

## RECOMMENDED EXEMPTION FROM FURTHER PALAEOONTOLOGICAL STUDIES:

### PROPOSED MIXED USE DEVELOPMENT (JUPITER EXTENSION 8) ON PORTION 2 OF FARM ELANDSFONTEIN 90-1R, EKURHULENI METROPOLITAN MUNICIPALITY, GAUTENG

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#### 1. OUTLINE OF PROPOSED DEVELOPMENT

The company Abland (Pty) Ltd is proposing to construct a mixed use / industrial 1 development, to be known as Jupiter Extension 8, situated on Portion 2 of Farm Elandsfontein 90-1R in Germiston, within the jurisdiction of Ekurhuleni Metropolitan Municipality, Gauteng Province (See map Fig. 2). The proposed Jupiter Extension 8 project will entail the construction of buildings, internal roads and necessary infrastructure (storm water and sewerage) to service the development.

As part of an application for Environmental Authorisation for the proposed development, co-ordinated by Strategic Environmental Focus (PO BOX 74785, Lynnwood Ridge 0040), the present palaeontological heritage comment has been commissioned by Ms Karen van Ryneveld of ArchaeoMaps - Archaeological and Heritage Consultancy (Contact details: Postnet Suite 239, Private Bag X3, Beacon Bay, 5205. Cell: 084 871 1064. E-mail: [kvanryneveld@gmail.com](mailto:kvanryneveld@gmail.com)).

#### 2. GEOLOGICAL BACKGROUND

The c. 20 ha Jupiter Extension 8 site concerned overlies an existing mine and is currently used by Ergo Gold Mining (Pty) Ltd. for re-processing of surface gold tailing retreatment using new technology.

According to the 1: 250 000 geology sheet 2628 East Rand (Council for Geoscience, Pretoria) (Fig. 1) the study site is largely or entirely underlain by early Precambrian (Archaean) sedimentary rocks of the **Witwatersrand Supergroup**, and in particular by fluvial quartzites of the **Johannesburg Group** (Rjo, red in Fig. 1). This succession of braided-fluvial quartzites contains thin gravels lags associated with gold placer deposits and thin layers of carbonaceous material (kerogen or bitumen) (McCarthy 2006).



Figure 1. Extract from 1: 250 000 geology sheet 2628 East Rand (Council for Geoscience, Pretoria) showing the approximate location of the Jupiter Extension 8 study site (yellow circle). The site is largely underlain by south-dipping fluvial quartzites of the Johannesburg Subgroup (Central Rand Group, Witwatersrand Supergroup) of Archaean age (Rjo, red) as well as reworked mine tailings at surface. Scale bar = 4 km. Arrow points to North.

### 3. PALAEOLOGICAL HERITAGE

Incontrovertible macrofossil remains have not been recorded from the Archaean sediments of the Witwatersrand Supergroup that are of Archaean / Randian age (c. 2.9-2.7 Ga = billion years old). Columnar kerogen and fly speck carbon associated with some gold reefs has been interpreted as an inorganic precipitate induced by radioactive uranium minerals by some authors. However, a strong case for the *in situ* microbial origin of the patchy but extensive gold-bearing “carbon seam reefs” within the Witwatersrand succession - including microstromatolitic and filamentous structures of probable cyanobacterial affinity – has been made by Mossman *et al.* (2008) and several earlier authors (See, for example, Hallbauer & Van Warmelo 1974, Hallbauer 1975, Hallbauer 1986, as well as discussion and illustrations in MacRae 1999, pp. 64-72).

The overall palaeontological sensitivity of the Central Rand Group bedrocks as well as the residual mine tailings remaining in the study area is assessed as VERY LOW.

#### 4. CONCLUSIONS & RECOMMENDATIONS

The proposed Jupiter Extension 8 mixed use / Industrial 1 development on Portion 2 of Farm Elandsfontein 90-IR, Germiston, Gauteng, is of LOW significance in terms of local palaeontological heritage since the Precambrian sedimentary rocks underlying the site contain, at most, sparse microbial fossil remains that are of widespread occurrence while the overlying reworked mine tailings are unfossiferous.

