ALCATEL SUBMARINE NETWORKS (ASN)

PROPOSED 2AFRICA (WEST) SUBMARINE FIBRE OPTIC CABLE SYSTEM TO BE LANDED AT YZERFONTEIN, WEST COAST DISTRICT, WESTERN CAPE, SOUTH AFRICA

MOBILE TELEPHONE NETWORK (PTY) LTD (LANDING PARTNER)

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

EIA REFERENCE: 14/12/16/3/3/2/2047

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Proposed 2AFRICA (West) Submarine Fibre Optic Cable System to be landed at Yzerfontein, West Coast District, Western Cape, South Africa. Draft Environmental Impact Assessment Report. EIA REFERENCE: 14/12/16/3/3/2/2047 May 2021	ACER (Africa) Environmental Consultants (Externally reviewed by Jacolette Adams, Exigent)	MTN Mr P. Janse van Rensburg	MTN Mr P Janse van Rensburg
	Date: 30 April 2021	Date: 19 May 2021	Date: 24 May 2021

DISTRIBUTION OF DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR COMMENT

This draft report is available for public review at the following public venues in the project area for a period of 30 days (28 May – 29 June 2021).

Venue	Street	Contact Person and Number
Yzerfontein Municipal Office	46 Main Road, Yzerfontein, 7351	Ms Lizelle Coetzee Tel: 022 451 2366 Email: lizellec@swartland.org.za
Darling South Public Library (Swartland Municipality)	Church Street Darling, 7345	Mrs Elizabeth Mostert Tel: 022 492 2237 Email: Darlingbib@swartland.org.za

The draft report is also available on ACER's web site (www.acerafrica.co.za) under the 'Current Projects' link.

Please submit your comments on the draft report by no later than 29 June 2021 to:

Glenda Du Toit ► P O Box 503, Mtunzini, 3867
► Tel: 035 340 2715 ► E-mail: 2africa.yzerfontein@acerafrica.co.za

Please note that, in line with the EIA Regulations, all registered interested and affected parties are required to disclose any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

The draft EIA report was made available to the following authorities:

1. Department of Forestry, Fisheries and the Environment
   Ms Sindiswa Dlomo
   Email: Sdlomo@environment.gov.za

2. Department of Forestry, Fisheries and the Environment: Biodiversity Oceans and Coast Directorate
   Mr. Xolani Myanga Ms Nontsasa Tonjeni; Ms Funanani Ditinti
   Email: XMyanga@environment.gov.za ;
   fditinti@environment.gov.za; ntonjeni@environment.gov.za

3. Department of Environmental Affairs and Development Planning, Western Cape Government
   Mrs Adri La Meyer
   Email: Adri.LaMeyer@Westerncape.gov.za

4. Swartland Local Municipality
   Name: Mr Alwyn Zaayman
   Email: AlwynZaayman@swartland.org.za

5. West Coast District Municipality
   Ms. Doretha Kotze- town & Regional Planner
   Email: Westcoastdm@wcdm.co.za

6. CapeNature (West Coast District)
   Mr. Marius Wheeler

Email: mwheeler@capenature.co.za

7. Department of Human Settlements, Water & Sanitation
   Mr Warren Dreyer
   Email: danielsd@dws.gov.za

8. Department of Public Works
   Mr Basson Geldenhuys
   Email: basson.geldenhuys@dpw.gov.za

EXECUTIVE SUMMARY

Introduction

Submarine telecommunication cables are important for international telecommunication networks as they transport almost 100% of the trans-oceanic Internet traffic throughout the world. It is widely recognised that access to affordable international bandwidth is key to economic development in every country. As such, the improvement in Africa's information technology infrastructure via telecommunication cables will remove one of the current key inhibitors to development in Africa and support economic growth and opportunities on the continent.

Alcatel Submarine Networks (ASN) has been contracted to supply and install the proposed 2AFRICA (West) Cable System, with one South African landing at Yzerfontein, located on the west coast of South Africa within the Swartland Local Municipality, West Coast District Municipality, Western Cape Province. This is to be operated by Mobile Telephone Network (Pty) Ltd (MTN) as the South African landing partner (Project Applicant).

The project requires environmental authorisation from the Department of Forestry, Fisheries and the Environment (DFFE[1]) in terms of the 2014 Environmental Impact Assessment (EIA) Regulations (as amended), published under the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) (as amended). ACER (Africa) Environmental Consultants (ACER) has been appointed as the independent Environmental Assessment Practitioner (EAP) to assist with the application for environmental authorisation as well as other environmental permitting/licensing requirements (including a Sea Shore Lease from Cape Nature).

This Draft EIA Report (DEIAR) and accompanying Environmental Management Programme (EMPr) have been prepared in accordance with the 2014 EIA Regulations.

Project Location and Scope

The project involves the installation and operation of the 2AFRICA (West) Cable System landing at Yzerfontein, which comprises marine and terrestrial components. These include the cable from when it enters South Africa's Exclusive Economic Zone (EEZ) (within 200 Nm from the seashore), passes through South Africa's Territorial Waters (12 Nm from the seashore), lands on shore and traverses the beach to an existing beach manhole (BMH) at Yzerfontein Beach. Note that on land, the 2AFRICA (West) cable at Yzerfontein will be accommodated within existing West Africa Cable System (WACS) infrastructure, viz. from the WACS BMH via existing underground ducting to the WACS Cable Landing Station (CLS). Relevant GPS co-ordinates (approximate) are provided below. Project activities are described further under the technical description.

GPS Co-ordinates of the Alternative 1 infrastructure at Yzerfontein (approximate)		
Location	**Latitude**	**Longitude**
Start of marine cable	S 33° 6'8.51"	E 16°16'45.67"
Mid-point of marine cable	S 33 35'09.25"	E 17 11'02.40"
Landing Point on shore	S 33°20'23.54"	E 18° 9'38.35"
WACS Conduit Opening on Beach	S 33°20'23.64"	E 18° 9'38.94"
WACS BMH at Yzerfontein	S 33°20'23.91"	E 18° 9'41.12"
End of cable at WACS CLS	S 33° 20'12.92"	E 18°11'51.45"

Legal Requirements

There are many legal requirements (International, National, Provincial and Local Government spheres) to which the project proponent must adhere for the proposed 2AFRICA (West) Cable System

1 Previously named Department of Environment, Forestry and Fisheries (DEFF).

(Yzerfontein landing). These were detailed in the Final Scoping Report (ACER, 2021) and a summary of applicable legislation and guidelines is provided in Chapter 2 of this report.

In terms of the 2014 EIA Regulations (as amended 2017) the proposed 2AFRICA (West) Cable System (Yzerfontein landing) potentially triggers activities in Listing Notices 1, 2 and 3, as shown in Table 2 of this report. The application for environmental authorisation therefore requires a full Scoping and Environmental Impact Assessment (EIA) process.

Technical Description

The main 2AFRICA (West) marine cable trunk comes down from the north roughly parallel to the West Coast of Africa, several hundred km offshore in international waters. It starts to veer south-eastwards towards the South African coastline and enters the South African EEZ roughly opposite Cape Columbine. Once reaching depths of approximately 1000m, the route closely follows that of the existing WACS cable, curving south and then north again to enter South African territorial waters approximately 22 km (12 Nm) from the seashore, before landing on shore at Yzerfontein Beach on the Cape's West Coast.

Marine fibre-optic cables range in diameter from 17mm to 50 mm. They are essentially inert, as any heat emissions, electric or electro-magnetic associated with the cable are of negligible magnitude. Cables are laid on the seabed surface in deep water and buried under the seabed in shallower waters (approximately < 1,500 m depths).

The proposed 2AFRICA (West) Cable System (Yzerfontein landing) will include the following project components:

- Pre-installation activities including cable route survey, route engineering, route clearance and Pre-Lay Grapnel Run.
- A Marine Cable Route Survey to determine the suitability of the substrate and topography of the ocean floor. This includes a geophysical survey using echosounders and sonar techniques and a geotechnical survey involving cone penetrometer tests and core sampling and analysis.
- Laying of the cable in the offshore environment, preceded by route clearance and including cable burial to a water depth of 1,500 m.
- The laying of the cable within the shallow water environment is likely to involve a direct shore end operation where the shore end of the subsea cable is installed directly from the main subsea cable installation vessel and floated to the beach landing point using buoys, assisted by small boats and divers. It is then buried in the seabed using the diver jet burial technique. The cable will be buried in sediment wherever possible, and the route will be adjusted to avoid obvious visible rock. The aim is to bury the cable to a depth of 2 m where possible.
- Excavations within the intertidal zone to bury the cable before it is anchored into the existing WACS anchor block and BMH (already constructed and located directly inland of the beach at the preferred landing point). The BMH is a concrete utility vault where the marine portion of the subsea cable is connected to the terrestrial portion.
- Installation of a sea earth system (System Earth).
- On the beach, the cable will be buried to a depth of 2 meters, substrate permitting.

A detailed description of the various project components and the proposed construction methods are provided in Chapter 4 of this report.

Project Alternatives
Various project alternatives were considered during Scoping. One preferred landing site and one marine cable route were taken forward for assessment in this Draft EIA Report (DEIAR), as described in the project scope and technical description.

Need and Desirability
The need and desirability of a proposed development is a key consideration of an application for environmental authorisation and differs from the developer's aims and purpose of the development. The Guideline on Need and Desirability in terms of the EIA Regulations (DEA, 2017) states that *"consistent with national priorities, environmental authorities must support "increased economic growth and promote social inclusion" while ensuring that such growth is "ecologically sustainable"*. In essence, need and desirability are based on the principle of sustainability, viz. that a development is ecologically sustainable and socially and economically justifiable. Chapter 3 of this report deals with aspects of Need and Desirability, in terms of the Guideline.

Description of the Environment
The proposed construction and operation of the 2AFRICA (West) Cable System (Yzerfontein Landing) takes place within the marine and terrestrial environments, and, as such, a description of both environments is provided in Chapter 6 of this report.

Natural environment (terrestrial and marine)
Ecological drivers of relevance to the project include ocean currents, the natural oceanic wave climate, wind, mobility of sand, nearshore sand circulation, and offshore sediment transport, the deposition and decomposition of organic material and colonisation of dunes by vegetation. These will have more of an impact on the cable, rather than the cable affecting the drivers.

No sensitive ecosystems (or habitat) on land, nor any Marine Protected Areas (MPA) will be directly affected by the proposed 2AFRICA (West) Cable System (Yzerfontein landing). However, sections of the marine cable will traverse marine areas classified as Critical Biodiversity areas (CBA1 and CBA2) as well as the Cape Canyon and Associated Islands Ecologically or Biologically Significant Area (EBSA). The alignment as far as possible avoids rocky substrates. Due to cable burial, it is primarily sandy substrates and the benthic organisms that live in it, that will be disturbed. Larger and more mobile marine organisms in the water body, including fish, whales, dolphins, as well as seabirds and shorebirds, will be able to move out of the direct area of disturbance. Due to the nature of the project and the dynamic nature of the environment (allowing for rapid recovery), impacts on the biophysical environment are mostly minor and temporary, occurring during the installation phase.

Social/socio-economic environment
From a development planning perspective, this project aligns with the objectives of the South African government's Strategic Infrastructure Project 15 (SIP 15: Expanding Access to Communication Technology), which is also compatible with district and local development plans.

The cable landing will take place at Yzerfontein, which is a small coastal village popular amongst retirees, holiday makers and tourists. The coastal zone between the high-water mark of the sea and residential areas at Yzerfontein is under the administration of the Department of Public Works. CapeNature is a key roleplayer with respect to biodiversity and conservation issues at Yzerfontein, as well as to obtain a Sea Shore lease Permit. Yzerfontein lies adjacent to the West Coast National Park, which is managed by SanParks.

Offshore in the study area, there are a number of economic interests and activities to be considered, including pelagic and demersal fishing/trawling, the presence of other subsea cables and Oil and Gas exploration blocks on the seabed.

Cultural heritage
There are no land-based cultural heritage resources to be considered. Although potentially present, submerged prehistoric archaeological resources, palaeontological features and fossil material are very unlikely to be affected by the marine cable and shore landing. There are no recorded wrecks within the study area or within approximately 8,5 km of the cable alignment.

The Environmental Assessment Process and Methodology
The assessment process began with Scoping, which is a process designed to define the limits of the assessment, to elicit inputs from Interested and Affected Parties (I&APs), and to focus the scope of the assessment. The Impact Assessment process has followed Scoping, in accordance with the approved Plan of Study for Impact Assessment, with the main activities being:

- Focused scientific studies with contributions from specialists, engineers and the EAP team.
- Ongoing communication and participation with stakeholders.
- Integration of the findings into an EIAR, inclusive of mitigation measures. The final assessment of the significance of impacts was undertaken by the EAP, in accordance with assessment conventions stipulated in GNR 326.
- Preparation of an Environmental Management Programme (EMPr).

Public Participation Process
The public participation process was designed to comply with the 2014 EIA Regulations (as amended) and NEMA. The project team has been available for communication with I&APs throughout Scoping and the Impact Assessment. However, formal stages at which the public were notified, provided with information and given an opportunity to raise concerns and provide input were:

- Project Announcement, which included media adverts, Background Information Document, on site notices and written correspondence (28 October 2020).
- Notifications by telephone and one on one meetings.
- Posting of all relevant documents on ACER's website www.acerafrica.co.za.
- Circulation of the Draft Scoping Report for comment (15 January to 15 February 2021).
- Notification of submission of the Final Scoping Report (25 February 2021).
- Circulation of this DEIAR for comment.

Issues raised by I&APs and responses thereto, have been captured in Comments and Responses Reports (CRR) appended to this DEIAR. Where relevant, they have been addressed in this DEIAR. To date, the comments received from I&APs and relevant authorities relate to the following topics:

- Stakeholder registration details.
- Acknowledgements of receipt of documents.
- Requests for documents.
- Approval (from DEFF Integrated Environmental Authorisations) of the plan for public participation.
- Various comments from I&APs and commenting authorities relating to:
  - Applicable legislation, permit and lease requirements.
  - The landing site and cable position.
  - Request to monitor excavations for geological research purposes.
  - Information requested from Maritime Safety, to be provided 72 hours prior to the cable landing.
  - Public access, health and safety.
  - Risk to WACS cable.
  - Effect on Critical Biodiversity Areas.
  - Effect of climate change.

- Ecological impacts within the Coastal Protection Zone (CPZ).
- Impacts on the littoral active zone of Yzerfontein beach.
- Scheduling of construction periods.
- Specialist studies.
- Potential impact on trawling blocks/ the fishing industry.
- Relevant information on shipwrecks from SAHRA.
- Heritage Western Cape requirements.
- Use of the National Coastal and Marine Spatial Biodiversity Plan for updated data.
- Terms of reference for specialist input.

All relevant public participation documentation is appended to this report.

Summary of specialist findings

Seven specialist studies were undertaken. The table below summarises the main conclusions of these specialist reports.

	Specialist Study	Organisation	Main conclusions
1	Compliance Statement for Terrestrial and Freshwater Ecosystems (Appendix B1)	Inland Waters Consultancy in association with Capensis	No vegetation or freshwater habitat will be affected, therefore no negative impacts on terrestrial and wetland habitat and non-marine fauna.
2	Commercial Fisheries Specialist Study (Appendix B2)	Capricorn Marine Environmental (Pty) Ltd (CapMarine)	The causes of potential impacts of the project on the fishing industry were identified as noise emissions; temporary exclusion from fishing grounds from vessels during cable laying (up to 1.5 km) and long-term exclusion of anchoring and trawling 500 m either side of the cable. Various fishing sectors will be affected, but those most affected are the demersal trawl and demersal longline. After mitigation (where applicable) the significance of all related impacts on fishing sectors is assessed as very low or low
3	Beach and Coastal Dune Dynamics Impact Assessment (Appendix B3)	SDP Ecological & Environmental Services	The environment in which the cable will be laid is subject to ongoing erosion, presently stabilised with a concrete wall. The proposed alternative meets with an existing cable and concrete walkway at the point of landing and therefore will have little further impact on the dune cordon and the associated environment. After mitigation (where applicable) the significance of impacts on the beach and dunes is assessed as very low or low.
4	Marine Ecology Assessment (Appendix B4)	Pisces Environmental Services (Pty) Ltd	The report identifies various impacts resulting from vessels and other activities during geophysical survey, installation and operation of the cable. There will be impacts on marine biota due to disturbance of the upper beach and intertidal and shallow subtidal sandy habitats, as well as the unconsolidated seabed beyond the surf-zone and across the shelf. There will also be impacts on marine biota including fish, marine mammals, seabirds and shorebirds. However, the significance of all these impacts is assessed as very low or low.
5	Maritime Archaeological Impact Assessment (Appendix B5)	ACO Associates cc	The report indicates no fatal flaws and is unlikely to have any impact on known or unknown maritime and underwater cultural heritage resources.

	Specialist Study	Organisation	Main conclusions
6	A review of the potential effects of submarine telecommunications cables on marine mammals in Southern Africa (Appendix B6)	Sea Search Research and Conservation	The main impacts which might affect marine mammals are: 1) avoidance of noise and masking of vocalisations by general ship noises and depth sounders and 2) potential startle responses of marine mammals to multi-beam echosounders, which could lead to mass stranding events. Mitigation options for these activities are limited. Entanglement of cetaceans in the cable is not regarded as a threat. There are concerns for the general impact of cable deployment operations on coastal species such as Heaviside's and humpback dolphins and southern right whales during work in the nearshore environment. The use of a suitably trained crew member as a Marine Mammal / Protected Species Observer (MMO/PSO) is recommended, and cable laying should take place outside of the main migration seasons for whales.
7	Submarine Telecommunications Cables EIA: Generic Avifaunal Impact Assessment (Appendix B7)	WildSkies Ecological Services (Pty) Ltd	In general, the significance of anticipated impacts of submarine telecommunications cables projects on seabirds and shorebirds is low, provided the cable avoids particularly sensitive bird areas such as MPAs, IBAs, sensitive onshore areas and any islands.

Environmental Issues and Potential Impacts

The key issues identified during Scoping and carried through to the Impact Assessment were formulated as seven key questions:

- What are the potential social and socio-economic impacts associated with the construction and operation of the proposed 2AFRICA (West) Cable System (Yzerfontein landing)?
- What impacts will the construction and operation of the 2AFRICA (West) Cable System (Yzerfontein landing) have on the natural environment (terrestrial vegetation, wetlands, fauna, and avifauna)?
- What impacts will the construction and operation of the 2AFRICA (West) Cable System (Yzerfontein landing) have on the marine environment including MPA's?
- What impacts will the construction and operation of the 2AFRICA (West) Cable System (Yzerfontein landing) have on the fishing industry?
- What impact will the construction and operation of the 2AFRICA (West) Cable System have on the beach and dune cordon at Yzerfontein?
- What impact will the construction of 2AFRICA (West) Cable System have on cultural and heritage resources, including any paleontological resources (if any are identified during the study)?
- What cumulative impacts will result from the construction of the 2AFRICA (West) Cable System (Yzerfontein landing)?

Potentially significant impacts associated with each of the above issues were discussed and assessed. **Where relevant**, significance ratings were assigned to impacts, both before mitigation, as well as after application of recommended mitigation measures.

Environmental Impact Statement

Taking the key issues and the assessment of associated potential impacts into account, a summary of the environmental impacts of the proposed activity, and their significance (after mitigation, where applicable) is provided below.

Social and socio-economic impacts
Overall, the project is expected to contribute positively to the goal of improving livelihoods for South Africans through the education and economic opportunities opened up as a result of access to improved telecommunications networks. While expanding access to communication technology will be done primarily through broadband infrastructure roll-out, this requires a national backbone connected to the rest of the world. In this case, the proposed 2AFRICA (West) Cable System supports SIP 15 via it's international connectivity, capacity and speed. The significance of this positive impact is assessed as medium.

The Yzerfontein cable landing will render very limited areas of the seabed permanently unavailable to some concession holders in the Oil and Gas sector. This needs to be dealt with via agreements between MTN and the affected rights holders, outside of this EIA process. During installation, there is potential to negatively impact other existing subsea telecommunications cables. However, this can be managed by adherence to international guidelines and standards. The project may cause minor nuisance impacts to the local community during the installation phase. In general, the negative social and socio-economic impacts are of low significance, after mitigation.

Impacts on terrestrial ecosystems, vegetation and fauna
The implementation of the proposed landing site will have no negative impacts on terrestrial ecosystems of conservation value. No vegetation or wetland habitat is present on site and consequently there will be no impact on terrestrial (non-marine) fauna.

Impacts on marine ecosystems, vegetation, fauna and avifauna
While the 2AFRICA (West) Cable System (Yzerfontein landing) passes through the Cape Canyon and Associated Islands Ecologically or Biologically Significant Area (EBSA) as well as areas classified as Critical Biodiversity Areas (CBAs), the residual impacts of the project on the benthic environment will be of low significance. The potential negative impacts of the project on marine flora and fauna (small and large) on shore, nearshore and offshore, are all of low significance (after applying mitigation where feasible). Similarly, the impacts on seabirds and shorebirds will be of low significance.

The cable, once in place, will afford a section of the seabed long term protection due to the exclusion of anchoring and trawling 500 m either side of the cable, which is considered a positive impact of low to medium significance.

Impacts on fisheries
Several fisheries operating in the area will potentially be negatively affected by the 2AFRICA (West) Cable System (Yzerfontein landing). A potential decline in catch rates due to noise disturbance is assessed as being of low significance. The potential effect on operational activities and decline in catch rates due to the temporary (1,500 m) exclusion zones around cable laying vessels is assessed as being of low significance. The long-term effect on operational activities due to the 500 m exclusion zone either side of the cable will negatively impact fishing sectors, most particularly the demersal trawl and demersal longline as it affects a heavily trawled area. However, the cable will not prevent trawling from continuing in the area, as trawlers will lift gear as they pass over the cable. The loss of fishing ground is estimated to be approximately 0.1% of the total trawl grounds available in that area and overall, the significance of this impact is assessed as low. The potential for mitigation of identified impacts of the project on fisheries is very low.

Impacts on the beach and coastal dunes
The project will have little impact on the beach and coastal dunes. The significance of potential negative impacts on drivers of coastal processes, sediment transport and habitat/eco-morphology of the beach and dunes will be low, both before and after mitigation. The beach environment at the landing site is, however, subject to ongoing erosion which may be exacerbated by climate change.

Impacts on cultural heritage
While there is evidence of submerged pre-historic archaeological resources, palaeontological resources and maritime archaeological resources in the broader study area, the likelihood of the project negatively impacting these resources is very low. There are no recorded shipwrecks along the cable alignment. As the impacts would be non-reversable if they should occur, the significance of impacts on these cultural heritage resources is assessed as medium, (after applying mitigation, where possible).

Cumulative impacts
The impacts resulting from the proposed 2AFRICA (West) Cable System (Yzerfontein landing), as identified above, are both positive and negative and along with other existing or future cables in the area can have cumulative effects on the environment. However, the contribution of this project to negative cumulative impacts is anticipated to be low.

The No Development Alternative
It is not anticipated that the No-Development Alternative would have any negative impacts of high significance. However, it would preclude the positive impacts which improved telecommunications would have on the country's socio-economic environment and would fail to support the country's SIP 15 goals. It is anticipated that, with required mitigation of negative impacts, the advantages of the project will outweigh the disadvantages. For this reason, the No-Development Alternative is not preferred.

Concluding Remarks
Based on the findings of the specialists and the assessment of key issues and associated impacts undertaken in this report, it is the professional opinion of the EAP that there are no fatal flaws associated with the proposed project and that the negative impacts resulting from the proposed 2AFRICA (West) Cable System (Yzerfontein Landing) can be mitigated to acceptable levels. Therefore, the project should be granted environmental authorisation by DFFE , conditional on compliance with the mitigation measures as recommended in this report and contained within the EMPr.

The project components to be authorised are the installation and operation of the marine cable, along the alignment as proposed, with the shore landing at Yzerfontein to link up to the existing WACS BMH. From there, the cable will link to the WACS CLS via existing underground ducting.

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DEFINITIONS

Alternatives - In relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to –

i. The property on which or location where it is proposed to undertake the activity.
ii. The type of activity to be undertaken.
iii. The design or layout of the activity.
iv. The technology to be used in the activity.
v. The operational aspects of the activity.

Baseline - Information gathered at the beginning of a study which describes the environment prior to development of a project, and against which predicted changes (impacts) are measured.

Benthic - Referring to organisms living in, or on, the sediments of aquatic habitats (lakes, rivers, ponds, etc.).

Biodiversity - The diversity, or variety, of plants, animals and other living things in a particular area or region. It encompasses habitat diversity, species diversity and genetic diversity.

Community - Those people who may be impacted upon by the construction and operation of the project. This includes neighbouring landowners, local communities and other occasional users of the area.

Construction Phase - The stage of project development comprising site preparation as well as all construction activities associated with the development.

