Palaeontological heritage assessment: letter of exemption from specialist studies & mitigation

PROPOSED BRICK-MAKING PLANT ON KOFFIEFONTEIN 733, KOFFIEFONTEIN, FREE STATE

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EXECUTIVE SUMMARY

Blue Diamond Mines (Pty) Ltd (t.a. Koffiefontein Diamond Mine) is proposing to develop a brick-making facility on Farm Koffiefontein 733, situated on the southern outskirts of Kofffiefontein, Free State.

The proposed brick-making plant study area overlies Permian basinal mudrocks of the Tierberg Formation (Ecca Group). Although there are occasional records of fossil remains - fish scales, coprolites, sponge spicules, low diversity trace fossil assemblages - from this formation elsewhere in the Koffiefontein 1: 250 000 sheet area, none appear to be known from Koffiefontein itself (There are possible but unconfirmed reports of fossil fish from Ecca Group rocks excavated from the Koffiefontein diamond pipe). The Ecca bedrocks in the study area are likely to be highly disturbed and weathered near-surface, with possible disruptive calcrete veining and baking by local dolerite or younger intrusions. Overling Late Caenozoic superficial sediments (gravels, soils, pedocretes, slimes dam tailings *etc*) are likewise highly disturbed and of low to very low palaeontological sensitivity. Quaternary alluvium of the Rietrivier has yielded important fossil mammal remains near Koffiefontein but is not mapped in the study area which lies *c*. 2 km distant from the modern riverbanks. Unique or rare fossil heritage resources are therefore not threatened by the proposed development.

The impact significance of the proposed brick-making plant, which in addition has a small footprint area, is accordingly assessed as VERY LOW. No further specialist palaeontological heritage studies or mitigation are recommended for this project, pending the discovery of substantial new fossil material during development.

The responsible Environmental Control Officer (ECO) should monitor all substantial (> 1 m deep) bedrock excavations for fossil material. In the case of any significant new fossil finds (*e.g.* vertebrate teeth, bones, burrows, petrified wood, shells), these should be safeguarded - preferably *in situ* - and reported by the ECO as soon as possible to SAHRA so that appropriate mitigation (*i.e.* recording, sampling or collection) by a palaeontological specialist can be considered and implemented (Contact details: Dr Ragna Redelstorff, SAHRA, P.O.Box 4637, Cape Town 8000. Tel: 021 202 8651. Email: rredelstorff@sahra.org.za).

These recommendations should be incorporated into the Environmental Management Plan (EMP) for the brick-making plant.

1. INTRODUCTION AND BRIEF

The company Blue Diamond Mines (Pty) Ltd (t.a. Koffiefontein Diamond Mine) is proposing to develop a brick-making facility on Farm Koffiefontein 733, situated on the southern outskirts of Kofffiefontein, Free State. The site is located on the northern side of the slimes dam and about one kilometre southeast of the opencast pit of the Koffiefontein Diamond Mine (Figs. 1 to 5).

The principal infrastructural components of the proposed brick-making facility, together with their respective fooprints, are shown in Figure 5 and include the following:

- Mining area – based in the existing slimes dam
- Clay and crushing stone stockpile
- Dry brick holding area
- Drying area
- Front product stock yard
- Plant area and office
- Turning and loading area
- Future development area
- Access roads

The development site overlies potentially fossiliferous sedimentary rocks of the Ecca Group. A desktop palaeontological assessment of the project has therefore been requested by SAHRA (Interim Comment dated 20 April 2017; Case ID 10937). The present palaeontological heritage assessment was accordingly commissioned on behalf of the developer by Greenrsa (Pty) Ltd (Contact details: Mnr Frank van der Kooy. Greenrsa (Pty) Ltd. P.O. Box 32497, Totiusdal 0134, RSA. Tel: 082 8901918. E-mail: frankvdkooy49@gmail.co.za) as part of a broad-based heritage assessment for the project by G&A Heritage (Pty) Ltd, Louis Trichardt (Contact details: Mnr Stephan Gaigher. G&A Heritage (Pty) Ltd, 38A Vorster Street, Louis Trichardt 0920, RSA. Tel: 073 752 6583. E-mail: stephan@gaheritage.co.za).

The approach to this palaeontological heritage study is briefly as follows. Fossil bearing rock units occurring beneath the development footprint are determined from geological maps and satellite images (Section 2). Known fossil heritage from each rock unit is inventoried from scientific literature, including previous assessments of the broader study region (*e.g.* Almond 2013a, 2013b, 2015) as well as the author's field experience and palaeontological database (Section 3). Based on this data the palaeontological heritage sensitivity of the proposed development is assessed, with recommendations for any further specialist studies (Section 4).

