

**HIA FOR THE RICHARDS BAY POWERSHIP,
RICHARDS BAY, KZN**

FOR TRIPLO4 ENVIRONMENTAL SERVICES

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Abbreviations

EIA	Early Iron Age
ESA	Early Stone Age
HIA	Heritage Impact Assessment
HP	Historical Period
IIA	Indeterminate Iron Age
ISA	Indeterminate Stone Age
KZNARI	KwaZulu-Natal Amafa & Research Institute
LIA	Late Iron Age
LSA	Late Stone Age
MSA	Middle Stone Age
PIA	Palaeontological Impact Assessment
SAHRA	South African Heritage Resources Agency

EXECUTIVE SUMMARY

The Project entails the generation of electricity by two Powerships moored in the Port of Richards Bay, fed with natural gas from a third ship, a Floating Storage & Regasification Unit (FSRU). The three ships will be moored in the port for the Project's anticipated 20-year lifespan. A Liquefied Natural Gas Carrier (LNGC) will bring in liquified natural gas (LNG) and offload it to the FSRU approximately once every 20 to 30 days, dependent on power demand which is determined by the buyer, ESKOM. The FSRU stores the LNG onboard and turns the liquid form into gaseous form (Natural Gas) upon demand from the Powership (Regassification). Natural gas will be transferred from the FSRU to the Powerships via a subsea gas pipeline. The generated electricity will be evacuated via a 132kV transmission line over a distance of approximately 3.6km. The power will be evacuated from the Powership to the Impala substation, via a connection point (necessitating a new switching station) in proximity to the existing Bayside Substation, which feeds electricity into the national grid.

Both a desktop and field survey were undertaken for the proposed project. The proposed development extends over two vegetation unit at a desktop level namely the Maputaland Coastal Belt and Subtropical Freshwater Wetlands. Some of these areas were used in the past as agricultural fields.

No heritage sites were noted during the survey.

While some of the area has moderately sensitive palaeontology, the project will not be affecting the Cretaceous deposits as they are ~10m below the surface.

DECLARATION OF INDEPENDENCE

I, Gavin Anderson, declare that I am an independent specialist consultant and have no financial, personal or other interest in the proposed development, nor the developers or any of their subsidiaries, apart from fair remuneration for work performed in the delivery of heritage assessment services. There are no circumstances that compromise the objectivity of my performing such work.

A handwritten signature in black ink, appearing to read 'Gavin Anderson', with a horizontal line underneath.

Gavin Anderson
Archaeologist/Heritage Impact Assessor

INTRODUCTION

“The Project entails the generation of electricity by two Powerships moored in the Port of Richards Bay, fed with natural gas from a third ship, a Floating Storage & Regasification Unit (FSRU). The three ships will be moored in the port for the Project’s anticipated 20-year lifespan. A Liquefied Natural Gas Carrier (LNGC) will bring in liquified natural gas (LNG) and offload it to the FSRU approximately once every 20 to 30 days, dependent on power demand which is determined by the buyer, ESKOM. The FSRU stores the LNG onboard and turns the liquid form into gaseous form (Natural Gas) upon demand from the Powership (Regassification). Natural gas will be transferred from the FSRU to the Powerships via a subsea gas pipeline. The Project’s design capacity is 540MW. Electricity will be generated on Powerships by 27 reciprocating engines, each having a heat input in excess of 10MW (design capacity of 18.32MW each at full capacity). Heat generated by operation of the reciprocating engines is captured, and that energy is used to create steam to drive three steam turbines that each have a heat input of circa 15.45MW. The contracted capacity of 450MW, which cannot be exceeded under the terms of the RMIPPPP, will be evacuated via a 132kV transmission line over a distance of approximately 3km from the Richards Bay Port tie-in point to the Eskom line, at a connection point (necessitating a new switching station) in proximity to the existing Bayside Substation, which feeds electricity into the national grid” (Triplo4 BID 2022).

The proposed project is situated within the Port of Richard’s Bay, and in proximity to the Richard’s Bay Industrial Development Zone (RBIDZ), which was designated Special Economic Zone (SEZ) status in July 2017 in terms of the Special Economic Zones Act 16 of 2014.

A polycentric approach to the proposed project requires the holistic consideration of all relevant factors, inclusive of potential impacts that the proposed Project could have on the local as well as the broader community.

Section 2(4)(b) of NEMA states that *Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.* Sustainable development as per NEMA requires the integration of social, economic, and environmental factors in the planning, implementation, and evaluation of proposed projects, to ensure that development serves the needs of present and future generations.

This specialist assessment considered both the positive and negative impacts of actual and potential impacts on the geographical, physical, biological, social, economic, and cultural aspects of the environment in a polycentric and holistic approach:

- To ensure that all aspects are weighed up against each other;
- To identify the risks and consequences of alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management as set out in section 2 of NEMA.

A specialist integrative workshop and weekly meetings were held during the EIA process where specialists raised matters to be considered by the specialist team and also verified technical information to prevent any discrepancies and where relevant, to co-ordinate approaches.

This approach ensured that there are no gaps contained between the various specialist reports and provides a holistic picture of the project and allows a polycentric assessment of environmental and socio-economic impacts and the identification of appropriate mitigations and recommendations for potential negative impacts and the maximisation of positive impacts and the value of the project to society.