Consultation - A process for the exchange of views, concerns and proposals about a project through meaningful discussions and the open sharing of information.

Critical Biodiversity Area - Areas of the landscape that must be conserved in a natural or near-natural state in order for the continued existence and functioning of species and ecosystems and the delivery of ecosystem services.

Cumulative Impacts - Direct and indirect impacts that act together with current or future potential impacts of other activities or proposed activities in the area/region that affect the same resources and/or receptors.

Ecosystem - A community of plants, animals and organisms interacting with each other and with the non-living (physical and chemical) components of their environment.

Environment - The surroundings within which humans exist and that are made up of

i. The land, water and atmosphere of the earth;
ii. Micro-organisms, plant and animal life;
iii. Any Part or combination of (i) and (ii) and the interrelationships among and between them; and
iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Authorisation (EA) – The authorisation by a competent authority of a listed activity.

Environmental Assessment Practitioner (EAP) – The person responsible for planning, management and co-ordination of environmental impact assessment, strategic environmental assessments,

environmental management plans or any other appropriate environmental instrument introduced through regulations.

Environmental Impact Assessment (EIA) – In relation to an application to which scoping must be applied, means the process of collecting, organizing, analysing, interpreting and communicating information that is relevant to the consideration of that application. This process necessitates the compilation of an Environmental Impact Report, which describes the process of examining the environmental effects of a proposed development, the anticipated impacts and proposed mitigatory measures.

Environmental Impact Report (EIR) - A report assessing the potential significant impacts as identified during the Scoping phase.

Environmental Management Programme (EMPr) - A management programme designed specifically to introduce the mitigation measures proposed in the Reports and contained in the Conditions of Approval in the Environmental Authorisation.

Epifauna[2] - Organisms, which live at or on the sediment surface being either attached (sessile) or capable of movement.

Gross Domestic Product (GDP) by region - represents the value of all goods and services produced within a region, over a period of one year, plus taxes minus subsidies.

Habitat - The place where a population (*.e.g.,* animal, plant, micro-organism) lives and its surroundings, both living and non-living.

Hazardous waste – means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical, or toxicological characteristics of the waste, have a detrimental impact on health and the environment.

Hydrocarbons – Oils used in machinery as lubricants, including diesel and petrol used as fuel.

Impact - A change to the existing environment, either adverse or beneficial, that is directly or indirectly due to the development of the project and its associated activities.

Infauna - Animals of any size living within the marine sediment. They move freely through interstitial spaces between sedimentary particles or they build burrows or tubes.

Interested and Affected Party (I&AP) – Any individual, group, organization or associations which are interested in or affected by an activity as well as any organ of state that may have jurisdiction over any aspect of the activity.

Marine environment - Marine environment includes estuaries, coastal marine and nearshore zones, and open-ocean-deep-sea regions.

Memorandum of Understanding (MOU or MoU) is an agreement between two or more parties outlined in a formal document. It is not legally binding but signals the willingness of the parties to come to an agreement.

Municipality –
(a) Means a metropolitan, district or local municipality established in terms of the Local Government: Municipal Structures Act, 1998 (Act No. 117 of 1998); or

2 Marine Ecology Report (Appendix 5.4)

(b) In relation to the implementation of a provision of this Act in an area which falls within both a local municipality and a district municipality, means
  (i) The district municipality, or
  (ii) The local municipality, if the district municipality, by agreement with the local municipality, has assigned the implementation of that provision in that area to the local municipality.

NEMA EIA Regulations - The EIA Regulations means the regulations made under section 24(5) of the National Environmental Management Act (Act 107 of 1998) (Government Notice No. R 982, R 983, R984 and R 985 in the Government Gazette of 4 December 2014 refer as amended by GNR 324, 325, 326 and 327 of 7 April 2017.

No-Go Alternative – The option of not proceeding with the activity, implying a continuation of the current situation / status quo

Public Participation Process (PPP) - A process in which potential Interested and Affected Parties are given an opportunity to comment on, or raise issues relevant to, specific matters.

Recruitment - The replenishment or addition of individuals of an animal or plant population through reproduction, dispersion and migration

Registered Interested and Affected Party (I&AP) – All persons who, as a consequence of the Public Participation Process conducted in respect of an application, have submitted written comments or attended meeting with the applicant or environmental assessment practitioner (EAP); all persons who have requested the applicant or the EAP in writing, for their names to be placed on the register and all organs of state which have jurisdiction in respect of the activity to which the application relates.

Scoping process - A procedure for determining the extent of and approach to an EIA, used to focus the EIA to ensure that only the significant issues and reasonable alternatives are examined in detail

Scoping Report - The report describing the issues identified during the scoping process.

Sediment - Unconsolidated mineral and organic particulate material that settles to the bottom of aquatic environment.

Significant impact - Means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Spatial Development Framework (SDF) - A document required by legislation and essential in providing conservation and development guidelines for an urban area, which is situated in an environmentally sensitive area and for which major expansion is expected in the foreseeable future.

Specialist study - A study into a particular aspect of the environment, undertaken by an expert in that discipline.

Species - A group of organisms that resemble each other to a greater degree than members of other groups and that form a reproductively isolated group that will not produce viable offspring if bred with members of another group.

Stakeholders - All parties affected by and/or able to influence a project, often those in a position of authority and/or representing others.

Subtidal - The zone below the low-tide level, *i.e.,* it is never exposed at low tide.

Sustainable development - Sustainable development is generally defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. NEMA defines sustainable development as the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

Surf-zone - Also referred to as the 'breaker zone' where water depths are less than half the wavelength of the incoming waves with the result that the orbital pattern of the waves collapses and breakers are formed

Turbidity - Measure of the light-scattering properties of a volume of water, usually measured in nephelometric turbidity units.

ABBREVIATIONS AND ACRONYMS

ACER	ACER (Africa) Environmental Consultants
ASN	Alcatel Submarine Networks
BID	Background Information Document
BMH	Beach Manhole
CA	Competent Authority
CBA	Critical Biodiversity Area
CITES	Convention on International Trade in Endangered Species
CLS	Cable Landing Station
CMS	Convention on Migratory Species
CPTs	Cone Penetrometer Tests
CPZ	Coastal Protection Zone
CRR	Comments and Responses Report
DEA	Department Environmental Affairs (national)
DEADP	Western Cape Department of Environmental Affairs and Development Planning
DEFF	Department of Environment, Forestry and Fisheries (now DFFE, as below)
DEIAR	Draft Environmental Impact Assessment Report
DFFE	Department of Forestry, Fisheries and the Environment (previously DEFF, as above)
DGPS	Differential Global Positioning System
DSR	Draft Scoping Report
DHSWS	Department of Human Settlements, Water and Sanitation
EBSA	Ecologically or Biologically Significant Area
EAP	Environmental Assessment Practitioner
EIAR	Environmental Impact Assessment Report
EIS	Ecological Importance and Sensitivity
EMF	Environmental Management Frameworks
EMPr	Environmental Management Programme
Eskom	Eskom Holdings (SOC) Limited
EEZ	Exclusive Economic Zone
FSR	Final Scoping Report
GPS	Global Positioning System
GVA	Gross Value Added
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IFC	International Finance Corporation
IBA	Important Bird Area
ICMA	Integrated Coastal Management Act (Act No. 24 of 2008)
IUCN	International Union for Conservation of Nature
LWM	Low Water Mark
MARISMA	Marine Spatial Management and Governance Programme (2014-2020)
MBES	Multi-beam echo sounder
MMO	Marine Mammal Observer
MoU	Memorandum of Understanding
MPAs	Marine Protected Areas
MTN	MTN (Pty) Ltd
NAVTEX	Navigational Telex
NCAS	National Climate Change Adaptation Strategy
NDP	National Development Plan
NEMA	National Environmental Management Act
NEPAD	New Partnership for Africa's Development
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act
Nm	Nautical Mile

NWA	National Water Act, 1998 (Act 36 of 1998)
OC	Department of Forestry, Fisheries and the Environmental – Oceans and Coasts
ONA	Other Natural Areas
PAM	Passive acoustic monitoring
PASA	Petroleum Agency South Africa
PAZ	Precautionary Action Zone
PEB	Public Exclusion Boundary
PES	Present Ecological State
PICC	Presidential Infrastructure Coordinating Commission
PLGR	Pre-Lay Grapnel Run
PSDF	Provincial Spatial Development Framework
PSO	Protected Species Observer
ROV	Remote Operated Vehicle
SAHRA	South African Heritage Resources Association
SAFE	South Africa Far WEST Cable
SADSTIA	South African Deep Sea Trawling Industry Association
SAHRA	South African Heritage Resources Agency
SAN	South African Navy
SAMSA	South African Maritime Safety Authority
SAT-3/WASC	South Atlantic 3/West Africa Submarine Cable
SARCA	Southern African Reptile Conservation Assessment
SDF	Spatial Development Framework
SIP	Strategic Infrastructure Plan
TAC	Total Allowable Catch (TAC).
Telkom	Telkom SA SOC Limited
TW	Territorial Waters
UNCLOS	United Nations Convention on the Laws of the Sea
USBL	Ultra-short base line
WA	National Environmental Management: Waste Act, 2008 (Act 59 of 2008)
WACS	West Africa Cable System
WCBSP	Western Cape Biodiversity Spatial Plan
WD	Water Depth

AUTHORS

The co-authors of this Draft EIA Report are Ms A McKenzie and Mr. G Churchill of ACER (Africa) Environmental Consultants. An external review was conducted by Ms Jacolette Adams (Exigent).

AFFIRMATION BY THE ENVIRONMENTAL IMPACT ASSESSMENT PRACTITIONER

AFFIRMATION BY THE ENVIRONMENTAL IMPACT ASSESSMENT PRACTITIONER

I, Giles John Churchill affirm that the information submitted for the purposes of this application is true and correct with respect to:

(i) the information provided (as drawn from information from multiple sources including the Client, specialists, design engineers, national provincial and metropolitan databases, Google Earth images, Interested and Affected Parties, observation form site visits, websites, publications and other referenced documentation which are assumed true and correct at the time of writing this report).

(ii) the inclusion of comments and inputs from stakeholders and I&APs.

(iii) the inclusion of inputs and recommendations from the specialist reports where relevant.

(iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.

(v) I further affirm that, the issues identified include those submitted by I&APs to date (as relevant to the assessment).

Signature of the Environmental Assessment Practitioner

ACER (AFRICA) ENVIRONMENTAL MANAGEMENT CONSULTANTS
Name of Company

18 May 2021
Date

Signature of the Commissioner of Oaths

18 / 05 / 2021
Date

SENZO EMMANUEL MABASO
EX OFFICIO COMMISSIONER OF OATHS
PRACTISING ATTORNEY RSA
GROUND FLOOR, GOLDEN PENNY CENTRE
26 HELY HUTCHINSON STREET, MTUNZINI
TEL: 035 340 1351

ADHERANCE TO REGULATORY REQUIREMENTS

Table i Content of an EIA Report as per the 2014 EIA Regulations (GNR 326) published in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (as amended)

CONTENT OF ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT AS PER THE 2014 EIA REGULATIONS (APPENDIX 3)		RELEVANT SECTION WITHIN THE EIA REPORT
(a)	Details of:	-
	(i) the EAP who prepared the report; and	Section 1.3
	(ii) the expertise of the EAP, including a curriculum vitae;	Section 1.3; Appendix A
(b)	The location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report including:	Section 1.2, Figures 1, 2 and 3
	(i) the 21 digit Surveyor General code of each cadastral land parcel;	Appendix C
	(ii) where available, the physical address and farm name;	Appendix C
	(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	N/A
(c)	A plan which locates the proposed activity or activities applied for as well as the associated structure and infrastructure at an appropriate scale, or, if it is:	Figure 1, Figure 2 & Figure 3
	(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken;	Section 1.2
	(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 1.2
(d)	A description of the scope of the proposed activity, including:	Section 1.2,
	(i) all listed and specified activities triggered and being applied for; and	Section 1.4 (Table 2)
	(ii) a description of the associated structures and infrastructure related to the development;	Chapter 4
(e)	A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Section 2.2
(f)	A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report;	Chapter 3
(g)	A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;	Chapter 5
(h)	A full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report including:	
	(i) details of all the alternatives considered;	Chapter 5
	(ii) details of the Public Participation Process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Chapter 8 and Appendix D

	(iii) a summary of the issues raised by I&APs, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section 7.5 and Comments and Responses Report (Appendix E)
	(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 6
	(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts: (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Chapter 10
	(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	Section 7.5
	(vii) positive and negative impacts that the proposed activity will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 10
	(viii) the possible mitigation measures that could be applied and level of residual risk;	Chapter 10 (mitigation measures)
	(ix) If no alternative development footprints for the activity were investigated, the motivation for not considering such; and	N/A
	(x) A concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report;	Chapter 12
(i)	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including -	Chapter 7
	(i) A description of all environmental issues and risks that were identified during the environmental impact assessment process; and	Chapter 10
	(ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Chapter 10
(j)	An assessment of each identified potentially significant impact and risk, including	
	(i) Cumulative impacts;	Chapter 10
	(ii) The nature, significance and consequences of the impact and risk;	Chapter 10
	(iii) The extent and duration of the impact and risk;	Chapter 10
	(iv) The probability of the impact and risk occurring;	Chapter 10
	(v) The degree to which the impact and risk can be reversed;	Chapter 10
	(vi) The degree to which the impact and risk may cause irreplaceable loss of resources; and	Chapter 10
	(vii) The degree to which the impact and risk can be mitigated;	Chapter 10
(k)	Where applicable, a summary of the finding and recommendation of any specialist report complying with Appendix 6 to these Regulation and an indication as to how	Chapter 9

	these finding and recommendation have been included in the final assessment report;	
(l)	An environmental impact statement which contains	Chapter 11
	(i) A summary of the key findings of the environmental impact assessment	Chapter 11
	(ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and	Figures 2, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16a, 16b, 17, 18, 21, 34, 35, 37 & 39
	(iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Chapter 10
(m)	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;	Chapter 10
(n)	The Final proposed alternatives which respond to the impact management measures, avoidance, the mitigation measures identified through the assessment;	Chapter 5
(o)	Any aspects which were conditional to the finding of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	Chapter 12
(p)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 1.7
(q)	A reasoned opinion as to whether the proposed activity should or shouldn't be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Chapter 12
(r)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A
(s)	An undertaking under oath or affirmation by the EAP in relation to -	Near the front of this report (Affirmation by the Environmental Impact Assessment Practitioner)
	(i) the correctness of the information provide in the reports;	As above
	(ii) the inclusion of comments and inputs from stakeholders and I&APs;	As above
	(iii) The inclusion of inputs and recommendation from the specialist reports where relevant; and	As above
	(iv) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made interested or affected parties;	As above
(t)	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
(u)	An indication of any deviation from the approved scoping report, including the plan of study, including	N/A

	(i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and	N/A
	(ii) a motivation for the deviation;	N/A
(v)	Any specific information that may be required by the competent authority; and	Refer to the Comments and Responses Report in Appendix E
(w)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

1 INTRODUCTION

1.1 Background

The proposed submarine cable system known as 2AFRICA, essentially circumnavigates Africa, connecting Africa to Europe and the United Kingdom (Figure 1). The 2AFRICA (West) component connects South Africa to the United Kingdom and the 2AFRICA/GERA (East) component connects over eight countries on the east Africa continent to Europe (collectively, 2AFRICA West and East provide two submarine telecommunications cables around Africa connecting to Europe and the United Kingdom). The Yzerfontein landing site in South Africa will connect at least 11 countries on the west coast of Africa with Europe. The proposed landing at Yzerfontein (Figure 2) will utilize the existing land-based infrastructure which was installed for the landing of the West Africa Cable System (WACS) in 2011 and which is operated by Telkom SA SOC Limited (Telkom). The subsea fibre optic cable system consists of a main trunk running offshore from the shoreline to international waters through South Africa's Exclusive Economic Zone (EEZ) and territorial waters (Figure 3).

Alcatel Submarine Networks (ASN) has been contracted to supply and install the proposed 2AFRICA (West) Cable System (Yzerfontein landing). This is to be operated by Mobile Telephone Network (Pty) Ltd (MTN) as the South African landing partner (License/Permit Applicant). The proposed project requires environmental authorisation from the Department of Forestry, Fisheries and the Environment[3] (DFFE) in terms of the 2014 Environmental Impact Assessment Regulations (as amended April 2017) (EIA Regulations) published under the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) (as amended). ASN, on behalf of MTN, has appointed ACER (Africa) Environmental Consultants (ACER) as the independent Environmental Assessment Practitioner (EAP) to undertake the application for environmental authorisation for the proposed 2AFRICA (West) Cable System (Yzerfontein landing).

The application to DFFE requires a process of Scoping and Impact Assessment. Scoping has been completed, with the Final Scoping Report (FSR) submitted to DEFF (now DFFE) on 25 February 2021. The FSR and the Plan of Study for Impact Assessment was subsequently accepted (01 April 2021) with notice to proceed with the Impact Assessment. This Draft Environmental Impact Assessment Report (DEIAR) presents the findings of the Impact Assessment and has been compiled in accordance with NEMA, in particular, Government Notice Regulation (GNR) 326 (April 2017), which outlines the requirements of an EIA process to be undertaken as part of the application for environmental authorisation for activities in Listing Notices 1, 2 and 3 of the EIA Regulations.

The purpose of the project is to improve Africa's information technology infrastructure via telecommunication cables. Submarine telecommunication cables are important for international telecommunication networks as they transport almost 100% of transoceanic Internet traffic throughout the world (www.iscpc.org). It is widely recognised that access to affordable international bandwidth is key to economic development in every country. Today, Africa relies primarily on satellites with few submarine cables to provide its international communications. Communication via submarine telecommunication cables generally allows for lower cost, better performance, and greater capacity (throughput) than that available via satellite.

Improvement in the technology will assist in removing one of the current key inhibitors to overall development in Africa and support economic growth and opportunities on the continent. By

3 Previously Department of Environment, Forestry and Fisheries (DEFF). The name change came into effect 1 April 2021.

supplying increased bandwidths, the proposed 2AFRICA (West) Cable System (Yzerfontein landing) will support the primary objective of the New Partnership for Africa's Development (NEPAD to eradicate poverty in Africa and to place African countries both individually and collectively on a path of sustainable growth and development, to thereby halt the marginalisation of Africa in the globalisation process. At the core of the NEPAD process is its African ownership, which must be retained and strongly promoted, so as to meet the legitimate aspirations of the African people (http://www.dirco.gov.za/au.nepad/nepad_overview.htm).

Telecommunications is one of the fastest growing sectors of South Africa's economy which has been driven by rapid growth in the number of mobile phone users and their need for broadband connectivity. The proposed project will provide an opportunity to facilitate the growth of the telecommunications infrastructure in South Africa and in this way support the country's national development goals, including the goals of the Strategic Integrated Project (SIP) 15: *Expanding Access to Communication Technology*.

Figure 1 General overview of the proposed 2AFRICA/GERA (East) and (West) Cable Systems (Source: 2africacable.com)

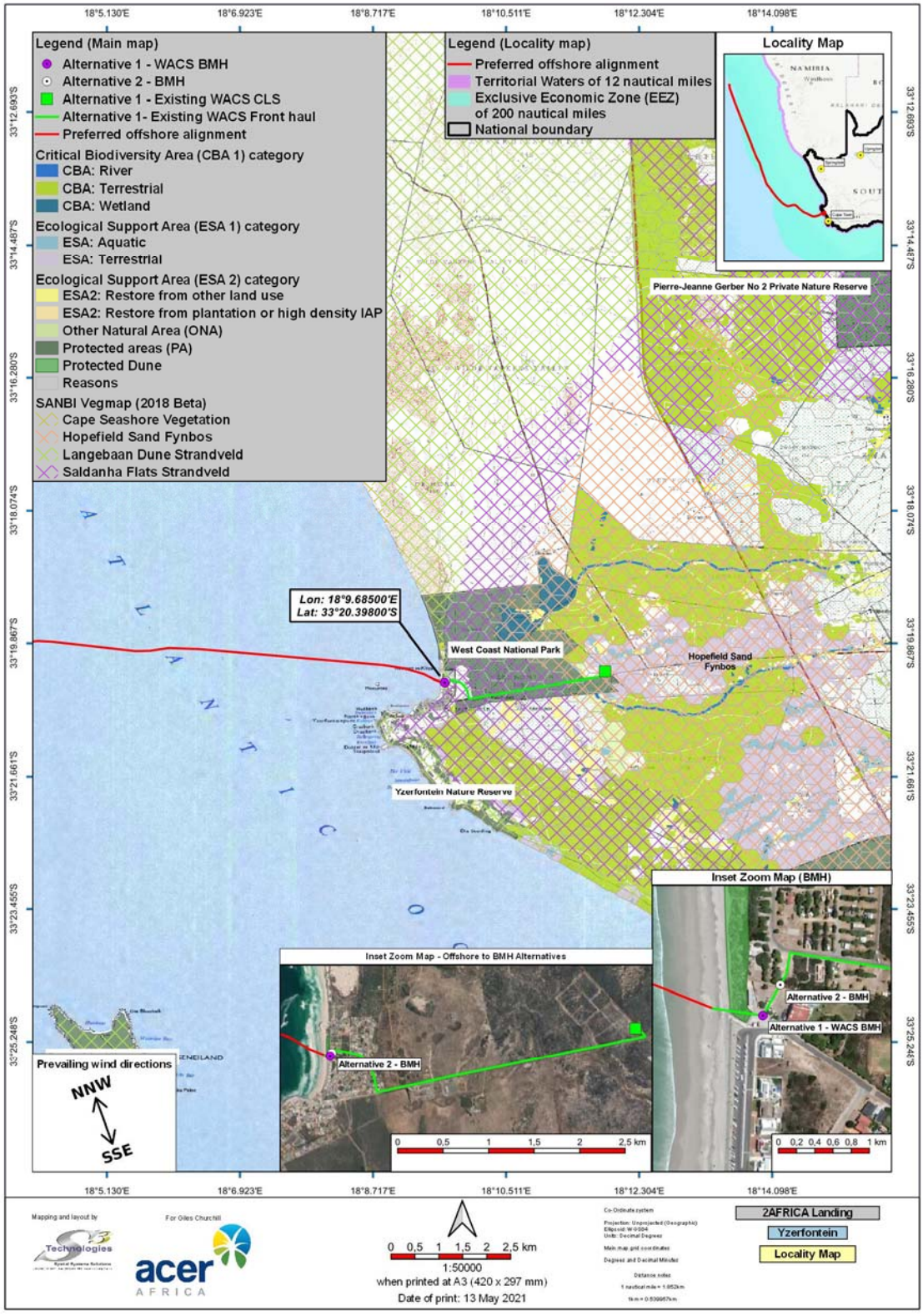


Figure 2 Locality of the proposed 2AFRICA (West) Cable System (Yzerfontein Landing), Western Cape, South Africa

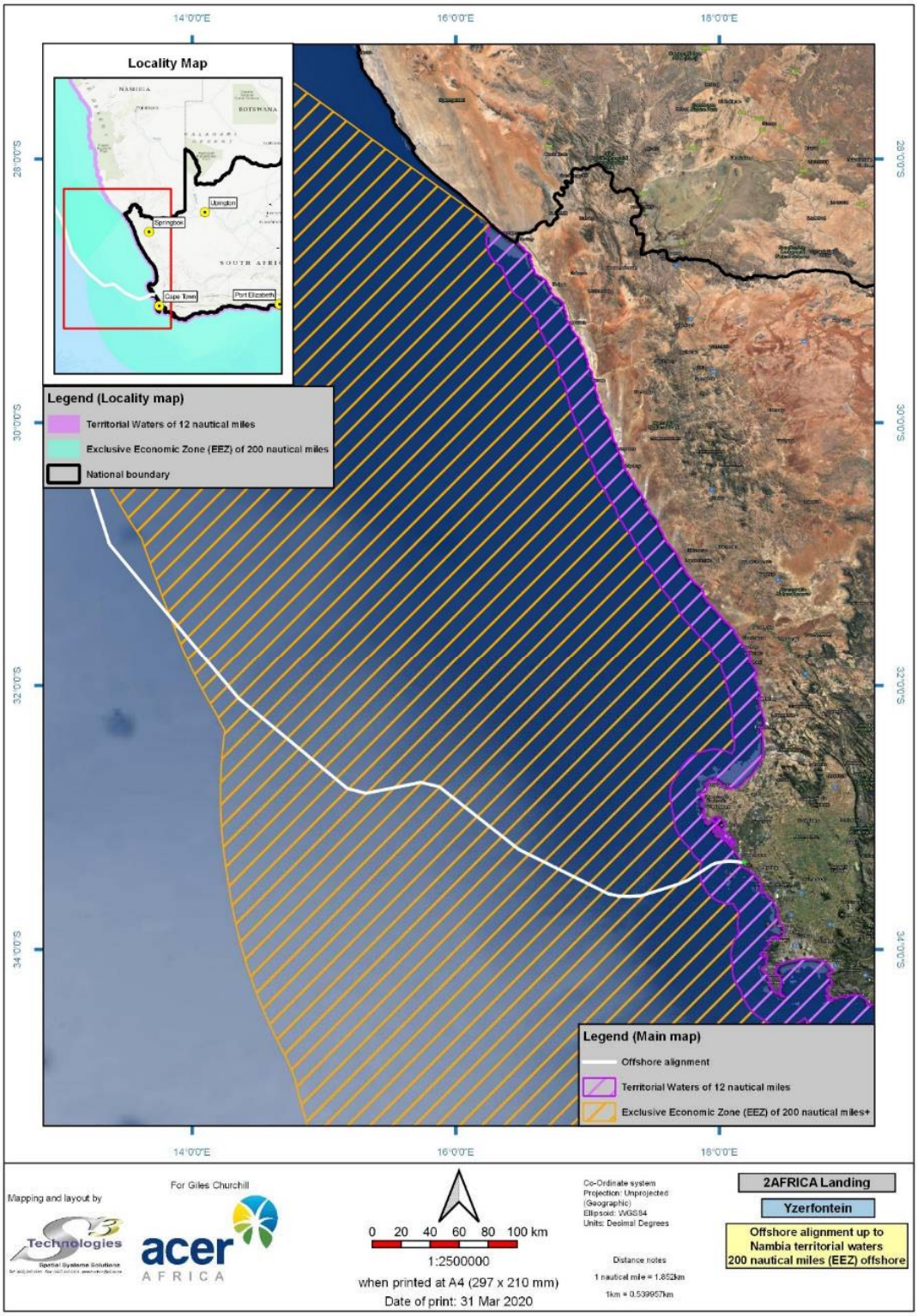


Figure 3 Proposed alignment of the 2AFRICA (West) Cable System to be landed at Yzerfontein in the Western Cape, South Africa in relation to South Africa's Exclusive Economic Zone and Territorial Waters

1.2 General location and scope of the project

The project involves the installation and operation of the 2AFRICA/GERA (West) Cable System (Yzerfontein landing), which comprises marine and terrestrial components. The section of the 2AFRICA/GERA (West) Cable System which forms part of this environmental assessment includes the section of cable from where it enters South Africa's EEZ (200 nautical miles (Nm) from the seashore), passes through South Africa's territorial waters (12 Nm from the seashore), lands on shore and traverses the beach to the existing WACS Beach Man Hole (BMH) at Yzerfontein, as shown generally in Figure 2 and Figure 3. Note that on land, the 2AFRICA (West) cable at Yzerfontein will be accommodated within existing infrastructure, viz. the WACS cable sleeves from the beach to the WACS BMH and extending to the WACS Cable Landing Station (CLS).

