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HERITAGE SURVEY OF THE EAST LONDON IDZ PHOTOVOLTAIC FACILITY, EASTERN CAPE.

FOR

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Management

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INTRODUCTION

Gehrlicher Ikwhezi (Pty) Ltd proposes to construct a Photovoltaic (PV) solar energy facility of up to 10 – 12 Mega Watts (MW) on land located within Zone 1 of the East London Industrial Development Zone (ELIDZ), which is located near the suburbs of Sunnyridge and Siyakha in East London. The total area of undeveloped land that will possibly accommodate the PV panels on elevated frames is about 18.5 Ha..

The project will take place in two phases as follows;

□ Phase 1 – construction of pilot scale 2 - 3 MW PV facility on about 3 Ha of existing covered car park area

□ Phase 2 – construction of a further 8 – 9 MW PV facility on about 18.5 Ha of private open space.

Phase 2 will only be implemented if Phase 1 proves to be feasible. The following is a summary of the proposed parcels of land that will accommodate the PV facility:

- Parking area depicted as Parking Area A (about 1.5 Ha)
- Parking area depicted as Parking Area B (about 1.5 Ha)
- Private Open Space Erf 60826 (about 3.0 Ha)
- Private Open Space Erf 60905 (about 3.0 ha)
- Private Open Space Erf 60846 (about 6.0 Ha)
- Private Open Space Erf 60866 (about 2.5 Ha)
- Private Open Space Erf 60872 (about 0.5 Ha)
- Private Open Space Erf 60916 (about 3.5 ha)

The physical alteration of undeveloped land amounts to a total of about 18.5 Ha (i.e., below the 20 ha threshold which would trigger a full EIA under GN 545). This area has been determined to be suitable to accommodate the PV arrays and is based on a specialist CES ecological and botanical... It is very important to note though that this does not involve complete transformation of the land in

question, as the PV panels will be mounted on elevated frames that will be supported by a series of concrete footings that will be constructed on the land. The vast majority of the 18.5 Ha of land will remain un-transformed...

...the intention of the project proponent to make an application for the generation of Certified Emission Reductions (CERs) in terms of the Clean Development Mechanism (CDM) program under the Kyoto Protocol. All of the identified parcels of land proposed for the PV development are all located within the boundary of the ELIDZ. The proposed site is easily accessible via the R78 from East London and lies about 10km from the town's CBD.

The proposed development falls under the jurisdiction of Buffalo City Municipality (BCM), in the Eastern Cape Province. It is expected that the PV facility will be connected onto the ELIDZ electricity grid" (CES BID 2015).

Figures 1 - 3 give the locality of the site.

Umlando was requested to undertake a field survey of both areas in February 2015. The project is referred to as the East London IDZ Photovoltaic Project (ELIDZ PP)

FIG. 1 GENERAL LOCATION OF THE ELIDZ PP



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FIG. 2: AERIAL OVERVIEW OF THE ELIDZ PP



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FIG. 3: TOPOGRAPHICAL MAP OF THE ELIDZ PP



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NATIONAL HERITAGE RESOURCES ACT OF 1999

The National Heritage Resources Act of 1999 (pp 12-14) protects a variety of heritage resources. This are resources are defined as follows:

- "For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.
- 2. Without limiting the generality of subsection (1), the national estate may include—
 - 2.1. Places, buildings, structures and equipment of cultural significance;
 - 2.2. Places to which oral traditions are attached or which are associated with living heritage;
 - 2.3. Historical settlements and townscapes;
 - 2.4. Landscapes and natural features of cultural significance;
 - 2.5. Geological sites of scientific or cultural importance;
 - 2.6. Archaeological and palaeontological sites;
 - 2.7. Graves and burial grounds, including-
 - 2.7.1. Ancestral graves;
 - 2.7.2. Royal graves and graves of traditional leaders;
 - 2.7.3. Graves of victims of conflict;
 - 2.7.4. Graves of individuals designated by the Minister by notice in the Gazette;
 - 2.7.5. Historical graves and cemeteries; and
 - 2.7.6. Other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- 3. Sites of significance relating to the history of slavery in South Africa;
 - 3.1. Movable objects, including—

- Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - 4.1. Objects to which oral traditions are attached or which are associated with living heritage;
 - 4.2. Ethnographic art and objects;
 - 4.3. Military objects;
 - 4.4. objects of decorative or fine art;
 - 4.5. Objects of scientific or technological interest; and
 - 4.6. books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).
- 5. Without limiting the generality of subsections (1) and (2), a place or object is to be considered part of the national estate if it has cultural significance or other special value because of—
 - 5.1. Its importance in the community, or pattern of South Africa's history;
 - 5.2. Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
 - 5.3. Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
 - 5.4. Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
 - 5.5. Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
 - 5.6. Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
 - 5.7. Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
 - 5.8. Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and

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5.9. sites of significance relating to the history of slavery in South Africa"

METHOD

The method for Heritage assessment consists of several steps.

The first step forms part of the desktop assessment. Here we would consult the database that has been collated by Umlando. These database contain archaeological site locations and basic information from several provinces (information from Umlando surveys and some colleagues), most of the national and provincial monuments and battlefields in Southern Africa (http://www.vuvuzela.com/googleearth/monuments.html) and cemeteries in southern Africa (information supplied by the Genealogical Society of Southern Africa). We use 1st and 2nd edition 1:50 000 topographical and 1937 aerial photographs where available, to assist in general location and dating of buildings and/or graves. The database is in Google Earth format and thus used as a quick reference when undertaking desktop studies. Where required we would consult with a local data recording centre, however these tend to be fragmented between different institutions and areas and thus difficult to access at times. We also consult with an historical architect, palaeontologist, and an historian where necessary.

The survey results will define the significance of each recorded site, as well as a management plan.

All sites are grouped according to low, medium, and high significance for the purpose of this report. Sites of low significance have no diagnostic artefacts or features. Sites of medium significance have diagnostic artefacts or features and these sites tend to be sampled. Sampling includes the collection of artefacts for future analysis. All diagnostic pottery, such as rims, lips, and decorated sherds are sampled, while bone, stone, and shell are mostly noted. Sampling usually

occurs on most sites. Sites of high significance are excavated and/or extensively sampled. Those sites that are extensively sampled have high research potential, yet poor preservation of features.

Defining significance

Heritage sites vary according to significance and several different criteria relate to each type of site. However, there are several criteria that allow for a general significance rating of archaeological sites.

These criteria are:

1. State of preservation of:

- 1.1. Organic remains:
- 1.1.1. Faunal
- 1.1.2. Botanical
- 1.2. Rock art
- 1.3. Walling
- 1.4. Presence of a cultural deposit
- 1.5. Features:
- 1.5.1. Ash Features
- 1.5.2. Graves
- 1.5.3. Middens
- 1.5.4. Cattle byres
- 1.5.5. Bedding and ash complexes

2. Spatial arrangements:

- 2.1. Internal housing arrangements
- 2.2. Intra-site settlement patterns
- 2.3. Inter-site settlement patterns

3. Features of the site:

3.1. Are there any unusual, unique or rare artefacts or images at the site?

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3.2. Is it a type site?

3.3. Does the site have a very good example of a specific time period, feature, or artefact?

4. Research:

4.1. Providing information on current research projects

4.2. Salvaging information for potential future research projects

5. Inter- and intra-site variability

5.1. Can this particular site yield information regarding intra-site variability, i.e. spatial relationships between various features and artefacts?

5.2. Can this particular site yield information about a community's social relationships within itself, or between other communities?

6. Archaeological Experience:

6.1. The personal experience and expertise of the CRM practitioner should not be ignored. Experience can indicate sites that have potentially significant aspects, but need to be tested prior to any conclusions.

7. Educational:

7.1. Does the site have the potential to be used as an educational instrument?

7.2. Does the site have the potential to become a tourist attraction?

7.3. The educational value of a site can only be fully determined after initial test-pit excavations and/or full excavations.

