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29th August 2006

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SCOPING REPORT
HERITAGE SPECIALIST IMPACT ASSESSMENT - PALAEONTOLOGY

PALAEONTOLOGICAL MITIGATORY ACTIONS - DEVELOPMENT OF ERF 578, VELDDRIF (LAAIPLEK)

Prepared for ENVIRO DINAMIK

By John Pether

PROJECT DESCRIPTION

This document is prepared for ENVIRO DINAMIK, the environmental management consultants conducting the Screening and Scoping phases of the Environmental Impact Assessment (EIA) processes for their client whom intends development of Erf 578, Velddrif (Laaiplek) (Map 1).

An example of work done in terms of the Heritage Resources Act is the report *Palaeontological Mitigation Report, Coastal Marine Deposits Dwarskersbos. Dwarskersbos Erf 276 Housing Development. For BKS (Pty) Ltd, Sept 2004*. These are observations made in a 6 m deep pit made for a sewage pump station which illustrate the nature of the exercise and how scientifically valuable the exposures created during coastal developments can be if the opportunity is used.

The main purposes of this assessment are to:

- Outline the nature of palaeontological heritage resources in the subsurface of the site Erf 578.
- Suggest the mitigatory actions to be taken during the construction of developments on the site Erf 578 with respect to the occurrence of fossils.

This document also serves as the basis for the Agreed Terms of Reference for the heritage impact management part of the project.

As yet there are no dates scheduled for the work or provision of details of the excavations wrt. precise positions and excavation depths.

THE HERITAGE RESOURCE

The significance of fossils as natural heritage is primarily their scientific value. They contribute to the understanding of South Africa's geohistory, the progression through "deep time" of changing climates, oceanography and of the biota, both plant and animal, that lived on the land and in the sea,

and which ultimately resulted in the landscapes and coasts and the resources that sustain us today. Generally-speaking they are scarce, non-renewable and irreplaceable when destroyed.

The value of fossils extends far beyond the curiosity of palaeontological study in museums, for they provide the basis for biostratigraphy, the division of the sedimentary record into units of distinct ages that can be correlated both regionally and globally. The fossil content of strata is very important in the formulation of "geological models" of earth processes. These "geological models" furnish the understanding of the genesis of exploitable mineral resources and inform the strategies for mineral and fossil-fuel exploration.

The value of fossils is severely compromised when they are collected without proper recording of their geological context. Detailed geological (sedimentological/palaeoecological) observations are indispensable for the interpretation of fossil finds.

In terms of the National Heritage Resources Act No. 25 of 1999, Sections 35 & 38, palaeontological materials (fossils) are regarded as a heritage resource and appropriate actions are required to mitigate impacts from construction and development on palaeontological heritage.

THE PALAEONTOLOGICAL ASSESSMENT AND MITIGATION PROCESSES

Introduction

Although fossiliferous strata may be exposed at some sites in the vicinity, most of the fossils will be exposed in the excavations made for the installation. Palaeontological interventions mainly happen once fossil material is exposed at depth, *i.e.* once the EIA process is done and construction commences.

The management action plans and protocols for palaeontological mitigation must therefore be *included in the EMP* and embodied in the Agreed Terms of Reference for the appointed heritage assessment/mitigation practitioner.

Therefore, although this submission occurs at the screening/scoping phase, it may be regarded as the draft input for the EIA phase.

Screening/Scoping Phase

Desktop Study. Existing scientific literature and collection holdings of relevance to the palaeontological/geological record of the site area will be reviewed, assessed and summarized. On this basis the general expectations wrt. potential fossil occurrences will be outlined.

Specific site features. The object here is the advance earmarking of fossil sites of such importance that they may constitute a temporary or permanent No-Go site, necessitating revision of the siting of the envisaged installation. Alternatively, that the outcrop/exposure is sufficiently important that mitigation measures should be carried out *before* the commencement of construction activities on the site.

Outcome: Initial HIA Palaeontological Report for the site (this report).

EIA Phase

At this stage, any additional information arising and issues from discussions with interested parties wrt. recommendations for mitigatory actions for the selected site will be elaborated for inclusion in the finalized EIA Report, for the input to the EMP.