Relevant Global Positioning System (GPS) co-ordinates (approximate) are provided below.

GPS Co-ordinates of the Alternative 1 infrastructure at Yzerfontein (approximate)		
Location	**Latitude**	**Longitude**
Start of marine cable	S 33° 6'8.51"	E 16°16'45.67"
Mid-point of marine cable	S 33 35'09.25"	E 17 11'02.40"
Landing Point on shore	S 33°20'23.54"	E 18° 9'38.35"
WACS Conduit Opening on Beach	S 33°20'23.64"	E 18° 9'38.94"
WACS BMH at Yzerfontein	S 33°20'23.91"	E 18° 9'41.12"
End of cable at WACS CLS	S 33° 20'12.92"	E 18°11'51.45"

Project activities include:

- Pre-installation (marine).
  - Cable Route Survey.
  - Route engineering.
  - Route Clearance.
  - Pre-Lay Grapnel Run.
- Installation (marine and terrestrial).
  - Cable Surface Lay (> 1,500 m depths).
  - Cable Burial (<1,500 m water depths).
  - Shore End Landing.
  - Beach Burial (including sea earth system).
  - Post Lay Inspection and Inshore Burial (burial in shallow water off the beach).
  - Installation of the terrestrial Fibre Optic Cable in existing sleeves installed during the construction of WACS (Beach Manhole to the CLS site in Yzerfontein).
  - Construction of a new 2AFRICA (West) Cable System control room at the Telkom CLS outside Yzerfontein.
- Operation of the cable (maintenance only, should breakages occur).
- Decommissioning of the cable (only after expected life span of > 25 years).

The above provides a summary. Refer to Chapters 4 and 5 for detailed descriptions of the project activities and alternatives.

1.3 Qualifications and experience of the Environmental Assessment Practitioner

ACER (Africa) Environmental Consultants (ACER) is a well-established company with wide ranging expertise in environmental management and assessment processes. ACER has twice won the IAIAsa National Premium Award for excellence in environmental management and assessment. The qualifications and experience of the primary assessors and report compilers are listed in Table 1 and *curriculum vitae* are provided in Appendix A.

Table 1 Qualifications and experience of the Environmental Assessment Practitioner Team

Name	Academic Qualification	Relevant Work Experience
Ms A McKenzie (EAP, Pr. Sci. Nat. Author)	MSc	More than 21 years' experience in the field of environmental management. She is registered with the Environmental Assessment Practitioners Association of South Africa (2019/1337) and the South African Council for Natural Scientific Professions in the field of environmental science (Registration No 400026/05).
Mr Giles Churchill (EAP , Pr. Sci. Nat. Co-Author and internal review)	MSc	More than 13 years' experience in environmental management, impact assessments and the monitoring of compliance with specifications contained in Environmental Management Programmes. He is registered with the Environmental Assessment Practitioners Association of South Africa (2019/1687) and the South African Council for Natural Scientific Professions in the field of environmental science (Registration No 116348).
Carina Boonzaaier (Public Participation)	Matric	Various work experience in the private business sector for several years, before joining ACER and being involved in public participation for EIA processes for 2 years.

1.4 Triggered listed activities, environmental assessment requirements and process

In terms of the EIA Regulations published under Section 24(5) read with Sections 24, 24D and 44 of NEMA, the proposed project potentially triggers activities in Listing Notices 1, 2 and 3 (GNR 327, GNR 325 and GNR 324 respectively - 7 April 2017) as shown in Table 2. As such, the project may not commence without environmental authorisation from the relevant competent authority, in this case, DFFE[4] (in close consultation with the Western Cape Department of Environmental Affairs and Development Planning (DEADP)). In terms of the current regulations and environmental best practise, the potential impacts of the project on the environment (social, economic and biophysical) must be considered, investigated and assessed prior to implementation.

Given that the proposed project triggers listed activities in Listing Notice 2, the application for environmental authorisation requires a process of Scoping and Impact Assessment with specified timeframes (Figure 4), as outlined in GNR 326 (April 2017). The process is currently in the Impact Assessment Phase.

[4] DEFF is the authorising authority as the project crosses international boundaries and is of national importance.

Based on the current regulations, the EAP must complete Scoping and the Impact Assessment within 300 days of acceptance of the Application for Authorisation by the National Department of Environment, Forestry and Fisheries (DFFE), which is the Competent Authority (CA).

It is important to note that timeframes in the 2014 EIA Regulations (as amended) are based on calendar days and the following conditions apply:

- 15 December to 5 January are excluded from the calculation.
- No Public Participation between 15 December and 5 January unless justified by exceptional circumstances.
- Organs of State to comment within 30 days from the date on which it was requested to submit comments.
- For both Basic Assessments and Environmental Impact Assessments, the Competent Authority (CA) must issue a decision within 107 days.
- Notification of decision by CA within 5 days of date of decision.

Table 1 Listed activities potentially triggered by the proposed 2AFRICA (West) Cable System (Yzerfontein Landing)

Activity Numbers	Relevant Listed Activities as set out in Listing Notice 1 (GNR. 327) and reasons why they are triggered
Activity 15 of Listing Notice 1 (No. R. 327 of 2017) The development of structures in the coastal public property where the development footprint is bigger than 50 square metres, excluding - (i) the development of structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (ii) the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (iii) the development of temporary structures within the beach zone where such structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared; or (iv) activities listed in activity 14 in Listing Notice 2 of 2014, in which case that activity applies.	The project will entail the landing of a marine telecommunications cable at Yzerfontein Beach. This will require digging of a trench across the beach into the intertidal zone and the installation of the telecommunications cable, system earth and associated activities.
Activity 17 of Listing Notice 1 (No. R. 327 of 2017) Development- i. in the sea; ii. .. iii. within the littoral active zone; iv. in front of a development setback; or v. if no development setback exists, within a distance of 100 metres inland of the high- water mark of the sea or an estuary, whichever is the greater; in respect of- a) .. b) .. c) .. d) .. e) infrastructure with a development footprint of 50 square metres or more - but excluding-	The project will entail the landing of a marine telecommunications cable at Yzerfontein Beach. This will require the digging of a trench across the beach into the intertidal zone and the installation of the telecommunications cable, as well as the system earth. The subsea cable will be buried to a depth of approx. 2m, at water depths < 1,500 m, to provide additional protection.

(aa) .. (bb) .. (cc) .. (dd) ..	
Activity 18 of Listing Notice 1 (No. R. 327 of 2017) The planting of vegetation or placing of any material on dunes or exposed sand surfaces of more than 10 square metres, within the littoral active zone, for the purpose of preventing the free movement of sand, erosion or accretion, excluding where - (i) .. (ii) ..	The project will require reinstatement of trenching across the beach after the installation of the cable and sea earth system. It may result in minor disturbance of vegetation in the littoral active zone during construction and will involve some planting of vegetation and material to aid in dune rehabilitation once construction is complete. As such, this listed activity is triggered.
Activity 19A of Listing Notice 1 (No. R. 327 of 2017) The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from- (i) .. (ii) the seashore; or (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing , dredging, excavation, removal or moving- (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.	The project will entail the excavation and deposition of more than 5 m^3 of material within a 100 m of the high-water mark of the sea when trenching for, and backfilling of, the marine telecommunications cable takes place as such, this listed activity is triggered.
Activity Numbers	**Relevant Listed Activities as set out in Listing Notice 2 (GN No. R. 325) and reasons why they are triggered**
Activity 14 of Listing Notice 2 (No. R. 984 of 2014) The development and related operation of- (i) .. (ii) anchored platform; or (iii) any other structure or infrastructure on, below or along the seabed; excluding - (a) development of facilities, infrastructure or structures for aquaculture purposes; or (b) the development of temporary structures or infrastructure where such structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	The proposed development triggers this listed activity as the 2AFRICA (West) Cable System (Yzerfontein landing) will be placed on the seabed once it enters the marine environment. In shallow waters (up to 1,500 m in depth) the cable will be buried under the seabed to provide extra protection to the cable system.
Activity 26 of Listing Notice 2 (No. R. 325 of 2017) Development-- i. in the sea;	Although unlikely to be triggered, this listed activity has been included as the proposed trench for the marine cable may result in the

ii. .. iii. within the littoral active zone; iv. .. v. if no development setback exists, within a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater; in respect of – a) .. b) .. c) inter- and sub-tidal structures for entrapment of sand; d) .. e) .. f) .. g) .. or h) underwater channels; but excluding the development of structures within existing ports or harbours that will not increase the development footprint of the port or harbour.	entrapment of sand within the inter- and sub-tidal zones. In addition, the trench created to bury the cable may be construed as an underwater channel.

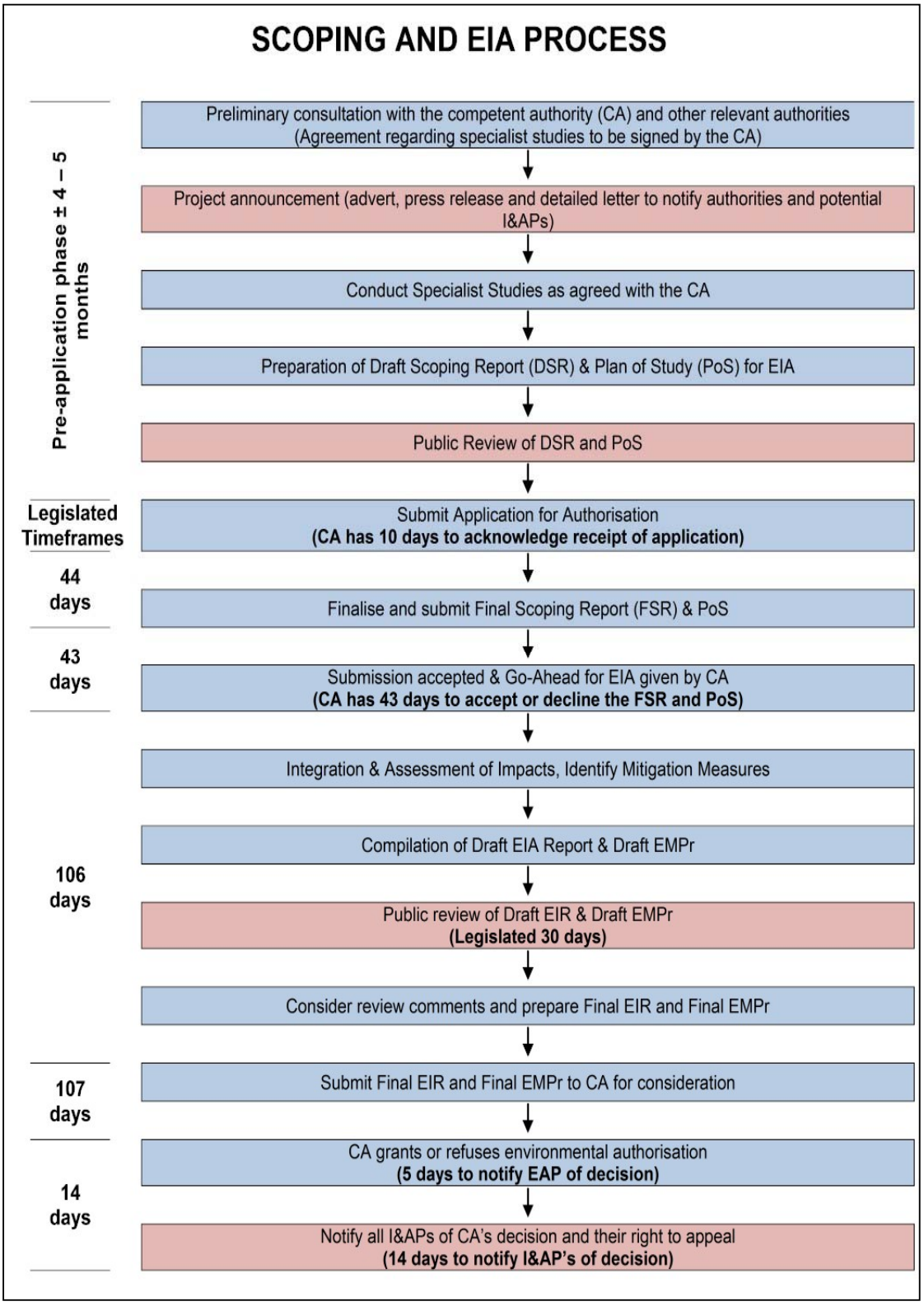


Figure 4 The phases of an environmental impact assessment, including legislated timeframes

1.5 Environmental Impact Assessment Report

This report fulfils the function of the DEIAR, the findings of which will be reviewed by authorities, key stakeholders and the public.

The purpose of the DEIAR is to collate, integrate, summarise and evaluate the findings of the specialist studies and to consider each of the issues raised during Scoping. This aims at providing the reader with a holistic understanding of the potential positive and negative impacts of the proposed development in a singular congruent unit. A number of inputs have informed the content of the DEIAR, most notably the outcomes of the different specialist studies that were commissioned as part of the Impact Assessment.

The information provided in this DEIAR complies with the legal requirements of GNR 326, as referenced in Tables (i) and (ii). The DEIAR will be made available for public review, after which, the report will be finalised and submitted to the authorities for review and decision-making.

The following documentation is appended to this report:

- Appendix A: EAP *Curriculum Vitae.*
- Appendix B: Specialist reports, *Curriculum Vitae* and Declarations.
- Appendix C: Property Details.
- Appendix D: Public Participation Documentation.
- Appendix E: Comments and Responses Report.
- Appendix F: Environmental Management Programme.
- Appendix G: Supporting Maps.

1.6 Environmental Management Programme

An Environmental Management Programme (EMPr) has been prepared as part of this assessment. It contains mitigation measures to prevent, limit or enhance impacts identified during this EIA process. These measures may be applied at different stages of the project (design, construction or rehabilitation).

1.7 Assumptions, limitations and gaps in knowledge

Key assumptions, limitations and/or gaps in knowledge applying to the EAP are listed below. Additional discipline specific ones are listed in the individual specialist reports contained in Appendix B.

- This DEIAR has drawn on primary and secondary information from various sources including the client; engineering team; national, provincial and municipal databases; municipal planning documents; specialist studies and input from Interested and Affected Parties (I&APs). It is assumed that this information from these sources was true and correct at the time of writing this report.
- It is assumed that the project scope and information, including maps, GPS co-ordinates and kml files, provided by the client and the engineering/survey team to the EAP and specialists, are accurate.
- The impact assessment conventions are more applicable to the biophysical environment. Therefore, for social/socio-economic impacts, professional judgement is applied to the conventions to arrive at the assessment of impact significance.
- Economic impacts are not quantified.
- Cumulative impacts are not quantified in all cases.

2 FRAMEWORK FOR THE ENVIRONMENTAL ASSESSMENT

The Scoping process defined the limits of the assessment, identified and elicited inputs from I&APs, and defined the assessment framework with the purpose of focusing the scope of the assessment ensuring a focus on key issues and associated impacts.

2.1 Concept of sustainability

The framework (Figure 5) within which environmental aspects arising from or influencing the proposed project (and its alternatives) are considered is the concept of sustainability. This considers the inter-related dimensions of the environment, viz. the social, economic and biophysical dimensions, underpinned by a system of sound governance through the legal/statutory requirements of South Africa (particularly NEMA).

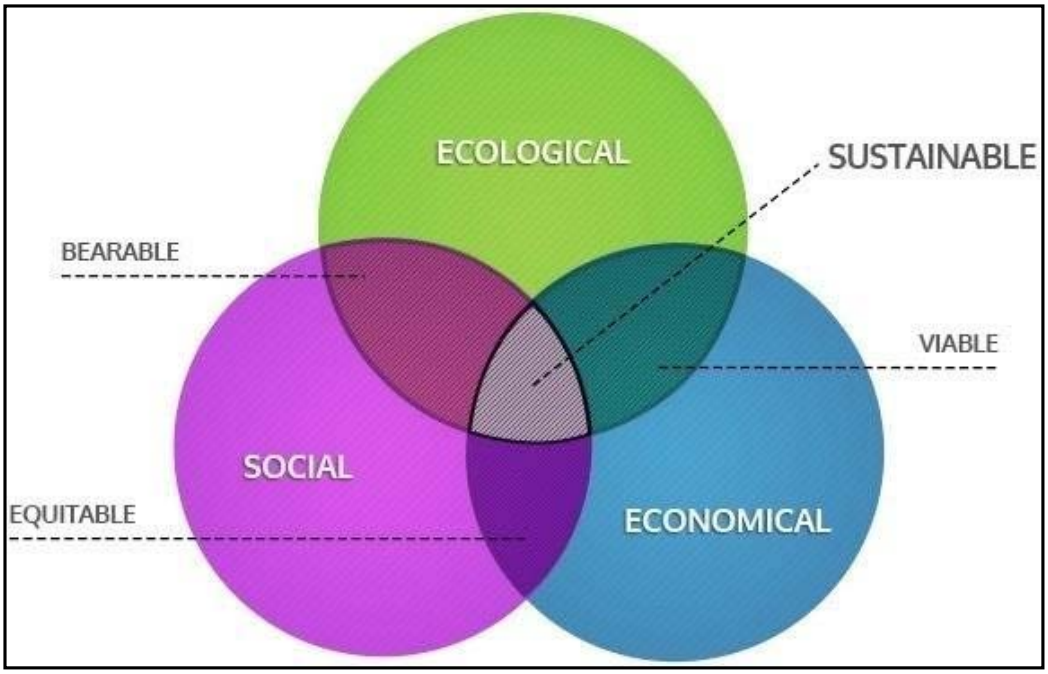


Figure 5 Assessment framework based on the concept of sustainability

All three dimensions of the environment, and the interactions between them (two- and three - dimensional), contribute to achieving sustainability and, therefore, each dimension, individually and its combined interaction with the other two dimensions, needs to be taken into account when assessing a proposed option or project, taking due cognisance that the three dimensions are seldom in perfect balance, with optimised solutions often being dictated by local circumstances, and requiring trade-offs between the dimensions.

In terms of sustainability and the assessment framework, key principles included:

- Development must not irretrievably degrade the natural, built, social, economic and governance resources on which it is based.
- Current actions should not cause irreversible damage to natural and other resources, as this potentially precludes sustainable options.

- Where there is uncertainty about the impact of activities on the environment, caution should be exercised in favour of the environment.
- Land-use and environmental planning need to be integrated.
- Immediate and long-term actions need to be identified and planned for, so that urgent needs can be met while still progressing towards longer-term sustainable solutions.

Issues and impacts were identified by way of interlinked technical and public participation processes. Information gathering focused on gaining an understanding of the interactions between the different dimensions of the environment to identify potentially significant issues and associated impacts. This involved site visits, reference to existing documentation and maps, liaison with the project proponent and technical team, as well as consideration and incorporation of the issues raised during the public participation process. Information was collated, integrated and evaluated, and potentially significant issues and impacts were identified. This enabled the EAP to focus and tailor the scope of work for Specialist Studies and further detailed investigations, the results of which are documented in this report.

In addition to the requirement for Scoping and an Impact Assessment, a review of legislation applicable to the proposed 2AFRICA (West) Cable System (Yzerfontein landing) was undertaken to establish licencing and permitting requirements applicable to the project. Included in this review of legislation were the permit requirements of the Department of Human Settlements, Water and Sanitation (water use licences), the permit requirements of the DFFE – Oceans and Coasts (OC) (in terms of the proposed cable laying activities and beach access), plant permit requirements from DFFE and Cape Nature, permit requirements from the South African Heritage Resources Agency (SAHRA) and permit requirements of DFFE in terms of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008). Findings from this review of applicable legislation and the required licence and permits are included in Section 2.2.

It should be noted that OC is also directly involved with Operation Phakisa which includes the sustainable utilisation of the oceans around South Africa to meet Government's development targets. It is estimated that the oceans around South Africa have the potential to contribute up to ZAR 177 billion to the country's Gross Domestic Product (GDP) and create just over one million jobs by 2033 (http://www.operationphakisa.gov.za).

Operation Phakisa consists of four critical areas to unlock the potential of South Africa's coastline:

- Marine Transport and Manufacturing.
- Offshore Oil and Gas Exploration.
- Aquaculture.
- Marine Protection Services and Ocean Governance.

Of particular relevance to the proposed 2AFRICA/GERA (West) Cable System Cable System (Yzerfontein landing) are the newly established Marine Protected Areas (MPA) which have been implemented as part of the programme in an attempt to ensure the sustainable utilisation of South Africa's marine environments.

For the proposed 2AFRICA (West) Cable System (Yzerfontein landing), as is shown in later sections of this report, there will be limited negative impacts on the biophysical dimension. These impacts are localised and can be managed to reduce their intensity and significance. Similarly, there may be limited negative impacts on the local social dimension that can be managed to reduce their intensity and significance. Impacts to the local and national economic dimension are positive and, with active management intervention, they can be optimised.

Considering the three dimensions on a regional and national scale, it can be argued that although there will be some localised impacts on the biophysical environment, the cumulative positive impact on the socio-economic environment of South Africa outweighs the localised negative impacts, which can be mitigated.

2.2 Legal or statutory requirements

There are a host of legal requirements (national, provincial and local government spheres) to which MTN must adhere for the installation of the proposed 2AFRICA (West) Cable System (Yzerfontein landing) and related infrastructure. Fundamentally, MTN is required to include and integrate environmental principles and values into all planning and implementation procedures taken for development purposes.

Underlying the above reasoning is the constitutional right that people have to environmental protection as set out in the Bill of Rights in the Constitution (Section 24). These rights have been interpreted and included into NEMA, which, together with other national and provincial legislation, governs the way environmental principles are incorporated into any form of development.

