HERITAGE SCOPING STUDY FOR THE PROPOSED SALDANHA STRENGTHENING PROJECT, VREDENBURG AND HOPEFIELD MAGISTERIAL DISTRICTS, WESTERN CAPE

HWC Case No.: 15091511

Report for:

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EXECUTIVE SUMMARY

New transmission and distribution substations are planned in the vicinity of the Saldanha Bay Industrial Development Zone and existing Blouwater Substation along with power lines running from there to the existing Aurora Substation some 16 km to the east. A study area of approximately 13 km by 21 km is under consideration for the routing of the power lines.

The entire study area is sensitive from a palaeontological point of view, although different geological formations carry different levels of sensitivity and fossils may be found at variable depths across the area. Importantly, fossils can be associated with a geological stratum and be relatively widespread but they can also very easily be concentrated in very restricted areas, such as an old hyaena lair. Many known palaeontological sites occur in the general area including Elandsfontein (where a hominin cranium was recovered) a few kilometres to the south and Langebaanweg which is a declared grade 1 heritage site and which falls within the northern part of the study area. Although archaeological sites are rare, a significant site, Anyskop, lies within the study area at the southern edge of the Langebaanweg declaration area and some of the fossil sites, most notably Elandsfontein, include archaeological material in them and are therefore also sensitive for that reason.

It should be noted that while most impacts to heritage material are negative, the fact that palaeontological resources are buried and generally unknown until revealed in excavation means that, with monitoring, the impacts could be seen as positive because of the opportunity for scientific study that would be presented during implementation.

It is recommended from a heritage point of view that the proposed project be carried forward to the impact assessment phase. However, the following should be borne in mind when planning the proposed routes for assessment:

» The whole area is sensitive from a palaeontological point of view and it is impossible to minimise impacts during the design phase;
» The Langebaanweg Fossil Park area, because of its Grade 1 status, should be avoided completely, however;
» Built structures should be avoided with a buffer of at least 50 m; and
» A heritage impact assessment should be carried out, primarily to assess the impacts to palaeontological and archaeological resources.

Glossary

Early Stone Age: Period of the Stone Age extending approximately between 2 million and 200 000 years ago.

Hand-axe: A bifacially flaked, pointed stone tool type typical of the Early Stone Age.

Holocene: The geological period spanning the last approximately 10-12 000 years.

Hominin: a group consisting of modern humans, extinct species of humans and all their immediate ancestors.

Later Stone Age: Period of the Stone Age extending over the last approximately 20 000 years.

Middle Stone Age: Period of the Stone Age extending approximately between 200 000 and 20 000 years ago.

Pleistocene: The geological period beginning approximately 2.5 million years ago and preceding the Holocene.

Abbreviations

ASAPA: Association of Southern African Professional Archaeologists

CRM: Cultural Resources Management

EIA: Environmental Impact Assessment

ESA: Early Stone Age

HIA: Heritage Impact Assessment

HWC: Heritage Western Cape

IDZ: Industrial Development Zone

LSA: Later Stone Age

MSA: Middle Stone Age

NHRA: National Heritage Resources Act (No. 25) of 1999

NID: Notification of Intent to Develop

PHS: Provincial Heritage Site

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

Contents

1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by Savannah Environmental (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed implementation of the Saldanha Strengthening project. The project involves additions to and upgrades of the existing electrical infrastructure in the Saldanha Bay area (Figure 1) in order to meet the projected demand for electricity supply, particularly from users within the Saldanha Industrial Development Zone (IDZ), and to facilitate the integration of power from renewable sources into the grid. The present report fulfils the requirements of the scoping phase of the assessment.

1.1. Project description

The project will entail the following components:

» replacing of two of the four existing 250 MVA transformers with 2 x 500 MVA, 400/132 kV transformers at the existing Aurora Substation;
» establishing 2 x 132 kV feeder bays at Aurora Substation;
» construction of new 132kV/66kV Blouwater Distribution Substation in the Saldanha Bay area with a planned capacity of 2 x 160MVA transformers;
» construction of the new 400/132kV Transmission Substation in the Saldanha Bay area with a planned capacity of 3 x 500 MVA transformers; and
» construction of 2 x 400 kV power lines from Aurora Substation to the new distribution and transmission substations approximately 16 km to the west.

1.2. Terms of reference and purpose of the report

ASHA Consulting was asked to provide a heritage scoping report, inclusive of palaeontology, that would serve to inform the subsequent environmental impact assessment (EIA) process. As part of the scoping assessment, a Notification of Intent to Develop (NID) form has been submitted to Heritage Western Cape (HWC). They will respond with their comments and requirements for the heritage impact assessment (HIA) to be undertaken during the EIA phase of the project.

1.3. The authors

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in the Western Cape and Northern Cape provinces of South Africa since 2004. He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is accredited with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

» Principal Investigator: Stone Age, Shell Middens & Grave Relocation; and
» Field Director: Colonial Period & Rock Art.

Dr Graham Avery has an MA (UCT, 1976) and a PhD (UCT, 1990), both in archaeology, and has been conducting research in the fields of archaeozoology, Stone Age archaeology and Quaternary palaeontology since the 1970s. He is accredited with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #008) as follows:

» Principal Investigator: Coastal Shell Middens, Stone Age; Middle Pleistocene Studies, Archaeozoology.