Figure 1. Extract from 1: 250 000 topographical map 2924 Koffiefontein (Courtesy of the Chief Directorate: National Geo-spatial Information, Mowbray) showing the location of the proposed brick-making facility on Farm Koffiefontein 733 close to the Koffiefontein open cast diamond mine, southern outskirts of Koffiefontein, Free State.

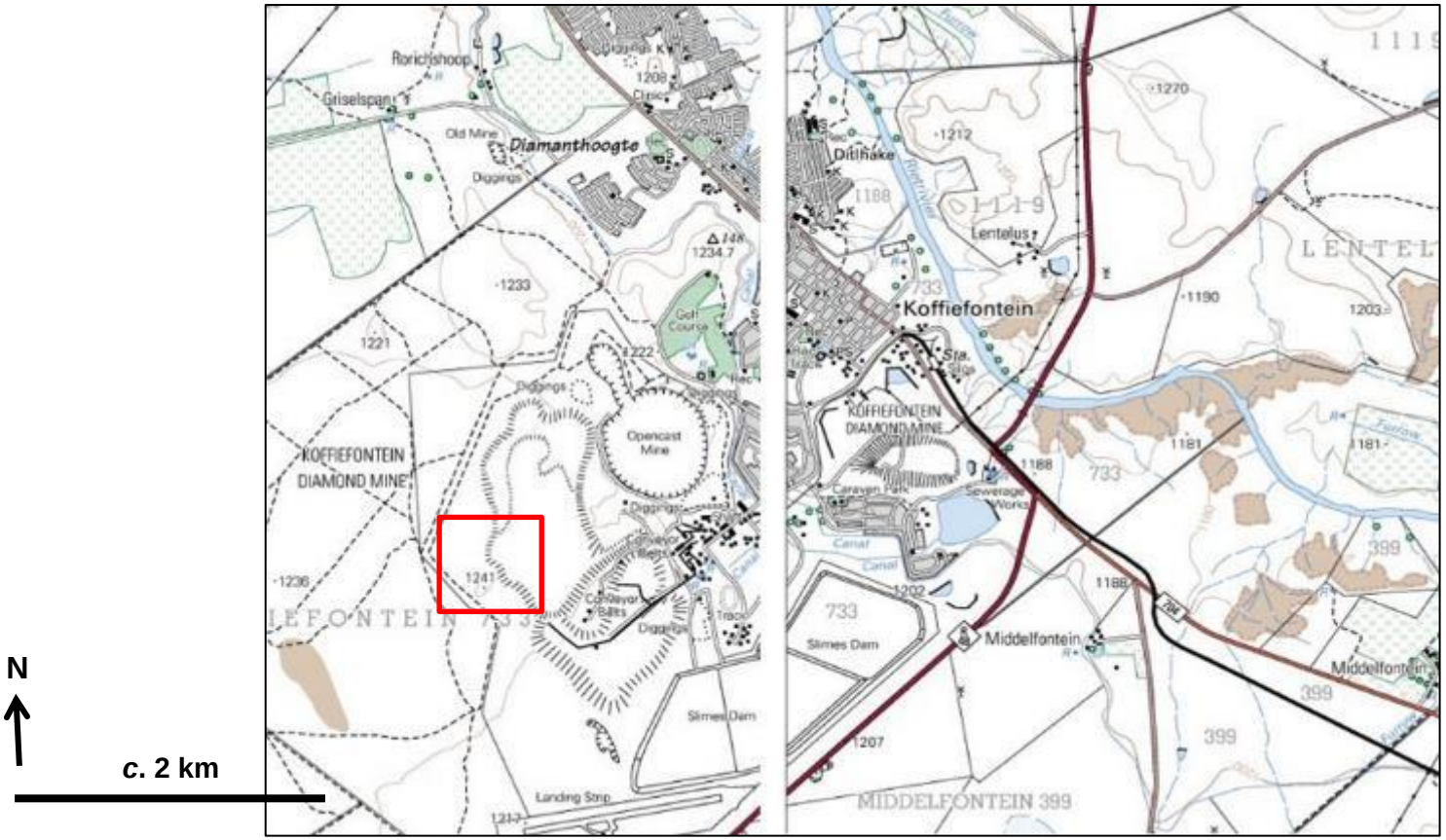

Figure 2. Extracts from adjoining 1: 50 000 topographic sheets 2924BD and 2925AC (Courtesy of the Chief Directorate: National Geo-spatial Information, Mowbray) showing the approximate location of the brick-making plant study area on the northern side of the Koffiefontein diamond mine slimes dam (red rectangle).