The Scoping Report (Draft and Final) have dealt in detail with the key pieces of legislation relevant to the proposed 2AFRICA/GERA (West) Cable System (Yzerfontein landing). These are not repeated in this DEIAR. Rather, for completeness, the key pieces of legislation are listed below:

2.2.1 Legislation

- Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996) as amended by the Constitution of the Republic of South Africa, Amendment Act, 1997 (Act No. 35 of 1997).
- National Environmental Management Act , 1998 (Act 107 of 1998).
- The EIA Regulations, 2014 (as amended 2017).
- National Water Act, 1998 (Act 36 of 1998).
- National Heritage Resources Act, 1999 (Act 25 of 1999).
- National Forest Act, 1998 (Act 84 of 1998).
- Hazardous Substance Act, 1973 (Act 15 of 1973).
- Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).
- National Environmental Management: Waste Act, 2008 (Act 59 of 2008).
- National Environmental Management: Biodiversity, 2004 (Act 10 of 2004).
- National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003).
- Integrated Coastal Management Act, 2008 (Act 24 of 2008).
- Seashore Act. 1935 (Act 21 of 1935).
- The Marine Living Resources Act, 1998 (Act 18 of 1998).
- Maritime Zones Act, 1994 (Act 15 of 1994).
- Telecommunications Act, 1996 (Act 103 of 1996).
- Marine Traffic Act, 1981 (Act 2 of 1981).

For the proposed project, the Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996) as amended by the Constitution of the Republic of South Africa, Amendment Act, 1997 (Act No. 35 of 1997) is the overarching legislation of over-riding importance. Chapter 2 of the Constitution contains the Bill of Rights, which is the cornerstone of democracy in South Africa. It enshrines the rights of all people in our country and affirms the democratic values of

human dignity, equality and freedom. It is within this context that all legislation since 1996 has been formulated.

There are several other pieces of key legislation through which the protection of human rights, community health, and safety and security will be assured:

- Labour Relations Act.
- Basic Conditions of Employment Act.
- Employment Equity Act.
- Occupational Health and Safety Act.
- Promotion of Access to Information Act.

And some key associated Regulations:

- Labour Relations Regulations.
- Compensation for Occupational Injuries and Diseases Regulations.
- Construction Regulations.
- General Safety Regulations.
- Hazardous Chemical Substances Regulations.

2.2.2 Guidelines

The following guidelines are also applicable:

- Public Participation Guideline in Terms of NEMA, 1998 and the EIA Regulations.
- Guideline Series 5: Companion to the EIA Regulations of 2010.
- Guideline Series 7: Public Participation in the EIA Process.
- Guideline Series 9: Need and Desirability in terms of the EIA Regulations of 2010 (Draft).
- Department of Environmental Affairs (DEA) Alternatives Guideline 5.
- DEA Guidelines for EMPrs.

2.2.3 National, provincial and local policies and plans

- National Development Plan 2030 (NDP).
- South African National Infrastructure Plan 2012 (with reference specifically to SIP 15 - expanding access to communication technology)
- National Climate Change Adaptation Strategy (NCCAS).
- National Climate Change Response White Paper.
- Western Cape Provincial Spatial Development Framework (PSDF).
- State of the Environment Outlook Report for the Western Cape Province (2018)
- State of the Coast Western Cape: A Review of the State of the Coastal Zone in the Western Cape (2018)
- Integrated Development Plan (IDP) for West Coast District Municipality (2017 – 2022) – 2 May 2019
- West Coast District Spatial Development Framework, 2020 (WDSDF)
- Swartland IDP & Spatial Development Framework Amendment (2018/2019) Spatial Vision, Principles and Directives 2017-2022

2.2.4 International treaties, conventions and protocols

There are various international treaties, conventions and protocols of relevance to this project:

- The National Convention for the Prevention of Pollution by Ships of 1973 and 1978, and the Protocol of 1997.
- The Convention on the Prevention of Marine Pollution through the Disposal of Waste and Other Matter, 1972 or the London Convention, 1972.
- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.
- United Nations Convention on the Laws of the Sea (UNCLOS).

2.2.5 Permits required

The main licenses/permits[5] required for the proposed 2AFRICA/GERA (West) Cable System (Yzerfontein landing) are summarised in Table 3.

Table 2 Main licenses/permit obligations for the proposed 2AFRICA/GERA (West) Cable System (Yzerfontein landing)

License/Permit	Authority
Heritage Permit (Offshore)	South African Heritage Resources Agency (SAHRA)
Beach Driving Permit	Oceans and Coast (DFFE)
Seashore Lease Permit	CapeNature
Permit to construct infrastructure in the Coastal Public Property	Department of Public Works
Local Municipal Permits and Approvals	Yzerfontein Municipality
Cultural Heritage Permits	SAHRA
Section 53 of the Mineral and Petroleum Resources Development Act	Department of Mineral and Petroleum Resources

It is within this framework that the proposed development will need to be constructed and operated.

It should also be noted that due to the Covid -19 pandemic, South Africa declared a national state of disaster on 15 March 2020 in terms of the Disaster Management Act, 2002 (Act No. 57 of 2002). Since this date, a host of Regulations have been promulgated in terms of the Disaster Management Act, dealing with a wide range of matters affected by the pandemic. Of possible relevance to the implementation of this project will be the effect on various government department's processes of engagement with applicants and the public, as well as time frames for permitting and authorisation processes. The Regulations also govern the manner in which public participation can be carried out, with a view to limiting social interaction via social distancing.

[5] Excluded from the above are the following which are the responsibility of Openserve (i) Telecommunications operators' licenses, cable landing station licences and similar licenses required from the national telecommunications regulators (ii) Permits in Principle specifically for system elements landward of the Beach Manholes (iii) Operational clearances (iv) Agreements to cross other submarine cables, oil and gas concession blocks, pipelines and other seabed assets.

3 NEED AND DESIRABILITY

The need and desirability of a proposed development is a key consideration of an application for environmental authorisation and differs from the developer's aims and purpose of the development. The Guideline on Need and Desirability in terms of the EIA Regulations (DEA, 2017) states that *"consistent with national priorities, environmental authorities must support "increased economic growth and promote social inclusion" while ensuring that such growth is "ecologically sustainable"*. In essence, need and desirability are based on the principle of sustainability, viz. that a development is ecologically sustainable and socially and economically justifiable.

Sustainability in this context implies ecological sustainability, recognising that the maintenance of healthy ecosystems and natural resources are preconditions for human wellbeing and recognising that there are limits to the goods and services that can be provided by the environment. Sustainable development is the process that is followed to achieve the goal of sustainability.

Over recent years, private sector finance for infrastructure projects, both in the developed and developing world, has increased in importance. This has exposed financial institutions to increasing pressure from Non-Governmental Organisations (NGOs) for their involvement in a variety of controversial projects and the need for greater transparency, accountability and tighter standards in the operations of commercial banking. Stemming from these demands and concerns is a set of standards known as the Equator Principles, which are based on the International Finance Corporation (IFC) performance standards on social and environmental sustainability, and on the World Bank Group's Environmental, Health and Safety General Guidelines. The Equator Principles promote socially responsible conduct and sound environmental practices in relation to project financing initiatives.

The single most important factor in reducing the environmental (and social) impacts of marine telecommunications infrastructure projects is good site selection and the ease at which marine telecommunications cable can tie into the existing land based telecommunications network (distance from landing site to the CLS and existing network). The best option is, as much as possible, to avoid negative impacts on the environment from the outset, thereby minimising the amount of environmental mitigation measures required.

Table 4 and Table 5 are derived directly from the Guideline and contain the *"questions to be engaged with when considering need and desirability"* as highlighted in the guideline. Responses to these questions are correspondingly provided in the table, based on the information and knowledge gained during this EIA.

Table 4 Need and desirability aspects considered for securing ecological sustainable development and use of natural resources

Ref #	Description	Comment
1	How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	Implementation of the marine component of the cable is expected to have localised impacts on the marine benthic and shallow benthic environment. The terrestrial cable component is expected to have a highly localised impact on Yzerfontein beach and no additional impacts inland from the cable landing site.
1.1	How will the following ecological integrity considerations be taken into account?	
1.1.1	Threatened ecosystems.	The proposed marine cable alignment, where possible, avoids sensitive reef areas and environments such as MPAs. It will however pass through the Cape Canyon and Associated Islands Ecologically or Biologically Significant Area (EBSA). The terrestrial portion of the cable will cross the beach and link up to existing terrestrial infrastructure, thereby avoiding impacts on the endangered ecosystem (Saldanha Flats Strandveld).
1.1.2	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems which require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.	A specialist Beach and Coastal Dune Dynamics Impact Assessment study was undertaken to identify potential impacts of the landing on the beach and coastal dunes. Findings indicate that the preferred landing site will not impact significantly on the beach and coastal dunes (refer to Appendix B).
1.1.3	Critical Biodiversity Areas and Ecological Support Areas.	The coastal foredune, beach and section of the inter-tidal zone are classified as an Ecological Support Area (ESA2), which means that these areas are not essential for meeting biodiversity targets, but they play an important role in supporting the functioning of Protected Areas or Critical Biodiversity Areas and are often vital for delivering ecosystem services. A specialist study on terrestrial and freshwater ecosystems was undertaken to identify potential impacts of the landing on vegetation, wetlands and fauna. The findings indicate that the preferred landing site will not impact on vegetation, wetlands or habitat for terrestrial fauna (refer to Appendix B).
1.1.4	Conservation targets.	The proposed cable will have no significant negative impacts on terrestrial or marine areas of conservation significance or conservation targets.
1.1.5	Ecological drivers of the ecosystem.	Findings from the specialist studies indicate that there will be no significant impact on ecological drivers of the marine or beach ecosystems (refer to Appendix B).
1.1.6	Environmental Management Frameworks (EMF).	The proposed landing utilises existing infrastructure on land. The principles of sustainable development are incorporated into the identification, avoidance, and mitigation of impacts. It must be noted however that there is no approved EMF for both the Swartland and West Coast District Municipalities.
1.1.7	Spatial Development Frameworks (SDF).	The proposed development is line with the SDF's objectives of sustainable development, as it is aimed at improving

Ref #	Description	Comment
		telecommunications that will stimulate local economic growth through data connectivity.
1.1.8	Global and international responsibilities relating to the environment (e.g. RAMSAR sites, climate change, etc).	Climate change is recognised in terms of the cumulative impact of sea-level rise and increased storm events on the beach environment, with the need to ensure beach erosion monitoring to be included in the in the EMPr.
2	How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Benthic ecosystems are associated with microorganisms that are essential for ecological functions. Initially, the installation of the marine cable will disturb both shallow and deep benthic ecosystems along its alignment. However, once installed, the cable and its legislated buffer zone and the continuation of this buffer zone will have a positive impact on benthic communities as no trawling or anchoring of ships is permitted in the buffer zone. This will preserve the ecological longevity of these sensitive systems.
3	How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Potential pollution is confined to the onshore environment for the trenching of the cable to the BMH. Sources of pollution are limited to hydrocarbon spills and light industrial and domestic waste. Specifications for the handling of waste and dealing with incidents are contained in the EMPr. Potential offshore pollution will be isolated and maintained, until disposed of at a registered landfill site. Further details are included in the EMPr.
4	What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	Waste will be limited to light industrial waste (cable offcuts and reclaimed cable from the seabed) in the marine environment and domestic waste in the terrestrial environment. Volumes are anticipated to be very small. Waste management specifications are provided in the EMPr.
5	How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	A maritime heritage specialist study was undertaken to identify potential impacts of the cable installation on cultural heritage resources under the sea. The findings indicate that there is potential to impact these resources, but the likelihood is improbable (refer to Appendix B).
6	How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored	Electricity is required to power the optical amplifiers to transmit the telecommunications signals over greater distances through the marine cable. It is possible that the generation of this power is from renewable energy sources. The source of energy originating at the start of the cable is outside the scope of this EIA.

Ref #	Description	Comment
	to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	
7	How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?	Electricity is required to transmit the telecommunication signal through the marine cable. It is possible that the generation of this power is from renewable energy sources. The source of energy originating at the start of the cable is outside the scope of this EIA.
7.1	Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (Sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life).	The development is neutral in terms of resource use, as once the cable has been laid it functions in its purposes of improving international telecommunications without further resource investment. Only cable repairs will be required on an *ad hoc* basis.
7.2	Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and inter-generational equity and are there more important priorities for which the resources should be used (i.e., what are the opportunity costs of using these resources for this proposed development?).	An exclusion zone of 500 m either side of the cable will be enforced once the cable is laid, within which no trawling or anchoring will be allowed, nor prospecting or mining for Oil and Gas.
7.3	Do the proposed location, type and scale of development promote a reduced dependency on resources?	N/A
8	How will a risk-averse and cautious approach be applied in terms of ecological impacts?	The cable alignment both offshore and onshore has been selected to minimise ecological impacts.
8.1	What are the limits of current knowledge (the gaps, uncertainties and assumptions must be clearly stated)?	Assumptions, limitations, and gaps in knowledge are clearly stated in section 1.7 of this report and in each individual specialist report in Appendix B.
8.2	What is the level of risk associated with the limits of current knowledge?	Based on knowledge of previous (similar) projects and current knowledge of, the proposed project and study area, the risk is considered low.
8.3	Based on the limits of knowledge and the level of risk, how and to what extent will a	Please see Item 8.

Ref #	Description	Comment
	risk-averse and cautious approach be applied to the development?	
9	How will the ecological impacts arising from this development impact on people's environmental rights in terms following:	
9.1	Negative impacts, e.g., access to resources, opportunity costs, loss of amenity (e.g., open space), air and water quality impacts, nuisance (noise, odour, etc), health impacts, visual impacts, etc. What measures will be taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	The project will result in a temporary exclusion zone for fishing within 1,500 m of the cable laying vessels. A permanent exclusion zone of 500 m will apply either side of the cable once installed, precluding demersal trawling and longlining, anchoring, oil and gas mining, etc. This exclusion zone will serve to protect marine resources along the alignment.
9.2	Positive impacts, e.g., improved access to resources, improved amenity, improved air or water quality, etc. What measures will be taken to enhance positive impacts?	The project is expected to have a significant positive impact on the South African economy through improved telecommunications which, in turn, promotes economic development, job creation and education.
10	Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g., on livelihoods, loss of heritage sites, opportunity costs, etc).	No ecological impacts associated with this development that result in significant negative socio-economic impacts, have been identified for this project.
11	Based on the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	The project will have negative impacts on the natural environment (marine and terrestrial). These have been assessed by specialists to be of low significance, after mitigation.
12	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being projected) will result in the selection of the "best practicable environmental option" in terms of ecological considerations.	The proposed landing site will use the existing WACS Cable System BMH and ducting to the existing CLS, thereby avoiding most impacts on land. The marine cable alignment follows the WACS cable alignment closely, and avoids rocky areas and reefs, thereby minimising impacts and limiting the "spread" of environmental impacts widely across the ocean floor.
13	Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area.	No negative cumulative impacts of high significance were identified by the EAP or specialists.

Table 5 Need and desirability aspects considered for promoting justifiable economic and social development

Ref #	Description	Comment
1	What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?	
1.1	The Integrated Development Plan (IDP) (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks or policies applicable to the area.	The proposed development is in line with the vision of the Swartland Municipality and West Coast District objectives in terms of improving telecommunications technologies to facilitate investment and stimulate both the regional and national economy.
1.2	Spatial priorities and desired spatial patterns (e.g., need for the integration of segregated communities, need to upgrade informal settlements, need for densification, etc.).	N/A
1.3	Spatial characteristics (e.g., existing land uses, planned land uses, cultural landscapes, etc.)	Existing infrastructure will be accessed, with no impact on spatial characteristics.
1.4	Municipal Economic Development Strategy.	The project conforms to the Local and District Municipality's' development strategy in that it will improve the telecommunications infrastructure within the province and in South Africa. This is intended to stimulate the local and international economy and open the gateway to further international trade agreements.
2	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects) and specifically also on the socio-economic objectives of the area?	Overall, the project is expected to contribute positively to the goal of improving livelihoods for South Africans through the educational and economic opportunities opened up as a result of access to improved telecommunications networks. The cable will render limited areas of the seabed permanently unavailable to the Oil and Gas industry. Offshore lease areas held by the following rights holders are crossed by the marine cable, starting from the Namibian EEZ to the landing point on the West coast of South Africa at Yzerfontein ❑ OK Energy ❑ Sezigyn ❑ Ricocure ❑ Anadarko PetroSA ❑ Rhino Oil (located in Territorial waters) During installation, there is potential to negatively impact other existing cables if not well managed. The project will cause minor nuisance impacts during the installation phase (temporary).
2.1	Will the development complement the local socio-	Improved telecommunications capacity in

Ref #	Description	Comment
	economic initiatives (such as local economic development initiatives), or skills development programs?	South Africa is anticipated to positively impact on skills development programs and education.
3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	Improved telecommunications, as a key driver for economic development, is expected to benefit all communities within South Africa.
4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	The investment in the 2AFRICA (West) Cable System is substantial and the telecommunications cable is anticipated to stay in operation for 25 years. There is no planned decommissioning date; however, technology will improve, and it is possible that the cable system will be replaced by enhanced technology in years to come.
5	In terms of location, describe how the placement of the proposed development will:	
5.1	Result in the creation of residential and employment opportunities in proximity to or integrated with each other.	Limited temporary employment opportunities will be created during cable installation via the appointed contractor through the employment of skilled and unskilled labour. A small amount of spending in the local economy is anticipated (for services, accommodation, etc.).
5.2	Reduce the need for transport of people and goods.	Improved telecommunications will reduce the need for people to travel to meetings, etc.
5.3	Result in access to public transport or enable non-motorised and pedestrian transport (e.g., will the development result in densification and the achievement of thresholds in terms of public transport?).	N/A
5.4	Complement other uses in the area.	The improved telecommunications will support all other uses that make use of telecommunications in the area.
5.5	Be in line with the planning for the area.	The proposed development complements the development initiatives at the Local, District, Provincial level, including the rest of South Africa.
5.6	For urban related development, make use of under-utilised land available within the urban edge.	N/A
5.7	Optimise the use of existing resources and infrastructure.	The proposed development will make use of the existing WACS infrastructure.
5.8	Opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g., not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement).	N/A
5.9	Discourage urban sprawl and contribute to compaction/densification.	N/A
5.10	Contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs.	Improved telecommunications will be accessible to all communities/locations with internet connections.
5.11	Encourage environmentally sustainable land development practices and processes.	N/A
5.12	Take into account special locational factors that might favour the specific location (e.g., the location of a	The offshore alignment will take sensitive marine ecosystems into account. It must be

Ref #	Description	Comment
	strategic mineral resource, access to a port, access to rail, etc.).	noted that the offshore alignment has been selected based on suitable seabed conditions, alignments of existing cables and minimising impacts on fishing grounds. The existing WACS telecommunications infrastructure plays a vital role in the site selection as it provides an existing footprint with capacity to facilitate the 2 AFRICA (West) marine cable system.
5.13	The investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential).	N/A
5.14	Impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area.	While there is potential for the project to negatively impact on submerged pre-historic archaeological resources and palaeontological resources, the likelihood is very low. The significance of the impact is assessed as medium. Mitigation is not possible (other than the no -go option). Potential negative impacts on maritime archaeological resources (e.g. shipwrecks) are improbable. Should they occur, the significance is assessed as medium.
5.15	In terms of the nature, scale and location of the development, promote or act as a catalyst to create a more integrated settlement.	N/A
6	How will a risk-averse and cautious approach be applied in terms of socio-economic impacts?	The use of existing infrastructure was selected to reduce socio-economic impacts on the residents. A marine cable alignment in close proximity to the WACS cable was selected to reduce the impact on other users of the seabed.
6.1	What are the limits of current knowledge? (The gaps, uncertainties and assumptions must be clearly stated).	Assumptions, limitations and gaps in knowledge are clearly stated in section 1.7 of this report and in each individual specialist report in Appendix B.
6.2	What is the level of risk? (Related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge).	Nil.
6.3	Based on the limits of knowledge and the level of risk, how and to what extent will a risk-averse and cautious approach be applied to the development?	See Item 6.
7	How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following?	
7.1	Negative impacts: e.g., health (e.g., HIV/AIDS), safety, social ills, etc. What measures will be taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	The EMPr (Appendix F) provides specifications aimed at reducing negative impacts on health and wellbeing.
7.2	Positive impacts. What measures will be taken to enhance positive impacts?	The use of existing infrastructure on land is key to the project design. Measures include local employment opportunities and improved telecommunications with a positive socio-economic impact.
8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services,	N/A

Ref #	Description	Comment
	describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.).	
9	What measures will be taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	The use of existing infrastructure on land is key to the project design.
10	What measures will be taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified allow the "best practicable environmental option" to be selected or is there a need for other alternatives to be considered?	Improved telecommunications enabled by the proposed project will benefit all South Africans, including the disadvantaged.
11	What measures will be taken to pursue equitable access to environmental resources, benefits, and services to meet basic human needs and ensure human wellbeing, and what special measures will be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	The technology enabled by the cable will be widely accessible.
12	What measures will be taken to ensure that the responsibility for the environmental health and safety consequences of the development have been addressed throughout the development's life cycle?	Environmental considerations are actioned by the Developer through all phases of the project (design, construction, operation and maintenance) by various measures, including: • Technical research and development. • Risk analyses. • Compliance with environmental and safety legislation. • Environmental Screening, Scoping and Impact Assessment. • EMPRs Ongoing maintenance and monitoring.
13	What measures will be taken to:	
13.1	Ensure the participation of all interested and affected parties.	The minimum requirements of the EIA Regulations were followed with respect to public participation, also taking into account special requirements to reduce the spread of Covid 19. Refer to the Chapter on Public Participation in this report, and to Appendix D and Appendix E.
13.2	Provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation.	The regulated public participation process is designed to share information and facilitate public comment. ACER staff make themselves available to discuss the project telephonically and respond to queries throughout the duration of the project. Given the current Covid risk, public meetings are not recommended but ACER will be available to hold virtual focus group meetings.
13.3	Ensure participation by vulnerable and disadvantaged persons.	Disadvantaged individuals will be involved in the project during the construction phase, via local contractors who adopt unskilled, disadvantaged workers as part of their

Ref #	Description	Comment
		company policies/ BEE principles.
13.4	Promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.	The regulated public participation process is designed to share information and raise awareness.
13.5	Ensure openness and transparency, and access to information in terms of the process.	The Scoping Report has been and DEIAR will be circulated for comment, and all documents are made available on ACER's website. All issues raised during the Public Participation Process have been responded to and captured in a CRR (Appendix E). The EAP team has been available throughout the EIA process to respond to project related queries and concerns.
13.6	Ensure that the interests, needs and values of all interested and affected parties will be taken into account, and that adequate recognition is given to all forms of knowledge, including traditional and ordinary knowledge.	Refer to all responses under Item 13.
13.7	Ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein is promoted.	Internal empowerment was promoted during the EIA process, with both women and younger EAP team members. The Public Participation Process in terms of the 2014 EIA Regulations is open to all I&Aps including women and youth. The improved telecommunications resulting from the proposed project will benefit all segments of society, including those involved in education.
14	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that are consistent with the priority needs of the local area (or that are proportional to the needs of an area).	The improved telecommunication provision will benefit all segments of society.
15	What measures will be taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	Environmental awareness training was employed during the cable survey and will be provided to staff once cable laying commences. Furthermore, ASN is an internationally acclaimed cable laying company with stringent Health, Safety and Environment protocols.
16	Describe how the development will impact on job creation in terms of, amongst other aspects:	
16.1	The number of temporary versus permanent jobs that will be created.	Job creation during the installation phase of the project will be limited to temporary jobs during cable landing activities. The project is, however, expected to promote economic development within South Africa which could result in significant job opportunities (albeit not directly related to the project).
16.2	Will the labour available in the area be able to take up the job opportunities (i.e., do the required skills match the skills available in the area?).	Specific skills are required for the cable landing activities and, therefore, the use of local labour will be limited.
16.3	The distance from where labourers will have to travel.	N/A
16.4	The location of job opportunities versus the location of	The project will not result in any additional

Ref #	Description	Comment
	impacts (i.e., equitable distribution of costs and benefits).	permanent local job opportunities directly related to the project.
16.5	The opportunity costs in terms of job creation (e.g., a mine might create 100 jobs but impact on 1,000 agricultural jobs, etc.).	It is anticipated that 10-20 temporary jobs will be created during project implementation but not at the expense of job losses in other sectors either directly or indirectly affected by the proposed development.
17	What measures will be taken to ensure:	
17.1	That there is inter-governmental coordination and harmonisation of policies, legislation and actions relating to the environment.	Local, provincial, and national Government departments have been and will continue to be consulted during the EIA process, with the purpose of aligning requirements.
17.2	That actual or potential conflicts of interest between organs of state are resolved through conflict resolution procedures.	This is ongoing to achieve alignment between the three spheres of Government.
18	What measures will be taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	The environmental authorisation process will be undertaken as per the prescribed environmental legislation and associated regulations. Impacts will be mitigated to ensure the long-term sustainability of the proposed development.
19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	It is the EAP's opinion that the proposed mitigation measures will be realistic and achievable. The decommissioning of the marine cable in 25 years' time is likely to require an impact assessment at the time.
20	What measures will be taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	These will be addressed in the EMPr and the conditions of authorisation issued by the competent authority.
21	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), will result in the selection of the best practicable environmental option in terms of socio-economic considerations.	The use of existing infrastructure was selected as the preferred alternative as it limits additional risks and impacts to the environment. It is the EAP's opinion that the best practicable environmental option has been selected for the proposed development.
22	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area.	Various socio-economic impacts resulting from the proposed project are identified in the EIA report. They are both positive and negative and along with other existing or future cables in the area can have cumulative effects on the environment. However, there are no cumulative impacts that have been identified as being of high significance. Refer to Section 10.6 of this report.