Also, at this stage the examination of any available drill cores/samples of sediments obtained in the course of geotechnical and geohydrological investigations would facilitate an improved assessment of the fossils likely present. It might also "add value" to such investigations.

Site visits may not be necessary, unless to examine additional material such as cores.

EMP Phase

Mitigatory recommendations to be carried out during a fieldwork phase at the selected site. See below.

Outcome: Final Report. Rescued fossil material deposited in the appropriate scientific institution.

Geological History of Velddrif

Setting

The coast of St. Helena Bay is unusual for the South African West Coast in that extensive sets of shelly beach ridges are preserved, formed by the building out of the coast in relatively recent geological times. These coast-parallel ridges are easily seen on aerial and satellite images. Most of this coastal progradation took place during the Last Interglacial 120-127 thousand years before present (kilo-annum (ka) BP), when sea-level was about +6 m higher than present. Thus, beneath a cover of sandy soil and windblown sand, most of the Velddrif area is underlain by these fossil, shell-rich beach, deposits. It is not then co-incidental that the "type section" of Last Interglacial sea-level-high deposits on the West Coast is on Velddrif 110, these deposits being named the Velddrif Formation. (Map 2).

Erf 578 Velddrif is situated on the younger, outer set of ridges (the "Outer Bar") and is therefore underlain by shelly fossil beach deposits that are beneath a thin cover of sandy soil and windblown sand. Just inland of the outer, youngest set of beach ridges is a coast-parallel low area called "Die Brak" which is underlain by brackish calcareous soil and calcrete, with salt pans in places. Deposits of marine lagoons, freshwater pans and evaporitic pans occur in "Die Brak". Inland of "Die Brak" is another, older set of beach ridges, the "Inner Bar".

Geology

Rogers (1980, 1982) described aspects of the large-scale geology of the St. Helena Bay coastal plain, *viz*. gross bedrock topography, sediment thicknesses and lithostratigraphy, revealed by a Dept. Water Affairs drilling programme. The hard-rock bedrock deeper beneath Velddrif is Late Precambrian Malmesbury Group (MG) metasedimentary shales and greywackes older than ~600 Ma (mega-annum, million years). Only a few, small outcrops of this bedrock surface occur as it generally several metres below sea-level beneath sediment cover. This buried bedrock topography was cut by ancient rivers, ancestral to the Berg River. It is probable, from some borehole evidence, that a bedrock palaeochannel with fluvial infill underlies Velddrif. Visser & Schoch (1973) allude to a prominent kink in the beach ridges where they cross the Velddrif/Dwarskersbos boundary (Map 2). This they ascribe to the influence of an underlying bedrock high or promontory. Evidence for high bedrock in this vicinity is an MG outcrop on the beach at Soverby. Also, silcrete crops out in "Die Brak" at the northern boundary of Velddrif 110 and is evidently a silicified crust on Malmesbury rocks. Tankard (1976) mentions a +4 m MG platform in same vicinity (his site 6).

The overall perspective on the surface geology in this area has been provided by Visser & Schoch (1973). Aspects of some exposures of shelly Late Pleistocene, Last Interglacial "fossil" shoreline deposits in the vicinity of Velddrif were briefly described by Tankard (1976).

The beach ridges in the Velddrif-Dwarskersbos area were mapped as a single unit (QB1: estuarine and beach deposits) by Visser & Schoch (1973). These shelly beach deposits are most extensive on Velddrif 110, tapering off west of the Berg River mouth and northwards past Dwarskersbos. Northwards from the Berg River, the shelly QB1 beach-ridge deposits are divided by the "Die Brak" saline flat into an "Outer Bar" and an "Inner Bar" (*sensu lato*).

In earlier work (e.g Tankard, 1976), the "Inner" and "Outer" bars and the intervening low area of "Die Brak" have all been regarded as Last Interglacial (LIG) features, deposited ~125 ka ago) during a sea-level 4-6 m above present. Subsequently, it has been established that during the recent past, only 4-6 thousand years ago (4-6 ka BP), sea-level was again higher than present by 2-3 m. This is the mid-Holocene highstand, now well documented on numerous continental-margin and island sites worldwide. The local evidence is discussed in Miller (1990), Miller *et al*. (1993), Ramsay (1995) and Compton (2001).

