Palaeontological Impact Assessment for the proposed Kalahari Secondary School, north of Kuruman, Northern Cape Province

Desktop Study (Phase 1)

For

Humba Environmental Consultancy

31 July 2020

Prof Marion Bamford
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Expertise of Specialist

The Palaeontologist Consultant: Prof Marion Bamford
Qualifications: PhD (Wits Univ, 1990); FRSSAf, ASSAf
Experience: 31 years research; 23 years PIA studies

Declaration of Independence

This report has been compiled by Professor Marion Bamford, of the University of the Witwatersrand, sub-contracted by Humba Environmental Consultancy, Centurion, South Africa. The views expressed in this report are entirely those of the author and no other interest was displayed during the decision making process for the Project.

Specialist: Prof Marion Bamford

Signature: MKBamford

Executive Summary

A palaeontological Impact Assessment was requested for the proposed construction of Kalahari Secondary School, northern Kuruman, Northern Cape Province. 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), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed development.

The proposed site lies on the surface limestone and calcrete of the Kalahari Group that are Quaternary in age. Scattered plant, shell or bone fragments might be trapped in the calcrete and preserved but these are of little scientific value. Only assemblages of fossils trapped in palaeo-spring or palaeo-pan sites would be significant but these geomorphological features are not in evidence. Nonetheless a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no palaeontological site visit is required unless fossils are found once excavations commence.

Table of Contents

1. Background

The Department of Education proposes to build a school, the Kalahari Secondary School in Ga-Sekgonyana Local Municipality, in the northern part of Kuruman (Figure 1). The site is 39 – 77 ha??. and within an urban and semi-rural setting so has been disturbed.

The Proposed Kalahari Secondary School Project entails the following:

- 1 Large Admin Block
- 1 Nutrition Centre
- 1 Media Centre
- 2 x Multipurpose Classrooms
- 5 x 5 Classroom Block
- 1 x (2 Classrooms) Science Lab
- 1 x (1 Classroom) Science Lab
- 2 x Large Ablutions
- 1 Multipurpose Hall
- 1 Guard House
- 1 Refuse Yard
- 2 Disabled Parking's
- 24 Open Parking's
- 1 Sports Field (Soccer, Rugby equipment)
- 11 Drinking Fountains
- 2 Flag Poles
- Clear-vu Boundary fence
- Entrance Wall
- Covered Walkways
- 1 Janitor Quarters
- 2 Combi Court (Tennis, Basketball, Netball and volleyball equipment)
- Schedules
- Outdoor benches
- Solar panels

A Palaeontological Impact Assessment was requested for the project. 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), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed development and is presented herein.

Table 1: Specialist report requirements in terms of Appendix 6 of the EIA Regulations (amended 2017)

	A specialist report prepared in terms of the Environmental Impact Regulations of 2017 must contain:	**Relevant section in report**

ai	Details of the specialist who prepared the report	Appendix B
aii	The expertise of that person to compile a specialist report including a curriculum vitae	Appendix B
b	A declaration that the person is independent in a form as may be specified by the competent authority	Page 1
c	An indication of the scope of, and the purpose for which, the report was prepared	Section 1
ci	An indication of the quality and age of the base data used for the specialist report: SAHRIS palaeosensitivity map accessed – date of this report	Yes
cii	A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Section 5
d	The date and season of the site investigation and the relevance of the season to the outcome of the assessment	N/A
e	A description of the methodology adopted in preparing the report or carrying out the specialised process	Section 2
f	The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure	Section 4
g	An identification of any areas to be avoided, including buffers	N/A
h	A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	N/A
i	A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 5
j	A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Section 4
k	Any mitigation measures for inclusion in the EMPr	Section 7, Appendix A

l	Any conditions for inclusion in the environmental authorisation	N/A
m	Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 7, Appendix A
ni	A reasoned opinion as to whether the proposed activity or portions thereof should be authorised	N/A
nii	If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	N/A
o	A description of any consultation process that was undertaken during the course of carrying out the study	N/A
p	A summary and copies if any comments that were received during any consultation process	N/A
q	Any other information requested by the competent authority.	N/A