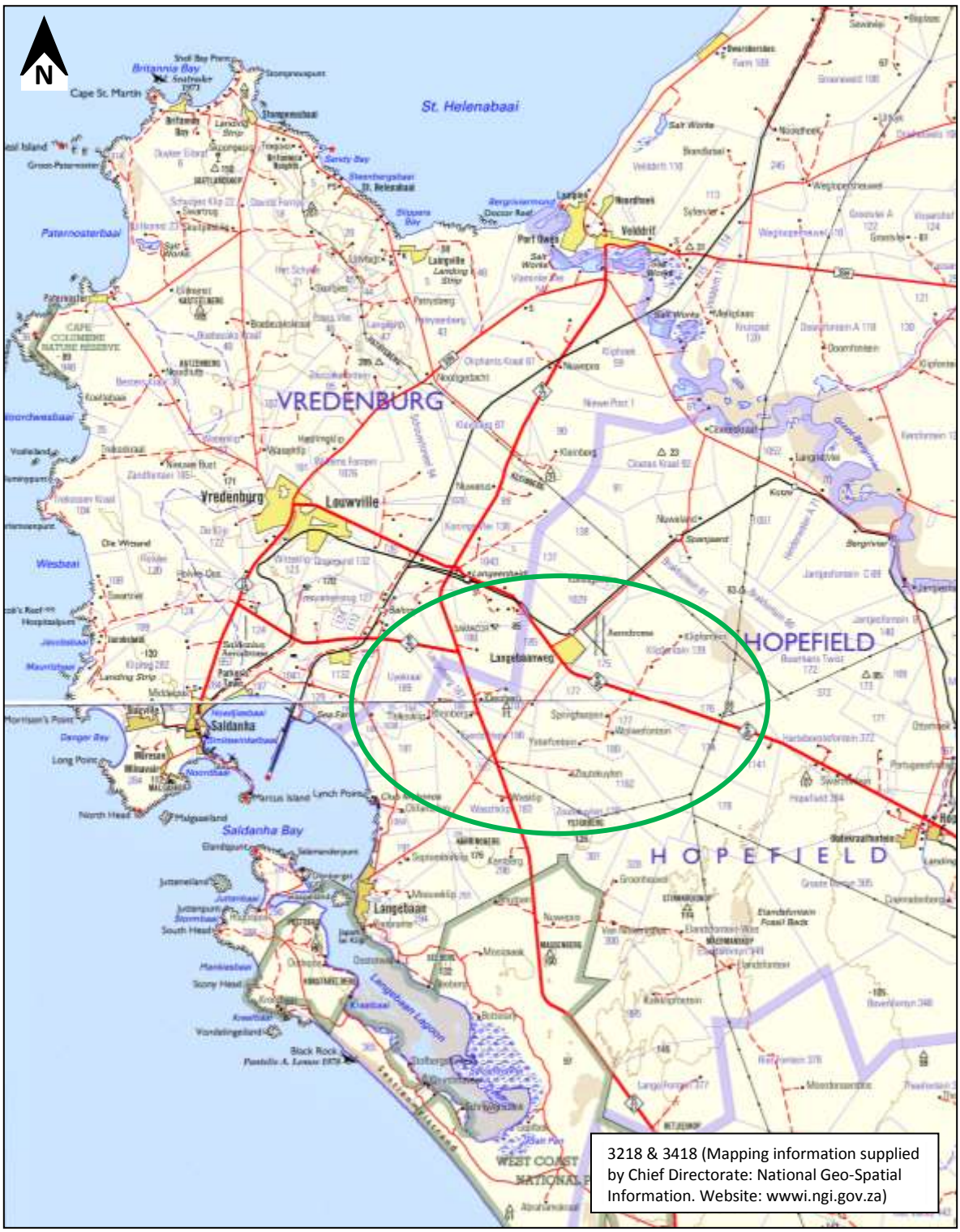

Figure 1: *Map showing the location of the study area.*

1.4. Declaration of independence

ASHA Consulting (Pty) Ltd and its consultants have no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

2. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources as follows:

» Section 34: structures older than 60 years;
» Section 35: palaeontological, prehistoric and historical material (including ruins) more than 100 years old;
» Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
» Section 37: public monuments and memorials.

Following Section 2, the definitions applicable to the above protections are as follows:

» Structures: "any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith";
» Palaeontological material: "any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace";
» Archaeological material: a) "material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures"; b) "rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation"; c) "wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation"; and d) "features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found";
» Grave: "means a place of interment and includes the contents, headstone or other marker of such a place and any other structure on or associated with such place"; and
» Public monuments and memorials: "all monuments and memorials a) "erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government"; or b) "which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual."

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list "historical settlements and townscapes" and "landscapes and natural features of cultural significance" as part of the National Estate. Furthermore, Section 3(3) describes the reasons a place or object may have cultural heritage value; some of these speak directly to cultural landscapes.

All of these resources are considered by the present scoping assessment and would need to be assessed during the impact assessment phase if it was determined that they would be affected by the proposed development.

3. METHODS

3.1. Literature survey

A survey of available literature was carried out to assess the general heritage context into which the development would be set. This literature included published material, unpublished

commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2. Assumptions and limitations

The study is carried out from the desktop only. This requires an assumption that our general knowledge of the region will apply to the study area. It is further assumed that the project could be sited anywhere within the study area indicated in Figure 1 above.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The majority of the surrounding land is agricultural land but one farm to the south (Elandsfontein) has recently become the site of a phosphate mine. Two regional roads, the R27 and R45, cross the study area and a number of existing power lines and two substations are present within it. The Langebaanweg Airforce Base also lies within the study area. Just outside the study area, to its northwest, there are a number of industrial facilities located within the Saldanha IDZ. The West Coast Fossil Park lies inside the study area and is a National Heritage Site, while the Elandsfontein fossil site, which is a Provincial Heritage Site, lies to the south just outside the study area.

5. CULTURAL HERITAGE CONTEXT

This section of the report contains the desktop study and establishes what is already known about heritage resources in the vicinity of the study area. Palaeontological resources are likely to be the primary issue for this project, although some fossil sites include stone tools which means that they are also archaeological.

5.1. Palaeontological aspects

The Cenozoic sediments of the region are in the Sandveld Group (Dingle, Lord *et al.* 1979; Hendey & Dingle 1983), and include shallow marine, back barrier, estuarine, fluvial and aeolian contexts (Rogers 1980[1]; Hendey 1981; Rogers 1982; Roberts & Brink 2002) that date from the Miocene, through the Pliocene, Pleistocene and Holocene. Each of these sediments is known to include fossils or sub-fossils (Hendey & Deacon 1977). The surface geology of the areas under study is shown in Figure 2. A summary of the regional stratigraphy and lithology is shown in Tables 1 and 2 and composites in Figures 3 to 5 with the latter two being specific to the Langebaanweg Fossil site and the Saldanha Steel site. Figure 6 illustrates one of Rogers' (1980) boreholes from Langebaanweg. It shows the succession and depths of sediment groups over the landscape. Langebaan Limestone occurs in the upper 23 m, while the Varswater Formation occupies the following 22 m.

[1] It should be noted that some terminology in Rogers (1980) has been updated, 'The Bredasdorp Formation', now 'The Sandveld Group', being an example.