It therefore has become likely that the youngest (seaward) beach ridges of the St. Helena Bay coastline are Holocene features. The recently described Dwarskersbos Pump Station 2 excavation (Pether, 2004) revealed that underneath the "Outer Bar" there is an unexpected >6 m thickness of young (less than 6 ka BP) prograded Holocene marine sequence (and not LIG deposits). This implies that the Holocene transgressive-maximum sea-level shoreline there is farther inland than hitherto appreciated and is apparently near the "Inner Bar". This provides a "peg" for making sense of the features in the immediate area, illustrating the value of monitoring excavation work at the coast.

Farther north at sites just inland of the shore-parallel dune barrier, Miller *et al*. (1993) described sequences seen in excavations made into the floor of "Die Brak". Initially, these were deposited in a back-barrier lagoonal setting that relates to the mid-Holocene sea-level high 4-6 ka BP, when "Die Brak" was flooded due to the 2-3 m higher sea-level. The ostracod fauna (microfossil crustacean

shells) from one such sequence reveals a palaeoenvironmental history involving a progressive succession from normal marine lagoon, to fluctuating high-salinity marine (evaporative), cut-off lagoon, to freshwater vlei conditions (Dingle & Honigstein, 1994). This indicates that, after a marine lagoon phase, saltpans and vleis formed in "Die Brak".

Assessment: Expected Geology/Palaeontology

Erfs 578 and 470, along the Velddrif area shoreline and situated on the "Outer Bar", are expected to be mainly underlain by Holocene beach deposits, built out in the last few thousand years.

The excavations/trenches to be made for the planned house foundations, pipes and cable connections will be mainly shallow, generally less than ~2 m deep. They will intersect the upper windblown sands and "weak" soil and penetrate into the underlying buried beach sands.

It is expected that fossil shells and bones in the uppermost windblown sands and "weak" soil will very likely be in an archaeological context *i.e.* due to man. Deeper trenches may intersect human burials. Occurrences of such archaeological material are not within this brief and must be dealt with by an accredited archaeologist.

The deeper trenches that penetrate into the underlying Holocene beach and shoreface sands will reveal fossil shell concentrations and other features of palaeontological/scientific importance.

It is possible that the older, shelly LIG deposits may be intersected in deeper excavations on erfs 578 and 470. However, the position of the contact between LIG beach deposits and the much younger, Holocene beach ridges has not been established in the area with any certainty. Nevertheless, beneath up to ~2 m of Holocene sediments, "Die Brak" is underlain by LIG shoreface deposits (personal observations). Just inland of Erf 470, the shelly beach ridges exposed along the western edge of "Die Brak" (*viz.* at the rubbish-tip and poultry-grit quarries) appear to be LIG deposits. This implies that the Holocene/LIG contact may occur at depth in the landward parts of Erfs 470 and 578 and could be exposed in excavations made there.

The older LIG deposits that may be exposed will have an upper part that has been subjected to soil-forming processes such as reddening, shell degradation, calcrete formation and carbonate dissolution, with an erosional and/or karst-like upper contact.

In addition to shells, scattered bones may occur in the beach and shoreface deposits, *e.g.* from whales, dolphins, seals, seabirds etc. Given the proximity of a major river, animal carcasses from the hinterland could also have been delivered to the nearby beaches.

Impact Assessment

Significance

Due to the all the interesting features in the Velddrif-Dwarskersbos area, it is has attracted scientific attention in the past, particularly for its potential as a record of higher sea-levels. Nevertheless, with some few exceptions, little detail has been sampled and recorded, particularly from the viewpoint of modern perspectives in the palaeoecological and sedimentological fields. This is partly because there are few naturally-formed exposures and also because opportunities provided by the excavations made in the course of the civil works have often been missed. Now that the fossil/scientific record is included in EIAs as a heritage resource, the circumstance arises to co-operatively remedy the missed opportunities within a more formal framework. This was initially adequately achieved for the Kersbos Strand development to the north of Dwarskersbos, where the 6 m deep excavation made for a pump station proved scientifically very informative.

It is worth noting that palaeontological and archaeological fossils from the broader Saldanha area have national and international scientific importance. Notwithstanding, major aspects of the geological history in the region are controversial. Thus opportunities to examine the subsurface geological and fossil record in the area continue to be vital.

