental Control Officer (ECO) for the project, or the foreman or site agent in the absence of the ECO. It is recommended that copies of the attached poster and procedure are printed out and displayed at the site office so that workmen may familiarise themselves with them and are thereby prepared in the event that accidental discovery of fossil material takes place.

Actions to be taken

One person in the staff must be identified and appointed as responsible for the implementation of the attached protocol in instances of accidental fossil discovery and must report to the ECO or site agent. If the ECO or site agent is not present on site, then the responsible person on site should follow the protocol correctly in order to not jeopardize the conservation and well-being of the fossil material. Once a workman notices possible fossil material, he/she should report this to the ECO or site agent.

Procedure to follow if it is likely that the material identified is a fossil:

- The ECO or site agent must ensure that all work ceases immediately in the vicinity of the area where the fossil or fossils have been found;
- The ECO or site agent must inform SAHRA of the find immediately. This information must include photographs of the findings and GPS co-ordinates;
- The ECO or site agent must compile a Preliminary Report and fill in the attached Fossil Discoveries: Preliminary Record Form within 24 hours without removing the fossil from its original position. The Preliminary Report records basic information about the find including:
 - The date
 - A description of the discovery
 - A description of the fossil and its context (e.g. position and depth of find)
 - Where and how the find has been stored
 - Photographs to accompany the preliminary report (the more the better):
 - A scale must be used
 - Photos of location from several angles
 - Photos of vertical section should be provided
 - Digital images of hole showing vertical section (side);
 - Digital images of fossil or fossils.

Upon receipt of this Preliminary Report, SAHRA will inform the ECO or site agent whether a rescue excavation or rescue collection by a palaeontologist is necessary.

- Exposed finds must be stabilised where they are unstable and the site capped, e.g., with a plastic sheet or sandbags. This protection should allow for the later excavation of the finds with due scientific care and diligence. SAHRA can advise on the most appropriate method for stabilisation.
- If the find cannot be stabilised, the fossil may be collected with extreme care by the ECO or the site agent and put aside and protected until SAHRA advises on further action. Finds collected in this way must be safely and securely stored in tissue paper and an appropriate box. Care must be taken to remove all the fossil material and any breakage of fossil material must be avoided at all costs.

No work may continue in the vicinity of the find until SAHRA has indicated, in writing, that it is appropriate to proceed.

FOSSIL DISCOVERIES: PRELIMINARY RECORDING FORM

Name of project:		
Name of fossil location:		
Date of discovery:		
Description of situation in which the fossil was found:		
Description of context in which the fossil was found:		
Description and condition of fossil identified:		
GPS coordinates:	Lat:	Long:
If no co-ordinates available then please describe the location:		
Time of discovery:		
Depth of find in hole		
Photographs (tick as appropriate and indicate number of the photograph)	Digital image of vertical section (side)	
	Fossil from different angles	
	Wider context of the find	
Wider context of the find. Temporary storage (where it is located and how it is conserved)		
Person identifying the fossil Name:		
Contact:		
Recorder Name:		
Contact:		
Photographer Name:		
Contact:		



herewith certifies that

Dewald Dirk Wilken

Registration Number: 115344

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)

in the following field(s) of practice (Schedule 1 of the Act)

Geological Science (Professional Natural Scientist)

Effective **20 July 2016**

Expires **31 March 2026**



A handwritten signature in black ink, appearing to read 'S. Neph'.

Chairperson

A handwritten signature in black ink, appearing to read 'N. Erasmus'.

Chief Executive Officer



To verify this certificate scan this code

Dewald Wilken

Palaeontologist/Geologist

Dewald is a palaeontologist and geologist with experience in palaeontological impact assessment, fossil excavation and preservation, environmental control, ground water, potable water, effluent, and Hazardous waste

Education & qualifications

*MSc, Palaeontology NMMU (Now NMU),
Port Elizabeth, South Africa, 2011*

*BSc Honours, Geology, NMMU, Port
Elizabeth, South Africa, 2005*

*Thesis title "A Palaeolimnological study of
the Knysna Wilderness area and its
application to sea level change"
supervisors R Shone & C Anderson*

*BSc Honours, GIS, NMMU, Port Elizabeth,
South Africa, 2012*

*BSc, Geosciences, NMMU, Port Elizabeth,
South Africa, 2005*

Professional Affiliations

*South African Council for Natural Scientific Professions - Pr.Sci.Nat. –
Professional Natural Scientist – 115344/4*

Experience

Company Name: SRK Consulting

Position: Geologist / Palaeontologist / Environmental Control Officer

Duration: 2015 -2017

Duties: *Paleontological Impact Assessment, Monitoring and enforcing
environmental regulations, sampling, data capturing, data
analysis and report writing*

Company Name: Nelson Mandela Metropolitan University

Position: Lecturer

Duties: *Lecturing 1st, 2nd, 3rd, Honours, and extended
Curriculum in Practical and Theory Classes*

(2004- 2015)

- *Mineralogy & Petrology*
- *Mapping*
- *Introduction to Earth*
- *Physical geology*
- *Photogrammetry*
- *Economic geology*
- *Sedimentology*
- *Stratigraphy*
- *Palaeontology*
- *Geomorphology*
- *Cartography (GIS)*

Company Name: **Anglo Gold Ashanti**

Position: In House facilitator

Duties: Lecturing and Examination of Practical &
Theory Classes (2009-2013)

- Mineralogy & Petrology
- General geology
- Structural geology

Company Name: **Nelson Mandela Metropolitan University**

Position: Demonstrator

Duties: Tutoring students in practical methodology (2002-2005)