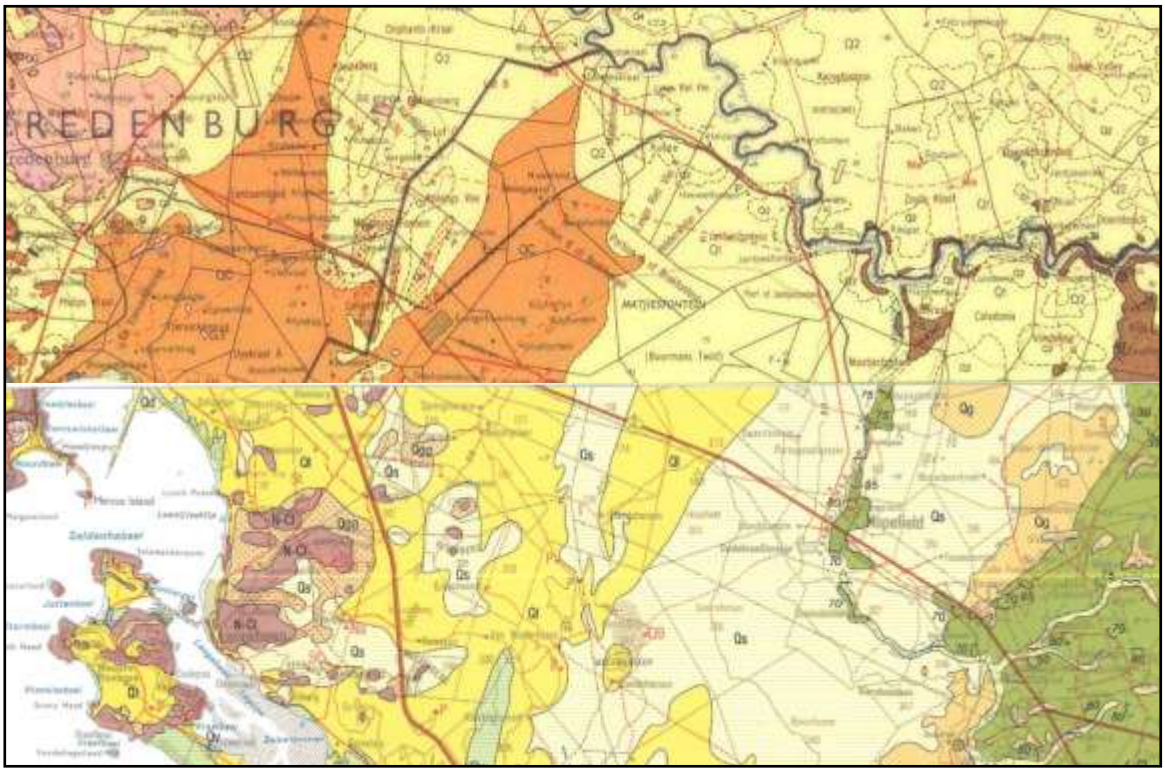

Figure 2: *Surface geology of the affected region excerpted from 1:250 000 Geological Series 3218 Clan William. In updated terminology, Q5 (= Cw): Recent (Holocene) Witzand Formation superficial dune sand; Q1 (= Ql): Quaternary Langebaan Formation – limestone and calcrete, partially cross-bedded; calcified parabolic dune sand); Q2 (= Qs): Quaternary Springfontyn Formation – light-grey to pale-red sandy soil; QC = Ql = Quaternary Langebaan Formation – limestone and calcrete, partially cross-bedded; calcified parabolic dune sand; G3 = Vredenburg batholith – Post Nama granite; G4 = Cape Columbine batholith – granite; MaQw2 = Nama System Malmesbury Group greywacke, phyllite and quartz schist with lenses of limestone and grit.*

Table 1: *Summary of the stratigraphy and lithology of the Sandveld Group (Roberts* et al. *2006). The Varswater, Langebaan, Springfontyn and Velddrif Formations, which can also occur below current sea level, are the most likely to yield palaeontological material vide Rogers (2006). Grey fill indicates the Formations most likely to occur in the project area.*

SANDVELD GROUP	**Age and Lithologies**
Witzand Formation	Holocene and recently active calcareous dune fields and cordons
Springfontyn Formation	Middle Pleistocene to Recent (Holocene) quartzose sand dunes, silts and peats
Langebaan Formation	Middle to late Pleistocene calcareous aeolianite with calcretized palaeosols
Velddrif Formation	Pleistocene shallow marine coquina, calcarenite, sand and conglomerate
Varswater Formation	Miocene and Pliocene phosphatic littoral and shallow marine sandstones, conglomerates and coquina
Prospect Hill Formation	Miocene and Pliocene aeolianite
Elandsfontyn Formation	Middle to late Miocene fluvial coarse, angular sands, muds and carbonaceous sediments

Table 2: *Estimated chronology for formations.*

Witzand Formation	<10 ka (ten thousand years ago)	Holocene/Recent
Langebaan Formation	?> 2.5 Ma to <100 ka	Lower to Late Pleistocene
Springfontyn Formation	>400 ka to ±160 ka (at DFT 2)	Middle Pleistocene
Velddrif Formation	?2 Ma	Lower Pleistocene
Varswater Formation	5 Ma	Early Pliocene
Prospect Hill Formation	12 Ma to 10 Ma	Late Middle Miocene
Elandsfontyn Formation	15 Ma to 12 Ma	Late Middle Miocene

5.1.1. Palaeontological Potential

The proposed substation and power lines are situated in a palaeontologically sensitive and important area of the west coast (Inskeep 1966; Hendey & Deacon 1977; Rogers 1980; Rogers 1982; Hendey & Cooke 1985; Avery 1988; Klein & Cruz-Uribe 1991; Theron, Gresse et al. 1992; Grine & Klein 1993; Berger and Parkington 1995; Stynder 1997; Manthi 2002; Brink 1997; Klein, *et al.* 2007; Braun *et al.* 2013a, 2013b; Hare & Sealy 2013). Iziko South African Museum's Cenozoic Palaeontology section holds marine and terrestrial vertebrate, mollusc and invertebrate trace fossils (pupa cases) from the Miocene, Pliocene and Pleistocene in its collection.