4 PROJECT DESCRIPTION

This chapter describes the infrastructure and operational aspects of the 2AFRICA (West) Cable System (Yzerfontein landing). The aim of this chapter is to enable readers to gain an understanding of how the cable system will be installed and maintained in order to understand the possible impacts the development may have on the receiving environment.

4.1 General description

The main 2AFRICA (West) cable trunk comes down from the north roughly parallel to the West Coast of Africa, several hundred km offshore in international waters. It starts to veer south-eastwards towards the South African coastline and enters the South African EEZ roughly opposite Cape Columbine. Once reaching depths of approximately 1,500 m, the route closely follows that of the existing WACS cable, curving south and then north again to enter South African territorial waters approximately 22 km (12 Nm) from the seashore, before landing on shore at Yzerfontein Beach on the Cape's West Coast.

The proposed 2AFRICA (West) Cable System (Yzerfontein landing) will include the following project components:

- Pre-installation activities including cable route survey, route engineering, route clearance and Pre-Lay Grapnel Run.
- A Marine Cable Route Survey to determine the suitability of the substrate and topography of the ocean floor. This includes a geophysical survey using echosounders and sonar techniques and a geotechnical survey involving cone penetrometer tests and core sampling and analysis.
- Laying of the cable in the offshore environment, preceded by route clearance and including cable burial to a water depth of approximately 1,500 m.
- The laying of the cable within the shallow water environment is likely to involve a direct shore end operation where the shore end of the subsea cable is installed directly from the main subsea cable installation vessel and floated to the beach landing point using buoys, assisted by small boats and divers. It is then buried in the seabed using the diver jet burial technique. The cable will be buried in sediment wherever possible, and the route will be adjusted to avoid obvious visible rock. The aim is to bury the cable to a target depth of 2 m where possible.
- Excavations within the intertidal zone to bury the cable before it is anchored into the existing WACS anchor block and BMH (already constructed and located directly inland of the beach at the preferred landing point). The BMH is a concrete utility vault where the marine portion of the subsea cable is connected to the terrestrial portion.
- Installation of a sea earth system (System Earth)
- On the beach, the cable will be buried to a depth of 2 meters, substrate permitting.

The 2AFRICA (West) Cable System (Yzerfontein Landing) will be accommodated within existing WACS cable sleeves from the beach to the BMH and then on to the WACS Cable Landing Station (Figure 6). A new control room will however be constructed at the WACS CLS to house the 2AFRICA infrastructure.

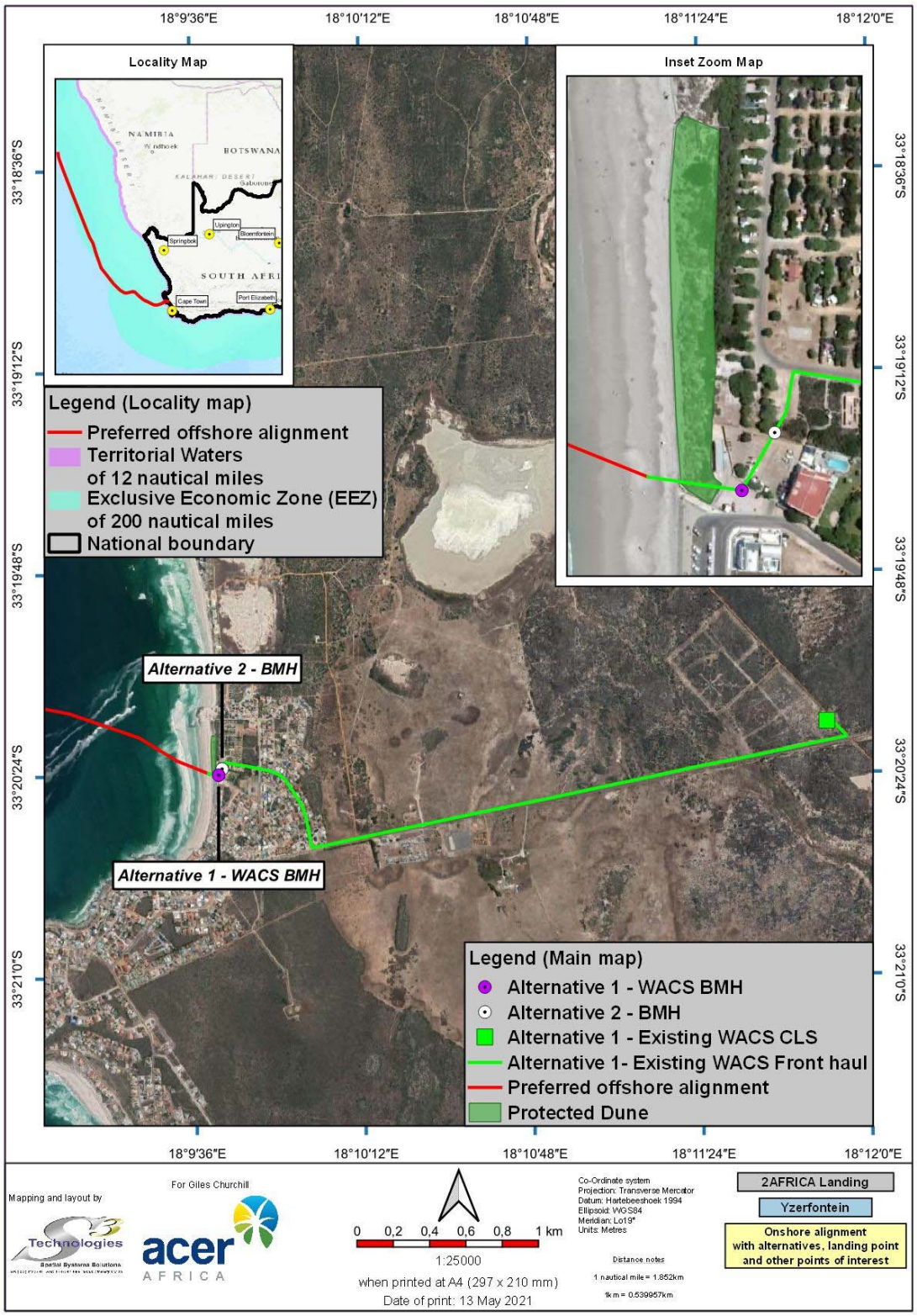
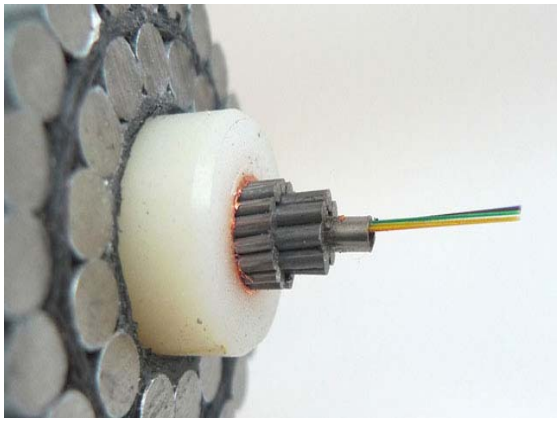


Figure 6 **Proposed landing alternatives at Yzerfontein Main Beach and existing WACS Cable System infrastructure operated by Telkom**

4.2 Marine components and installation methods

4.2.1 Marine fibre optic cable

Offshore, the cable is laid by a purpose-built cable-laying ship. Consistent with industry practice, the unarmoured cable (Plate 1 & 2) will rest on the seabed in water depths greater than approximately 1,500 m, where the risk of inadvertent damage from human activities is negligible.



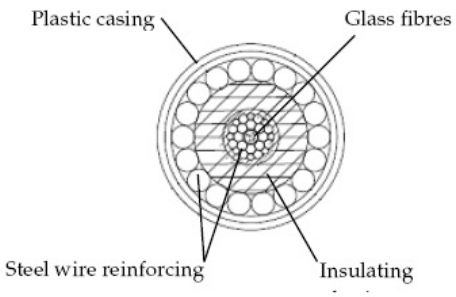


Plate 1 Cross section of a typical marine telecommunications cable

Lightweight (LW)	Lightweight Protected (LWP)	Single Armour (SA)	Double Armour (DA)	Rock Armour (RA)
Used in water depths up to 8,000m.	Used in water depths up to 7,000m.	Used in water depths up to 2,000m.	Used in water depths up to 500m.	Used in water depths up to 200m.

Plate 2 Examples of cable armouring and operational depths

At depths less than approximately 1,500 m, the cable will be buried beneath the sandy seabed of these shallower marine waters. This is typically achieved with the use of a specially designed plough which is submerged onto the seabed by the cable laying ship. The cable is then fed from the ship to the plough which effectively buries the cable to a target depth of approximately 2 m. This burial is intended to provide protection to the cable from the hazards posed by ships' anchors, fishing trawls/lines and the like.

The diameters of the marine fibre optic cables range in size from 17 mm diameter (cables installed at a water depth of between 7,000 – 1,500 m) to a maximum of 50 mm diameter (rock armoured cable which is installed in shallow water depths (< 200 m). In shallow waters close to the beach (generally less than 10 m water depth) articulated pipes may be used to protect the armoured cable which have a diameter of 148 mm. These articulated pipes protect the cable and aid in cable burial due to their weight.

4.2.1.1 Repeaters

Repeaters are optical amplifiers that are installed along the length of the cable and are used to extend the reach of optical communications links by overcoming loss due to attenuation of the optical fibre (Plate 3). Repeaters will be installed at specific distances along the route making up the cable system.

Repeaters are designed to function continuously without maintenance for 25 years in depths of up to 8,000m with no degradation in mechanical, electrical and optical performance. This requires among other, a controlled ambient internal climate and a durable enclosure.

Internal atmosphere is controlled to 20% relative humidity over the operating temperature range by the hydrogen getters[6] and moisture absorbing desiccants. The controlled internal gas atmosphere is suitable for maintaining the life expectations of all internal components.

The main structural component of the repeater housing is a monobloc tubular case fabricated from high tensile steel. The bulkhead and composite gland assembly provide full protection against water and gas ingress, either directly from the surrounding sea or from axial cable leakage due to a cable break close to the repeater.

The repeater housing is protected against corrosion with an organic electrically insulating barrier coating with additional mechanical reinforcement. This prevents seawater contact with the repeater housing steel surface and eliminates risk of metal wastage and galvanic corrosion and magneto-hydrodynamic effects that could generate hydrogen.

Repeaters are electrically powered. Voltage insulation is maintained between the internal unit and the repeater housing by two insulation paths: the polyethylene liner and the power conductor feeding through the gland assembly.

The repeaters will have the following specifications:

- The diameter of the rigid sea-case (white tube section in the photo) is approximately 270mm.
- The length of the sea-case section of the repeater is approximately 980 mm.
- The total length of repeater is approximately 3900 mm to 4240 mm depending on cable coupling.
- The spacing between repeaters is approximately 75 km to 83 km varying with the route plan.

6 A "getter" is a deposit of reactive material placed inside a vacuum system to maintaining the vacuum. Gas molecules striking the getter material combine with it chemically or by absorption, and the gas is removed from the evacuated space.

Plate 3 Example of a repeater

4.2.2 Physical characteristics of fibre optic cables

4.2.2.1 External chemical properties of the cable

The external protection of the cable comprises a naturally occurring bitumen (asphalt) as a compound to adhere the outer polypropylene roving to the armour wires on the armoured shallow water cables. No form of additive to prevent bio-degradation or anti-fouling is used in the cable's outermost layers. The other cable components in contact with the sea are the galvanized steel armour wires and the polyethylene sheath, which also contain no additives harmful to marine life (Heath; 2001).

4.2.2.2 Electrical Current

According to Heath (2001), optical fibre cables carry a constant dc[7] current of 1.6 Amps to feed power to the underwater repeaters. This current is fed along the copper clad steel inner conductor and depending on the length of the cable span it may require several thousands of volts to maintain it. In very approximate terms the cable resistance is about 1 Ohm per kilometre and the repeaters, spaced at 50 km, drop about 30 volts each. Therefore, a cable spanning 4,000 km would have about 80 repeaters and require a power feed voltage of about 6500 volts. It is normal practice to apply half this voltage at positive polarity to one end of the system and half the voltage at negative polarity to the other end to establish a zero voltage point midway along the cable span. This reduces the level of voltage stress on the cable and repeaters.

There is no external electric field associated with the power on the inner conductor. The ratio of the conductivity of the polyethylene insulation to that of seawater means that the electric field remains only within the cable insulation.

[7] Dc is direct current: the one directional or unidirectional flow electric charge

4.2.2.3 Electromagnetic Fields (EMFs)

Electromagnetic fields (EMFs) are generated by current flow passing through cables and can be divided into electric fields (called E-fields, measured in volts per metre, V m^{-1}) and magnetic fields (called B-fields, measured in µT) (Taormina *et al*., 2018). The DC current in the inner conductor does set up a stationary magnetic field in the form of concentric rings emanating from the cable. The magnetizing force produced by this field diminishes with increasing radius from the cable. EMF's are generally effectively confined inside cables by armouring (Taormina et al., 2018). As referenced from Heath (2001), for a cable carrying 1.6 amps this means that the magnetic flux density due to the cable at a distance 1 metre away is 0.32 micro Tesla. This is two orders of magnitude lower than the vertical component of the earth's magnetic field on the West Coast of the United States, which is about 43 micro Tesla. This means that marine life forms would need to approach to within less than half an inch of the cable to detect its magnetic field above that of the earth.

4.2.2.4 Audible sound and frequency association with "toning"

Audible sound lies in the range 15 to 40,000 Hertz and neither coaxial nor optical cables emit this range, or any other frequencies, during their normal operation. During the laying of the cable, it does vibrate as a result of regular vortex shedding as it descends the water column. This is a low frequency phenomenon, at approximately 10 Hertz, is short lived and ceases when the cable comes to rest on the bottom.

The injection of a low frequency electrical signal from the land station is known as "toning". Toning is undertaken as an aid to cable location in the event of a fault on the cable or where other marine work is being conducted, which involves keeping a safe distance from the working cable. Toning works on the principle of a coaxial transmission line, formed by the inner conductor of the cable and the external armouring, providing a circuit for a low frequency signal.

At low frequency, a current applied to the inner conductor will propagate along the line, with its return path provided by a combination of the steel armour wires and the surrounding seawater. It is the proportion of current in the seawater, which enables electrodes trailed from a ship to detect the cable by locating the maximum level of the tone. During toning the level of the signal injected is usually around 160 mA at 25 Hz as the threshold level of detection on the ship electrodes is normally around 20 mA. The attenuation of the cables at low frequency is such that the tone injected at the terminal should be detectable across the length of the cable.

Toning is undertaken infrequently and is only really required prior to or during a repair operation on the cable. Toning is also undertaken during the installation of new cables, which have to cross or come close to the existing working cables. To increase safety margins in this situation, it helps the new installer to know the precise whereabouts of existing cables, which are mostly buried on the shelf area. Although toning is less effective in buried cables, it is much more reliable than visual or magnetometer detection in shallow water regions.

Toning has been used for many years on telegraph, coaxial, and optical fibre submarine cables throughout the world. From video evidence of ROV's tracking toned cables, the short-term presence of a low frequency, low level electric field in seawater does not appear to have any influence on the behaviour of fish.

4.2.2.5 Heat dissipation

When electric energy is transported, a certain amount is lost as heat by the Joule effect, leading to an increase in temperature at the cable surface and subsequent warming of the immediate surrounding environment (OSPAR, 2012). This is commonly referred to as thermal radiation. Thermal radiation in buried cables can warm the surrounding sediment in direct contact with a high voltage cable (Emeana *et al*.; 2016). High voltage cables are used for transferring electricity related to offshore energy projects. Heat emission is higher in AC than DC cables at equal transmission rates (Taormina *et al*., 2018). According to Taormina *et al*. (2018), the impacts of local temperature increase caused by electric cables on benthic communities have rarely been examined and *in situ* investigations are lacking. They refer to this knowledge gap as preventing conclusions from being drawn about ecological impacts of long-lasting thermal radiation on ecosystems. They conclude that considering the narrowness of the corridor and the expected weakness of thermal radiation, impacts are not considered to be significant, referring to the need for new field measurements and experiments under operational conditions.

4.2.3 Marine fibre optic cable installation

Prior to the installation of the 2AFRICA (West) Cable System (Yzerfontein landing) taking place, the following offshore marine investigations will be performed by a contractor appointed by ASN to install the cable system.

4.2.3.1 Cable Route Survey

The proposed cable route was surveyed by the project team to identify whether the substrate and topography of the ocean floor is suitable for the installation of 2AFRICA (West) Cable System (Yzerfontein landing). The survey included the following activities:

- A geophysical survey of the deep water, shallow water, and inshore sections of each proposed cable route was undertaken. This included the establishment of bathymetric corridor widths of 500 m (inshore and up to a depth of 1, 500 m). In deeper water this corridor extended up to three times the water depth centred on the proposed cable route.
- Conducting a side scan sonar and survey of a 500 m corridor width (inshore and up to a depth of 500 m) centred along the proposed cable route.
- Bottom samples taken at an average 10 km spacing in shallow water (less than 1,500 m in depth) (Sample sizes were approximately the size of a standard 10 l bucket).
- The cable route was surveyed using a multi-beam echo sounder (MBES) Swath Bathymetry system (the MBES equipment is integrated with the ship's surface navigation equipment (GPS)).
- Bathymetric data was processed using the onboard workstation with specialised software to verify the coverage and accuracy of the collected bathymetry data and to provide colour contour charts. These charts were used to review the proposed route and where necessary plan offset lines.
- In the shallow water sections, an integrated Side Scan Sonar and a Sub-bottom Profiler was used. These were housed in a device which was towed behind the ship to get to an optimum position close to the seabed. The position of this towed device was tracked acoustically using an ultra-short base line (USBL) tracking system.
- A burial assessment survey was undertaken from the shoreline up to a depth of 1,500 m to test the suitability of the substrate for cable burial. The survey included Cone

Penetrometer Tests (CPTs) with an average of 1 CPT taken at 4 km intervals in planned burial areas.

- ❑ The landing sites for all cable segments were positioned utilising GPS and topographic surveying practices. (The in-shore survey vessels used a GPS navigation system).
- ❑ At each landing site, the survey of the shore approaches was supported where appropriate by a diver/swim team equipped with both video camera and bar probes. Any obstructions, potential hazards or engineering constraints to the submarine cable were located and fully documented.

4.2.3.2 Cable Route Clearance Operations

Prior to the installation of the 2AFRICA (West) Cable System (Yzerfontein landing), route clearance operations will be conducted along those sections of the route where burial is to be performed to ensure that, as far as practically possible, the burial operation will not be hindered by out of service cables or discarded fishing gear. This route clearance operation is typically called the Pre-Lay Grapnel Run (PLGR). The objective of the PLGR operation is the clearance of any seabed debris, for example wires or hawsers, fishing equipment etc., which may have been deposited along the route.

PLGR is undertaken by dragging grapnels (Plate 4) behind a ship along the proposed cable route in order to clear the route of debris. Different types of grapnels can be used depending on the seabed conditions (Gillford in rockier areas and Rennies and Flat Fish in softer sandy sediments). The PLGR operations are normally carried out by a vessel specifically fitted out with winches and grapnels, and capable of sustaining good slow speed positional control. The vessel will be equipped with navigation and positioning system to the same specification as the main lay vessel.

Any debris recovered during these operations will be discharged ashore on completion of the operations and disposed in accordance with local regulations. If any debris cannot be recovered, then a local re-route of the cable system will be planned to avoid the debris.

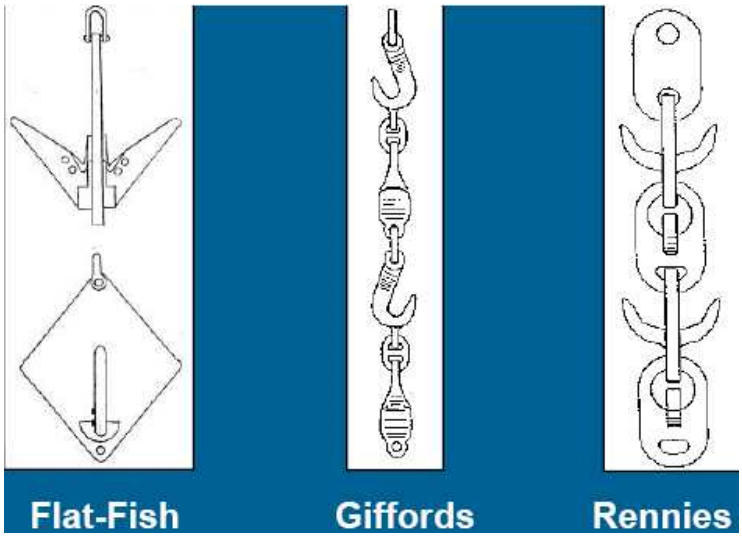


Plate 4 Types of grapnels used to clear the cable route of debris

4.2.3.3 Installation of the marine telecommunications cable

The 2AFRICA (West) Cable System (Yzerfontein landing) will be installed using a purpose-built cable ship fully equipped with all the necessary equipment, tools and facilities to safely handle and install, join, test, and power the submerged plant, including simultaneous lay and plough burial. The vessel will have sufficient power and dynamic positioning capability to carry out the installation in the expected weather and current conditions. During cable laying an automatic log of all critical operational parameters will be kept including navigational data, speed, tension, slack, cable counter and plough data.

SURFACE LAYING OPERATIONS

Surface laying implies that the cable will be laid on the surface of the seabed. The objective is to install the cable as close as possible to the planned route with the correct amount of cable slack to enable the cable to conform to the contours of the seabed without loops or suspensions.

PLOUGH BURIAL OPERATIONS

The cable will be buried to a target depth as defined in the burial plan, and as determined by the cable route and burial assessment surveys. Burial depth will be controlled by adjusting the height of the plough's front skids. The depth of burial achieved will be continuously recorded by the plough and logged with the ship's data. In areas where plough burial is planned, the cable will be buried to a target depth of 2 m (Plate 5). The footprint of the cable trench is generally less than a 1 m in width with the plough skids having a width of less than 6 m.

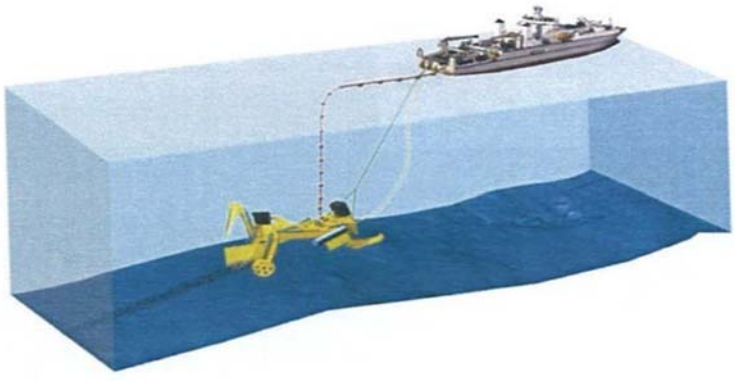


Plate 5 Sea plough to be used to bury the cable along sections of the cable alignment (less than 100 m deep) where conditions permit burial

CROSSING OF EXISTING SUBMARINE CABLES AND PIPELINES

For cable route planning, ASN uses the Global Marine Cable Database (Global Marine, 2019) augmented by ASN's own internal databases and Admiralty Charts (UKHO, 2019) to identify all known existing and proposed telecommunication and power cable systems that will be crossed by the 2AFRICA (West) Cable System (Yzerfontein landing) [8]. Where existing cables are crossed, the industry norm is to ensure that the crossing is undertaken using a similar type of cable, i.e. an armoured cable crosses an armoured cable or an un-armoured cable crosses an un-armoured cable. Where seabed conditions allow, post lay cable burial using a Remote Operated Vehicle (ROV) can be performed to afford additional protection to the cables at the crossing point.

For pipeline crossings, ASN recommends the application of Uraduct (or similar product) (Plate 6) to the cable at the point of contact with the pipeline. Uraduct is a protection system designed and developed to protect subsea fiber optic cables, power cables, umbilicals, flexible flowlines, rigid flowlines, hoses and bundled products from abrasion and impact. Generally, the length of Uraduct required for a pipeline crossing is 50 m each side of the crossing or quarter the water depth either side of the crossing. Mattressing[9] can also be used when crossing pipelines; however, this is not considered necessary for standard pipeline crossings but may be installed in special circumstances at the request of the pipeline operator. (There will be no such pipeline crossing in South African waters, but there are pipeline crossings in other parts of the system).