Although the expected fossil shells in the Holocene deposits are modern species living today (extant species), representative collections should be made from the area under development, with documentation of their context. The shells from the older LIG deposits are also mainly extant species, but unexpected taxa sometimes occur.

The significance of such samples/documentation involves:

Significance in the history of sea-level change.

Record of changes in faunal communities with time.

For future radiometric and chemical dating purposes (rates of coastal change).

Preservation of fossils for future palaeo-oceanographic research *e.g.* stable isotope/palaeotemperature analysis etc.

Preservation for the application of yet unforeseen investigative techniques.

There is a significance to fossils beyond their conventional academic/scientific importance that is more firmly in the realm of cultural aesthetics. Fossils are part of the physical strata of the landscape and inform the appreciation of its space-time depth and its biota, living and extinct. Such apprehensions initiate in the young from encounters with fossils. Ultimately this heritage resource must be rendered known and accessible to the wider community *via* educational programmes emanating from *e.g.* museums, sponsorship, NGOs. The first priority, however, is to rescue fossils and attendant information that would otherwise be lost.

Nature of the Impact

Extents

Initially, the physical extent of impacts on potential palaeontological resources relates directly to the extents of subsurface disturbance during construction. This will be in the areas of deeper infrastructure installation for the development.

In the longer term, the development largely "sterilizes" the palaeontological resource potential within its extents, as the subsurface becomes "sealed" beneath buildings and roads.

Duration

According with the above, the initial duration of the impact is shorter term (< year) and primarily related to the period over which infrastructural excavations are made. This is the "time window" for mitigation.

In the medium term (several years) the development extents may be covered and the subsurface rendered increasingly unavailable. In the longer term (>decade), upgrading/repair of services and larger installations (*e.g.* basements, fuel tanks) might provide further exposures.

In the case of "borrow-pit" and quarry-type excavations that are left open, natural erosion of the quarry faces continues to both expose and destroy fossils in the longer term.

Intensity

The impact of development/construction on fossil resources is high in the absence of mitigation. This is because fossils are rare objects, often preserved due to unusual circumstances. This is particularly applicable to vertebrate fossils (bones), which tend to be sporadically preserved and have high value wrt. palaeoecological and biostratigraphic (dating) information. Such fossils are non-renewable resources and loss of the opportunity to recover them and their contexts when exposed at a particular site is irreversible.

Probability

The likelihood of impact is definite. The area is known to have considerable fossil potential, being in the region of significant fossil occurrences. Specifically, the existing excavations in the nearby area show that fossils are readily evident.

Confidence

The level of confidence of the nature and degree of impact is medium to high. Existing information has been assessed and the author has made observations in the area.

Status of the Impact

Fossils will definitely be lost in the absence of management actions to mitigate such loss.

There remains a medium to high risk of valuable fossils being lost *in spite of* management actions to mitigate such loss. Machinery involved in excavation may damage or destroy fossils, or they may be hidden in "spoil" of excavated material.

The status of the potential impact for palaeontology is not neutral. From the point of view that the "windows" into the coastal plain depository, that provide access to fossils, would not exist without excavations being made, the impact is positive for palaeontology. However, some fossils will be lost

and destroyed, in spite of efforts at mitigation. The development largely renders the subsurface fossils inaccessible over large areas and in the long term to indefinitely.

On this basis it is suggested that an acceptable degree of mitigation, entailing both monitoring and a detailed inspection of excavations (primary fieldwork), be carried out. A management framework for the mitigation process is proposed below.

Recommended Management - Mitigation

Firstly, any exposed fossil occurrences threatened by construction should be mitigated by description and sampling. A detailed site survey on foot has not yet been undertaken. However, the author is familiar with the general features of the area. At this stage it is assumed that pre-construction mitigation is unnecessary.

As mentioned, palaeontological interventions mainly happen once fossil material is exposed at depth, *i.e.* once the EIA process is done and construction commences.

It is not possible to predict the buried fossil content of an area other than in general terms. Fossil bones are sparsely scattered in coastal deposits and much depends on spotting them as they are uncovered during digging. In contrast, shelly layers are usually fairly extensive and normally are exposed in the sides of the finished excavation, when they can be documented and sampled easily.