The palaeontological potential varies with substrate. Large portions of the study area have been heavily disturbed by agriculture and their superficial palaeontological potential cannot be accurately assessed. However, one cannot exclude the possibility that sub-surface fossils may occur there, since fossils or sub-fossils of interest, which will probably be sparsely distributed, if preserved, could be encountered during excavations into undisturbed deposits.

Small, dense pockets of bone can occur where bone accumulators like hyaenas, jackals or porcupines used holes or old aardvark burrows, often under the edge of exposed calcrete beds. Both older and younger sediments may contain ancient wetland deposits and/or more-recent fossils. In addition to fossil bones, there is the potential for encountering macro-plant remains and pollens of considerable age in wetland deposits. While occurrences like that exposed in the Langebaanweg Fossil Park are extremely unusual, the possibility of intersecting similar or related material does exist in the area.

It is entirely possible that excavations into sediments not normally accessible to palaeontologists could reveal fossils in sub-surface deposits. However, although such impacts could be seen as negative, appropriate management may provide opportunities to recover potentially important fossil material that would not otherwise be accessible, thus resulting in benefits to science. Such eventualities could be better assessed during the impact assessment phase when the locations of the proposed infrastructure and depth of required foundations are available. It would then be possible to assess whether and where monitoring may be necessary during construction.

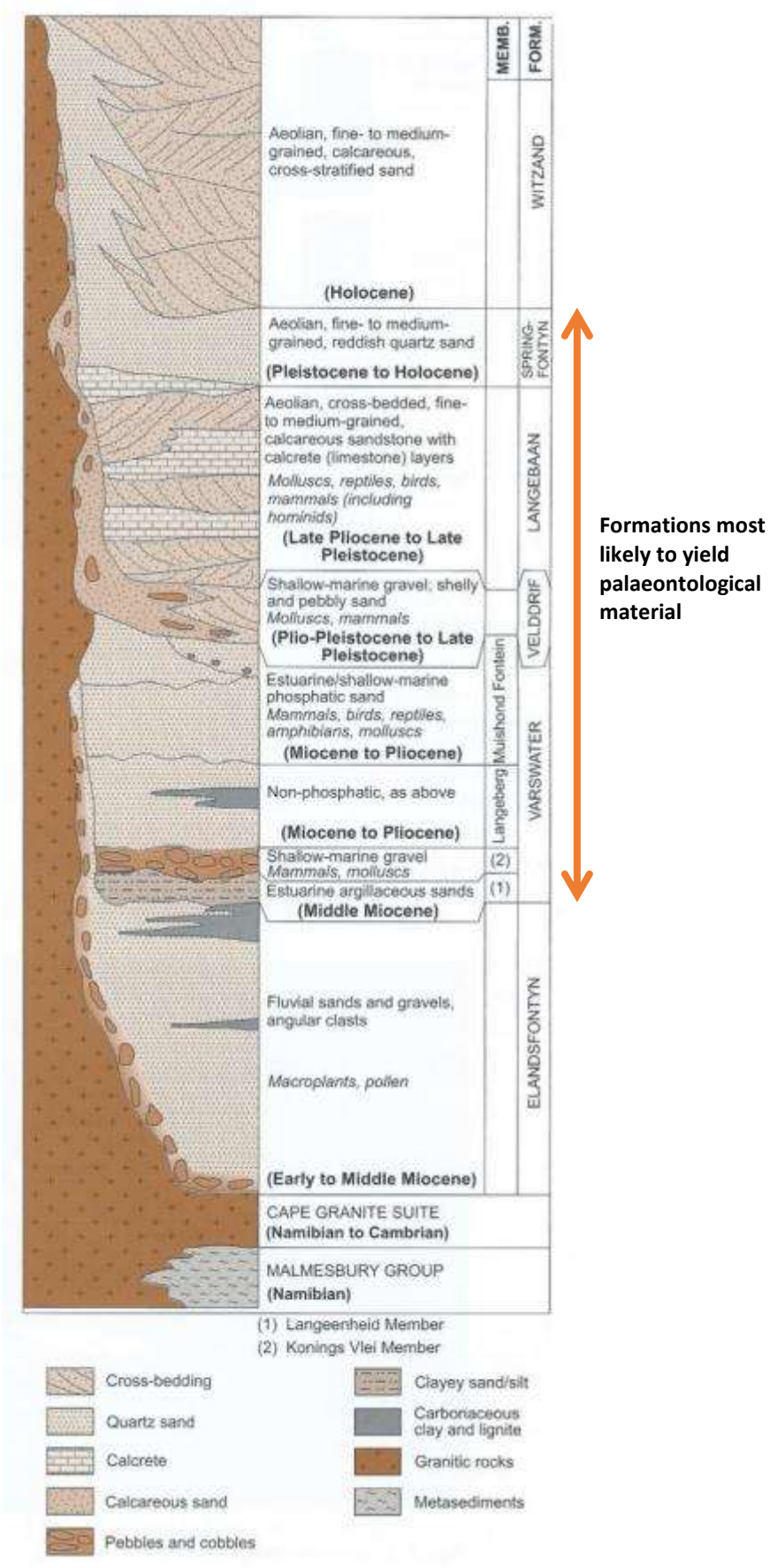

Figure 3. *Composite stratigraphy and lithology of the Sandveld Group (Roberts* et al. *2006).*