Figure 3. Google earth© satellite image of Kofiefontein showing the approximate location of the proposed brick-making facility (red rectangle) on the southern outskirts of Koffiefontein, *c*. 1 km southwest of the opencast diamong mine pit and on the NW side of the slimes dam (Please see following two figures for more detail). Note Rietrivier flowing *c*. 2 km to the northeast.

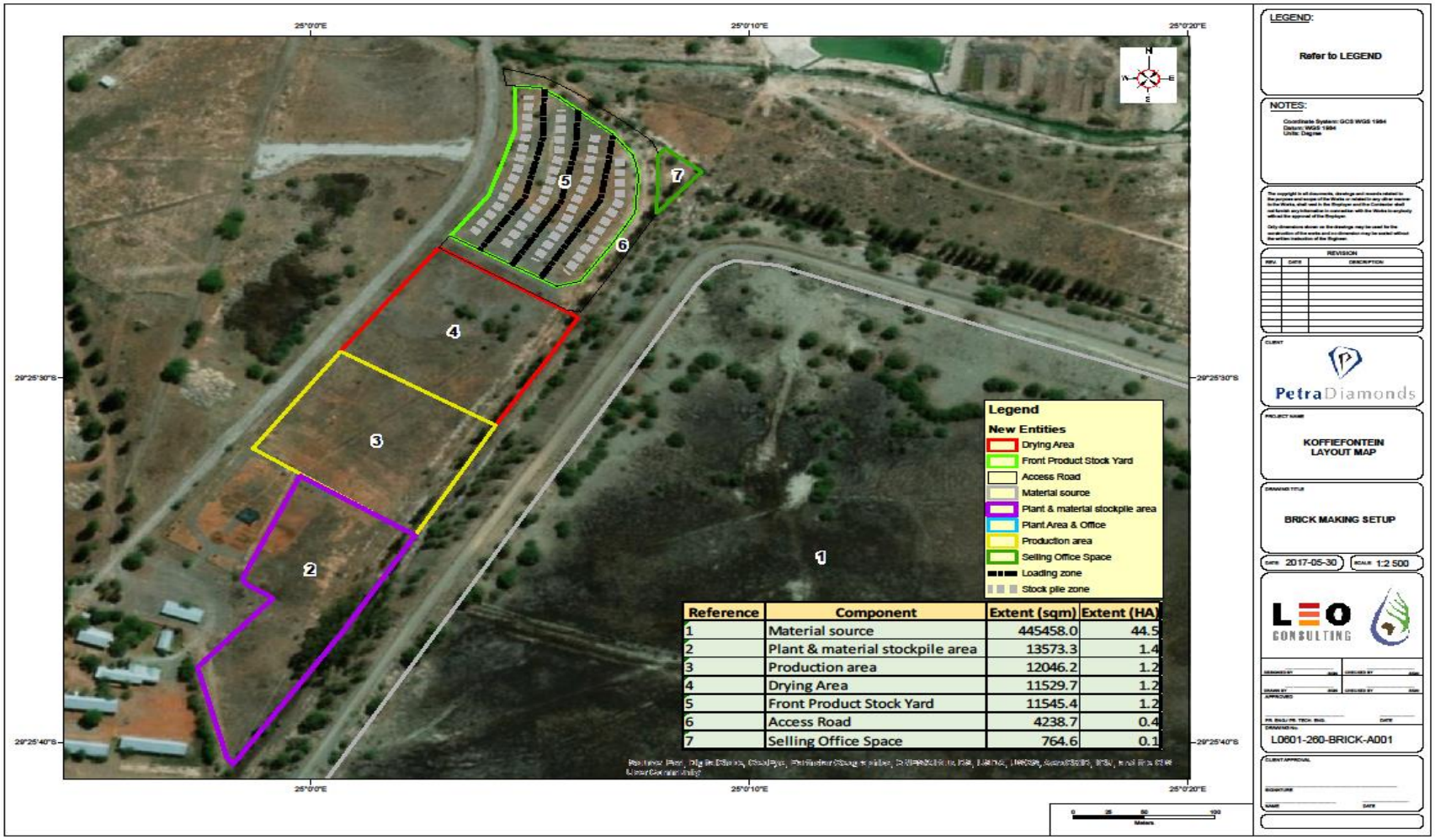

Figure 4. Layout of the various infrastructural components of the proposed brick-making plant, Koffiefontein diamond mine (Image supplied by Greenrsa (Pty) Ltd).

1.1. Legislative context of this palaeontological study

The proposed brick-making plant development footprint overlies areas that are underlain by potentially fossil-rich sedimentary rocks of Palaeozoic age (Sections 2 and 3). The construction phase of the development will entail substantial surface clearance and excavations into the superficial sediment cover as well as locally into the underlying bedrock. All these developments may adversely affect fossil heritage preserved at or beneath the surface of the ground within the study area by destroying, disturbing or permanently sealing-in fossils that are then no longer available for scientific research or other public good.