Polycentric integrated specialist reports considered in the assessment

The Wetland Delineation and Functional Assessment provided information regarding areas used for potential human occupation.

Umlando was requested to undertake a HIA of the proposed development. Site/ Figures 1 – 4 show the location of the development.

FIG. 1 GENERAL LOCATION OF THE PROPOSED DEVELOPMENT



FIG. 2: AERIAL OVERVIEW OF THE PROPOSED DEVELOPMENT



FIG. 3: TOPOGRAPHICAL MAP OF THE PROPOSED DEVELOPMENT (2002)

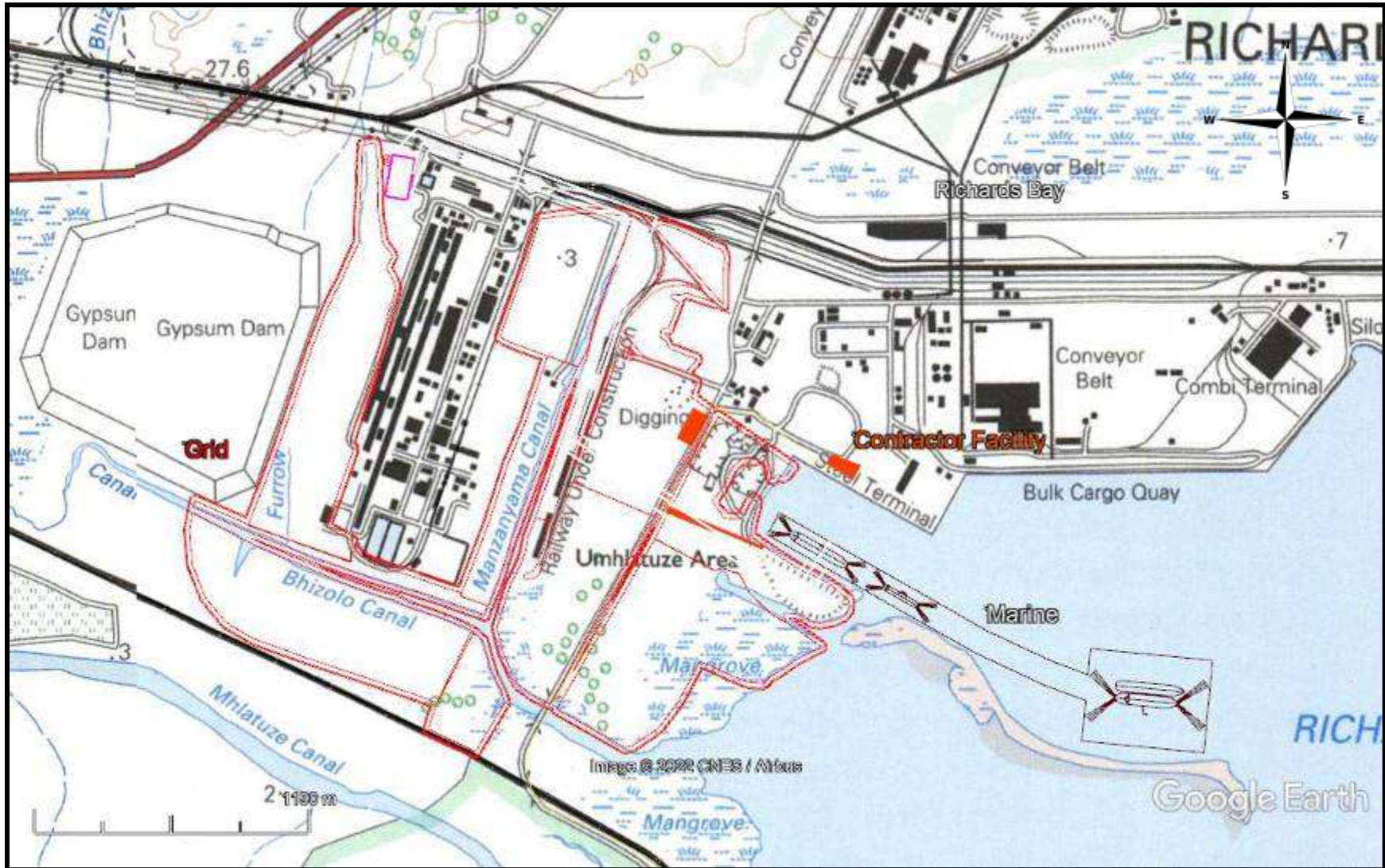


FIG. 4: SCENIC VIEWS ALONG THE PROPOSED (TOP) & ALTERNATIVE LINE



KWAZULU NATAL AMAFA AND RESEARCH INSTITUTE, ACT 05, 2018,

The Kwazulu Natal Amafa And Research Institute, Act 05, 2018, Chapter 8 (pp 29 – 32) define heritage resources.

“General protection: Structures.

37.(1)(a) No structure which is, or which may reasonably be expected to be older than 60 years, may be demolished, altered or added to without the prior written approval of the Institute having been obtained on written application to the Council.

(b) Where the Institute does not grant approval, the Institute must consider special protection in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.