8. Other Heritage Significance:

8.1. Palaeontological sites

8.2. Historical buildings

8.3. Battlefields and general Anglo-Zulu and Anglo-Boer sites

8.4. Graves and/or community cemeteries

8.5. Living Heritage Sites

8.6. Cultural Landscapes, that includes old trees, hills, mountains, rivers, etc related to cultural or historical experiences.

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The more a site can fulfill the above criteria, the more significant it becomes. Test-pit excavations are used to test the full potential of an archaeological deposit. This occurs in Phase 2. These test-pit excavations may require further excavations if the site is of significance (Phase 3). Sites may also be mapped and/or have artefacts sampled as a form of mitigation. Sampling normally occurs when the artefacts may be good examples of their type, but are not in a primary archaeological context. Mapping records the spatial relationship between features and artefacts.

SITE SIGNIFICANCE	FIELD RATING	GRADE	RECOMMENDED MITIGATION
High Significance	National Significance	Grade 1	Site conservation / Site development
High Significance	Provincial Significance	Grade 2	Site conservation / Site development
High Significance	Local Significance	Grade 3A / 3B	
High / Medium Significance	Generally Protected A		Site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B		Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	Generally Protected C		On-site sampling monitoring or no archaeological mitigation required prior to or during development / destruction

TABLE 1: SAHRA GRADINGS FOR HERITAGE SITES

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RESULTS

DESKTOP STUDY

The desktop study consisted of analysing various maps for evidence of prior habitation in the study area, as well as for previous archaeological surveys. No national monuments, battlefields, or historical cemeteries are known to occur along the route.

The area was previously surveyed by Binneman and Webley (1998). No sites were observed during this survey, due to dense vegetation. The area was marked as being sensitive and requiring an archaeologist on site during clearance. Anderson (2009) and Van Ryneveld (1998a-d) have surveyed adjacent areas (fig. 4). Anderson recorded seven shell middens closer to the ocean as well as the remains of human settlements and possible graves. Van Ryneveld recorded historical buildings and Cove Rock itself as having cultural significance.

Rubidge (1998) has undertaken desktop study adjacent to the study area and noted that the Beaufort Formations is very sensitive and would require inspection if affected. Similarly, Groenewald has noted that the deeper layer are sensitive and require mitigation if affected (see Appendix A).

The 1959 aerial (figures 5 - 6) and topographical (fig. 7) clearly show that site 5 has no structures or settlements. Site 1 has buildings adjacent to it, and the northern part of the site was bisected with a road and some form of industrial buildings. The northern half of Site 1 is thus already disturbed. These maps also show that the area has several settlements (and thus graves) and historical buildings within the IDZ boundaries and these are protected by the heritage legislation.

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FIG. 4: LOCATIONS OF PREVIOUSLY SURVEYED AREAS¹



¹ Yellow = Binneman & Wadley (1996), Purple = van Ryneveld (2008a-d), red = Rubridge (2008); White = Anderson (2009,2011)

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FIG. 5: STUDY AREA IN 1959



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FIG. 6: CLOSE UP OF SITE 1 IN 1959



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FIG. 7: STUDY AREA IN 1959





FIELD SURVEY

The field trip was undertaken in February 2015. Figure 8 and 9 shows the general views of Sites 1 and 5 respectively.

The vegetation was dense in both areas resulting in poor visibility for heritage sites. However, there were small paths and excavations/burrows that allowed for a general assessment. The vegetation assessment has reduced the initial footprints of the two sites so as to omit riverine areas.

SITE 1

Site 1 has been effected by a previous development as noted in the desktop assessment. Two broken grinding stones were noted at Site 1 (fig. 10). The southern part of Site 1 was not as disturbed or densely vegetated as the northern and eastern parts. No shell middens, or parts thereof, were observed, nor were any fragments seen in the various molehills or animals burrows.