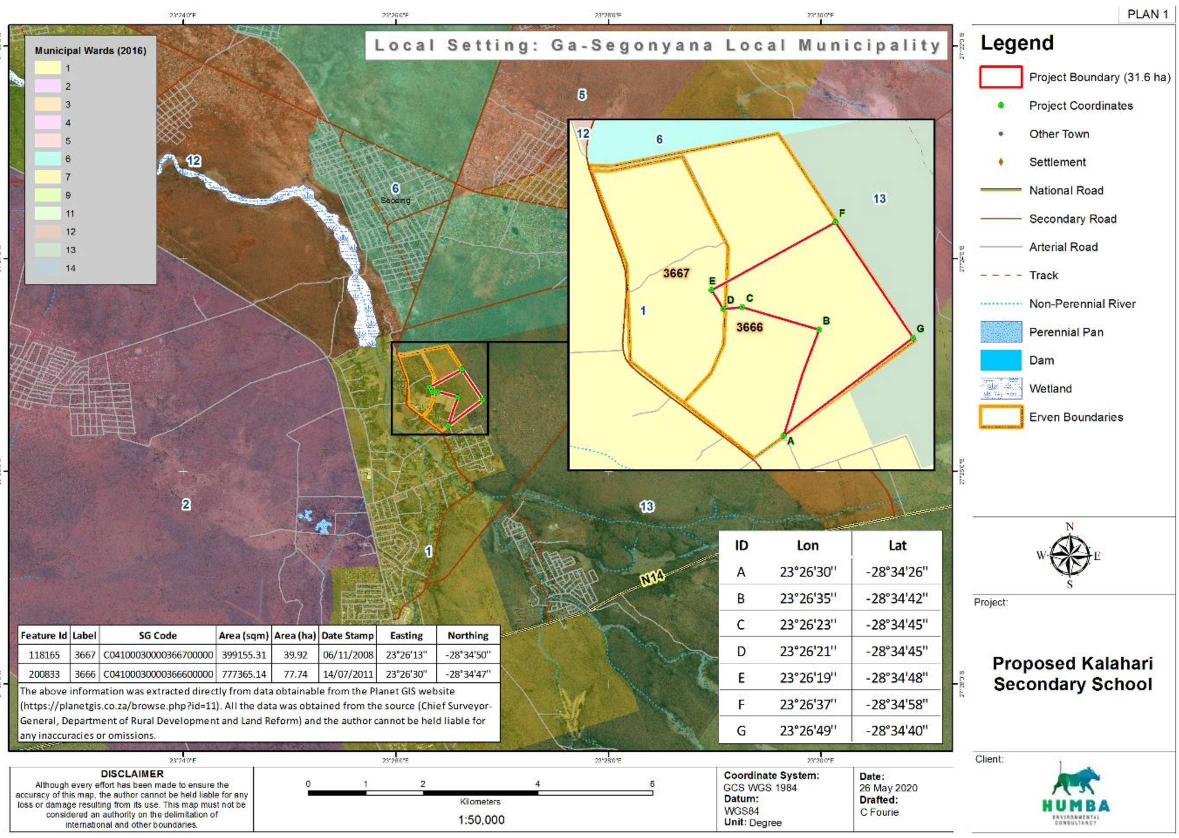

Figure 1: Planet GIS map of the proposed site for the Kalahari Secondary School shown within the orange outline. Map supplied by Humba.

2. Methods and Terms of Reference

The Terms of Reference (ToR) for this study were to undertake a PIA and provide feasible management measures to comply with the requirements of SAHRA.
The methods employed to address the ToR included:

1. Consultation of geological maps, literature, palaeontological databases, published and unpublished records to determine the likelihood of fossils occurring in the affected areas. Sources included records housed at the Evolutionary Studies Institute at the University of the Witwatersrand and SAHRA databases;
2. Where necessary, site visits by a qualified palaeontologist to locate any fossils and assess their importance (*not applicable to this assessment*);
3. Where appropriate, collection of unique or rare fossils with the necessary permits for storage and curation at an appropriate facility (*not applicable to this assessment*); and
4. Determination of fossils' representivity or scientific importance to decide if the fossils can be destroyed or a representative sample collected (*not applicable to this assessment*).