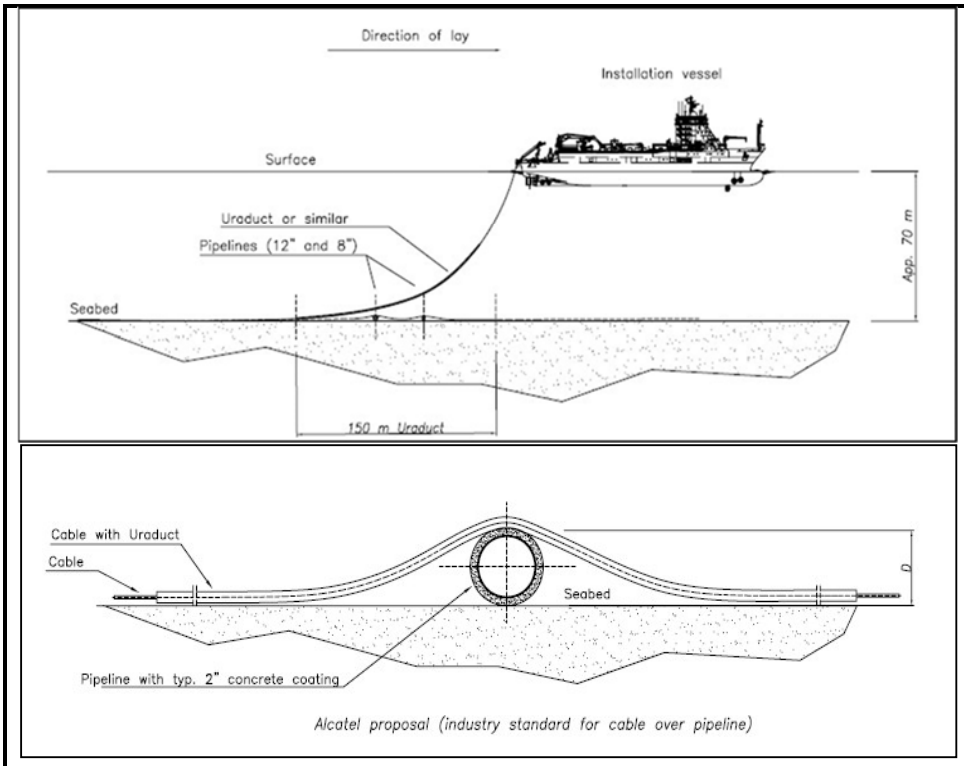


Plate 6 Example of a cable crossing using Uraduct or similar product (Source: ASN REH, 2019)

8 The proposed 2Africa (West) Cable System (Yzerfontein landing) will cross 3 in service cables, 1 out of service cable and 1 planned cable.

9 Generally, mattresses are made of high strength concrete segments linked together with a network of high strength polypropylene ropes to form a continuous flexible concrete barrier which is used to separate structures ensuring the protection of infrastructure.

SHORE END OPERATIONS

Shore end operations refer to the installation of the cable through the shallow water near shore, through the intertidal zone and up onto the beach (Plate 7 and Plate 8). All shore end landings will be performed directly from the main cable installation vessel except where shallow water conditions require the use of a small shallow draft vessel or barge, usually mobilised specifically for the task, and equipped with cable tanks, cable engines, cable handling gear and a suitable cable burial device.

During cable landing near Yzerfontein Beach, the following activities will be performed by the appointed contractor:

- ❑ Preparation of a detailed operational plan based on the findings of the survey, with site visits as necessary.
- ❑ Provision of an advance party to establish the beach equipment and to prepare the beach, cordon off a working area to protect the public, etc.
- ❑ The marking of any existing in-service cables at the shore end location (with the assistance of the cable owners).
- ❑ Performance of the installation of the shore end section of the sea cable and support of the cable vessel activity.
- ❑ Installation of cable slack at the beach, as required.
- ❑ Installation of a cable loop in the beach manhole to facilitate re-terminations.
- ❑ Securing the cable in the beach manhole by means of an armour wire anchor clamp.
- ❑ Burial of the cable from the Beach Manhole to the Low Water Mark (LWM) to a depth of 2 m (or to bedrock, if reached sooner).
- ❑ This may also include installation and burial of the sea earth plate and earth cable (System Earth).
- ❑ All digging will start the day before the planned cable landing.
- ❑ Reinstatement of the beach to the required standards.
- ❑ All testing, reporting, and accurate as-built records.
- ❑ Articulated pipe, where required across the beach up to the Beach Manhole, will be fixed to the beach manhole outside wall by means of a flange adapter.

Plate 7 Landing of a cable on shore. Similar works will be undertaken for the landing of the 2AFRICA (West) Cable System (Yzerfontein landing)

In the near shore zone (generally in waters less than 9m in depth) external protective measures such as articulated split pipes will be installed around the cable to guard against damage due to the following:

- ❑ Surf zone wave action.
- ❑ Small vessel anchoring.
- ❑ Nearshore currents and tidal ebb and flow.

Plate 8 Bringing the cable to shore from the cable laying vessel. Cable is buoyed off and pulled to shore with smaller vessels.

Using articulated pipe in the near shore environment increases cable protection against chafing by providing an additional physical barrier of protection against external forces. Articulated pipe (Plate 9) is usually made of cast iron and the additional weight it provides to the cable aids in stabilising the cable and in maintaining cable burial depth where that is possible. Standard practice is to apply articulated pipe to beyond the surf zone, however, at landings where burial may prove difficult, articulated pipe can be extended further offshore.

Plate 9 **Articulated pipe sections which are installed around the cable in shallow water to offer additional protection.**

4.2.4 Post construction maintenance of the cable

Once installed, marine telecommunications cables generally require little to no maintenance if the cable is not damaged by natural disasters (underwater landslides, earthquakes, etc.) or through human activities (fishing trawlers, anchors, etc.). If the cable is damaged, a cable repair ship is dispatched to repair the cable fault (Plate 10), which usually entails the following:

- Localization of the cable failure point and recovery of the failed cable section onto the ship.
- Cutting and removal of the cable failure section and then joining the recovered cable to the new cable section on board the ship.
- Testing of the cable followed by reburial of the cable on the exact same alignment.

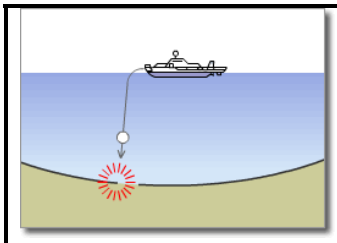
4.2.5 Cables in operation – life cycle analysis

A life cycle analysis study suggests that over a typical operational lifetime of 25 years (manufacture-to-decommissioning)[10] the main environmental impacts of a cable system are carbon emissions emanating from power consumption at the terminal station (chiefly related to air conditioning and powering of the terminal equipment); and b) vessel transits for cable maintenance.

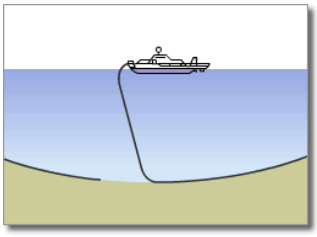
*"*The results show that the use and maintenance phase clearly dominates all impact categories at an average of 66 percent. By comparison, the raw materials and design and manufacturing phases account for, on average, only 6 percent of the total potential impact.

This clearly highlights that the greatest impact over the life cycle of a submarine cable system comes from the use and maintenance activities. Namely, electricity use at the terminal to power the terminal equipment and the combustion of marine fuel during cable maintenance with purpose-built ships."

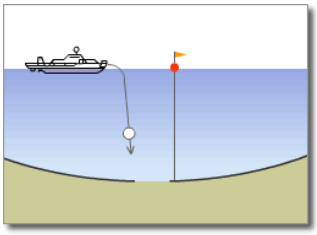
[10] Donavan, 2009. "Twenty thousand leagues under the sea: A life cycle assessment of fibre optic submarine cable systems".

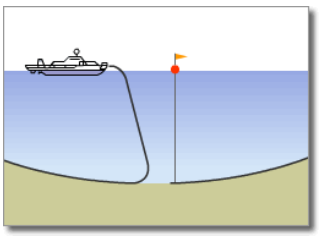


The cable ship is navigated to the location by a Differential GPS (DGPS). Once the fault is located, a cable cutting tool attached to the rope is paid out to the seabed. This tool and grapnel (Cable Catch) are then used to hook the cable before cutting the cable.

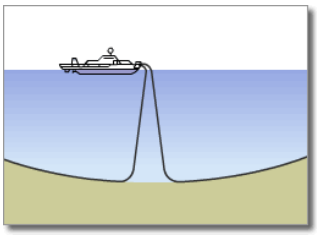


Once cut, the cable is recovered to the ship (Cable Recovery). Once on board the cable is tested to find the fault and that section of cable is removed. The cable is then waterproofed and dropped back to the sea floor attached to a buoy.





The same procedure is then carried out on the other section of cable still on the sea floor.



Once both sides of the fault have been repaired, the cables are once again bought up to the ship where a new section of cable is joined to the cable sections. Once completed the cable is placed back onto its original alignment and if necessary reburied.

Plate 10 Protocol for repairing cable faults to marine telecommunications cables
(Source: http://www.k-kcs.co.jp/english/solutionRepairingMethod.html)

4.3 Terrestrial components and installation methods

Plate 11 provides an illustration of the proposed terrestrial components of the project, as discussed below.

4.3.1 Beach Manhole

A BMH is typically an underground chamber made of reinforced concrete, with the approximate dimensions: 3m (length) x 1.8 m (height) x 2m (width). It usually houses 4 cable ducts (two spare for future use). Once complete, the only visible sign of the structure is the manhole covers and cement roof slab which will cause minimal interference with vehicle movement or other activities at the beach carpark (as demonstrated in Plate 11).

Beach access path adjacent to the existing WACS pipe conduit to the beach

Dune rehabilitation underway directly north of the proposed landing site

View from the proposed landing site to the south (along Yzerfontein Main Beach)

Manhole along the WACS front haul alignment

Area at the WACS CLS which is available for extending the CLS to accommodate the 2AFRICA cable

Location of the WACS BMH

Plate 11 Proposed landing site (Alternative 1) at the WACS Cable System landing point at Yzerfontein Main Beach

Once the fibre optic cable has made landfall and been buried through the beach section of the cable alignment, it will be anchored to a BMH. Two options were originally considered:

- The preferred option is to link into the existing WACS BMH which is located approximately 110 m from the surf zone in an open parking area.
- The second alternative (discarded after Scoping) would be to land at a site located approximately 40 m north of the WACS landing point and to construct a new BMH, to the north of Yzerfontein Main Beach.

4.3.2 Cable ducting from BMH to CLS

The 2AFRICA cable will be accommodated within sleeves already installed for the WACS Cable System. These sleeves run from the BMH to the WACS CLS site outside Yzerfontein. No excavations or unnecessary disturbance of surrounding vegetation or infrastructure will, therefore, result.

4.3.3 Cable Landing Station

A CLS is a building that functions as a control centre for the subsea cable system and where the system is connected to the domestic telecommunication network. The project will make use of the existing WACS CLS made available by Telkom. Telkom has indicated that an area adjacent to the WACS CLS building can be utilised to extend the WACS CLS to accommodate the 2AFRICA Cable. This area has already been cleared and demarcated and, therefore, no unnecessary disturbance of surrounding vegetation or infrastructure will be required for cable installation (Plate 11).

4.4 Existing services and project implementation

Construction and installation of the 2AFRICA (West) Cable System (Yzerfontein landing) on land will involve the following services/utilities/resources:

4.4.1 Water

Water for construction purposes will be sourced from the closest municipal supply point and tankered to site when required. Water use during construction is however very limited and would be primarily for the concrete works required for the construction of the BMH.

4.4.2 Sewage

Chemical toilets will be provided for construction workers. These chemical toilets will be routinely serviced by the appointed service providers and all waste will be disposed at a licensed waste treatment works within the area. Given the short construction period associated with this project, the impact associated with sewage is not expected to pose any significant risk.

4.4.3 Storm water

The proposed development should not have any impact on storm water once construction is completed. During construction, however, the appointed contractor will take cognisance that

the Swartland Municipality does have storm water structures within the project area and these structures will be avoided during construction.

While trenching of the cable alignment is underway, stockpiles of soil will be located outside any storm water drains to prevent the wash away of material and siltation of downstream habitats.

4.4.4 Waste streams

Little waste is expected to be generated on site and waste will be limited to litter, spoil from the trenching operations (where rubble or buried waste is unearthed) and material off cuts. It is envisaged that a skip will be hired for the duration of the construction period where all construction related waste will be stored and then disposed of by an appointed service provider.

4.4.5 Job creation and procurement

Specific skills are required for the cable landing activities and the land based work will be of short duration. Therefore, for the landing, the use of unskilled, local labour will be limited. There will be little to no fronthaul works. SMMEs will be offered part of the backhaul work provided they are compliant with respect to Health and Safety. A tender process will be set up for work available to SMMEs.

4.4.6 Anticipated construction dates and programme

It is anticipated that it will not take longer than 2-3 months to complete the offshore and onshore cable installation of the 2AFRICA (West) Cable System (Yzerfontein landing), as outlined below:

- Offshore installation is expected to take 1 month to complete.
- Installing the cable across the beach and anchoring is expected to take 2-3 days to complete.
- Completing the land-based installations and connections to the CLS is expected to take 1 month to complete.

The landing of the cable is entirely dependent on receiving a positive Environmental Authorisation which will be issued by the Department of Environment, Forestry and Fisheries. Only once the environmental authorisation process is nearing its completion will the project proponent be able to realistically set dates for project implementation. MTN is hoping to have the 2AFRICA (West) Cable System (Yzerfontein landing) installed and operational by mid-2022.

4.4.7 Decommissioning

Submarine Cables are designed to have a lifespan of 25 years. Decommissioning of the 2AFRICA (West) Cable System (Yzerfontein landing) in the near future is unlikely, given the current growth in the telecommunications sector within South Africa. If and when decommissioning takes place, all activities would be subject to legislation relevant at the time

5 PROJECT ALTERNATIVES

Alternatives are different means of achieving the purpose and need of a proposed development and include alternative sites, layouts or designs, technologies and the "no development" or "no go" alternative. This chapter describes the various alternatives applicable to the proposed 2AFRICA (West) Cable System (Yzerfontein landing).

5.1 Proposed landing site alternatives

Two potential sites for landing at Yzerfontein were considered during Scoping. The alternatives considered did not include CLS site alternatives or front haul alternatives as both alternatives would make use of the existing WACS ducting and CLS. Alternative 2 was discarded as it would require trenching through or under a sensitive natural dune cordon and require the construction of a new BMH with associated removal of vegetation and disturbance of the dune ecosystem and a shell midden. The preferred alternative (Alternative 1), makes use of existing WACS infrastructure on land, thus minimising environmental impacts, and is assessed in this report.

The preferred landing alternative lands on the northern section of the Yzerfontein Main Beach and will link into the existing WACS BMH located directly north of the public parking area (Figure 7). The existing pipe conduit for the WACS cable system is buried underneath the coastal dune cordon to the north of the concrete access path to the beach and extends onto the beach (Plate 11). This will then link into the existing WACS CLS via existing ducting. Once buried on the beach, no further excavation or removal of vegetation will be required.

5.2 Proposed Marine cable alignment alternatives

To reduce impacts on seabed user groups (fishing, trawling, offshore exploration and mining, etc.) the current and planned future cable landings tend to follow very similar alignments once reaching water depths of 1,500 m and less. These "cable corridors" have been selected to reduce the risks to other user groups as well as to capitalise on the seabed conditions required for the safe installation and longevity of the marine telecommunications cables.

Only one marine cable alignment is being considered for the 2AFRICA (West) Cable System (Yzerfontein landing), which arrives from the west coast of Africa and will align with the WACS cable coming from the north (as shown in Figure 8). South Africa is the southern-most point of the 2AFRICA (West) Cable System (end station).

5.3 Technology alternatives

Although there are a few available telecommunication mechanisms used world-wide and in South Africa, the scale of customer demand and expectation of ever faster data transfer have made many of these inadequate or obsolete. Radio has largely been phased out due to restricted bandwidth and poor data transmission. Currently, Africa relies primarily on satellites with few submarine cables to provide its international communications. Satellite and microwave transmissions are unable to offer the capacity required for South Africa and other African countries to remain part of the global community in terms of communication services.

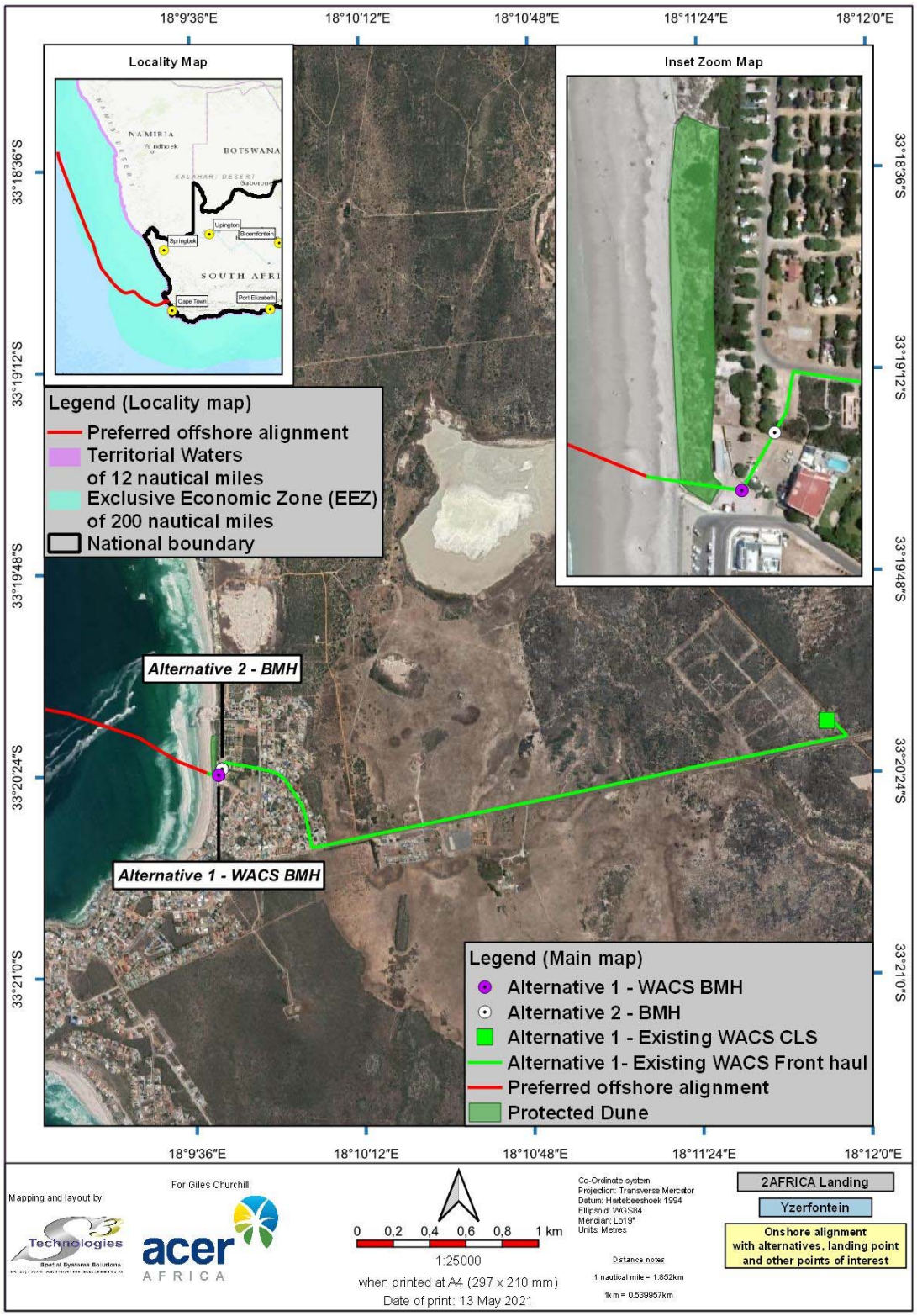


Figure 7 **Proposed landing site, showing the existing WACS BMH, WACS Front Haul and Cable Landing Station**

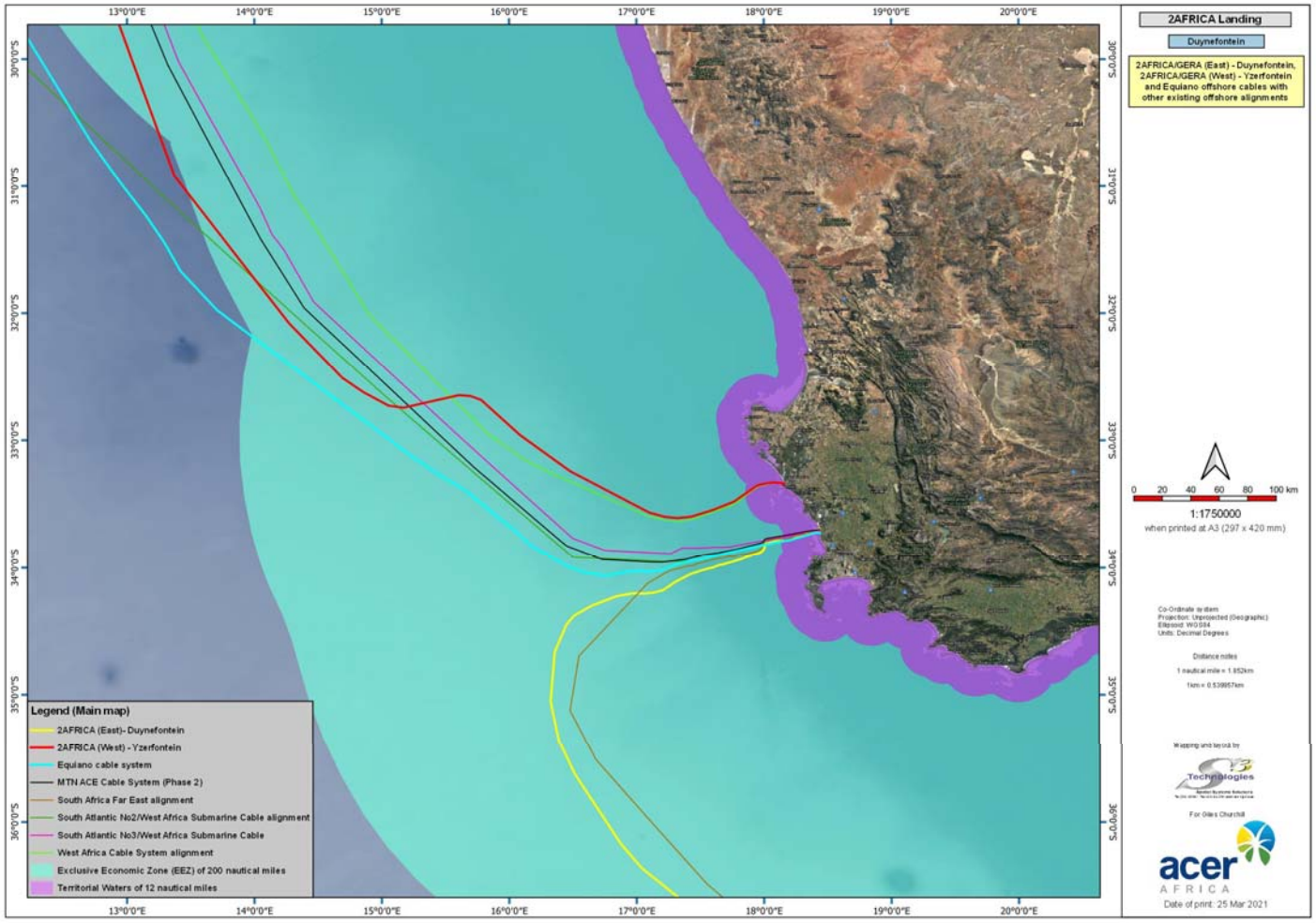


Figure 8 Map indicating other existing subsea cables in relation to the proposed 2AFRICA (West) Cable System (Yzerfontein landing)

Within South Africa, fibre optic networks are currently the only available technology that are able to transmit sufficiently high volumes of voice and data traffic, with higher security, reliability and at a lower cost. This is the current preferred technology for meeting demand for data and voice transmission on a global scale and is one of the main reasons why the 2AFRICA (West) Cable System is based on a fibre optic network.

5.4 Operational alternatives

The timing from a tourism and recreational perspective of the construction required on the beach, will need to be taken into consideration as soon as the project's timing is determined.

Operational alternatives are also applicable to the seasonal timing of offshore installation of the 2AFRICA (West) Cable System related to, for example, seasonal whale migration patterns.

5.5 No development (no-go) alternative

In the context of the proposed development, the No-Go alternative would involve MTN not landing and installing the proposed 2AFRICA (West) Cable System (Yzerfontein landing). Although impacts on the marine and terrestrial environments would be avoided entirely, the benefits from submarine telecommunication cables, which are important for international telecommunications, would not be realised. This needs to be understood in the context that access to affordable international bandwidth is widely recognised as being key to economic development in every country.