Shell middens were recorded to the south and southwest of Site 1 (Anderson 2009): IDZ02, 03, and 07. These sites were fragmented and scattered shell middens with a few stone tools. The more significant sites occurred closer to the beach. This is probably due to little development occurring that close to the beach and rock outcrops. It is unlikely that a large and intact shell midden would occur in the area of Site 1, especially in the northern area where the main part of the construction will occur.

FIG. 8: SCENIC VIEWS OF SITE 1



FIG. 9: SCENIC VIEWS OF SITE 5



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FIG. 10: BROKEN GRINDING STONE LOCATED AT SITE 1

SITE 5

Site 2 is located is located on a hill further in land than Site1, and ~1.3km from the beach. The area is a narrow section of land that has been partially disturbed by the construction of the road. No artefacts were noted in this area.

MANAGEMENT PLAN

The vegetation was too dense to undertake an accurate survey; however, I believe that if archaeological sites did exist, they would be minimally affected by the project. There are three poles per panel and the panel is 2 m x 10m in size. Each pole is 0.4m in diameter (fig. 11). If a shell midden or site occurs in the southern part of Site 1, then it will be minimally effected. The southern half if Site 1 is ~100m x 100m maximum. The shell middens tend to be a maximum of 5m in

An ECO should be on site during the construction of the lower part of Site 1. The ECO should report any exposed shell middens (if they occur) to a qualified archaeologist, who can make an assessment.



FIG. 12: PLAN OF THE SOLAR PANEL ARRAYS

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CONCLUSION

A heritage survey was undertaken for the two proposed photovoltaic sites in the East London IDZ. The vegetation was dense in both areas; however, there was no suggestion of heritage sites at Site 5. Two stone artefacts were noted at Site 1, but no shell middens were observed. The upper half of Site 1 has been effected by previous developments that would have destroyed any shell middens. The lower half of Site 1 had no visible shell middens.

The overall subsurface impact of the solar panels will be minimal and does not require soil clearance. The impact will be a 0.4m diameter hole every 5m. Even if the poles hit a subsurface midden they would not be damaging much of it.

An ECO should be on site during the construction phase of the southern half of Site 1. Any occurrences of marine shell should be reported to a qualified archaeologist and ECPHRA, in order to make an assessment.

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APPENDIX A PIA LETTER







Clarens Dinosaur Hunting Expeditions CC

Dr Gideon Groenewald (PhD; Nat Dip Nat Con; Pr Sci Nat Earth Scientist)

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31 October 2010

To Whom It May Concern:

Dear Gavin

POTENTIAL PALAEONTOLOGICAL IMPACT - IDZ East London: Fish farm on the dunes. 33° 3'39.90''S 27°51'8.50''E to 33° 3'28.30''S 27°51'32.30''E

Thank you for your request to comment on the potential impact of the development at IDZ East London.

Following a desktop survey we conclude that the site of the development is underlain by Permian sediments of the Adelaide Subgroup (geological map) and possibly sand dunes and dune sandstone of Tertiary age. The Adelaide Subgroup and the shales of this Subgroup is known for the remains of a mammal-like reptiles such as Dicynodon lacerticeps and other vertebrate fossils. In coastal areas the weathering of the shale can be extensive and the fossils are destroyed to depths of up to 2m under ground. Sandstone associated with more recent dune deposits, mostly of Tertiary age, might reveal fossils of more recent age. The sandstone is however highly weathered and the chance of finding fossils not very high.

We recommend that the developer and contractor be informed of the possibility of fossils on the site, specifically if the mudstone layers of the Adelaide Subgroup are exposed, or if significant excavation into the Tertiary dune sandstone is planned. We recommend the temporary appointment of a trained palaeontologist to do a site investigation if mudstone outcrops are known from the site. On reporting of a fossil find the developer must appoint a qualified palaeontologist to remove the fossils under guidance of a SAHRA permit.

Thank you for your request to be of assistance.

Greetings

GIDEON GROENEWALD (PhD; Pr Sci Nat Earth Scientist) Geologist

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