Monitoring

The monitoring of excavations for fossils takes place while the excavations are being dug. It is an exercise in optimism, with the object of spotting the more rare fossils, such as bones, as they are turned up. This depends on a regular presence. Since it is impractical to have all excavations monitored by a professional during the construction phase, it is very desirable to have the co-operation of the people on the ground. By these I mean personnel in supervisory/inspection roles, engineers, surveyors, site foremen, etc., who are willing and interested to look out for occurrences of potential heritage/scientific significance. This particularly applies to more unexpected finds, such as bones. To aid this process, a general background information document is useful. There should also be some guidelines for potential finds and a reporting/action protocol in place when finds are uncovered.

It is improbable that palaeontological finds in the Velddrif contexts will require declarations of permanent "no go" zones. At most a temporary pause in activity at a limited locale may be required. The strategy is to "rescue" the material as quickly as possible.

If a major bone concentration is encountered, the procedure would be to remove as much as is feasible in encased blocks and also to remove a large, disturbed sample by excavator and truck from the site. This material could then be stored/stockpiled locally, for sieving and further preparation. *(Note that the submitted work duration/budget does not provide for a major fossil bone-bed occurrence)*

Primary mitigation

The primary mitigation task entails the specialist documentation and sampling of larger, deeper excavations made for the infrastructure installations. This activity should co-incide with the time of maximum exposure of the faces of the excavations, for best cost-effectiveness. The main aim is to coincide periods of Primary Mitigation fieldwork with times when many open trenches are available. In this Erf 578 Velddrif case, it can be prioritized more narrowly, *viz.* that the deeper, coast-perpendicular trenches are the prime target and in particular, the deeper infrastructure such as sewerage pipes, pump stations and other sumps.

When the excavations are near or at completion:

The excavation faces must be inspected for fossil content.

Key vertical sections representative of the exposures must be identified.

These must be described in detail sedimentologically (logged), photographed and sampled.

Representative samples of fossils must be collected. In the case of shelly beds, bulk samples should be taken. If material is delicate/poorly-preserved, it should be removed within blocks of the enclosing sediment, reinforced if required by encasement.

The mitigation process makes some logistical demands. To this purpose I would need to establish liaison protocols with a suitably-placed persons with respect to scheduled excavation planning and the progress being made, in addition to the aforementioned reporting/action protocol when finds are uncovered during excavation monitoring.

The Report

At the end of the task a detailed report will be submitted.

This report is in the public domain and copies of the report must be deposited at the IZIKO S.A. Museum and Heritage Resources Western Cape. It must fulfil the reporting standards and data requirements of these bodies.

The report will be in standard scientific format, basically:

A summary/abstract.
Introduction.
Previous work/context.
Observations (incl. graphic sections, images).
Palaeontology.
Interpretation.
Concluding summary.
References.
Appendices

A prescribed data requirement is adequate 3D spatial referencing. For this I would require the assistance of the surveyor wrt. co-ordinates and base maps, to plot the locations of finds during monitoring, the measured sections, samples and other observations.

The draft report may be reviewed by the client, or externally, before submission of the Final Report.

Enhancement

The client might desire a display/exhibition of findings and features: out of a combination of interest, public-mindedness and to demonstrate diligence wrt. heritage/science resources. This would have to be at a location and under conditions approved under the auspices of the IZIKO S.A. Museum and the Heritage Resources Authority Western Cape (e.g. at the Fossil Park). *(Costing of such was not included in the submitted budget)*

APPLICATION FOR PALAEONTOLOGICAL PERMIT FROM HERITAGE WESTERN CAPE

It is required to obtain a palaeontological permit from the Provincial Heritage Resources Authority of the Western Cape in order to carry out the work. The application for this needs details of the registered owners of the sites, their permission and a site-plan map. A permit fee of R150 is now operative.

All samples of fossils and sediments must be deposited at the IZIKO S.A. Museum or an HWC-approved institution.

FORTHCOMING REQUIREMENTS/ACTIONS

Drafting of the Agreed Terms of Reference of the contract. In addition to the required mitigatory actions, this to include designation of contact persons for:

Progress of the EIA process and further liaison wrt. palaeontological heritage inputs (provisionally Anél Joubert of ENVIRO DINAMIK)

Provision of information for the HWC permit application.