Africa relies primarily on satellites (with few submarine cables) to provide its international communications. Communication via submarine telecommunications cables generally allows for lower cost, better performance, and greater capacity (throughput) than that available via satellites. If the No-Go alternative is selected, MTN and South Africa as a whole, would miss an opportunity to unlock economic development within the country. In addition, should the No-Go alternative be selected, it would mean that MTN would be unable to increase their supply of international fibre-optic bandwidth and they will be unable to facilitate more affordable and effective transport of voice, data, Internet and television services to South Africa's population.

6 DESCRIPTION OF THE RECEIVING ENVIRONMENT

A broad description of the receiving environment was provided in the Scoping Report for the 2AFRICA(West) Cable System (Yzerfontein landing). Where applicable, further detailed information is provided in this section, most of it sourced directly from the specialist reports contained in Appendix B, unless otherwise cited. Note that the primary literature references for the information presented in this section can be found in the corresponding specialist reports and have not been cited here.

6.1 Marine and offshore environment

6.1.1 Geophysical characteristics

6.1.1.1 Bathymetry

The continental shelf along the west coast is generally wide and deep, although large variations in both depth and width occur. The shelf maintains a general north-northwest trend, widening north of Cape Columbine and reaching its widest (180 km) off the Orange River. Underwater features in the general project area include the Cape Canyon and Cape Valley. The cable route crosses the base of the Cape Canyon, but lies some 100 km north of the Cape Valley.

6.1.1.2 Coastal and inner-shelf geology and seabed geomorphology

Figure 9 illustrates the distribution of seabed surface sediment types off the South African north-western coast. The inner shelf is underlain by Precambrian bedrock (Pre-Mesozoic basement), whilst the middle and outer shelf areas are composed of Cretaceous and Tertiary sediments. As a result of erosion on the continental shelf, the unconsolidated sediment cover is generally thin, often less than 1 m. Sediments are finer seawards, changing from sand on the inner and outer shelves to muddy sand and sandy mud in deeper water. However, this general pattern has been modified considerably by biological deposition (large areas of shelf sediments contain high levels of calcium carbonate) and localised river input. A ~500-km long mud belt (up to 40 km wide, and of 15 m average thickness) is situated over the inner shelf between the Orange River and St Helena Bay. Further offshore, sediment is dominated by muds and sandy muds. The continental slope, seaward of the shelf break, has a smooth seafloor, underlain by calcareous ooze.

Detailed descriptions of the seabed geomorphology along the proposed cable route are provided in Fugro (2020b). This report emphasizes the diversity of seabed sediments and features often over small spatial scales and at great depths.

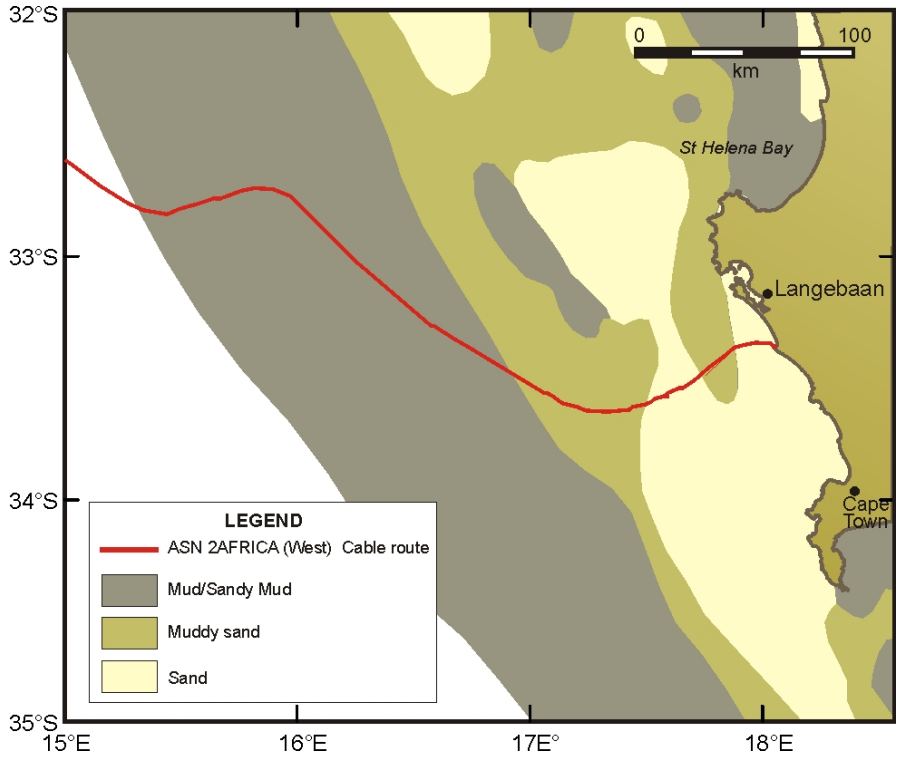


Figure 9 Sediment distribution on the continental shelf of the South African West Coast in relation to the proposed 2AFRICA(West) Cable System (Yzerfontein landing).

6.1.2 Biophysical characteristics

6.1.2.1 Wind patterns

Yzerfontein is primarily affected by southerly winds. The strongest winds occur in summer (October to March), during which winds blow 98% of the time, and gales (winds exceeding 18 m/s or 35 kts) are frequent. Virtually all winds in summer come from the south to south-southeast , averaging 20 - 30 kts and reaching speeds in excess of 100 km/h (60 kts). The combination of these southerly/south-easterly winds drives the massive offshore movements of surface water, and the resultant strong upwelling of nutrient-rich bottom waters, which characterise this region in summer. Winter remains dominated by southerly to south-easterly winds.

6.1.2.2 Large scale circulation and coastal currents

The southern African West Coast is strongly influenced by the Benguela Current. On its Western side, flow is more transient and characterised by large eddies shed from the retroflection of the Agulhas Current, resulting in considerable variation in current speed and direction over the domain. In the south, the Benguela current has a width of 200 km, widening rapidly northwards to 750 km. Current speeds decrease with depth, while directions rotate from predominantly north-Westerly at the surface to south-easterly near the seabed. Near bottom shelf flow is mainly poleward with low velocities of typically <5 cm/s. Refer to Figure 10.

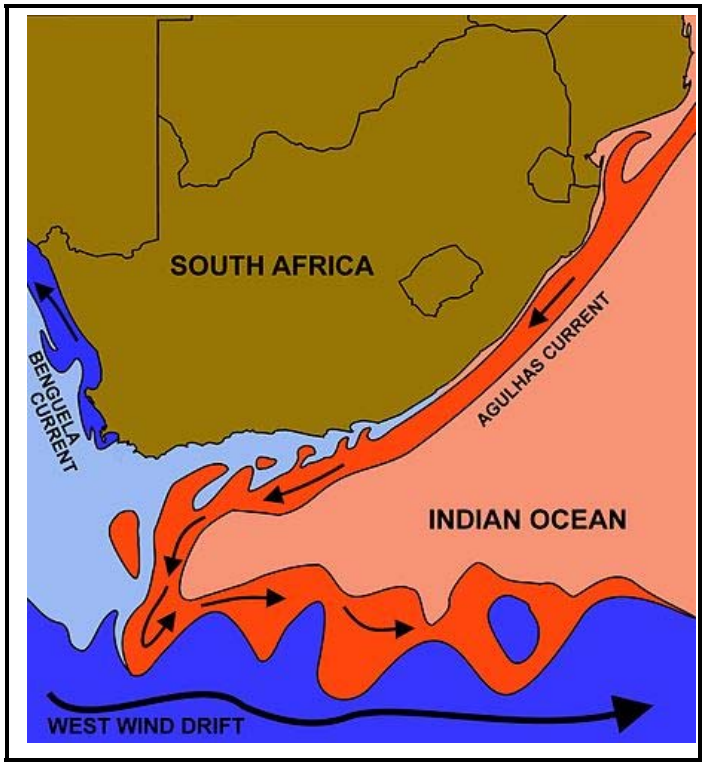


Figure 10 Major ocean currents off the coast of South Africa

6.1.2.3 Waves and Tides along the west coast of South Africa

Most of the West coast of southern Africa is classified as exposed, experiencing strong wave action. Much of the coastline is therefore impacted by heavy south-westerly swells generated in the roaring forties, as well as significant sea waves generated locally by the prevailing moderate to strong southerly winds characteristic of the region.

The wave regime along the southern African west coast shows only moderate seasonal variation in direction, with virtually all swells throughout the year coming from the S and SSW direction. Winter swells typically exceed 2 m in height, averaging about 3 m, and often attaining over 5 m. With wind speeds capable of reaching 100 km/h during heavy winter south-westerly storms, winter swell heights can exceed 10 m. Summer swells tend to be smaller on average, typically around 2 m. There is also a slightly more pronounced southerly swell component in summer. These wind-induced southerly waves are relatively local and, although less powerful, tend to work together with the strong southerly winds of summer to cause the northward-flowing nearshore surface currents which result in substantial nearshore sediment mobilisation, and northwards transport, by the combined action of currents, wind and waves.

As with the rest of the southern African coast, tides are semi-diurnal, with a total range of some 1.5 m at spring tide, but only 0.6 m during neap tide periods.

6.1.2.4 Water

South Atlantic Central Water comprises the bulk of the seawater in the study area, either in its pure form in the deeper regions, or mixed with previously upwelled water of the same origin on the continental shelf. Salinities range between 34.5 ‰ and 35.5 ‰.

Seawater temperatures on the continental shelf of the southern Benguela typically vary between 6°C and 16°C. Well-developed thermal fronts exist. The continental shelf waters of the Benguela system are characterised by low oxygen concentrations, especially on the bottom.

6.1.2.5 Upwelling and plankton production

The west coast of Southern Africa is characterised by upwelling events where comparatively nutrient-poor surface waters are displaced by enriched deep water, supporting substantial seasonal primary phytoplankton production. These plankton blooms in turn serve as the basis for a rich food chain up through pelagic baitfish (anchovy, pilchard, round-herring and others), to predatory fish (snoek), mammals (primarily seals and dolphins) and seabirds (jackass penguins, cormorants, pelicans, terns and others).

6.1.3 The biological environment

6.1.3.1 Overview of ecoregions, ecosystems and habitat types encountered by the 2AFRICA (West) Cable System (Yzerfontein landing)

Biogeographically, the 2AFRICA(West) Cable System (Yzerfontein landing) will traverse the South-eastern Atlantic Deep Ocean and Southern Benguela Ecoregions (**Error! Reference source not found.**). These were previously referred to as the Southwestern and Atlantic Offshore Cape Bioregions.

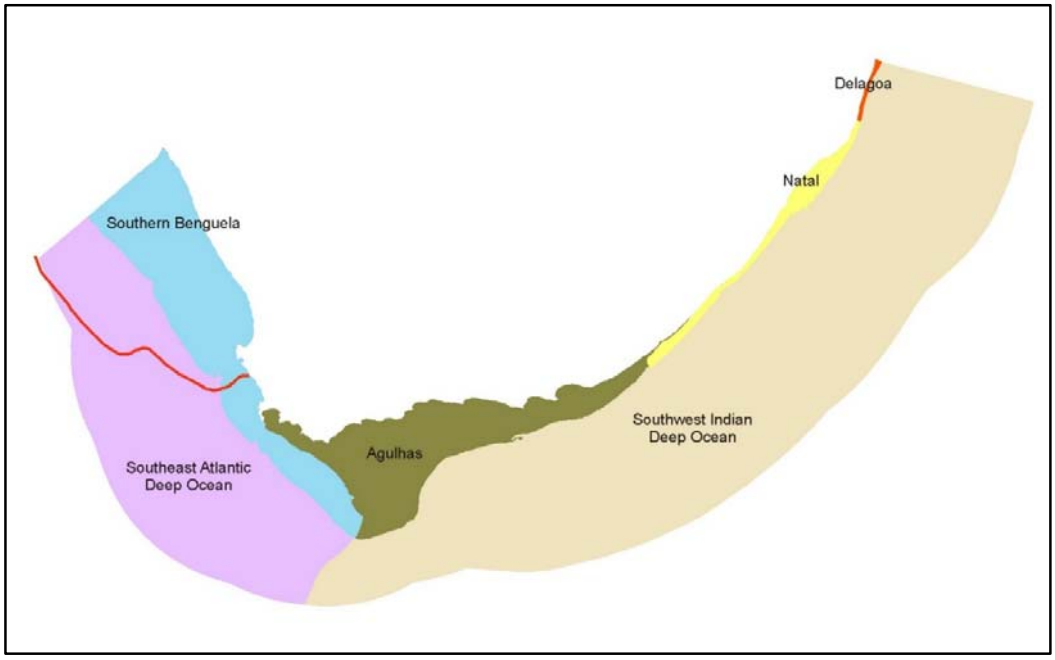


Figure 11 The South African inshore and offshore ecoregions in relation to the proposed 2AFRICA (West) Cable System (Yzerfontein landing) (red line) (adapted from Sink et al. 2019).

The seabed communities in the project area lie within the Namaqua photic, sub-photic and continental slope biozones, which extend from the shore to the shelf edge, and beyond to the lower deepsea slope, respectively. The benthic habitats of South Africa were mapped as part of the 2018 National Biodiversity Assessment and subsequently the benthic ecosystem types (Figure 12) were assigned an ecosystem threat status based on their level of protection (Figure 13).

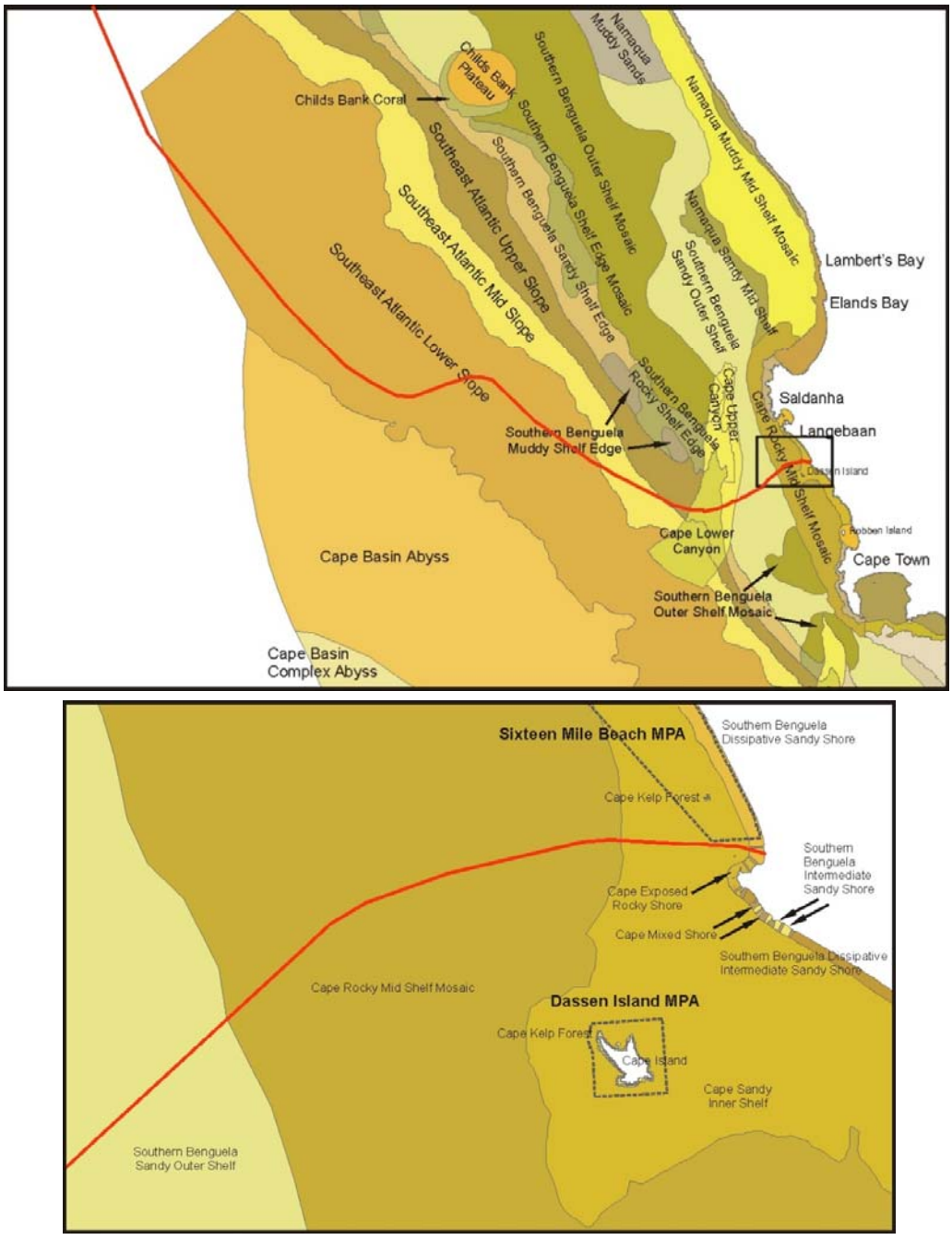


Figure 12: Offshore benthic and coastal ecosystem types along the Southwestern Cape coastline (top), detailing the habitats affected by the proposed 2AFRICA(West) Cable System (Yzerfontein landing) (red line). Those inshore habitats affected by the shore crossing are detailed in the insert (bottom). MPAs are also illustrated.

Although most of the cable route falls within offshore habitats considered by the 2018 National Biodiversity Assessment as of 'least concern', the cable does pass through portions of the inner and outer continental shelf on the west coast rated as 'vulnerable' (Cape Rocky Midshelf Mosaic, Cape Sandy Inner Shelf and Cape Lower Canyon) and 'endangered' (Cape Upper Canyon) (**Error! Reference source not found.**).

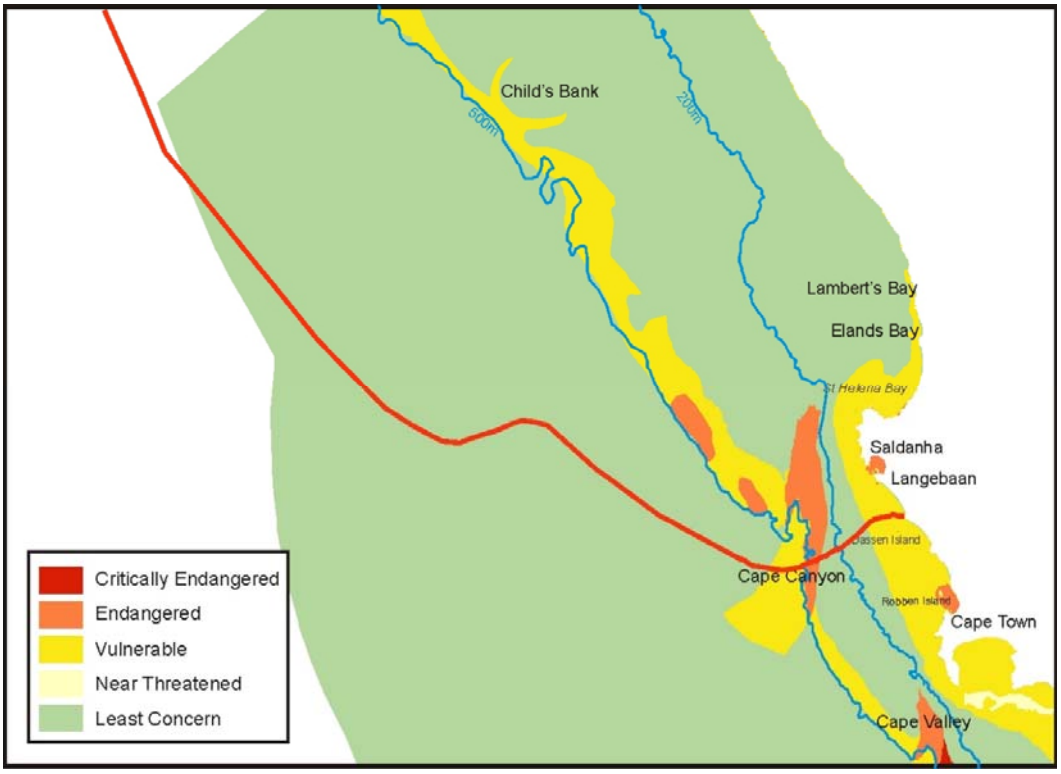


Figure 13 Ecosystem threat status for coastal and offshore benthic habitat types on the South African west coast in relation to the proposed 2AFRICA(West) Cable System (Yzerfontein landing) (red line) (adapted from Sink et al. 2019).

The biota of nearshore and offshore marine habitats on the west coast are relatively robust, being naturally adapted to an extremely dynamic environment where biophysical disturbances are commonplace. Communities within this region are largely ubiquitous, particular only to substrate type (i.e. hard vs. soft bottom), exposure to wave action, or water depth. Habitats that will be affected by the cable alignment for the 2AFRICA (West) Cable System (Yzerfontein landing) are:

- Sandy intertidal beaches and subtidal substrates.
- Subtidal rocky habitat.
- The water body: demersal fish species that live and feed on or near the seabed; pelagic communities live and feed in the water column; plankton associated with the upwelling characteristic of the area; cephalopods that are distributed on the mid-shelf or on the edges of a shelf at varying depths; turtles; seabirds, and marine mammals (whales, dolphins and seals).

A comprehensive description of the above habitats and the biological communities 'typical' of these habitats, as relevant to the proposed cable landing, are described in the marine ecology specialist report. The biological communities consist of many hundreds of species, often

displaying considerable temporal and spatial variability (even at small scales). No rare or endangered species have been recorded.

6.1.3.2 Sandy substrate habitats and biota

The benthic biota of soft bottom substrates constitutes invertebrates that live on, or burrow within, the sediments, and are generally divided into megafauna (>10 cm), macrofauna (animals >1 mm) and meiofauna (<1 mm).

INTERTIDAL SANDY BEACHES

The coastline between Cape Town and Saldanha Bay is dominated by sandy shores, although isolated rocky headlands occur within 500 m to the north and south of the proposed shore crossing at the Yzerfontein beach. Sandy beaches are one of the most dynamic coastal environments. With the exception of a few beaches in large bay systems, the beaches along the South African west coast are typically highly exposed. Exposed sandy shores consist of coupled surf-zone, beach and dune systems, which together form the active littoral sand transport zone. The composition of their faunal communities is largely dependent on the interaction of wave energy, beach slope and sand particle size, which is termed beach morphodynamics. Three morphodynamic beach types are described: dissipative, reflective and intermediate beaches (McLachlan *et al.* 1993). Generally, dissipative beaches are relatively wide and flat with fine sands and low wave energy, and usually harbour the richest intertidal faunal communities. According to the 2018 National Biodiversity Assessment, the beach at Yzerfontein is classified as dissipative. The landing site is characterised by a gently sloping beach of ~80 m width (Fugro 2020a).

NEARSHORE AND OFFSHORE UNCONSOLIDATED HABITATS

To date very few areas on the continental slope off the west coast have been biologically surveyed. Although sediment distribution studies suggest that the outer shelf is characterised by unconsolidated sediments, recent surveys conducted between 180 m and 480 m depth revealed high proportions of hard ground rather than unconsolidated sediment. A detailed description of currently known macro-infauna communities in areas on the continental shelf is provided in the marine ecology specialist report.

The invertebrate macrofauna are important in the marine benthic environment as they influence major ecological processes and serve as an important food source for commercially valuable fish species and other higher order consumers.

Also associated with soft-bottom substrates are demersal communities that comprise epifauna and bottom-dwelling vertebrate species, many of which are dependent on the invertebrate benthic macrofauna as a food source.

6.1.3.3 Rocky substrate habitats and biota

The biological communities of rocky intertidal and subtidal reefs are generally ubiquitous throughout the southern African west coast region, being particular only to wave exposure, turbulence and/or depth zone. A detailed description of these rocky substrate habitats and associated biota may be found in the marine specialist report, including intertidal rocky shores, rocky subtidal habitat and kelp beds, deep water coral communities and Vulnerable Marine Ecosystems.

It can be noted that the beach at Yzerfontein is sandy and intertidal rocky shores will not be encountered by the proposed marine cable. While the marine cable survey does indicate the presence of rock (boulders) within target burial depth offshore, no presence of coral reef was observed (Fugro, 2020b).

6.1.3.4 The Water Body

MARINE FAUNA

The marine environment off the south-Western coast of Africa with its nutrient rich waters supports large populations of pelagic[11], mid-water and demersal[12] fish species as well and high numbers of bird and mammalian predators. A comprehensive description is provided in the marine ecology report.

Fish species

Of particular relevance to the proposed 2AFRICA (West) Cable System (Yzerfontein landing) are the fish stocks occurring within the oceans surrounding the proposed cable route and the fishing industry which targets these fish species. Examples of commercially targeted species are listed below (Plate 12).