The Institute may, by notice in the *Gazette*, exempt—

(a) A defined geographical area; or

(b) defined categories of sites within a defined geographical area, from the provisions of subsection where the Institute is satisfied that heritage resources falling in the defined geographical area or category have been identified and are adequately protected in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.

(3) A notice referred to in subsection (2) may, by notice in the *Gazette*, be amended or withdrawn by the Council.

General protection: Graves of victims of conflict.

38. No person may damage, alter, exhume, or remove from its original position

(a) the grave of a victim of conflict;

(b) a cemetery made up of such graves; or

(c) any part of a cemetery containing such graves, without the prior written approval of the Institute having been obtained on written application to the Council.

General protection: Informal and private burial grounds

39.(1) or burial ground older than 60 years, or deemed to be of heritage significance by a heritage authority -

- (a) not otherwise protected by this Act; and
- (b) not located in a formal cemetery managed or administered by a local authority, may be damaged, altered, exhumed, removed from its original position, or otherwise disturbed without the prior written approval of the Institute having been obtained on written application to the Council.

The Institute may only issue written approval once the Institute is satisfied that—

- (a) the applicant has made a concerted effort to consult with communities and individuals who by tradition may have an interest in the grave; and
- (b) the applicant and the relevant communities or individuals have reached agreement regarding the grave.

General protection: Battlefield sites, archaeological sites, rock art sites, palaeontological sites, historic fortifications, meteorite or meteorite impact sites.—

40 (1) No person may destroy, damage, excavate, alter, write or draw upon, or otherwise disturb any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Institute having been obtained on written application to the Council.

(2) Upon discovery of archaeological or palaeontological material or a meteorite by any person, all activity or operations in the general vicinity of such material or meteorite must cease forthwith and a person who made the discovery must submit a written report to the Institute without delay.

(3) The Institute may, after consultation with an owner or controlling authority, by way of written notice served on the owner or controlling authority, prohibit

any activity considered by the Institute to be inappropriate within 50 metres of a rock art site.

(4) No person may exhume, remove from its original position or otherwise disturb, damage, destroy, own or collect any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Institute having been obtained on written application to the Council.

(5) No person may bring any equipment which assists in the detection of metals and archaeological and palaeontological objects and material, or excavation equipment onto any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, or meteorite impact site, or use similar detection or excavation equipment for the recovery of meteorites, without the prior written approval of the Institute having been obtained on written application to the Council.

(6)(a) The ownership of any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site, on discovery, vests in the Provincial Government and the Institute is regarded as the custodian on behalf of the Provincial Government.

(b) The Institute may establish and maintain a provincial repository or repositories for the safekeeping or display of —

- (i) archaeological objects;
- (ii) palaeontological material;
- (iii) ecofacts;
- (iv) objects related to battlefield sites;
- (v) material cultural artefacts; or
- (vi) meteorites,

(7) The Institute may, subject to such conditions as the Institute may determine, loan any object or material referred to in subsection (6) to a national or provincial museum or institution.

(8) No person may, without the prior written approval of the Institute having been obtained on written application to the Institute, trade in, export or attempt to export from the Province ~

- (a) any category of archaeological object;
- (b) any palaeontological material;
- (c) any ecofact;
- (d) any object which may reasonably be regarded as having been recovered from a battlefield site;
- (e) any material cultural artefact; or
- (f) any meteorite.

(9)(a) A person or institution in possession of an object or material, referred to in paragraphs (a) ~ (f) of subsection (8), must submit full particulars of such object or material, including such information as may be prescribed, to the Institute.

(b) An object or material referred to in paragraph (a) must, subject to paragraph (c) and the directives of the Institute, remain under the control of the person or institution submitting the particulars thereof.

(c) The ownership of any object or material referred to in paragraph (a) vests in the Provincial Government and the Institute is regarded as the custodian on behalf of the Provincial Government.”

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. This database contains archaeological site locations

and basic information from several provinces (information from all of Umlando's surveys and some colleagues), most of the national and provincial monuments and battlefields in Southern Africa 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?

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.

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. Table 1 lists the grading system.

TABLE 1: SAHRA GRADINGS FOR HERITAGE SITES

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	Generally		Site conservation or mitigation

Significance	Protected A	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

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. Anderson and Anderson (2009, 2010a-b, 2015, 2004 – 2018, 2005 - 2014) have undertaken several surveys in the general area where a variety of sites have been recorded, sampled and excavated (fig. 5). These cover the Early, Middle and Late Stone Ages, Early and Late Iron Ages, Historical Period and the 20th century. These are not well defined archaeological sites, rather a continual lag deposit of stone tools that occur throughout the area. In the past they were recorded as individual sites where in fact they were continuations of the same feature. For example RBP02, RBP03, and 2832CC 001 are all part of the same layer of stone tools over the last 2 million years.

The 1937 map indicates that the study area was mostly used as agricultural fields surrounding wetlands where ALUSAF currently occurs (fig. 6). Settlements and one cattle byre are visible on this map, but to the north of the study area. This is reiterated in the 1942 topographical map (fig. 7).

The 1964 topographical map (fig. 8) indicates that there is one settlement near the study area. Human graves would have been associated with this settlement. The railway line has now destroyed this.

The 1984 topographical map (fig. 9) shows the area as an industrial zone. These maps concur that there was a swamp and wetland formed by the Hlangabenzani River. However, by 1964 furrows/canals had drained much of the water.