3. Geology and Palaeontology

i. Project location and geological context

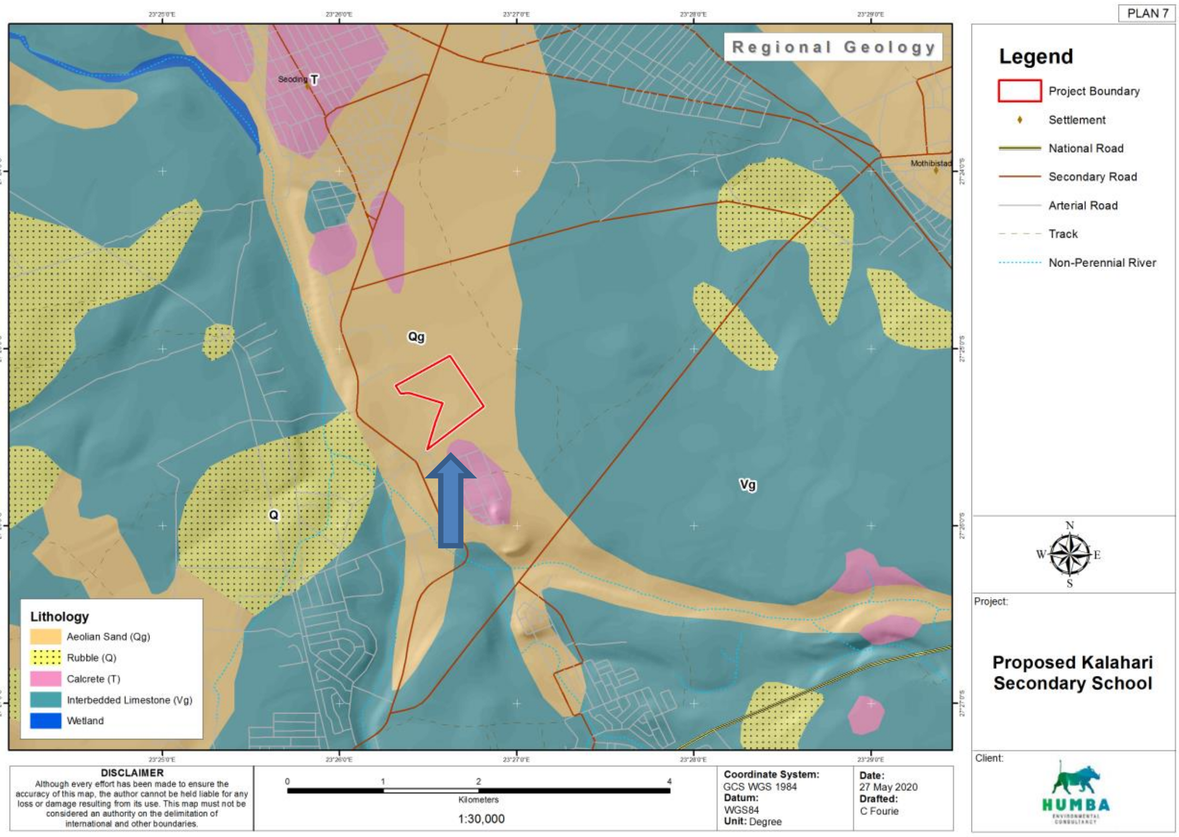

Figure 2: Geological map as provided by Humba for the Kalahari Secondary School, Kuruman