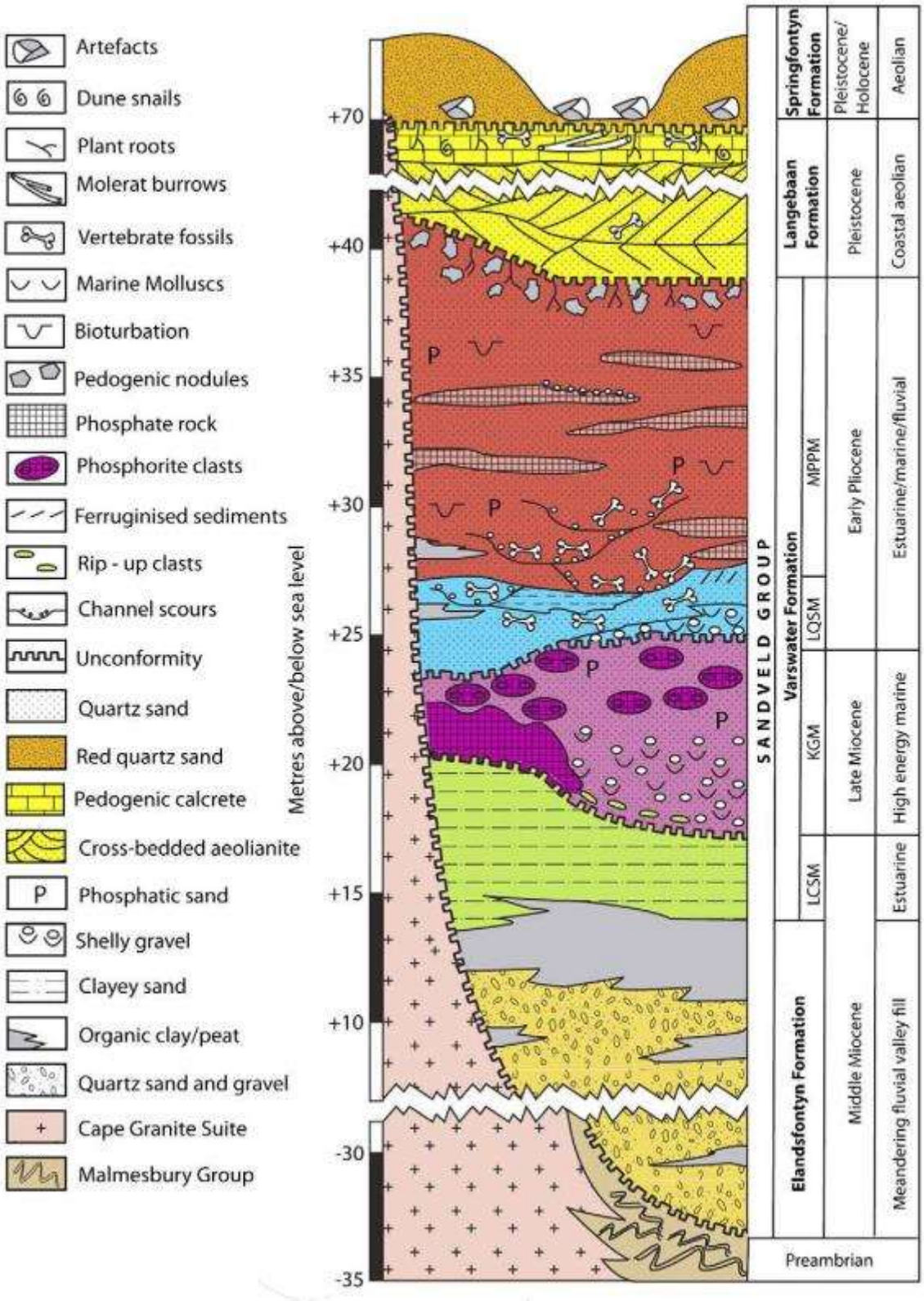

Figure 4. *Lithostratigraphy and fossil-bearing formations representing the Saldanha region at Langebaanweg from (Roberts* et al. *2011).*

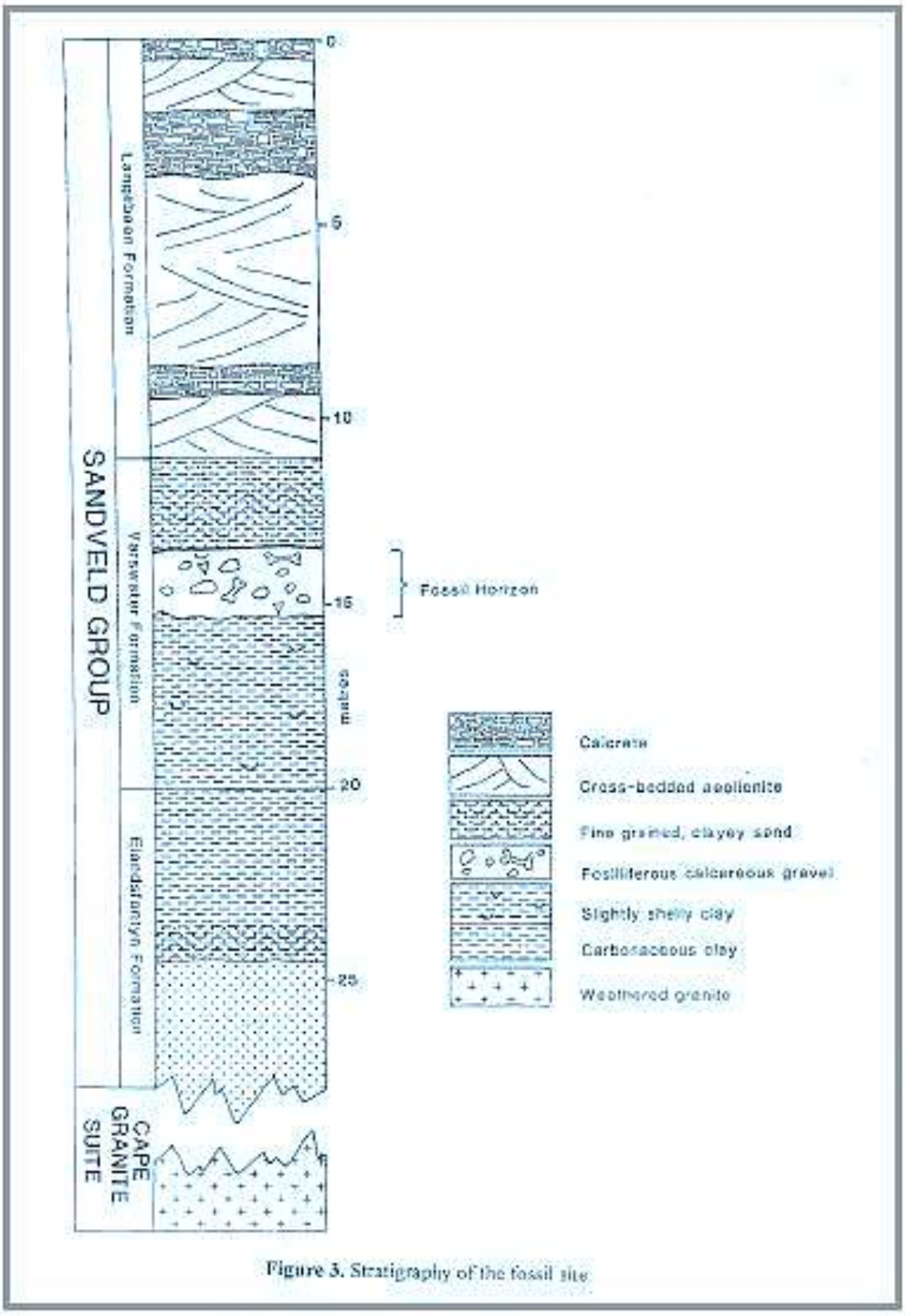

Figure 3. Stratigraphy of the fossil site

Figure 5: *Stratigraphy recorded in the Saldanha Steel foundation showing the geological formations and depth at which the Fossils occurred (Roberts 1997).*