The maps also indicate that much of the landscape has changed with the building of the harbour and extra docking areas. For example, the small peninsula where the powership will be anchored only occurs post-1983.

The historical maps indicate that human settlements did exist in the general area and thus there is a possibility for human graves associated with these sites. No sites occur within the study area.

This area has also been one of the many areas regarding forced removals of the Mandlazini people (Griffiths 1996; Ntuli 2019).

The British Navy had used port Durnford since the 1870s as a regular port. It is most famous for the location where King Cetshwayo was exiled from his homeland to Cape Town. While many ships have passed the area, there is no record of the lagoon being used for maritime activity. The Richards Bay Harbour is northeast of the port that was originally envisaged in 1902.

Historically the Mhlatuze Lagoon, as it was referred to in the 1940s, was connected to the sea via large sand banks that made entry into the lagoon with boats and ships near impossible. Freak accidents, such as the SS Newark (1908) did occur, where the ship was run aground in a storm.

The environment surrounding the harbour has been heavily impacted by the original harbour construction in the early 1970s. The harbour dredged the deep Thulazihleka Lake (or Mhlatuze Lagoon) and cleared areas to create a harbour entrance at the Mhlatuze River mouth. The lake was divided into two parts with the southern part of the lake becoming a sanctuary with its own newly created river mouth south of the harbour entrance.

The secondary effects were an increase in wetlands in the area, and much of the original area was flooded. Furthermore, the harbour created a larger area than the original lake and thus removed much of the original land. Areas were dredged and other areas were 'created' by the sand from the dredging, or the sand was dumped onto existing land. For example, 103 hectares of coastal dune was cleared along the southern dunes, and the sand was used to reclaim some of the land for the coal terminal (Zululand Observer, 1 April 1976).

The construction of the Richards Bay harbour involved dredging 25m of deposit from the lagoon and creating a direct accessible link to the ocean for the coal terminal. These excavations went through the Cretaceous deposits. Much of this material was deposited on the western side of the harbour where the Lagoon was now divided into two sections. The creation of the harbour means that the lagoon deposits were severely affected and removed all possible existing maritime heritage. THERE WILL BE NO MARITIME HERITAGE IN THE HARBOUR; IT WAS ALL REMOVED BY DREDGING.

In 2006, Transnet expanded the port and excavated the new Berth 306 in the location of the study area. Again, excavations went beyond the Cretaceous levels removing all heritage.

In summary the historical maps and history of the lagoon and Harbour shows that all remotely possible maritime heritage from this area has been removed. To

satisfy SAHRA's insistence that maritime heritage could still occur in the Berth, a chance find protocol has been included in the EIA.