**It is therefore recommended that, pending the discovery of significant fossil remains on site during construction, exemption from further specialist palaeontological studies and mitigation should be granted for this development.**

Should any substantial fossil remains (e.g. well-preserved stromatolites) be encountered during excavation, however, the procedures outlined in the attached ***Protocol for Chance Palaeontological Finds*** should be implemented.

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) by a suitably qualified palaeontologist.

#### 5. ACKNOWLEDGEMENTS

Ms Karen van Ryneveld of ArchaeoMaps - Archaeological and Heritage Consultancy, Beacon Bay, is thanked for commissioning this study, for providing the relevant background information, and for developing the template of the protocol for chance finds of heritage resource materials.

#### 6. KEY REFERENCES

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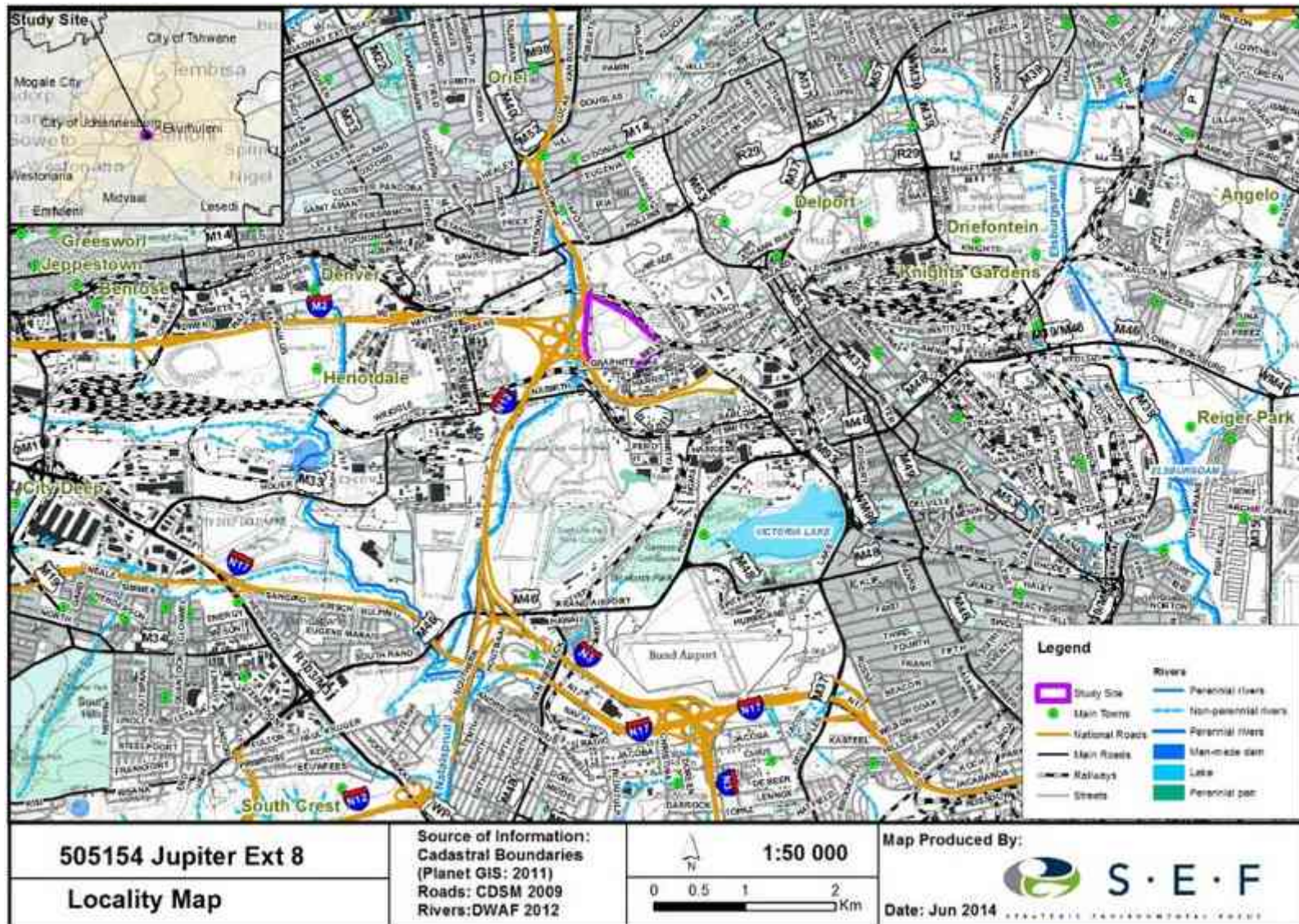