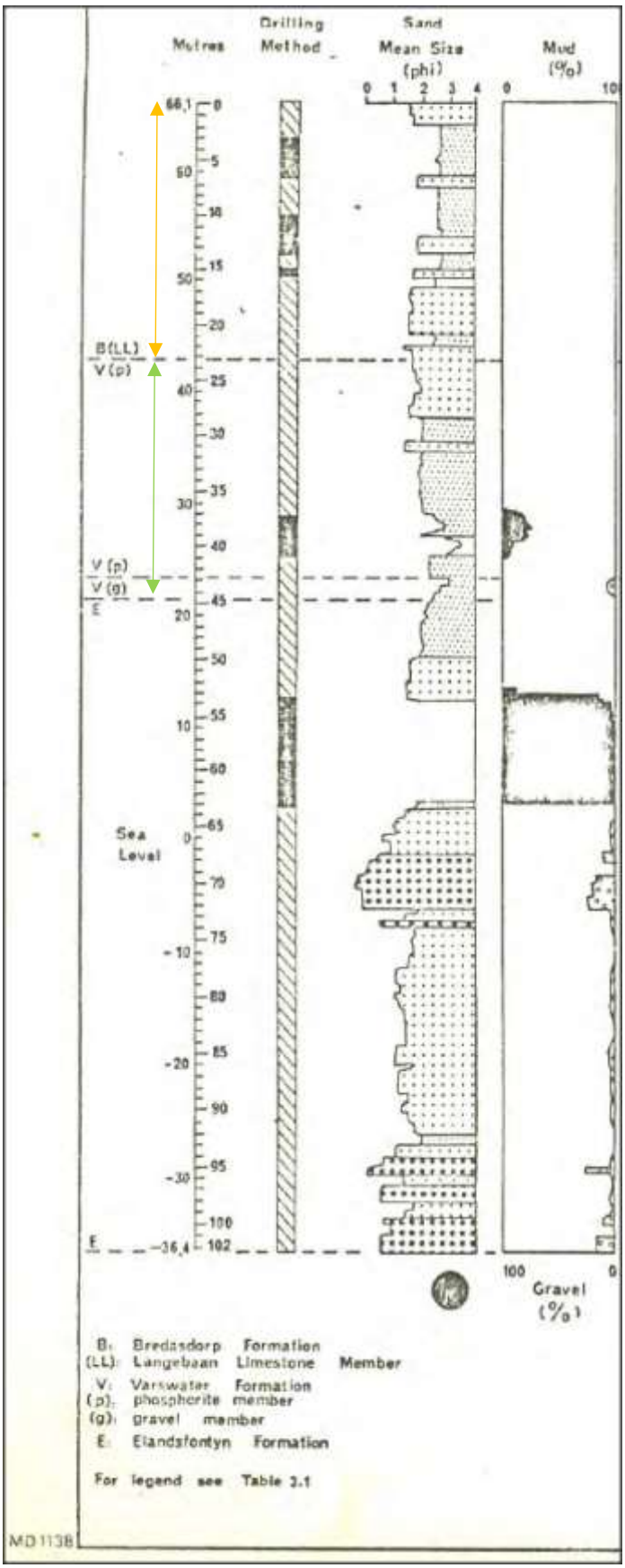

Figure 6. *Relative positions and depths of the Langebaan Limestone (orange arrow) and Varswater (green arrow) Formations as recorded by Rogers (1980: fig 3.26) at Borehole S1, Langeberg 188. Langebaanweg. Bredasdorp Formation = Sandveld Group.*

5.1.2. Known sites in the region

Many palaeontological sites and occurrences have been documented in the area over the course of a number of decades. These include sites discovered during both research and development projects. Known sites within and near the study area include:

» the Late Middle Miocene Prospect Hill upper quarry site (Roberts & Brink 2002; Stidham 2008);
» the Early Pliocene Langebaanweg Fossil site (West Coast Fossil Park) (Hendey 1981; Rogers 2006; Roberts, Matthews *et al.* 2011);
» Lower Pleistocene Langebaan Formation fossils at Langebaanweg (WCFP) (Hendey 1981; Hendey 1982)
» the Early Pliocene Saldanha Steel site (Roberts 1997);
» the Lower Pleistocene Prospect Hill lower quarry site (Roberts & Brink 2002);
» the Lower Pleistocene Baard's Quarry site near Langebaanweg (Hendey 1978);
» the Middle Pleistocene Elandsfontein fossil site (Mabbutt 1956; Singer & Wymer 1968; Klein 1983; Avery 1988; Klein & Cruz-Uribe 1991; Roberts 1996; Klein, Avery *et al.* 2007; Braun *et al.* 2013a, 2013b);
» Elandsfontein Wes (Singer & Wymer 1968; Plasket 2013), where deflation of Langebaan and Springfontyn Formation sediments have exposed Middle Pleistocene fossils.
» Middle Pleistocene Skurwerug, from which a key specimen of *Kolpochoerus paiceae*, a fossil pig, was recovered (Hendey and Cooke 1985).
» The Late Pleistocene wetland site known as Spreeuwalle, which includes well-preserved aquatic and terrestrial fossils (Avery, Klein *et al.* in prep.).
» The Late Pleistocene hyaena den at Besaansklip, which includes well-preserved terrestrial fossils (Brink 1997).