The various categories of heritage resources recognised as part of the National Estate in Section 3 of the National Heritage Resources Act (1999) include, among others:

- geological sites of scientific or cultural importance;
- palaeontological sites;
- palaeontological objects and material, meteorites and rare geological specimens.

According to Section 35 of the National Heritage Resources Act, dealing with archaeology, palaeontology and meteorites:

(1) The protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority.

(2) All archaeological objects, palaeontological material and meteorites are the property of the State.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) No person may, without a permit issued by the responsible heritage resources authority—

(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

(5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may—

(a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;

(b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;

(c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph *(a)* to apply for a permit as required in subsection (4); and

(d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.

Minimum standards for the palaeontological component of heritage impact assessment reports have been developed by SAHRA (2013).

1.2. Approach to the palaeontological heritage assessment

In preparing a palaeontological desktop study the potentially fossiliferous rock units (groups, formations *etc*) represented within the study area are determined from geological maps. The known fossil heritage within each rock unit is inventoried from the published scientific literature, previous palaeontological impact studies in the same region, and the author's field experience (Consultation with professional colleagues as well as examination of institutional fossil collections may play a role here, or later following field assessment during the compilation of the final report). This data is then used to assess the palaeontological sensitivity of each rock unit to development (Table 1. Provisional tabulations of palaeontological sensitivity of all formations in Free State have already been compiled by J. Almond (2011, unpublished data). The potential impact of the proposed development on local fossil heritage is then determined on the basis of (1) the palaeontological sensitivity of the rock units concerned and (2) the nature and scale of the development itself, most significantly the extent of fresh bedrock excavation envisaged. When rock units of moderate to high palaeontological sensitivity are present within the development footprint, a Phase 1 field assessment study by a professional palaeontologist is usually warranted to identify any palaeontological hotspots and make specific recommendations for any mitigation required before or during the construction phase of the development.

On the basis of the desktop and Phase 1 field assessment studies, the likely impact of the proposed development on local fossil heritage and any need for specialist mitigation are then determined. Adverse palaeontological impacts normally occur during the construction rather than the operational or decommissioning phase. Phase 2 mitigation by a professional palaeontologist – normally involving the recording and sampling of fossil material and associated geological information (*e.g.* sedimentological data) may be required (a) in the pre-construction phase where important fossils are already exposed at or near the land surface and / or (b) during the construction phase when fresh fossiliferous bedrock has been exposed by excavations. To carry out mitigation, the palaeontologist involved will need to apply for a palaeontological collection permit from the relevant heritage management authority, *i.e.* SAHRA for the Free State (Contact details: Dr Ragna Redelstorff, SAHRA, P.O.Box 4637, Cape Town 8000. Tel: 021 202 8651. Email: rredelstorff@sahra.org.za). It should be emphasized that, *providing appropriate mitigation is carried out*, the majority of developments involving bedrock excavation can make a *positive* contribution to our understanding of local palaeontological heritage.

1.4. Assumptions & limitations

The accuracy and reliability of palaeontological specialist studies as components of heritage impact assessments are generally limited by the following constraints:

1. Inadequate database for fossil heritage for much of the RSA, given the large size of the country and the small number of professional palaeontologists carrying out fieldwork here. Most development study areas have never been surveyed by a palaeontologist.

2. Variable accuracy of geological maps which underpin these desktop studies. For large areas of terrain these maps are largely based on aerial photographs alone, without ground-truthing. The maps generally depict only significant ("mappable") bedrock units as well as major areas of superficial "drift" deposits (alluvium, colluvium) but for most regions give little or no idea of the level of bedrock outcrop, depth of superficial cover (soil *etc*), degree of bedrock weathering or levels of small-scale tectonic deformation, such as cleavage. All of these factors may have a major influence on the impact significance of a given development on fossil heritage and can only be reliably assessed in the field.

3. Inadequate sheet explanations for geological maps, with little or no attention paid to palaeontological issues in many cases, including poor locality information;

4. The extensive relevant palaeontological "grey literature" - in the form of unpublished university theses, impact studies and other reports (*e.g*. of commercial mining companies) - that is not readily available for desktop studies;

5. Absence of a comprehensive computerized database of fossil collections in major RSA institutions which can be consulted for impact studies. A Karoo fossil vertebrate database is now accessible for impact study work.

In the case of palaeontological desktop studies without supporting Phase 1 field assessments these limitations may variously lead to either:

(a) *underestimation* of the palaeontological significance of a given study area due to ignorance of significant recorded or unrecorded fossils preserved there, or

(b) *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 tectonism or weathering, or are buried beneath a thick mantle of unfossiliferous "drift" (soil, alluvium *etc*).