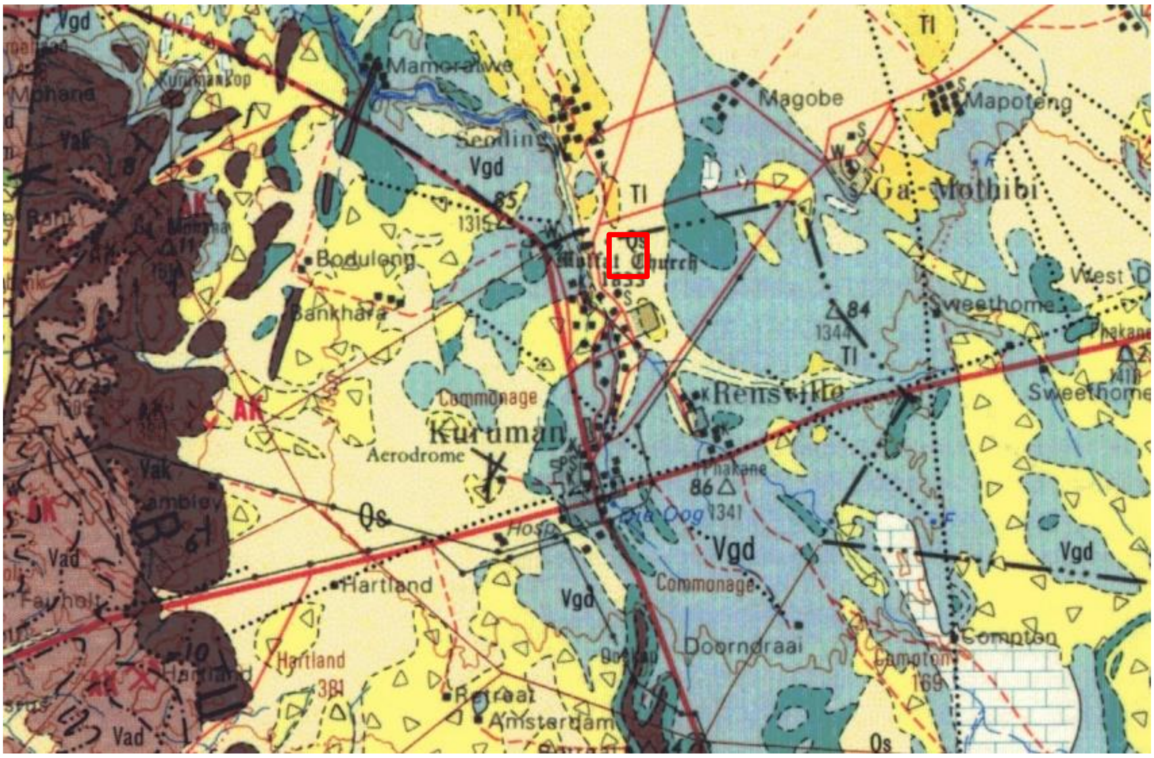

Figure 3: Geological map of the area around Kuruman. The location of the proposed school project is indicated within the red rectangle. Abbreviations of the rock types are explained in Table 2. Map enlarged from the Geological Survey 1: 250 000 map 2722 Kuruman.

Table 2: Explanation of symbols for the geological map and approximate ages (Eriksson et al., 2006. Partridge et al., 2006). SG = Supergroup; Fm = Formation; Ma = million years; grey shading = formations impacted by the project.

Symbol	Group/Formation	Lithology	Approximate Age
Qs	Gordonia Fm, Kalahari Group	Aeolian sand and sand dunes	Quaternary, last 2.5 Ma
Qs triangle	Gordonia Fm, Kalahari Group	Rubble	Quaternary, last 2.5 Ma
Tl	Surface limestone of the Kalahari Group	Surface limestone/calcrete	Quaternary, last 2.5 Ma
Vak	Kuruman Fm, Asbestos Hills Subgroup, Ghaap Group, Transvaal SG	Banded ironstone with subordinate amphibolite and crocidolite	Ca 2500 Ma
Vgd (light)	Ghaap Group, Transvaal SG	Fine to coarse-grained dolomite, chert and dolomitic sandstone.	2642 – 2432 Ma
Vgd (dark)	Ghaap Group, Transvaal SG	Fine to coarse-grained dolomite, chert and dolomitic sandstone with prominent interbedded chert.	2642 – 2432 Ma

Kuruman town lies to the north of the Kuruman Hills that are a prominent feature running roughly north-south in the northern part of the Griqualand West Basin of the Transvaal Supergroup. There are three large structural basins in the Kaapvaal Craton that formed in the Archaean and filled up with sediments known as the Transvaal Supergroup. The three basins (Transvaal Basin, Griqualand West Basin and Kanye Basin in Botswana) are more or less contemporaneous and some formations occur in all three. The Transvaal Supergroup is one of the world's largest and earliest carbonate platform successions where extensive stromatolites and layers of photosynthesising algae released huge volumes of oxygen that was initially trapped by the reduced minerals and later when the minerals were oxidised there was free oxygen and later ozone, the so-called Great Oxygen Event (Beukes, 1987; Frauenstein et al., 2009), around 2600-2500 million years ago.

The Griqualand West Basin is divided into the Ghaap Plateau and Prieska sub-basins, and the southwestern portion has been severely deformed during several events (Eriksson). Overlying the Transvaal Supergroup sediments, represented by the Kuruman Formation (Asbestos Hills Subgroup, Ghaap Group) to the west and the Ghaap Group to the east, in the Kuruman town area, are much younger Quaternary Kalahari sands and limestones. The age difference is more than 2500 million years.

Kalahari Group sediments were laid down in another and much larger structural basin (the Kalahari Basin) and extends from the Congo River down to the Orange River and eastwards to the middle of the continent. During the Cenozoic these predominantly wind-blown sands filled the basin and palaeo-valleys covering the older Transvaal Supergroup or Karoo Supergroup rocks. The climate, in very general terms, was one of aridification from hot and humid Late Cretaceous to Eocene times to the present day hot and arid climate, with some intervening wet phases (Thomas and Shaw, 1991; Ward and Corbett, 1990). Divided into six formations, the Kalahari Group comprises variously sorted or unsorted gravels and sands that were deposited under wet to drier conditions. The uppermost Gordonia Formation sands are the most geographically extensive lithology and typically have an iron oxide (haematite) coating on the sand grains, giving them a characteristic red colour (Partridge et al., 2006). According to Haddon and McCarthy (2005) the Kalahari sands were deposited, reworked and eroded throughout the Cenozoic but Matmon et al., (2015) have shown that, at least in the southern part of the Kalahari Basin, near Kuruman, deposition was mainly in the Pleistocene and so very rapid. Most earlier deposits had been eroded before the final phase.