Arrangements and protocols for access to the site.

Liaison protocol with appropriate managers regarding:

- scheduled excavation planning and progress
- provision of detailed spatial data, site maps

Responsible persons and reporting/action protocol when finds/features are uncovered during *ad hoc* monitoring during excavation

Provision by myself, prior to commencement of construction, of a general-interest information document for circulation, with guidelines for potential finds uncovered during digging the excavations.

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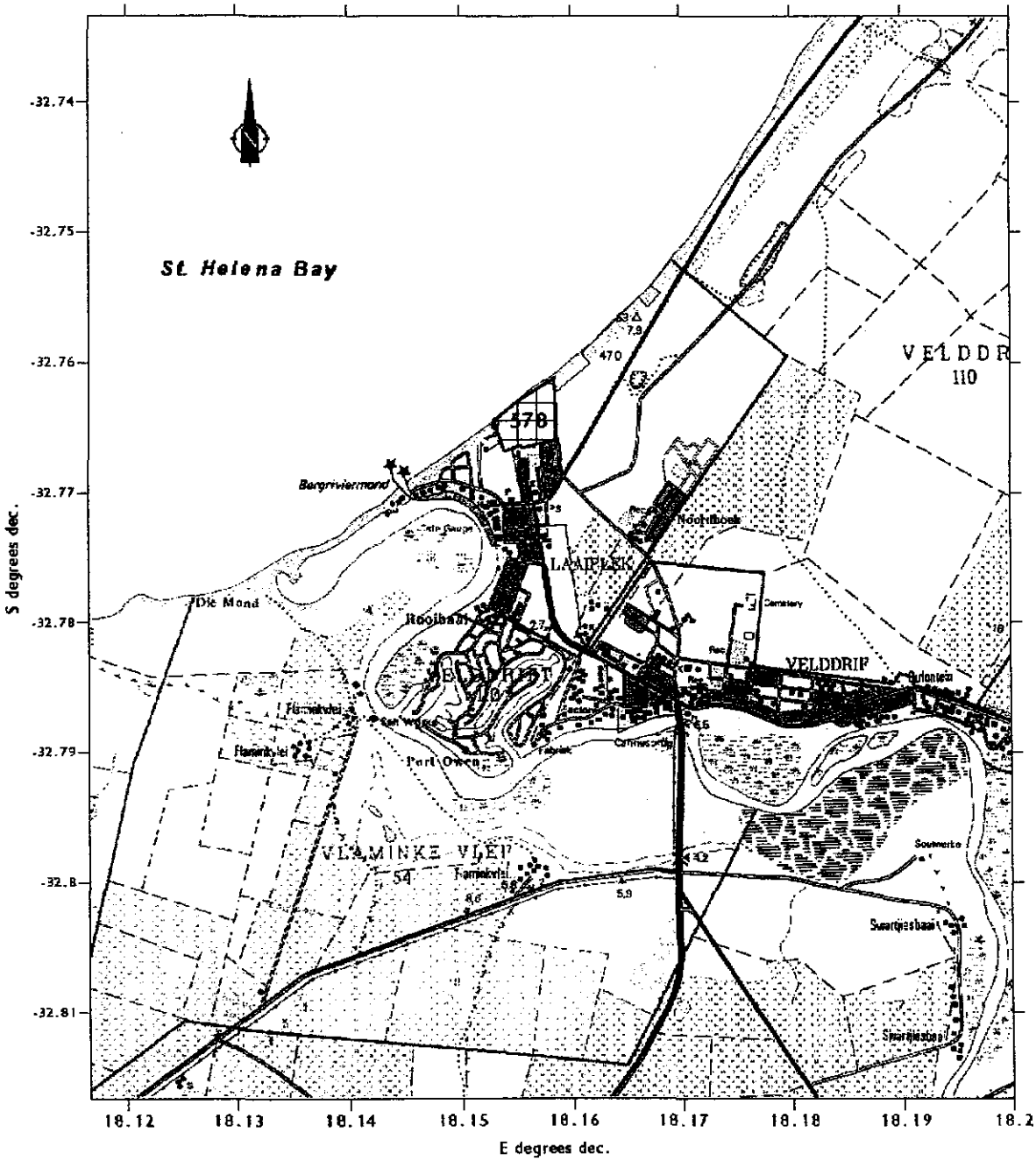
John Pether