Since most areas of the RSA have not been studied palaeontologically, a palaeontological desktop study usually entails *inferring* the presence of buried fossil heritage within the study area from relevant fossil data collected from similar or the same rock units elsewhere, sometimes at localities far away. Where substantial exposures of bedrocks or potentially fossiliferous superficial sediments are present in the study area, the reliability of a palaeontological impact assessment may be significantly enhanced through field assessment by a professional palaeontologist.

In the case of the Koffiefontein study area a major limitation for fossil heritage studies is the paucity of previous specialist palaeontological studies in the region as a whole. Little palaeontological data is available in the relevant geological sheet map explanation (Zawada 1992), for example.

1.5. Information sources

The information used in this desktop study was based on the following:

1. A short project outline and maps provided by Greenrsa (Pty) Ltd;

2. A review of the relevant scientific literature, including published geological maps and accompanying sheet explanations as well as previous palaeontological assessment reports for the broader region (*e.g.* Almond 2013a, 2013b, 2015);

3. The author's database on the formations concerned and their palaeontological heritage.

2. GEOLOGICAL OUTLINE OF THE STUDY AREA

The Koffiefontein brick-making plant study area is situated within fairly flat-lying terrain (apart from the slimes dam retaining wall) at *c*. 1200 m amsl. which has already been highly disturbed as a consequence of diamond mine activities. Based on satellite images, there is little or no bedrock exposure here and the vegetation compises mixed grasses and low shrubs with sparse trees and reedy vegetation along watercourses.

The geology of the Koffiefontein area is shown on 1: 250 000 sheet 2924 Koffiefontein for which a short explanation has been provided by Zawada (1992) (Fig. 6). The area is underlain by basinal fine-grained, non-marine sediments of the **Tierberg Formation** (Ecca Group, Karoo Supergroup) that have been intruded and baked by extensive sills of the Early Jurassic.**Karoo Dolerite Suite** as well as by the much younger Koffiefontein diamond pipe of the Kimberley Province kimberlites. This pipe has been dated to *c*. 90 Ma, *i.e.* Late Cretaceous (Field *et al.* 2008). The Late Caenozoic superficial deposits (soils, gravels, alluvium *etc*) in the area have been severely disturbed or removed by mine-related activites. Within the slimes dam itself, the bedrocks have been mantled by fine-grained tailings from the diamond mine. Quaternary alluvium of the Rietrivier has yielded important fossil mammal remains near Koffiefontein but is not mapped in the study area which lies *c*. 2 km distant from the modern riverbanks (Figs. 2, 3 and 6).

2.1. Tierberg Formation (Pt)

The Tierberg Formation is a thick, recessive-weathering, mudrock-dominated succession consisting predominantly of dark, often brown to grey, well-laminated, carbonaceous shales with subordinate thin, fine-grained sandstones or wackes (Prinsloo 1989, Le Roux 1993, Viljoen 2005, Johnson *et al*., 2006). The Tierberg shales are Early to Middle Permian in age and were deposited in a range of offshore, quiet water environments below wave base. These include basin plain, distal turbidite fan and distal prodelta in ascending order (Viljoen 2005, Almond *in* Macey *et al.* 2011). Thin coarsening-upwards cycles occur towards the top of the formation with local evidence of soft-sediment deformation, ripples and common calcareous concretions. Thin water-lain tuffs (volcanic ash layers) are also known. A restricted, brackish water environment is reconstructed for the Ecca Basin at this time. Close to the contact with Karoo dolerite intrusions the Tierberg mudrocks are often baked to a dark grey hornfels with a reddish-brown crust (Prinsloo 1989).

A brief account of the thick but poorly-exposed Tierberg succession close to the Orange River (Northern Cape – Free State border) has been provided by Visser *et al.* (1977-1978) as well as Zawada (1992). A semi-schematic profile through these sediments is given in Figure 7 herein. Due to lack of field data it is unclear exactly where the beds around Koffiefontein are placed within the Tierberg succession, however. Illustrations of Tierberg Formation exposures on the western portion of the Koffiefontein 1:

250 000 sheet are given by Almond (2013a) and for the Colesburg area by Almond (2015). In the former case, it is notable that the near-surface mudrocks in this region are frequently weathered, baked by nearby dolerite intrusions and deformed by secondary calcrete development.