Figure 2: Map showing the location of the Jupiter Extension 8 study area (purple polygon) , situated on Portion 2 of Farm Elandsfontein 90-IR in Germiston, Ekurhuleni Metropolitan Municipality, Gauteng Province (Image kindly supplied by SEF, Lynwood Ridge).

## 7. QUALIFICATIONS & EXPERIENCE OF THE AUTHOR

Dr John Almond has an Honours Degree in Natural Sciences (Zoology) as well as a PhD in Palaeontology from the University of Cambridge, UK. He has been awarded post-doctoral research fellowships at Cambridge University and in Germany, and has carried out palaeontological research in Europe, North America, the Middle East as well as North and South Africa. For eight years he was a scientific officer (palaeontologist) for the Geological Survey / Council for Geoscience in the RSA. His current palaeontological research focuses on fossil record of the Precambrian - Cambrian boundary and the Cape Supergroup of South Africa. He has recently written palaeontological reviews for several 1: 250 000 geological maps published by the Council for Geoscience and has contributed educational material on fossils and evolution for new school textbooks in the RSA.

Since 2002 Dr Almond has also carried out palaeontological impact assessments for developments and conservation areas in the Western, Eastern and Northern Cape under the aegis of his Cape Town-based company *Natura Viva cc*. He is a long-standing member of the Archaeology, Palaeontology and Meteorites Committee for Heritage Western Cape (HWC) and an advisor on palaeontological conservation and management issues for the Palaeontological Society of South Africa (PSSA), HWC and SAHRA. He is currently compiling technical reports on the provincial palaeontological heritage of Western, Northern and Eastern Cape for SAHRA and HWC. Dr Almond is an accredited member of PSSA and APHP (Association of Professional Heritage Practitioners – Western Cape).

### Declaration of Independence

I, John E. Almond, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed development project, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



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Should any palaeontological resources (*i.e.* fossil remains, such as well-preserved microbial mounds or stromatolites), as defined and protected by the NHRA 1999 and other relevant legislation, be identified during the course of development, it is recommended that the process described below be followed.