Figure 7: *Aerial view of the general vicinity of the study area showing known fossil sites. Note that some also contain stone artefacts and hominin remains and would thus be classified as archaeological sites in terms of the NHRA.*

A range of other Middle Pleistocene sites include mineralized bones that point to earlier carnivore activity and biodiversity in the region and to its general palaeontological sensitivity. Many of these sites also contain stone artefacts showing that they are also archaeological in nature. These sites include:

» Bokbaai (Mabbutt *et al.* 1955);
» Geelbek dunes (Kandel *et al.* 2003);
» Anyskop (Conard 2001);
» Hoedjiespunt (Klein 1983; Berger & Parkington 1995; Churchill, Berger et al. 2000; Stynder *et al.* 2001; Will *et al.* 2013);
» the Late Pleistocene Elandsfontein "Bone Circle" site (Inskeep 1966); and
» Sea Harvest (Klein 1983).

5.1.3. Discussion

The Langebaanweg and Saldanha Steel sediments provide a model for the area. Given the sedimentology of the region (Rogers 1980; Hendey 1981; Roberts 1997), and based on current knowledge, it is likely that marine and/or terrestrial fossils will occur in Varswater, Springfontyn and Langebaan Formation sediments should they be encountered during excavations.

From the above it is clear that potential exists for palaeontological occurrences in the study area, with the Varswater Formation being particularly sensitive. Unless appropriately mitigated, there is the potential for impacts of high intensity where Varswater deposits are intersected. The potential of high intensity impacts would be lower for Langebaan and Springfontein Formation deposits, although impacts of high intensity could be experienced should fossils be encountered in these units. There is a strong likelihood that palaeontological remains will be encountered at some point, within any part of the study area. To manage this, good communication with contractors and on-site monitoring during excavations will be required to minimise any potential loss when sub-surface sediments are penetrated.

More systematic mitigation may be required if the context of any fossil material encountered warrants more than just recording and collection.

5.2. Archaeological aspects

Although several very important archaeological sites are known from the Vredenburg Peninsula, the broader study area for this project is not generally archaeologically sensitive. Numerous surveys in the western part in particular have shown archaeological resources to be absent from the surface. A good example is the survey by Orton (2011) which covered a large area in the central western part of the present study area and did not reveal a single Stone Age artefact. Only one archaeological site is known to occur within the study area, while several others occur just outside of it (Figure 8).

The West Coast Fossil Park includes a sand dune with a deflation hollow in it that is known as Anyskop. This dune lies within the northern part of the study area. The deflation hollow has been the subject of archaeological research (Dietl *et al.* 2005; Kandel *et al.* 2006; Conard 2001, 2002) that has revealed stone artefacts from the Early (ESA), Middle (MSA) and Later (LSA) Stone Ages. The site also yielded pot sherds indicating occupation within the last 2000 years and two stone hearths made of local calcrete. The recovered animal bones were either mineralised, indicating a Pleistocene MSA age, or fresh and dating to the Holocene LSA. Occupation from the ESA appears to have been quite ephemeral, while MSA occupations (including both the Still Bay and Howieson's Poort periods) and to a greater extent, LSA occupations from the mid- and late Holocene were more extensive.

The Elandsfontein site is a very important archaeological site because it was there that the partial skull of an archaic hominid was found (Singer 1954). Although this is the only early human remain to have been recovered from the site, it has yielded many thousands of animal

bones which have been studied intensively (e.g. (Braun *et al.* 2013a, 2013b; Ewer & Singer 1956; Hendey 1969; Hooijer & Singer 1960, 1961; Keen & Singer 1956; Klein 1988; Klein *et al.* 2007; Klein & Cruz-Uribe 1991; Singer 1962; Singer & Boné 1960, 1966; Singer & Inskeep 1961, Singer & Keen 1965; Singer & Wymer 1968)). In addition to bones, stone artefacts dating to the ESA, MSA and LSA have been found. The ESA material, including hand-axes, has attracted more attention because it is this component that would likely have been associated with the hominid (Archer & Braun 2010; Goodwin & Van Riet Lowe 1929). Although the core of the Elandsfontein site lies 5 km away from the present study area and research there has been focussed on an area of approximately 3 km^2 (Braun *et al.* 2013), it is thought that the archaeological sediments may extend to cover as much as 6 km^2 to 15 km^2 (Besaans 1972; Mabutt 1956). These estimates are likely both too conservative as exemplified by the finding of fossil bones and stone artefacts in the northern part of the Elandsfontein Farm as near as 2.5 km from the present study area (Orton 2007) and on the Elandsfontein Wes mining site (G. Avery, personal observation).

Figure 8: *Aerial view of the study area (black oval) with the National Heritage Site of Langebaanweg, Provincial Heritage Site of Elandsfontein and other known archaeological sites in the area indicated.*

In the Club Mykonos area, just outside the indicated study area, many shell middens have been documented in association with the rocky points there. Some were excavated and revealed the typical cultural finds associated with coastal shell middens including stone artefacts, ostrich eggshell beads and shell scrapers (Hart 2001; Hart & Gribble 1998; Hart & Jerardino 1998). A small shell scatter has also been recorded on a dune top well away from the rocky shoreline and just outside the westernmost end of the study area (Orton 2012). Also in this general area, the Spreeuwalle fossil site mentioned before produced sparse MSA artefacts possibly dating to around 50 000 years ago (Avery, Klein *et al.*, in prep.).

Some of the archaeological sites in this region are important for what they tell us about human development and behaviour, but also about past biodiversity.

5.3. Graves

Although formal graveyards would not be impacted, there is always the chance of uncovering unmarked pre-colonial burials. However, such finds cannot be predicted.

5.4. Historical aspects

Planning of the air force base began in 1942 and it was officially proclaimed in the government gazette in 1946. It was originally intended as a base from which the threat of Japanese and German submarines could be countered but once opened just after the end of World War II it was used as a training facility. Originally known as the "Bomber Gunnery and Air Navigation School", its name was changed to "Air Force Station Langebaanweg" in 1947. In 1968 the name changed again to "Flying Training School Langebaanweg". In 1983 the name was again changed to "Air Force Base Langebaanweg". These and subsequent changes all reflected the changing role of the base in South Africa (AFB Langebaanweg 2015).

Mining started in 1943, initially at Baard's Quarry close to the air force base, where phosphate was extracted for use as fertilizer. In the early 1960s mining commenced in the Varswater 'C' and 'E' Quarries. The phosphate is part of the Varswater Formation, hence the name. Mining ended in 1993 because it was no longer economically viable (West Coast Fossil Park, n.d.). This same formation is now being targeted for phosphate mining at Elandsfontein.