29 August 2006

→ No objections

→ Mitigation will need HWC permit as stated by author



EXTRACT OF 1:50 000 MAP 3218CA & CC VELDDRIF

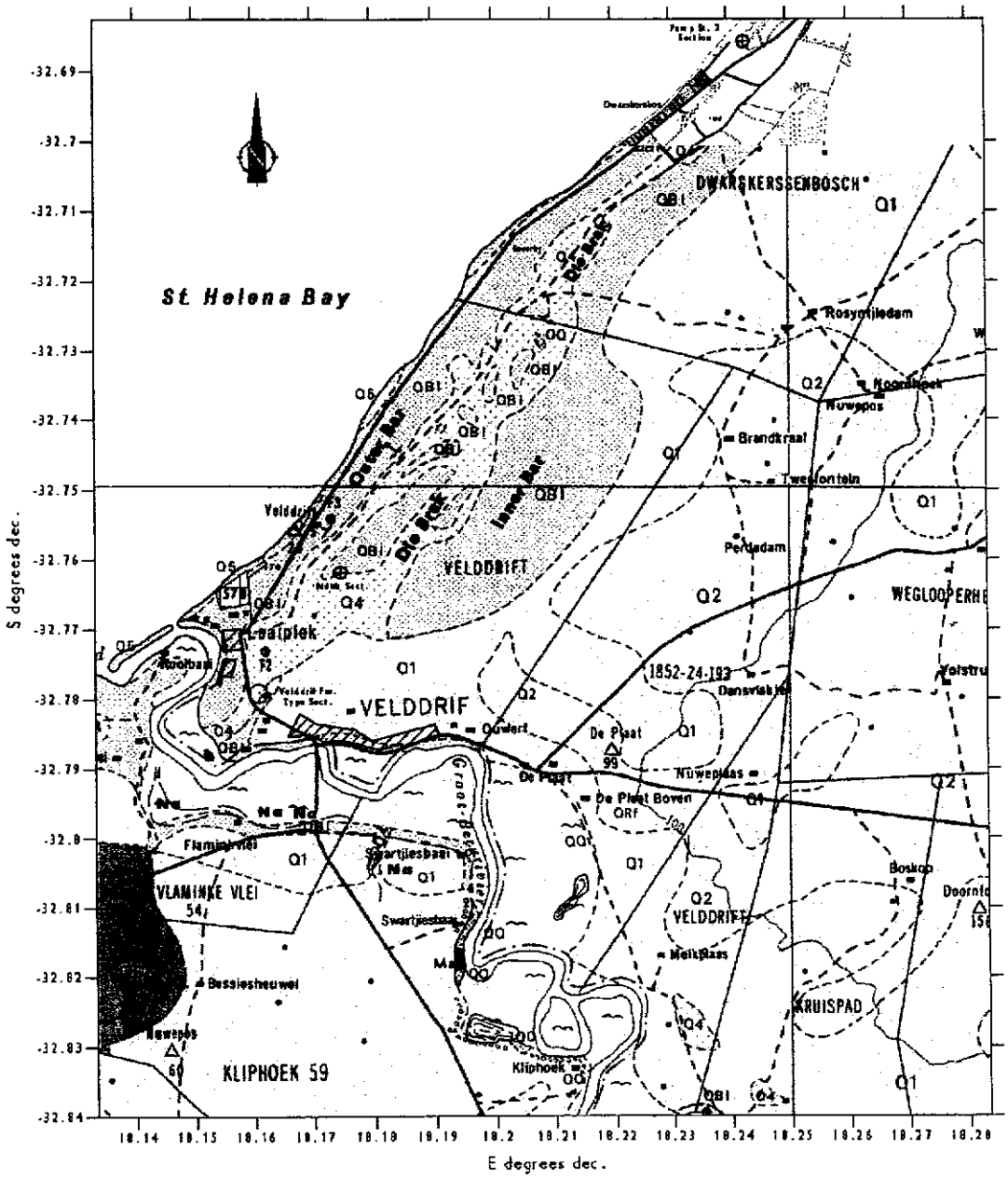
Clark 1880 Spheroid (Cape)