FIG. 4: LOCATION OF KNOWN HERITAGE SITES IN THE GENERAL AREA

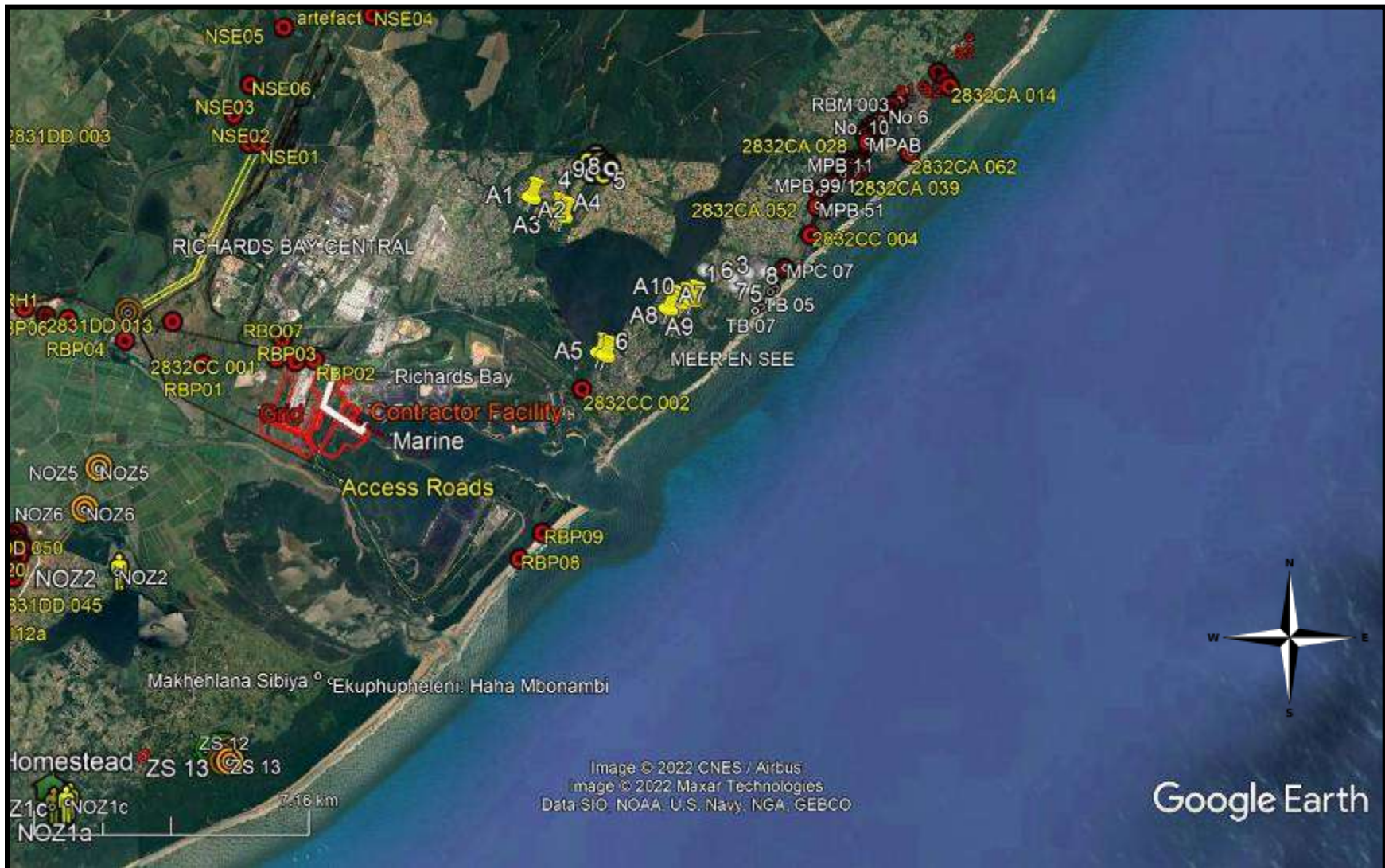


FIG. 5: LOCATION OF PROPOSED LINES IN 1937