ii. Palaeontological context

The palaeontological sensitivity of the area under consideration is presented in Figure 4. The site for development is in the surface limestones or calcretes of the Quaternary Kalahari Group sediments. Limestone, calcite and calcrete are all forms of calcium carbonate. This substance is soluble in slightly acidic ground water or rainwater and so is mobilised and deposited and redeposited in wet-dry cycles. The Pleistocene aridification in the central part of southern Africa has produced large areas of calcrete (Nash and McLaren, 2003; Walker et al., 2014) and occasionally fossils are trapped in the calcrete (or silcrete). Examples of these are the gastropods and root casts in the Kalahari or lithic artefacts at Kathu Pan (ibid). The ages of the calcretes and therefore of the fossils are difficult to determine so very young faunal and floral remains can be "preserved". Isolated fossils are of limited value but well-dated and extensive deposits are of scientific interest. The latter would be palaeo-pans or spring sites that have been visited or inhabited by people or animals so fossils or sub-fossils become entrapped in the calcrete and an assemblage preserved. No such features are visible on the satellite imagery in the project footprint.

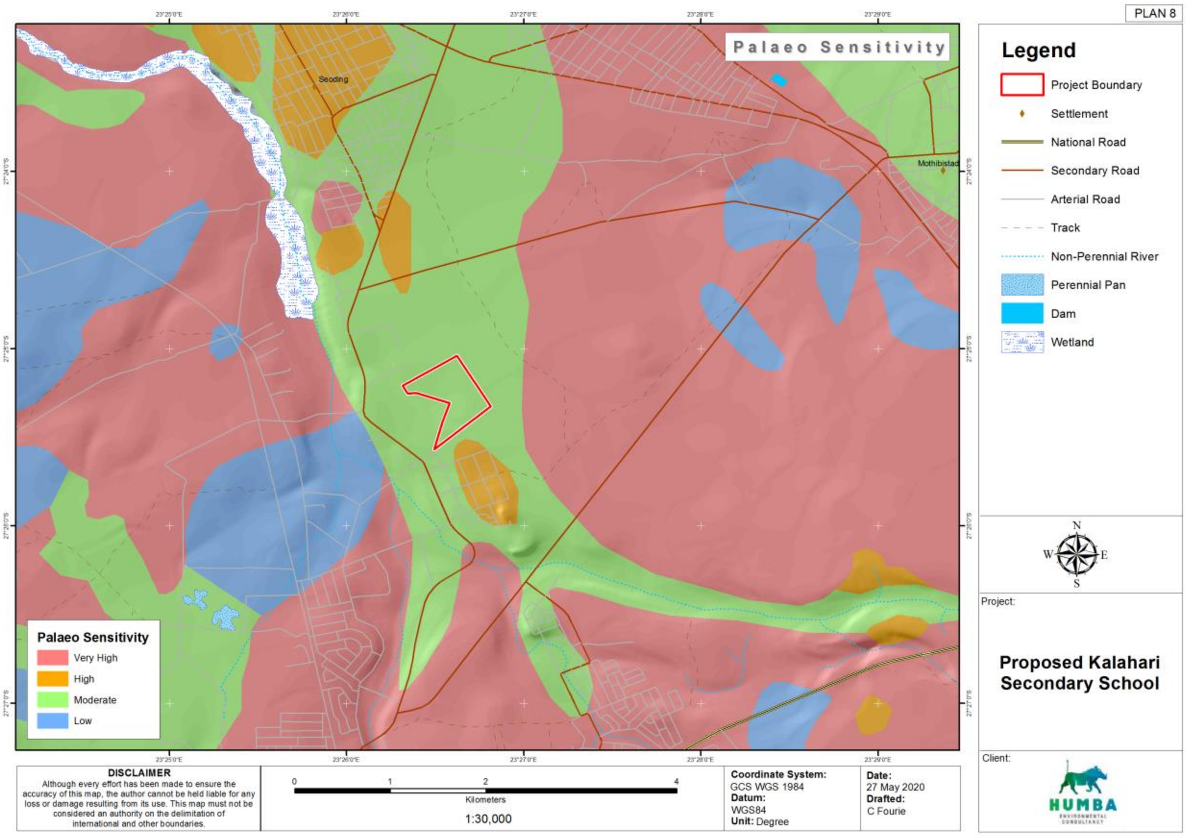

Figure 4: SAHRIS palaeosensitivity map for the site for the proposed Kalahari Secondary School in Kuruman shown within the red outline rectangle. Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

From the SAHRIS map above the area is indicated as moderately sensitive (green) for the Quaternary surface limestones or calcretes so a desktop study has been completed.