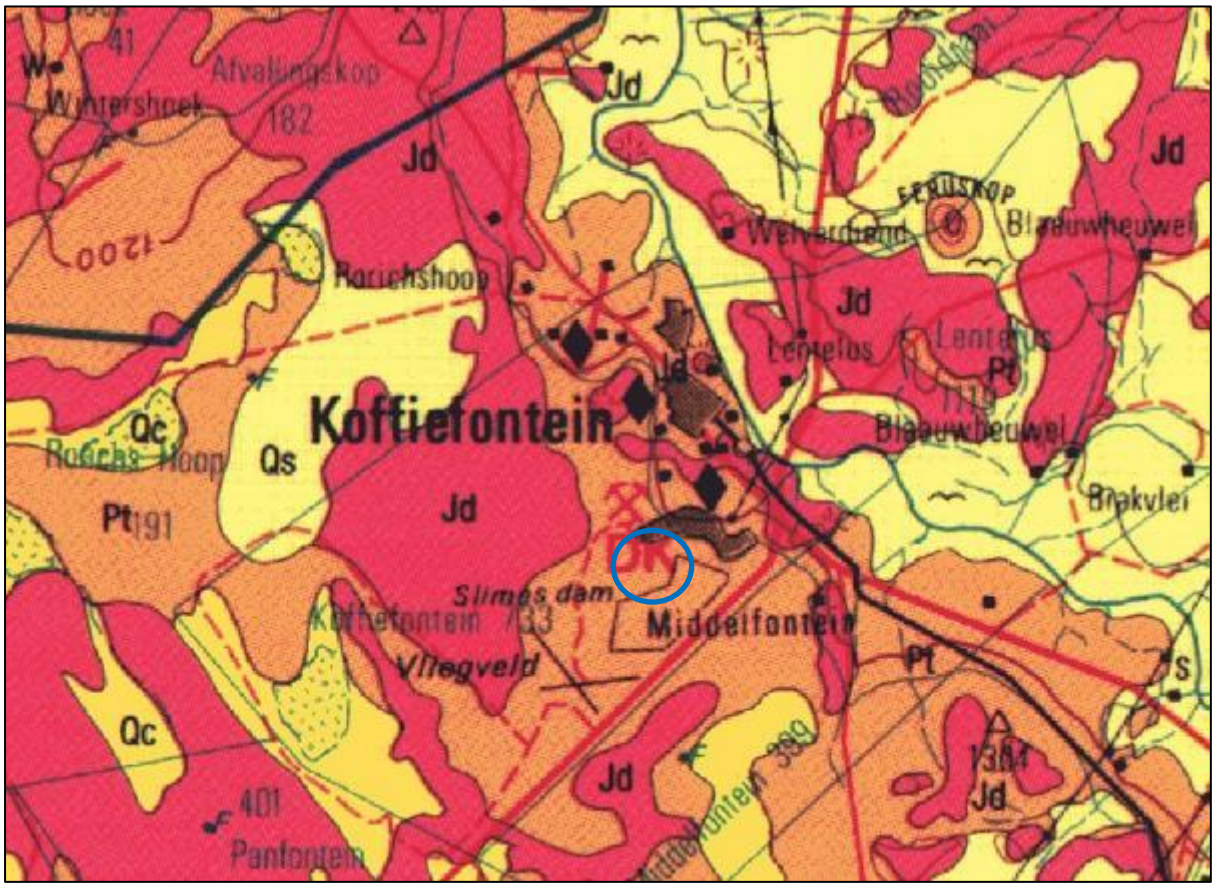

Figure 6. Extract from 1: 250 000 geology sheet 2924 Koffiefontein (Council for Geoscience, Pretoria) showing the approximate location of the proposed brick-making plant study area at the Koffiefontein Diamond Mine, Koffiefontein 733, Free State (blue circle). The bedrocks mapped in the study region are basinal mudrocks and fine-grained sandstones assigned to the Tierberg Formation (Pt, orange) of the Ecca Group (Middle Permian) that are extensively intruded in this region by Early Jurassic sills of the Karoo Dolerite Suite (Jd, red). In the diamond mine area the surface rocks are highly disturbed and comprise in part reworked material in the slimes dam. Elsewhere in the Koffiefontein area the bedrocks are overlain by Late Caenozoic calcretes (Qc) as well as aeolian sands and alluvium (Qs, pale yellow).