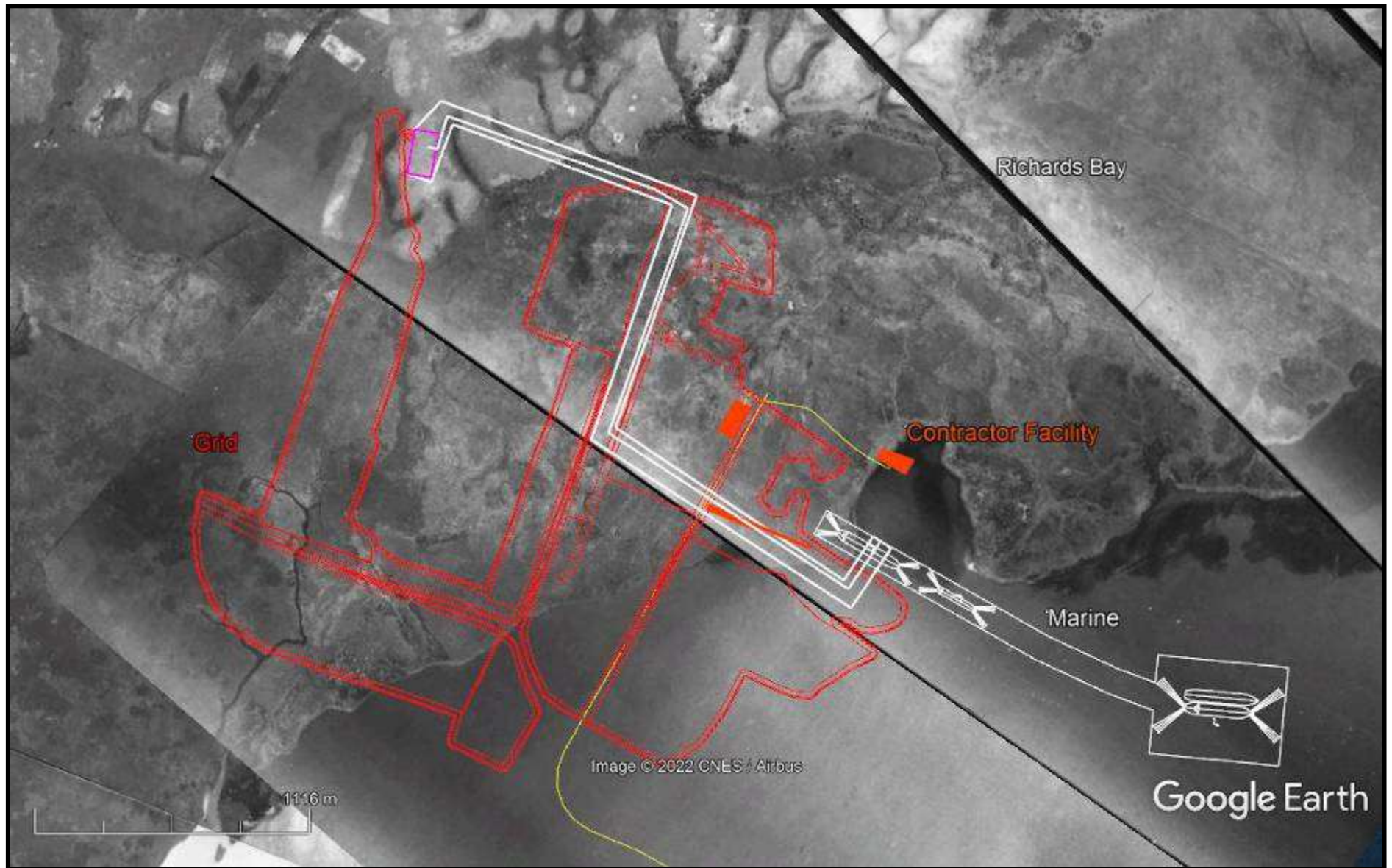


FIG. 6: LOCATION OF PROPOSED LINES IN 1943

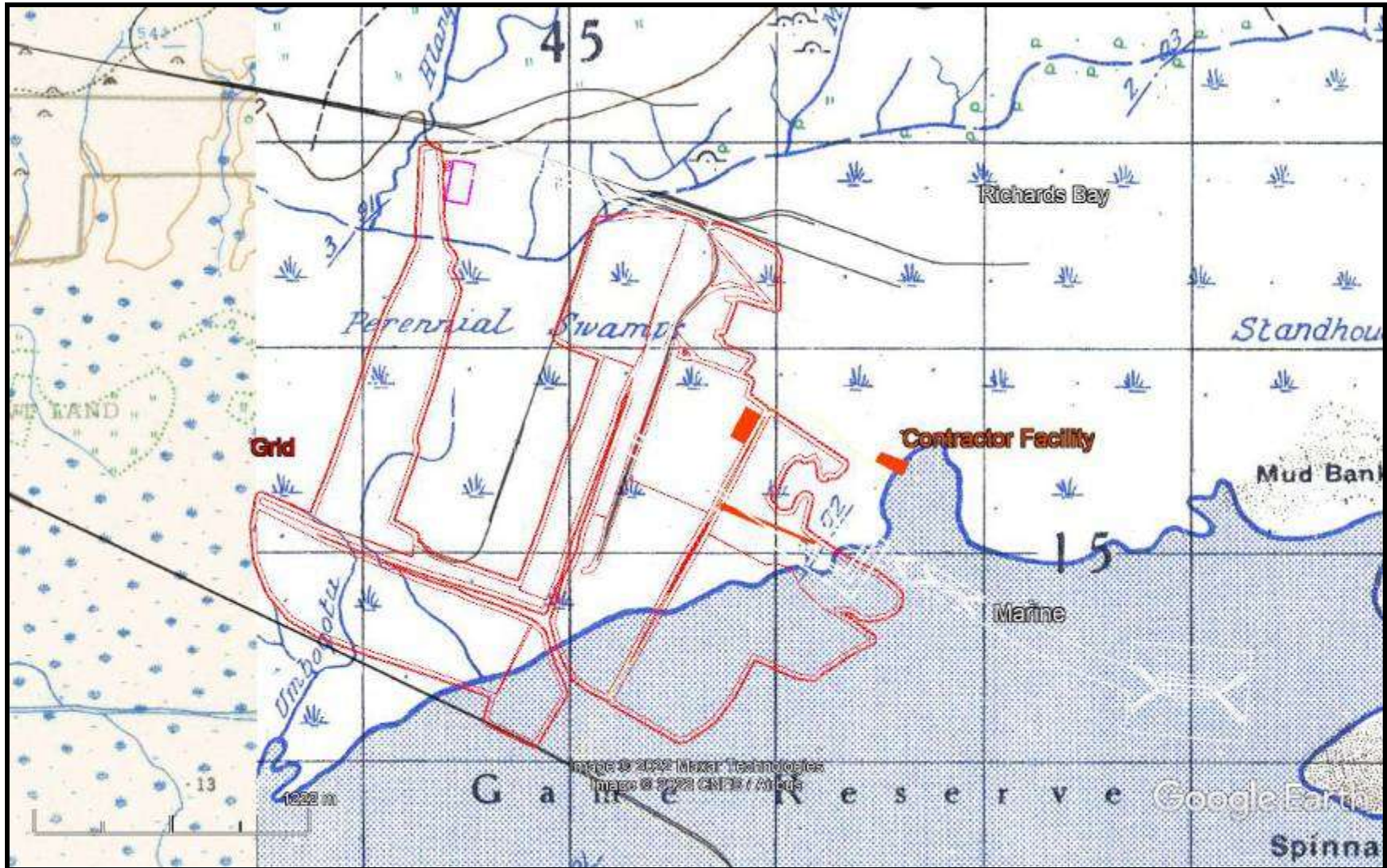