4. Impact assessment

An assessment of the potential impacts to possible palaeontological resources considers the criteria encapsulated in Table 3:

TABLE 3A: CRITERIA FOR ASSESSING IMPACTS

PART A: DEFINITION AND CRITERIA		
Criteria for ranking of the SEVERITY/NATURE of environmental impacts	**H**	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.

	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
Criteria for ranking the DURATION of impacts	**L**	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of impacts	**L**	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national
PROBABILITY (of exposure to impacts)	**H**	Definite/ Continuous
	M	Possible/ frequent
	L	Unlikely/ seldom

TABLE 3B: IMPACT ASSESSMENT

PART B: ASSESSMENT		
SEVERITY/NATURE	**H**	-
	M	-
	L	Limestone and calcrete associated with a palaeo-pan or spring might trap plant, animal or rocks. So far there are no records from the Kuruman area limestone so it is very unlikely that fossils occur on the site. The impact would be very unlikely.
	L+	-
	M+	-
	H+	-
DURATION	**L**	-
	M	-
	H	Where manifest, the impact will be permanent.
SPATIAL SCALE	**L**	Since only the possible fossils within the area would be fossil plant or animals trapped in the calcrete or limestone, the spatial scale will be localised within the site boundary.
	M	-
	H	-

PART B: ASSESSMENT		
PROBABILITY	H	-
	M	-
	L	It is extremely unlikely that any fossils would be found in the loose sand, soil or calcrete on the surface.Nonetheless a Fossil Chance Find protocol should be added to the eventual EMPr.

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are very young, Quaternary, and have been reworked and redeposited over time. Fossils might be trapped in the surface limestone or calcrete associated with palaeo-pans or springs but none has been reported and no features are visible on the satellite imagery. Since there is an extremely small chance that fossils from the nearby Vryheid Formation may be disturbed a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the potential impact to fossil heritage resources is extremely low.

5. Assumptions and uncertainties

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the limestone, calcrete, dolomites, sandstones, shales and sands are typical for the country and might contain fossil plant, insect, invertebrate and vertebrate material. Random fossils or sub fossils are of little interest and no assemblages are likely because the features that would trap such fossils, palaeo-pans or springs, are not visible in the satellite imagery. The surface soils and sands of the Quaternary period would not preserve fossils because they are highly weathered and disturbed by the roots of the vegetation.

6. Recommendation

Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the surface limestone and calcrete of the Quaternary. There is a very small chance that fossils may have been trapped in special features such as palaeo-pans or palaeo-springs but these do not seem to be present. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr: if fossils are found once drilling or excavations for the foundations and amenities for the school have has commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample.

7. References

Anderson, J.M., Anderson, H.M., 1985. Palaeoflora of Southern Africa: Prodromus of South African megafloras, Devonian to Lower Cretaceous. A.A. Balkema, Rotterdam. 423 pp.

Beukes, N.J., 1987. Facies relations, depositional environments, and diagenesis in a major early Proterozoic stromatolitic carbonate platform to basinal sequence, Campbell Rand Subgroup, Transvaal Supergroup, southern Africa. Sedimentary Geology 54, 1-46.

Eriksson, P.G., Altermann, W., Hartzer, F.J., 2006. The Transvaal Supergroup and its pre-cursors. In: Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J., (Eds). The Geology of South Africa. Geological Society of South Africa, Johannesburg / Council for Geoscience, Pretoria. pp 237-260.

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Nash, D.J., McLaren, S.J., 2003. Kalahari valley calcretes: their nature, origins, and environmental significance. Quaternary International 111, 3–22.

Partridge, T.C., Botha, G.A., Haddon, I.G., 2006. Cenozoic deposits of the interior. In: Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J., (Eds). The Geology of South Africa. Geological Society of South Africa, Johannesburg / Council for Geoscience, Pretoria. Pp 585-604.