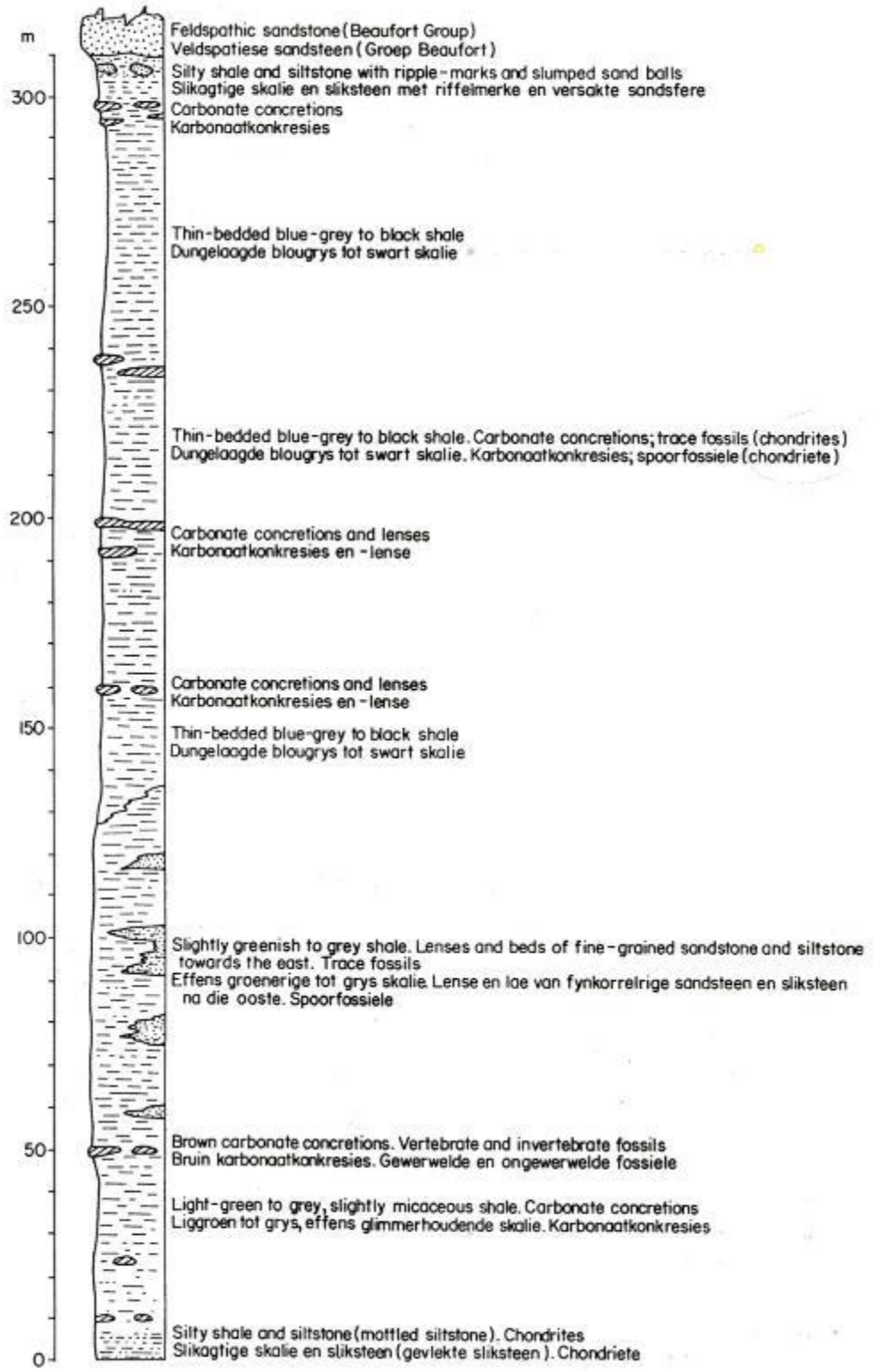

Figure 7. Schematic section through the Tierberg Formation succession in the Northern Cape and southern Free State (From Visser *et al.* 1977-1978). Vertebrate and invertebrate body fossils occur in association with carbonate concretions low down in the succession, while trace fossils are recorded at several stratigraphic levels.

3. OVERVIEW OF PALAEONTOLOGICAL HERITAGE WITHIN THE STUDY AREA

The Late Caenozoic superficial sediments overlying the Ecca Group bedrocks in the study area have been highly disturbed or largely removed by mining activity. The material in the slimes dam represented fine-grained, milled tailings from the Koffiefontein mine and is therefore unfossiliferous (with the possible exception of ubiquitous microfossils). It is noted that important mammalian and other fossil remains may be associated with Late Caenozoic alluvial deposits of the Rietrivier near Koffiefontein (*cf* Late Pleistocene fossil horse remains reported by Wells 1940, who gives neither locality nor stratigraphic details for these finds) but the present site lies over two kilometres from the present riverbanks and is, as mentioned, highly disturbed. Fossiliferous alluvial deposits are therefore not expected.

Only the fossil record of the Tierberg Formation (Ecca Group) that underlies the study area is further discussed here.