ERF 578 VELDDRIF (LAAIPLEK)

Velddrif Erf 578 50000.srf
John Pether Aug 2006

SITE FOR HWC PERMIT APPLICATION

MAP 1



GEOLOGY OF THE VELDDRIF AREA
(From Visser & Schoch, 1973)
1: 100 000

ERF 578 VELDDRIF (LAAIPLEK)

Velddrif Erf 578 Geomap.sit
John Pether Aug 2006

SITE FOR HWC PERMIT APPLICATION

MAP 2

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WESTERN CAPE ENVIRONMENTAL CONSULTANTS (PTY) LTD 2001/000010/07

Our ref : ED803.016
Your ref : Our Ref: C13/3/6/1/1/1/1/C3

31 August 2006

Heritage Western Cape
Private Bag X9067
CAPE TOWN
8000

For attention : Dr Antonieta Jerardino

Dear Madam

PROPOSED RESIDENTIAL DEVELOPMENT ON ERF 578, LAAIPLEK : SUBMISSION OF PALAEONTOLOGY REPORT

1. Your letter dated 15 June 2006 refers. Ndukuyakhe Ndlovu of Heritage Western Cape requested that an assessment of potential impacts to archaeological heritage (Phase 1 Archaeological Impact Assessment) be undertaken. HWC requested that the scoping palaeontological assessment (desk-top study) be undertaken. At the submission of the requested studies, they will be considered by the Archaeology, Palaeontology and Meteorites (APM) Committee of the Western Cape Provincial Heritage Resources Authority, HWC, at one of their monthly meetings where a formal decision stipulating our comments will be forwarded to DEA&DP. He also requested that all future correspondence be addressed to you.

2. Enviro Dinamik requested Mr Jonathan Kaplan to conduct a Phase I Archaeological Impact Assessment. Mr Kaplan submitted his report to the APM Committee earlier this month and are awaiting their findings. A copy of his report is attached but his findings and recommendations are as follows:

   - The impact of the proposed housing development of Erf 578, Laaiplek, on important archaeological heritage remains is likely to be very low.
   - Bulk earthworks and excavations must be monitored by a professional archaeologist. Alternatively, this task could be undertaken in consultation with an Environmental Control Officer (ECO).
   - Vegetation clearing operations must be monitored by a professional archaeologist. This task could also be undertaken in consultation with the ECO.
   - Should any human burials be uncovered during excavations, these should immediately be reported to the South African Heritage Resources Agency or Heritage Western Cape. Human burials should be treated sensitively at all times.

- Should any shipwreck material be uncovered during excavations and bulk earthworks, these should immediately be reported to the Maritime Archaeologist at the South African Heritage Resources Agency.

- Bulk earthworks and excavations must be inspected by a professional palaeontologist.

3. Enviro Dinamik requested Mr John Pether to conduct a scoping palaeontological assessment (desk-top study). A copy of his report is attached and his findings are as follows:

   - Pre-construction mitigation is unnecessary.

   - Palaeontological interventions mainly happen once fossil material is exposed at depth, i.e. once construction commences.

   - The excavations must be monitored for fossils and it is very desirable to have the co-operation of the personnel in supervisory / inspection roles, engineers, surveyors, site foreman, etc.

   - It is improbable that palaeontological finds in the Velddrif contexts will require declarations of permanent "no go" zones. At most, a temporary pause in activity at a limited locale may be required. The strategy is to "rescue" the material as quickly as possible.

   - Deeper, coast-perpendicular trenches and in particular, the deeper infrastructure such as sewerage pipes, pump stations and other sumps should be inspected.

   - When excavations are near or at completions the excavation faces must be inspected for fossil content, key vertical sections representative of the exposures must be identified, described in detail, photographed and sampled.

   - Provision of a general-interest information document for circulation with guidelines for potential finds uncovered during digging of excavations prior to commencement of construction.

4. We trust the above and enclosed is sufficient for your purposes but should you require any further information please do not hesitate to contact the undersigned.

Yours faithfully

ANéL JOUBERT (MS)

cc. The Director : Integrated Environmental Management, Department of Environmental Affairs and Development Planning (DEA&DP), P O Box X9086, Cape Town, 8000