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Walker, S.J.H., Lukich, V., Chazan, M., 2014. Kathu Townlands: A High Density Earlier Stone Age Locality in the Interior of South Africa. PLoS ONE 9(7): e103436. doi:10.1371/journal.pone.0103436.

Ward, J.D., Corbett, I.B., 1990. Towards an age for the Namib. In: Sealy, M.K. (ed), Namib Ecology: 25 years of Namib Research. Transvaal Museum Monographs No 7. Transvaal Museum, Pretoria.

8. Chance Find Protocol

Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin for all the buildings and amenities, and sports facilities.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
2. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones (for example see Figure 5, 6). This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished then no further monitoring is required.

Appendix A – Examples of fossils from the Quaternary.

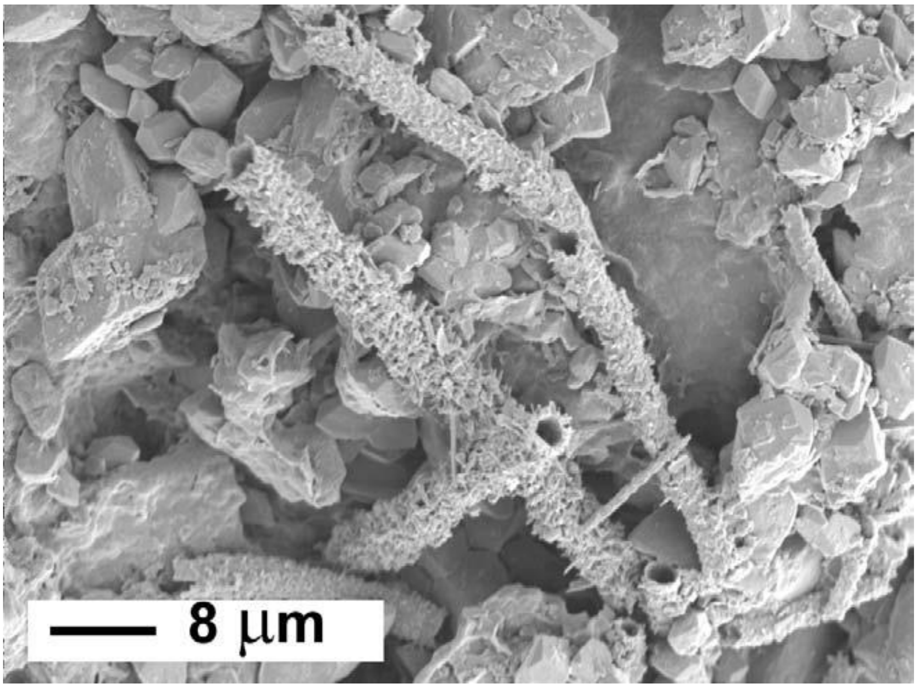

Figure 5: Fungal traces in the Kalahari calcrete. Root traces or rhizoliths look the same but are about ten times bigger. Photograph from (Nash and McLaren, 2003; Fig 5a).

Figure 6: Fossil plant fragment in tuffaceous sandstone (from Olduvai Gorge).

Appendix B – Details of specialist

Curriculum vitae (short) - Marion Bamford PhD
April 2020

I) Personal details

Surname	:	**Bamford**
First names	:	**Marion Kathleen**
Present employment	:	Professor; Director of the Evolutionary Studies Institute. Member Management Committee of the NRF/DST Centre of Excellence Palaeosciences, University of the Witwatersrand, Johannesburg, South Africa-
Telephone	:	+27 11 717 6690
Fax	:	+27 11 717 6694
Cell	:	082 555 6937
E-mail	:	marion.bamford@wits.ac.za ; marionbamford12@gmail.com

ii) Academic qualifications

Tertiary Education: All at the University of the Witwatersrand:
1980-1982: BSc, majors in Botany and Microbiology. Graduated April 1983.
1983: BSc Honours, Botany and Palaeobotany. Graduated April 1984.
1984-1986: MSc in Palaeobotany. Graduated with Distinction, November 1986.
1986-1989: PhD in Palaeobotany. Graduated in June 1990.

iii) Professional qualifications

Wood Anatomy Training (overseas as nothing was available in South Africa):
1994 - Service d'Anatomie des Bois, Musée Royal de l'Afrique Centrale, Tervuren, Belgium, by Roger Dechamps
1997 - Université Pierre et Marie Curie, Paris, France, by Dr Jean-Claude Koeniguer
1997 - Université Claude Bernard, Lyon, France by Prof Georges Barale, Dr Jean-Pierre Gros, and Dr Marc Philippe

iv) Membership of professional bodies/associations

Palaeontological Society of Southern Africa
Royal Society of Southern Africa - Fellow: 2006 onwards
Academy of Sciences of South Africa - Member: Oct 2014 onwards
International Association of Wood Anatomists - First enrolled: January 1991
International Organization of Palaeobotany – 1993+
Botanical Society of South Africa