FIG. 7: LOCATION OF PROPOSED LINES IN 1964

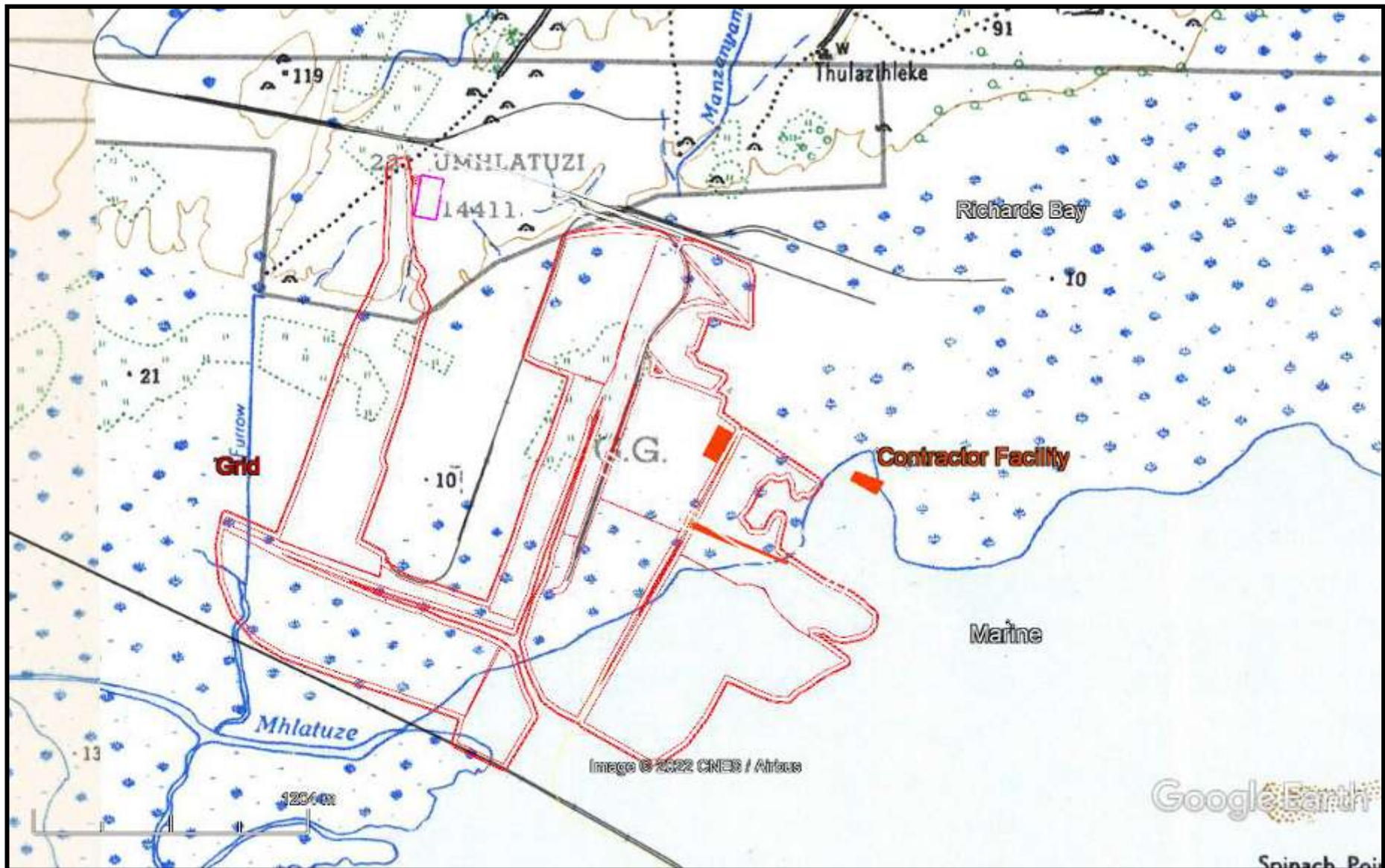
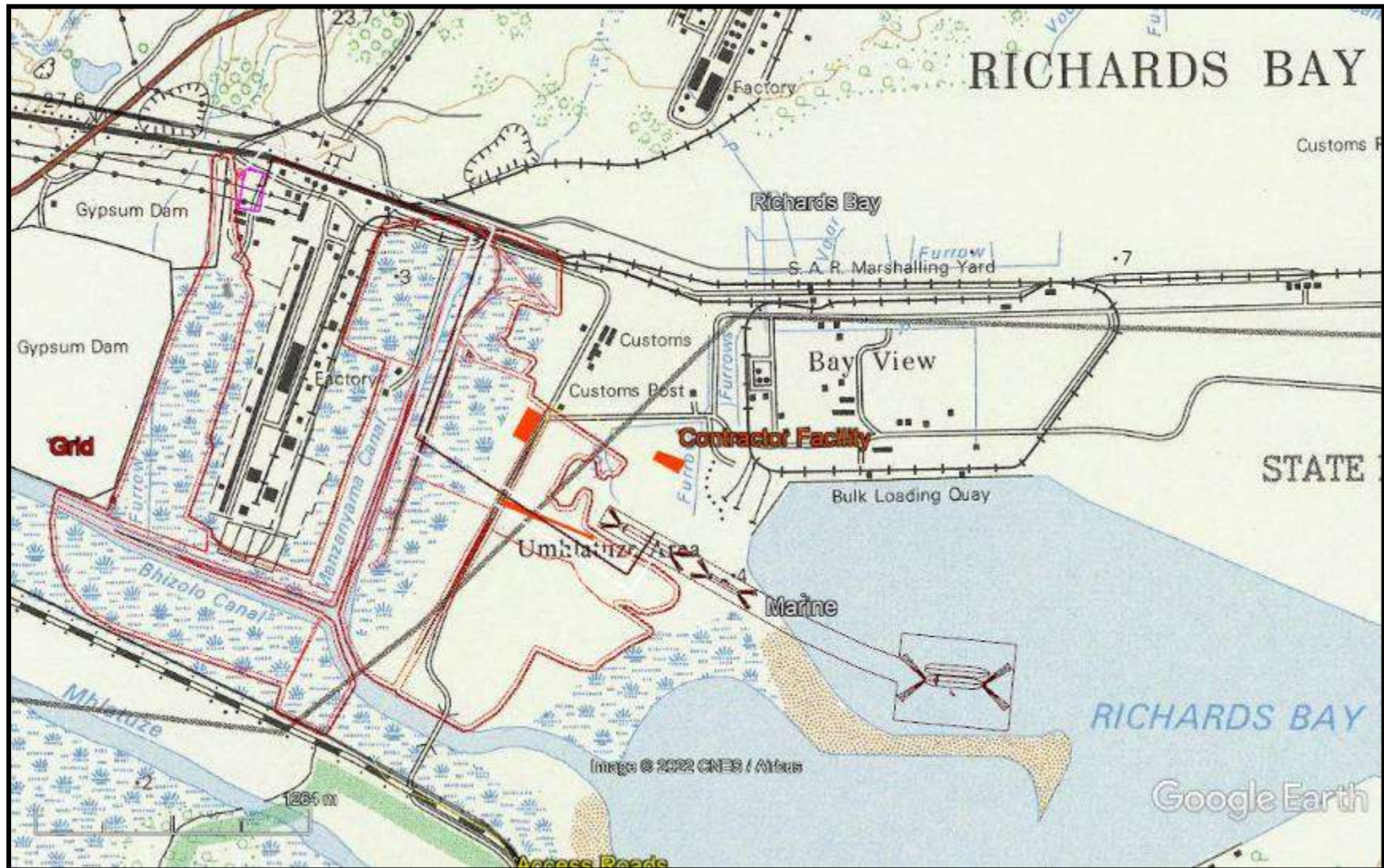