5.5. Built environment

The general area has many farm buildings that date back into the 19th and early 20th centuries. The Uyekraal farm complex is an excellent example that lies alongside the R27 in the western part of the study area (Orton 2011). Fransen (2004) only maps one built environment heritage site, Wasklip, inside the study area – it lies in the far south alongside the R27. He notes the main house to be much altered but to have originally dated to around 1860. A ruined stone house nearby, he thought, could have been an earlier homestead.

5.6. Cultural landscape

The cultural landscape of the area revolves strongly around dryland agriculture and livestock grazing. The landscape is generally flat with gum tree lines and groves the only natural, although anthropogenically planted, vertical elements. Industrial infrastructure is prominent to the northwest of the study area and a number of existing power lines and substations are present. The landscape is thus not sensitive to the proposed development because of the degree of modification already experienced through industrial development.

6. ASSESSMENT OF POTENTIAL IMPACTS

6.1. Palaeontology

Significant fossil occurrences, primarily at Saldanha Steel and Langebaanweg, exist in the study area. This should not be taken to imply that potential is lacking in the remainder of the study area, although it is highly unlikely that anything that might constitute a fatal flaw would be encountered. Excavations into sediments not normally accessible to palaeontologists should be seen as providing opportunities to recover potentially important fossil material that enables observations to be made on geology, past sea levels, climates, environments and biodiversity, that would otherwise be impossible. This would be a direct positive impact (benefit). Although often sparsely distributed and rare, palaeontological remains, if encountered, must be recorded and/or collected by an appropriately qualified person in order to reduce direct negative impacts. Given the known palaeontological potential of the region, mitigation action, beyond simple recording and recovery during monitoring, including the possibility of systematic excavations, may be necessary.

6.2. Archaeology

Because the project area lies largely between the known significant archaeological sites, it is not expected that there would be any fatal flaws in this regard. There is a good chance that fossil bones and/or associated stone artefacts might be revealed when excavating pylon foundations in the vicinity of Elandsfontein and the West Coast Fossil Park, but this material is likely to be sparse and of relatively low intrinsic significance. Direct negative impacts are thus likely to be of low significance. Perhaps of greater interest here is the potential that the project might have for enhancing our understanding of the distribution of archaeological and/or related fossil material in the area and it is envisaged that with monitoring of excavations the project may actually have a positive impact (benefit) in terms of archaeology.

6.3. Graves

Because the locations of unmarked graves cannot be predicted, they are not worth considering further in terms of whether they will affect any proposed development. They simply need to be dealt with on a case by case basis when they are discovered. This would involve reporting the find to an archaeologist or the heritage authorities, and appointing an archaeologist to obtain an emergency exhumation permit and remove the burial.

6.4. Other heritage

Because the area has a precedent for industrial development and a number of other examples of electrical infrastructure are already present, it is not anticipated that impacts to the landscape will be significant. Built structures are generally always avoided, although impacts to the context of significant structures could be a minor concern.

6.5. Description of expected significance of impact

Impacts

It is expected that archaeological material will be sparse but one of the proposed routes (Alternative 2) does run very near to a known Stone Age site (Anyskop). Impacts to fossil heritage, largely below the ground surface, will be more likely to occur though. Such impacts could occur throughout the study area.

Desktop Sensitivity Analysis of the Site:

Sensitivity analysis in terms of the impacts expected. Discuss areas of high concern.

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Disturbance and/or destruction of archaeological material.	Archaeological material could be directly impacted (damage or destruction) during construction activities by excavations.	Local	None anticipated.
Disturbance and/or destruction of palaeontological material.	Palaeontological material could be directly impacted (damage or destruction) during construction activities by excavations.	Local	The Langebaanweg Fossil Park (Grade 1; immediately adjacent to Alternative 2) and Elandsfontein PHS (5 km SE of Alternative 1) should be avoided.

Description of expected significance of impact

- Impact significance: Unknown. Could be VERY LOW but potential exists for impacts to be of MEDIUM-HIGH significance in localise areas. Best overall estimate is LOW-MEDIUM.
- Consequence: negative (loss of local fossil and/or archaeological heritage)
- Duration: permanent
- Probability: low
- Degree to which these impacts-
  - can be reversed: non-reversible
  - may cause irreplaceable loss of resources: unlikely
  - can be avoided, managed or mitigated: avoidance would be difficult, but mitigation of exposed fossils could be easily achieved during the construction phase.

Gaps in knowledge & recommendations for further study

- There is good broad knowledge of the study area but field survey is required to examine certain areas for likely sensitivity. The locations of buried resources can never be fully predicted but field survey will help because material exposed in mole heaps provides indications.
- It is recommended that a field study be undertaken and the results presented in an HIA for submission to HWC.

7. CONCLUSIONS

Palaeontology and archaeology are the two primary aspects of heritage that could be affected by the proposed development.

The above review of regional palaeontology suggests that there is a strong likelihood of uncovering fossil material during the excavation of foundations in the study area. However, with monitoring and any other appropriate mitigation, significant negative impacts to fossil resources would not be likely to occur. In fact, monitoring and/or mitigation could well result in positive impacts (benefits) because of the opportunity to examine deposits not otherwise visible on the surface.

Archaeological resources are sparsely distributed, although Elandsfontein, located outside of the study area, is a fairly extensive occurrence. The western part of the study area, where the substations would be built, is less sensitive than the eastern part. A surface survey during the impact assessment phase is likely to be sufficient to determine any areas that would require avoidance or mitigation, although this outcome is deemed unlikely. It is important that the declared area of Langebaanweg should be avoided completely.

8. RECOMMENDATIONS

It is recommended from a heritage point of view that the proposed project be carried forward to the impact assessment phase. However, the following should be borne in mind when planning the proposed routes for assessment:

- The whole area is sensitive from a palaeontological point of view and it is impossible to minimise impacts during the design phase;
- The Langebaanweg Fossil Park area, because of its Grade 1 status, should be avoided completely;
- Built structures should be avoided with an appropriate buffer; and
- A heritage impact assessment should be carried out, primarily to assess the impacts to palaeontological and archaeological resources.

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