South African Committee on Stratigraphy – Biostratigraphy - 1997 - 2016
SASQUA (South African Society for Quaternary Research) – 1997+
PAGES - 2008 –onwards: South African representative
ROCEEH / WAVE – 2008+
INQUA – PALCOMM – 2011+onwards

vii) Supervision of Higher Degrees

All at Wits University

Degree	Graduated/completed	Current
Honours	9	2
Masters	9	5
PhD	11	5
Postdoctoral fellows	10	4

viii) Undergraduate teaching
Geology II – Palaeobotany GEOL2008 – average 65 students per year
Biology III – Palaeobotany APES3029 – average 25 students per year
Honours – Evolution of Terrestrial Ecosystems; African Plio-Pleistocene Palaeoecology; Micropalaeontology – average 2-8 students per year.

ix) Editing and reviewing
Editor: Palaeontologia africana: 2003 to 2013; 2014 – Assistant editor
Guest Editor: Quaternary International: 2005 volume
Member of Board of Review: Review of Palaeobotany and Palynology: 2010 –
Cretaceous Research: 2014 –
Journal of African Earth Sciences: 2020 -

Review of manuscripts for ISI-listed journals: 25 local and international journals

x) Palaeontological Impact Assessments

Selected – list not complete:

- Thukela Biosphere Conservancy 1996; 2002 for DWAF
- Vioolsdrift 2007 for Xibula Exploration
- Rietfontein 2009 for Zitholele Consulting
- Bloeddrift-Baken 2010 for TransHex
- New Kleinfontein Gold Mine 2012 for Prime Resources (Pty) Ltd.
- Thabazimbi Iron Cave 2012 for Professional Grave Solutions (Pty) Ltd
- Delmas 2013 for Jones and Wagener
- Klipfontein 2013 for Jones and Wagener
- Platinum mine 2013 for Lonmin
- Syferfontein 2014 for Digby Wells
- Canyon Springs 2014 for Prime Resources

- Kimberley Eskom 2014 for Landscape Dynamics
- Yzermyne 2014 for Digby Wells
- Matimba 2015 for Royal HaskoningDV
- Commissiekraal 2015 for SLR
- Harmony PV 2015 for Savannah Environmental
- Glencore-Tweefontein 2015 for Digby Wells
- Umkomazi 2015 for JLB Consulting
- Ixia coal 2016 for Digby Wells
- Lambda Eskom for Digby Wells
- Alexander Scoping for SLR
- Perseus-Kronos-Aries Eskom 2016 for NGT
- Mala Mala 2017 for Henwood
- Modimolle 2017 for Green Vision
- Klipoortjie and Finaalspan 2017 for Delta BEC
- Ledjadja borrow pits 2018 for Digby Wells
- Lungile poultry farm 2018 for CTS
- Olienhout Dam 2018 for JP Celliers
- Isondlo and Kwasobabili 2018 for GCS
- Kanakies Gypsum 2018 for Cabanga
- Nababeep Copper mine 2018
- Glencore-Mbali pipeline 2018 for Digby Wells
- Remhoogte PR 2019 for A&HAS
- Bospoort Agriculture 2019 for Kudzala
- Overlooked Quarry 2019 for Cabanga
- Richards Bay Powerline 2019 for NGT
- Eilandia dam 2019 for ACO
- Eastlands Residential 2019 for HCAC
- Fairview MR 2019 for Cabanga
- Graspan project 2019 for HCAC
- Lieliefontein N&D 2019 for Enviropro
- Skeerpoort Farm Mast 2020 for HCAC
- Vulindlela Eco village 2020 for 1World
- KwaZamakhule Township 2020 for Kudzala
- Sunset Copper 2020 for Digby Wells
-

xi) Research Output

Publications by M K Bamford up to December 2019 peer-reviewed journals or scholarly books: over 140 articles published; 5 submitted/in press; 8 book chapters.
Scopus h-index = 27; Google scholar h-index = 32; -i10-index = 80
Conferences: numerous presentations at local and international conferences.

xii) NRF Rating

NRF Rating: B-2 (2016-2020)

NRF Rating: B-3 (2010-2015)
NRF Rating: B-3 (2005-2009)
NRF Rating: C-2 (1999-2004)