### **1.1) On-Site and Project Management Protocol for Chance Palaeontological Finds**

#### **On-site Reporting Process:**

1. The identifier should immediately notify his / her supervisor of the find.
2. The identifier's supervisor should immediately (and within 24 hours after reporting by the identifier) report the incident to the on-site SHE / SHEQ officer.
3. The on-site SHE / SHEQ officer should immediately (and within 24 hours after reporting by the relevant supervisor) report the incident to the appointed ECO officer.
4. The ECO officer should ensure that the find is within 72 hours after the SHE / SHEQ officers report reported on SAHRIS and that an accredited palaeontologist is contacted to make arrangements for a palaeontological site inspection.
5. The appointed palaeontologist should compile an 'palaeontological site inspection' report based on the site specific findings. The site inspection report should make recommendations for the destruction, conservation or mitigation of the find and prescribe a recommended way forward for development. The 'palaeontological site inspection' report should be submitted to the ECO, who should ensure submission thereof on SAHRIS.
6. SAHRA / the relevant PHRA will state legal requirements for development to proceed in the SAHRA / PHRA Comment on the 'palaeontological site inspection' report.
7. The developer should proceed with implementation of the SAHRA / PHRA Comment requirements. SAHRA / PHRA Comment requirements may well stipulate permit specifications for development to proceed.
  - Should permit specifications stipulate further Phase 2 palaeontological a suitably accredited palaeontologist should be appointed to conduct the work according to the applicable SAHRA / PHRA process. The palaeontologist should apply for the permit. Upon issue of the SAHRA / PHRA permit the Phase 2 palaeontological mitigation program may commence.
  - Should permit specifications stipulate destruction of the find under a SAHRA / PHRA permit the developer should immediately proceed with the permit application. Upon the issue of the SAHRA / PHRA permit the developer may legally proceed with destruction of the palaeontological heritage resource.
  - Upon completion of the Phase 2 palaeontological mitigation program the palaeontologist will submit a Phase 2 report to the ECO, who should in turn ensure submission thereof on SAHRIS. Report recommendations may include that the remainder of a palaeontological site be destroyed under a SAHRA / PHRA permit.

### **Duties of the Supervisor:**

1. The supervisor should immediately upon reporting by the identifier ensure that all work in the vicinity of the find is ceased.
2. The supervisor should ensure that the location of the find is immediately secured (and within 12 hours of reporting by the identifier), by means of a temporary conservation fence (construction netting) allowing for a 5-10m heritage conservation buffer zone around the find. The temporary conserved area should be sign-posted as a '*No Entry – Heritage Site*' zone.
3. Where development has impacted on the resource, no attempt should be made to remove fossil remains further from their context, and fossil remains that have been removed should be collected and placed within the conservation area or kept for safekeeping with the SHE / SHEQ officer. It is imperative that where development has impacted on palaeontological resources the context of the find be preserved as well as possible for interpretive and sample testing purposes.
4. The supervisor should record the name, company and capacity of the identifier and compile a brief report describing the events surrounding the find. The report should be submitted to the SHE / SHEQ officer at the time of the incident report.

### **Duties of the SHE / SHEQ Officer:**

1. The SHE / SHEQ officer should ensure that the location of the find is recorded with a GPS. A photographic record of the find (including implementation of temporary conservation measures) should be compiled. Where relevant a scale bar or object that can indicate scale should be inserted in photographs for interpretive purposes.
2. The SHE / SHEQ officer should ensure that the supervisors report, GPS co-ordinates and photographic record of the find be submitted to the ECO officer.
3. Any retrieved fossil remains should, in consultation with the ECO officer, be deposited in a safe place (preferably on-site) for safekeeping.

### **Duties of the ECO officer:**

1. The ECO officer should ensure that the incident is reported on SAHRIS. (The ECO officer should ensure that he / she is registered on the relevant SAHRIS case with SAHRIS authorship to the case at the time of appointment to enable heritage reporting].
2. The ECO officer should ensure that the incident report is forwarded to the palaeontologist for interpretive purposes at his / her soonest opportunity and prior to the palaeontological site inspection.
3. The ECO officer should facilitate appointment of the palaeontologist by the developer / construction consultant for the palaeontological site inspection.
4. The ECO officer should facilitate access by the palaeontologist to any retrieved fossil remains that have been kept in safekeeping.
5. The ECO officer should facilitate coordination of the palaeontological site inspection.
6. The ECO officer should facilitate palaeontological reporting and heritage compliance requirements by SAHRA / the relevant PHRA, between the developer / construction consultant, the palaeontologist, the SHE / SHEQ officer (where relevant) and the SAPS (where relevant).

**Duties of the Developer / Construction Consultant:**

1. The developer / construction consultant should ensure that an adequate heritage contingency budget is accommodated within the project budget to facilitate and streamline the heritage compliance process in the event of identification of incidental palaeontological and cultural heritage resources during the course of development, including as a norm during vegetation clearing, surface scraping, trenching and excavation phases, when resources not visible at the time of the surface assessment may well be exposed.