3.1. Fossil heritage within the Tierberg Formation

The fossil record of the Tierberg Formation within the Main Karoo Basin has been reviewed in detail by Almond *in* Macey *et al.* (2011). Rare body fossil records include disarticulated microvertebrates (*e.g.* fish teeth and scales) and invertebrates (sponge spicules) from calcareous concretions in the Koffiefontein sheet area (Visser *et al.* 1977-1978, Zawada 1992) (Fig. 7 herein) and allochthonous plant remains (leaves, petrified wood). The latter become more abundant in the upper, more proximal (prodeltaic) facies of the Tierberg succession (*e.g.* Wickens 1984). Prinsloo (1989) records numerous plant impressions and unspecified “fragmentary vertebrate fossils” within fine-grained sandstones in the Britstown sheet area. Dark carbonaceous Ecca mudrocks are likely to contain palynomorphs (*e.g.* pollens, spores, acritarchs).

The commonest fossils by far in the Tierberg Formation are sparse to locally concentrated assemblages of trace fossils that are often found in association with thin event beds (*e.g.* distal turbidites, prodeltaic sandstones) within more heterolithic successions. A modest range of ten or so different ichnogenera have been recorded from the Tierberg Formation (*e.g.* Abel 1935, Anderson 1974, 1976, Wickens 1980, 1984, 1994, 1996, Prinsloo 1989, De Beer *et al*., 2002, Viljoen 2005, Almond *in* Macey *et al.* (2011)). These are mainly bedding parallel, epichnial and hypichnial traces, some preserved as undertracks.

To the author’s knowledge, there are no records of fossils from the Tierberg Formation (“Middle Ecca”) at Koffiefonteiitself. There may be undescribed fossil fish material from the Ecca Group at Koffiefontein in museum palaeontological collections in Kimberley – possibly from the Lower Ecca rocks (*e.g.* Prince Albert and Whitehill Formations) excavated during mining of the diamond pipe - but no record of such fossils could be traced. Tierberg Formation exposures in the western portion of the Koffiefontein 1: 250 000 sheet area examined by Almond (2013a) were largely unfossiliferous, apart from low diversity trace fossil assemblages. The original fossil record has probably been destroyed by near-surface weathering, secondary calcrete formation and baking by dolerite dykes – all factors which may well also apply to the present study area at Koffiefontein Diamond Mine. It is concluded that the palaeontological sensitivity of the study site is LOW.

4. CONCLUSIONS & RECOMMENDATIONS

The proposed brick-making plant study area overlies Permian basinal mudrocks of the Tierberg Formation (Ecca Group). Although there are occasional records of fossil remains - fish scales, coprolites, sponge spicules, low diversity trace fossil assemblages - from this formation elsewhere in the Koffiefontein 1: 250 000 sheet area, none appear to be known from Koffiefontein itself (There are possible but unconfirmed reports of fossil fish from Ecca Group rocks excavated from the Koffiefontein

diamond pipe). The Ecca bedrocks in the study area are likely to be highly disturbed and weathered near-surface, with possible disruptive calcrete veining and baking by local dolerite or younger intrusions. Overling Late Caenozoic superficial sediments (gravels, soils, pedocretes, slimes dam tailings *etc*) are likewise highly disturbed and of low to very low palaeontological sensitivity. Quaternary alluvium of the Rietrivier has yielded important fossil mammal remains near Koffiefontein but is not mapped in the study area which lies *c*. 2 km distant from the modern riverbanks. Unique or rare fossil heritage resources are therefore not threatened by the proposed development.

The impact significance of the proposed brick-making plant, which in addition has a small footprint area, is accordingly assessed as VERY LOW. No further specialist palaeontological heritage studies or mitigation are recommended for this project, pending the discovery of substantial new fossil material during development.

The responsible Environmental Control Officer (ECO) should monitor all substantial (> 1 m deep) bedrock excavations for fossil material. In the case of any significant new fossil finds (*e.g.* vertebrate teeth, bones, burrows, petrified wood, shells), these should be safeguarded - preferably *in situ* - and reported by the ECO as soon as possible to SAHRA so that appropriate mitigation (*i.e.* recording, sampling or collection) by a palaeontological specialist can be considered and implemented (Contact details: Dr Ragna Redelstorff, SAHRA, P.O.Box 4637, Cape Town 8000. Tel: 021 202 8651. Email: rredelstorff@sahra.org.za). These recommendations should be incorporated into the Environmental Management Plan (EMP) for the brick-making plant.

5. ACKNOWLEDGEMENTS

Mr Frank van der Kooy of Greenrsa (Pty) Ltd, Totiusdal is thanked for commissioning this study and for kindly providing the necessary background information.

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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, Mpumalanga, Northwest, Free State, KwaZulu-Natal and Limpopo Provinces under the aegis of his Cape Town-based company *Natura Viva* cc. He has been 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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