FIG. 8: LOCATION OF PROPOSED LINES IN 1983



PALAEONTOLOGICAL SENSITIVITY

The proposed project is in an area of low to medium palaeontological sensitivity (fig. 9). The green area refers to the Cretaceous deposits that occur 10m (Anderson & Anderson 2009; van Jaarsveld 2006) below the surface. These deposits were noted during the harbor expansion project. A palaeontological monitoring program was set up during the construction of Berth 306 in 2006. Several Cretaceous period fossils were excavated, sampled and rescued during this program. In addition to this, Palaeocene, Miocene and Pleistocene sediments were also noted, and these contained diverse macrofaunal assemblages. Fossils that occur on the current surface are a result of Berth 306 excavations.

The proposed transmission line will not reach those depths and it will only consist of small impact areas for each pole.

If any shell layers are affected during the course of construction, then the ECO needs to inform KZNARI immediately. This will not delay the construction since the material would already be exposed and on the surface. It will be merely to assess the deposits.

FIG. 9: PALAEOLOGICAL SENSITIVITY MAP

FIELD SURVEY

A field survey was undertaken on the 15 September 2020. The proposed development extends over two vegetation units namely the Maputaland Coastal Belt and Subtropical Freshwater Wetlands. Only the area near ALUSAF was on raised ground in the past, and this has been highly disturbed.

No heritage sites were noted along the route, switching station site or proposed construction lay-down areas.

Since no heritage sites were noted, there is no cumulative impact.

RECOMMENDATIONS

In terms of the heritage aspect, either Route Option for the powerline is viable since no sites were recorded.

No heritage sites have been recorded in the study area. The project should be exempt from further HIA mitigation, especially for the maritime aspect since the harbour removed all potential heritage deposits. A Chance Find protocol will be initiated during construction. Although not anticipated, should maritime archaeology be discovered, SAHRA, as the contacting authority which deals underwater cultural heritage, must be contacted immediately, and approval must be obtained should there be need to demolish or remove such maritime archaeology site. Demolition / construction work must only commence once SAHRA's approval has being obtained.

Since there are no heritage resources in the study area there is no impacts to heritage resources and the reversibility and irreplaceability of these resources are not applicable.

Polycentric approach to the recommendations and conclusions

The following specialists considered the Wetland Delineation report findings and recommendations and internalised these within their reports to ensure a polycentric integrative approach to evaluations, assessment and recommendations:

- Heritage impact assessment – location of wetlands in relation to human habitats.

CONCLUSION

A desktop heritage survey and a site specific field survey was undertaken for the proposed Richards Bay powership Gas to Power Project in the Port and the proposed preferred and alternative powerlines. There will be a ~3km 132kV transmission line from the Richards Bay Port to the Impala substation, via a connection point (necessitating a new switching station) in proximity to the existing Bayside Substation. This in turn will supply to the national grid.

The study area occurs in the Maputaland Coastal Belt and Subtropical Freshwater Wetlands. Some of these wetlands have been drained resulting in a few raised small hills. These raised areas were used in the past as agricultural fields.

No heritage sites were noted during the survey. Based on the survey, heritage sites will not be impacted by the proposed development.

No further heritage mitigation is required for this project.

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117C_059_66291

117C_060_66303

EXPERIENCE OF THE HERITAGE CONSULTANT

Gavin Anderson has a M. Phil (in archaeology and social psychology) degree from the University of Cape Town. Gavin has been working as a professional archaeologist and heritage impact assessor since 1995. He joined the Association of Professional Archaeologists of Southern Africa in 1998 when it was formed. Gavin is rated as a Principle Investigator with expertise status in Rock Art, Stone Age and Iron Age studies. In addition to this, he was worked on both West and East Coast shell middens, Anglo-Boer War sites, and Historical Period sites.