Company Name: **Council for Geoscience (2005)**

Position: Data capturer

Duties: Data capturing

Relevant project experience

Solar Plant, Makhanda
St Francis Bay Grande Camore Estate
Loerie WWTW
CDC Coega Bulk Sewers

Palaeontological impact assessment
Palaeontological impact assessment
Palaeontological impact assessment
Palaeontological impact assessment

Newlyn Saldanha	Palaeontological impact assessment
Patensie Stuurman Kop Housing	Palaeontological impact assessment
Honeyville Ecovillage and Nature Reserve	Palaeontological impact assessment
Aberdeen low-cost housing	Palaeontological impact assessment
Kareedouw low-cost housing	Palaeontological impact assessment
Joubertina low-cost housing	Palaeontological impact assessment
Louterwater low-cost housing	Fossil Find Procedure
Woodlands low-cost housing	Fossil Find Procedure
Erf 1052 Theescombe	Palaeontological impact assessment
Keiskammahoek Pipelines Paleo Study	Palaeontological impact assessment
EIA Woodridge Sportfield	Fossil Find Procedure
Sunriver Citrus - Farm 714 Sunland	Palaeontological impact assessment
Oceanview, Jeffreys Bay, Sewer Line	Palaeontological impact assessment
DRDAR Projects	Palaeontological impact assessment
Mentors Retirement Estate and Business Area	Palaeontological impact assessment
Spekboom planting Heritage implant	Palaeontological impact assessment
Geelhout housing development	Palaeontological impact assessment
Bare Foot Adda Elephant Lodge	Palaeontological impact assessment
DRDAR Piggery	Palaeontological impact assessment
Kinkelbos poultry	Palaeontological impact assessment
Heights to Twee Reviere	Palaeontological impact assessment
Colchester Erf 1618	Palaeontological impact assessment
Transnet Manganese	Palaeontological impact assessment
Humandorp Erf 3279 & 3280	Palaeontological impact assessment
Klein Zeekoei Estate	Palaeontological impact assessment
Addo to Kirkwood	Palaeontological Excavation / Fossil Rescue
Wells Estate	Plant rescue
Eden Prop Development	Palaeontological impact assessment
Vlakte Plaas Jefereys Bay	Palaeontological impact assessment
Kwagga Citrus	Palaeontological impact assessment
Colchester Bank stabilisation	Palaeontological impact assessment
Erf 903 Westring solar	Palaeontological impact assessment
Bank Stabalisation Vetvlakte	Palaeontological impact assessment
Erf 77 Green bushes	Palaeontological impact assessment
Citrus Grove	Palaeontological impact assessment
Kwagga Citrus	Palaeontological impact assessment
Paradise Beach Residential	Palaeontological impact assessment
Beachview Residential	Palaeontological impact assessment
Platterug Bush Clearance	Palaeontological impact assessment
Mont Agri Dam	Palaeontological impact assessment
Gunstfontein WEF	Palaeontological Walk Through
Kudusberg OYA	Palaeontological Walk Through
Beaufort to Carnarvon SKA line	Palaeontological impact assessment
Castle Rock	Palaeontological impact assessment
Seriso Cultivation	Palaeontological impact assessment
Leopards trail, Baviaans	Palaeontological impact assessment

Mdantesane Interchange Upgrade Coega Development Corporation Zone 1 Palaeontological Investigation APLI Cold storage facility. R336 Road and Bridge upgrade Addo-Kirkwood Coega Development Corporation Zone 1 Palaeontological Investigation BAIC. Chatty Link Rd. Extension.	Palaeontological impact assessment paleontologist on site, during initial clearance and excavation in the CDC Zone 1
Kelvin Jones WWTW Upgrade	Palaeontological impact assessment paleontologist on site, during initial clearance and excavation in the CDC Zone 1. ECO during road and storm water drain construction ECO during the upgrading of the water works in the Kelvin Jones facility in Uitenhage.
Kabah Langa Phase 6 Civil Service Infrastructure Bloemendal Arterial Extension.	ECO during road and storm water drain construction. ECO during the botanical survey, and the subsequent search and rescue of fauna and flora.
Malabar Extension 6 Phase 2 Housing.	ECO during the botanical survey, and the subsequent search and rescue of fauna and flora.
Jachtlakte Precinct Sustainable Housing Plan: HS5B.	ECO during the botanical survey, and the subsequent search and rescue of fauna and flora.
Coega Kop Aquatic Study	Field survey for wetlands in and around Coega Kop.
TPT Water and Effluent Monitoring.	Sampling, analysis and reporting on the quality of effluent, storm water and drinking water.
TPT Bulk Terminal Monitoring	Sampling, analysis and reporting on the quality/contamination of ground water from boreholes in and around the TPT Bulk Terminal (Manganese storage).
NMBM Water Quality Project	Sampling of the Baakens, Papenkuils, Shark, and Hume river water, for quality assessment.
Motherwell Canal Monitoring	Sampling of water at the Motherwell Canal and artificial wetland.
Coega CDC Monitoring	Sampling, analysis and reporting on the quality of the effluent from the CDC.

NMBM monitoring – Arlington,
Koedoeskloof, iBhayi, Kwanobuhle.

Fry's Metal Groundwater
Monitoring

Sampling, analysis and reporting on the
quality of ground water in and around the
NMBM landfill sites.

Sampling, analysis and reporting on the
quality of ground water in the Fry's Metal
work yard.