- Pelagic fish species
  - Pilchard (*Sardinops occelata*).
  - Anchovy (Family Engraulidae).
  - Snoek (*Thyrsites atun*).
  - Chub mackerel (*Scomber japonicus*).
  - Yellowtail (*Seriola lalandi/rivoliana*).
  - Tuna (numerous species).
- Demersal fish species
  - Hake (*Merluccius paradoxus/capensis*).
  - Kingklip (*Genypterus capensis).*
  - Monkfish (*Lophius americanus*).

Marine mammals

There are a several marine mammals which are known to occur on the west coast of South Africa and within the project area. Included in this area is the:

- **Cape fur seal** (*Arctocephalus pusillus pusillus*) (Plate 13) is the only species of seal resident along the west coast of Africa. There are a number of Cape fur seal colonies within the broader study area. All have important conservation value since they are largely undisturbed at present. Seals are highly mobile animals with a general foraging area covering the continental shelf up to 120 Nm offshore with bulls ranging further out to sea than females. The timing of the annual breeding cycle is very regular, occurring between November and January.

11 Pelagic species live and feed in the water column.
12 Demersal fish are those that live and feed on or near the seabed.

	**Hake**
	**Pilchard**
	**Cape Snoek**
	**Kingklip**

Plate 12 Some of the commercially targeted fish species on the west coast of South Africa

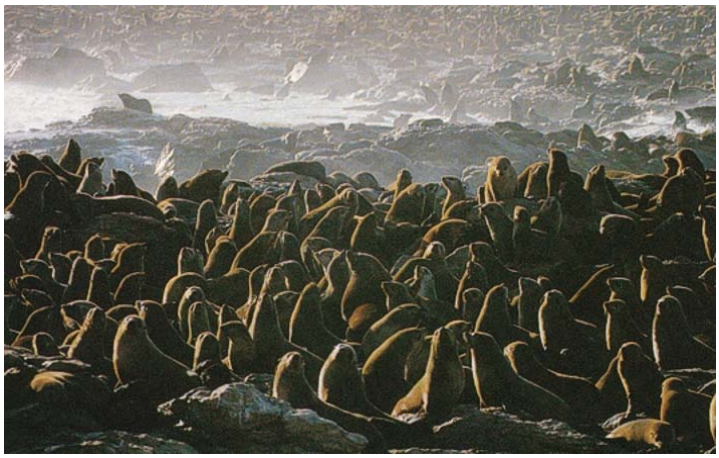


Plate 13 Colony of Cape fur seals *Arctocephalus pusillus*

- **Cetacean species (whales and dolphins**). Thirty-five species of whales and dolphins are known or likely to occur off the southern African coast. The area between St Helena Bay (~32° S, 18° E) and Cape Agulhas (~34° S, 20° E) is an area of transition between Atlantic and Indian Ocean species, as well as those more commonly associated with colder waters of the west coast (e.g. dusky dolphins and long finned pilot whales) and those of the warmer east coast (e.g. striped and Risso's dolphins). The cable route lies within and offshore of this transition zone, and the warmer waters that occur there provide an entirely different habitat, that despite the relatively high latitude may host some

species associated with the more tropical and temperate parts of the Atlantic. Table lists the cetaceans likely to be found within the greater project area. Seasonality differs between species. Table 7 illustrates the seasonality of some of the whales most likely to be encountered in the impact zone and Plate 14 shows some of the large cetaceans occurring along the southern African west coast.

Humpback whale

Killer Whale

Bryde's Whale

Plate 14 Cetacean species known to occur on the West coast of southern Africa

Table 6: Cetaceans occurrence off the west coast of South Africa, their seasonality, likely encounter frequency with proposed cable installation activities and South African Red List conservation status (Child et al. 2016).

Common Name	Species	Shelf	Offshore	Seasonality	IUCN Conservation Status
Delphinids (14 spp)					
Dusky dolphin	*Lagenorhynchus obscurus*	Yes (0- 800 m)	No	Year round	Data Deficient
Heaviside's dolphin	*Cephalorhynchus heavisidii*	Yes (0-200 m)	No	Year round	Least Concern
Common bottlenose dolphin	*Tursiops truncatus*	Yes	Yes	Year round	Least Concern
Common dolphin	*Delphinus delphis*	Yes	Yes	Year round	Least Concern
Southern right whale dolphin	*Lissodelphis peronii*	Yes	Yes	Year round	Least Concern
Striped dolphin	*Stenella coeruleoalba*	No	?	?	Least Concern
Pantropical spotted dolphin	*Stenella attenuata*	Edge	Yes	Year round	Least Concern
Long-finned pilot whale	*Globicephala melas*	Edge	Yes	Year round	Least Concern
Short-finned pilot whale	*Globicephala macrorhynchus*	?	?	?	Least Concern
Rough-toothed dolphin	*Steno bredanensis*	?	?	?	Least Concern
Killer whale	*Orcinus orca*	Occasional	Yes	Year round	Least Concern
False killer whale	*Pseudorca crassidens*	Occasional	Yes	Year round	Least Concern
Pygmy killer whale	*Feresa attenuata*	?	Yes	?	Least Concern
Risso's dolphin	*Grampus griseus*	Yes (edge)	Yes	?	Least Concern
Sperm whales (3 spp)					
Pygmy sperm whale	*Kogia breviceps*	Edge	Yes	Year round	Data Deficient
Dwarf sperm whale	*Kogia sima*	Edge	?	?	Data Deficient
Sperm whale	*Physeter macrocephalus*	Edge	Yes	Year round	Vulnerable

Common Name	Species	Shelf	Offshore	Seasonality	IUCN Conservation Status
Beaked whales (8 spp)					
Cuvier's	*Ziphius cavirostris*	No	Yes	Year round	Least Concern
Arnoux's	*Beradius arnouxii*	No	Yes	Year round	Data Deficient
Shepherd's	*Tasmacetus sheperdi*	No	Yes	Year Round	Not Assessed
Southern bottlenose	*Hyperoodon planifrons*	No	Yes	Year round	Least Concern
Layard's	*Mesoplodon layardii*	No	Yes	Year round	Data Deficient
True's	*M. mirus*	No	Yes	Year round	Data Deficient
Gray's	*M. grayi*	No	Yes	Year round	Data Deficient
Blainville's	*M. densirostris*	No	Yes	Year round	Data Deficient
Baleen whales (10.5 spp)					
Antarctic Minke	*Balaenoptera bonaerensis*	Yes	Yes	>Winter	Least Concern
Dwarf minke	*B. acutorostrata*	Yes	Yes	Year round	Least Concern
Fin whale	*B. physalus*	Yes	Yes	MJJ & ON, rarely in summer	Endangered
Blue whale (Antarctic)	*B. musculus intermedia*	No	Yes	?	Critically Endangered
Sei whale	*B. borealis*	Yes	Yes	MJ & ASO	Endangered
Bryde's (offshore)	*B. brydei*	Yes	Yes	Summer (JF)	Data Deficient
Bryde's (inshore)	*B brydei (subspp)*	Yes	Yes	Year round	Vulnerable
Pygmy right	*Caperea marginata*	Yes	?	Year round	Least Concern
Humpback sp.	*Megaptera novaeangliae*	Yes	Yes	Year round, higher in SONDJF	Least Concern
Humpback B2 population	*Megaptera novaeangliae*	Yes	Yes	Spring Summer peak ONDJF	Vulnerable
Southern right	*Eubalaena australis*	Yes	No	Year round, higher in SONDJF	Least Concern

Table 7: Seasonality of baleen whales in the impact zone based on data from multiple sources, predominantly commercial catches (Best 2007 and other sources) and data from stranding events (NDP unpubl data). Values of high (H), Medium (M) and Low (L) of the particular species within each month are relative within each row (species) and not comparable between species.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bryde's Inshore	L	L	L	L	L	L	L	L	L	L	L	L
Bryde's Offshore	**H**	**H**	**H**	L	L	L	L	L	L	L	L	L
Sei	L	L	L	L	**H**	**H**	L	**H**	**H**	**H**	L	L
Fin	M	M	M	**H**	**H**	**H**	M	**H**	**H**	**H**	M	M
Blue	L	L	L	L	L	**H**	**H**	**H**	L	M	L	L
Minke	M	M	M	**H**	**H**	**H**	M	**H**	**H**	**H**	M	M
Humpback	M	M	L	L	L	**H**	**H**	M	M	L	M	**H**
Southern Right	**H**	M	L	**L**	L	**H**	**H**	**H**	**M**	**M**	**H**	**H**
Pygmy right	**H**	**H**	**H**	M	L	L	L	L	L	L	M	M

Seabirds and shorebirds

Large numbers of coastal and pelagic seabirds exploit the pelagic fish stocks of the Benguela system. Fourteen species of seabirds breed in southern Africa; viz. Cape Gannet , African Penguin, four species of Cormorant, White Pelican, three Gull and four Tern species (see Plate 15 and Table 8Table 8). The breeding areas are distributed around the coast with islands being especially important. Breeding islands within the project area are Bird Island at Lambert's Bay, the Saldanha Bay islands, Dassen Island off Yzerfontein and Robben Island in Table Bay.

Shore birds likely to be encountered in the area of the proposed 2AFRICA (West) Cable System (Yzerfontein landing) shore crossings include the African Black Oystercatcher *Haematopus moquini*. As the southern African population is estimated at only between 5,000 and 6,000 individuals, the species has been listed as 'near threatened' on the IUCN red data list. The breeding success of African Black Oystercatcher is particularly susceptible to disturbance from off-road vehicles and coastal developments as they nest and breed on beaches between the Eastern Cape and southern Namibia.

Table 8: Breeding resident seabirds present along the west coast (CCA and CMS 2001).

Common name	Species name	National Assessment	Global IUCN Status
African Penguin	*Spheniscus demersus*	Endangered	Endangered
Great Cormorant	*Phalacrocorax carbo*	Least Concern	Least Concern
Cape Cormorant	*Phalacrocorax capensis*	Endangered	Endangered
Bank Cormorant	*Phalacrocorax neglectus*	Endangered	Endangered
Crowned Cormorant	*Phalacrocorax coronatus*	Near Threatened	Near Threatened
White Pelican	*Pelecanus onocrotalus*	Vulnerable	Least Concern
Cape Gannet	*Morus capensis*	Endangered	Endangered
Kelp Gull	*Larus dominicanus*	Least Concern	Least Concern
Greyheaded Gull	*Larus cirrocephalus*	Least Concern	Least Concern
Hartlaub's Gull	*Larus hartlaubii*	Least Concern	Least Concern
Caspian Tern	*Hydroprogne caspia*	Vulnerable	Least Concern
Swift Tern	*Sterna bergii*	Least Concern	Least Concern
Roseate Tern	*Sterna dougallii*	Endangered	Least Concern
Damara Tern	*Sterna balaenarum*	Critically Endangered	Vulnerable

Cape Cormorant

Jackass Penguin

Cape Gannet

Plate 15 Commonly encountered marine bird species off the west coast of South Africa

Turtles

Three species of turtle occur along the west coast, namely the Leatherback (*Dermochelys coriacea*), and occasionally the Loggerhead (*Caretta caretta*) and the Green (*Chelonia mydas*) turtle. Loggerhead and Green turtles are expected to occur only as occasional visitors along the west coast. The Leatherback is the only turtle likely to be encountered in the offshore waters of western South Africa. The Benguela ecosystem, especially the northern Benguela where jelly fish numbers are high, is increasingly being recognized as a potentially important feeding area for leatherback turtles.

Leatherback Turtles are listed as “Vulnerable” worldwide by the IUCN and are in the highest categories in terms of need for conservation in CITES (Convention on International Trade in Endangered Species), and CMS (Convention on Migratory Species). Loggerhead turtles are globally listed as “Vulnerable”, whereas Green turtles are globally listed as “Endangered”. As a signatory of CMS, South Africa has endorsed and signed a CMS International Memorandum of Understanding specific to the conservation of marine turtles. South Africa is thus committed to conserve these species at an international level.

6.1.4 Marine Protected Areas and marine areas of conservation significance

Numerous areas of conservation significance exist along the coastline of the Western Cape, onshore and offshore, affording protection to the marine ecosystems and biota. Those relevant to the proposed 2AFRICA (West) Cable System (Yzerfontein landing) are discussed in the sections below.

6.1.4.1 Biodiversity Priority Areas as per the National Coastal and Marine Spatial Biodiversity Plan

The 2018 National Biodiversity Assessment, with its updated ecosystem maps and assessments, provided an opportunity for the first National Coastal and Marine Critical Biodiversity Areas (CBA) to be developed as described in the National Coastal and Marine Spatial Biodiversity Plan (Version 1, Beta 2) (Harris, L.R., Sink, K.J., Holness, S.D., Kirkman, S.P., Driver, A. 2020). The CBA map aims to consolidate several past and present spatial assessment and planning initiatives to provide a coherent map of the coastal and marine biodiversity priority areas in South Africa that require focused management measures to support sustainable development of the blue economy. These initiatives include: the most recent classification, mapping and assessment of coastal and marine biodiversity in South Africa; previous and new work to support MPA expansion; identification, revised delineation and proposed management of Ecologically or Biologically Significant Marine Areas (EBSAs; MARISMA Project 2020); and other spatial prioritisations done at local, provincial or other sub-national scales.

Figure 14 shows part of the CBA map and indicates that while the proposed 2AFRICA (West) Cable System (Yzerfontein landing) cable route avoids MPAs, it does pass through CBA1, CBA2 and Ecological Support Areas (ESAs).

CBA 1 indicates irreplaceable or near-irreplaceable sites that are required to meet biodiversity targets with limited, if any, option to meet targets elsewhere, whereas CBA 2 indicates optimal sites that generally can be adjusted to meet targets in other areas. ESAs represent EBSAs outside of MPAs and not already selected as CBAs. The management objectives for these CBA and ESA categories is shown in Table 9 below.

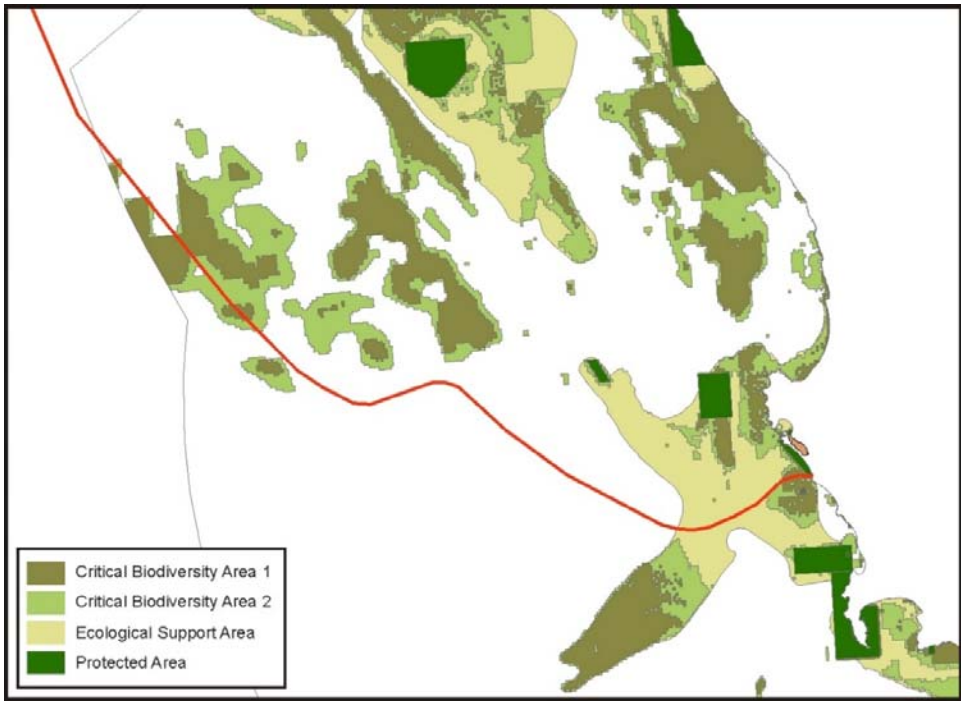


Figure 14 The proposed 2AFRICA (West) Cable System (Yzerfontein landing) (red line) in relation to the National Coastal and Marine Critical Biodiversity Areas (version 1.0 (Beta 2)) (adapted from Harris et al. (2020)).

Table 9: Definitions of biodiversity priority areas, including the management objective of each category (adapted from SANBI 2017). (CBA= Critical Biodiversity Area; ESA= Ecological Support Area).

Category	Definition	Broad management objective
Protected Areas	Protected areas declared or recognised in the National Environmental Management: Protected Areas Act (No. 57 of 2003)	As per each Protected Area Management Plan
CBA 1	Irreplaceable or near-irreplaceable sites where there are no other options to represent the features they contain in the planning area. Ideally these sites are natural or near-natural, but exceptions can be made if the only sites where a feature exists are degraded.	Must be kept in a natural or near-natural state
CBA 2	Sites that are the best option available for representing the features in a spatial prioritisation. Ideally these sites are natural or near-natural, but exceptions can be made if the only sites where a feature exists are degraded.	
ESA 1	Sites that are not CBAs but are still important for meeting targets for biodiversity and ecological processes. These sites must be in natural, near-natural or moderately modified ecological condition.	Must be kept in at least a functional state (ideally at least in a moderately modified ecological condition)
ESA 2	Sites that are not CBAs but are still important for meeting targets for biodiversity and ecological processes. These sites are generally in severely modified ecological condition.	

The National Coastal and Marine Spatial Biodiversity Plan further proposes a list of sea use activities under various proposed Marine Spatial Planning (MSP) Zones, in accordance with their compatibility with MPAs, CBAs and ESA's. Under the present draft National Coastal and Marine Spatial Biodiversity Plan (Version 1, Beta 2), undersea cables are proposed under a MSP Zone named "Underwater Infrastructure" and may be conditionally allowed in CBA areas and considered compatible in ESA's. These proposals are considered draft and still under discussion.

6.1.4.2 Marine Protected Areas

Figure 15 shows the location of MPAs on the west coast, in relation to the proposed 2AFRICA (West) Cable System (Yzerfontein landing). The cable passes between the Cape Canyon MPA and Robben Island MPA, described briefly below.

- The **Cape Canyon** is a deep and dramatic submarine canyon carved into the continental shelf and extending to a maximum depth of 3,600 m. It protects a rich diversity of marine life on the soft canyon floor. Rocky areas in the west of the canyon support fragile rocky habitat, but the area also includes sandy and muddy habitats. Interaction of nutrient-rich bottom water with a complex seascape results in upwelling, which in turn provides productive surface waters in which seabirds, humpback whales and Cape fur seals feed. **Note that the marine cable alignment of the 2AFRICA (West) Cable System (Yzerfontein landing) passes through an Impact management between Cape Canyon and Robben Island MPAs.**

- The **Robben Island MPA** protects surrounding kelp forests - one of the few areas that still supports viable stocks of abalone. This island harbours the 3rd largest penguin colony, and holds the largest numbers of breeding Bank Cormorant in the Western Cape and significant populations of Crowned Cormorant, African Black Oystercatcher, Hartlaub's Gull and Swift Tern.

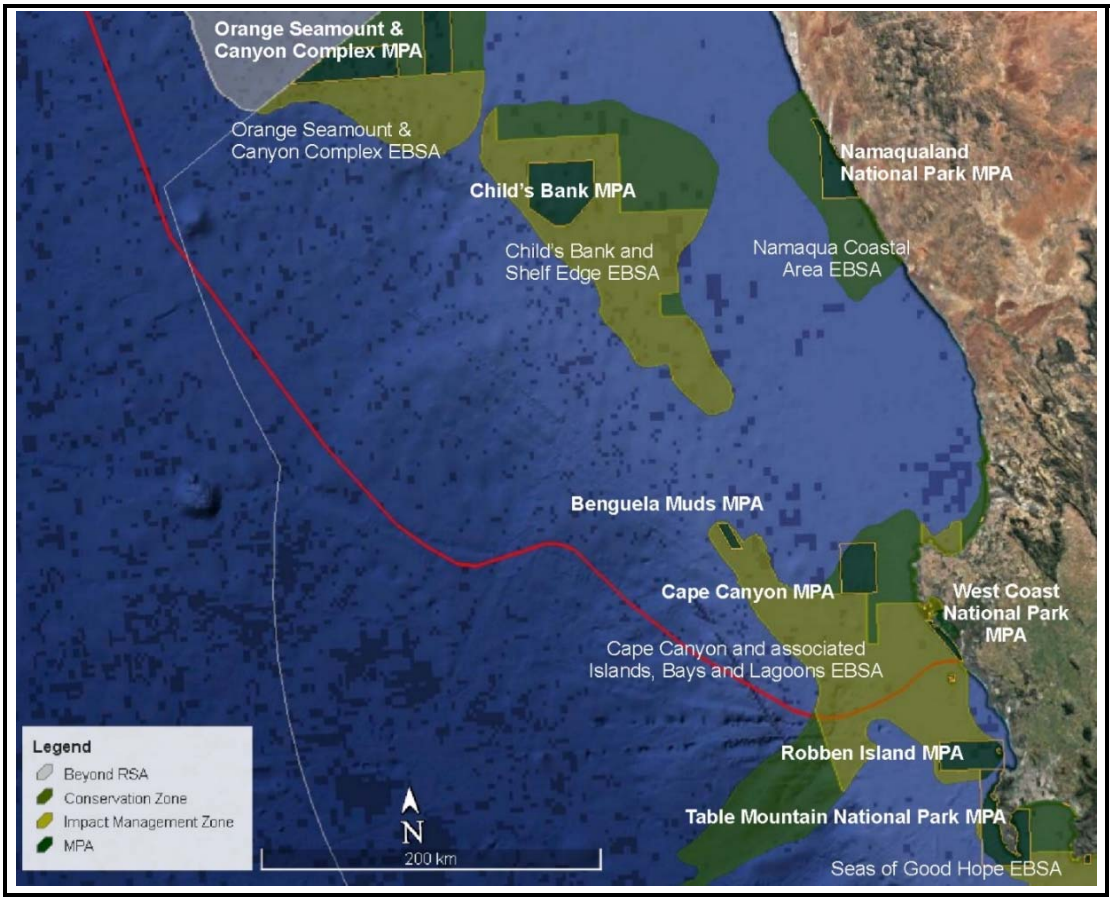


Figure 15: Conservation areas and Marine Protected Areas on the west coast, in relation to the proposed 2AFRICA (West) Cable System (Yzerfontein landing)

6.1.4.3 Ecologically or Biologically Significant Areas (EBSAs)

Figure 15 shows the location of EBSAs on the west coast, in relation to the proposed 2AFRICA (West) Cable System (Yzerfontein landing). Together with MPAs, EBSAs represent a network of sites that are important for biodiversity and contribute towards including connectivity in the CBA Map. They also encompass areas that are important for ecological processes. As shown in Figure 15, the proposed 2AFRICA(West) Cable System (Yzerfontein landing) alignment passes through the Cape Canyon and Associated Islands, Bays and Lagoons EBSA (Impact Management Zone).

Under the current Marine Spatial Management and Governance (MARISMA) Programme (MARISMA 2014-2020), South Africa has revised its EBSAs and is preparing management recommendations for each one. It is proposed that EBSAs comprise two zones, a Biodiversity Conservation Zone and an Environmental Impact Management Zone, with recommendations for management per zone. There is alignment in the management objectives of CBAs and the Biodiversity Conservation Zone, and of ESAs and the Environmental Impact Management Zone. Therefore, the National Coastal and Marine CBA map has been adopted as the tool by which South Africa's EBSAs are zoned for recommended inclusion in the national Marine Spatial Planning processes. This careful and deliberate alignment of the National Coastal and

Marine CBA Map and the EBSA zones is important for identifying a single, coherent portfolio of coastal and marine biodiversity priorities.

The management objective in the zones marked for 'Conservation' is "*strict place-based biodiversity protection aimed at securing key biodiversity features in a natural or semi-natural state, or as near to this state as possible*". The management objective in the zones marked for 'Impact Management' is "*management of impacts on key biodiversity features in a mixed-use area to keep key biodiversity features in at least a functional state*" (https://cmr.mandela.ac.za/EBSA-Portal/South-Africa/SA-EBSA-Status-Assessment-Management). Activities within these two zones can be placed into one of four different Marine Spatial Planning (MSP) categories depending on their compatibility with the EBSA features and management objective of that zone.

6.1.4.4 Important Bird Areas (IBAs)

Important Bird Areas (IBA) in the general project area include Lower Berg River wetlands and the West Coast National Park and Saldanha Bay Islands, Dassen and Robben Islands, Rietvlei Wetland and False Bay Nature Reserve. Various marine IBAs have also been proposed in South African territorial waters. The proposed 2AFRICA(West) Cable System (Yzerfontein landing) alignment passes through the proposed Bird Island / Dassen Island / Heuningnes river and estuary system / Lower Berg river wetlands – Marine IBA (**Error! Reference source not found.**).

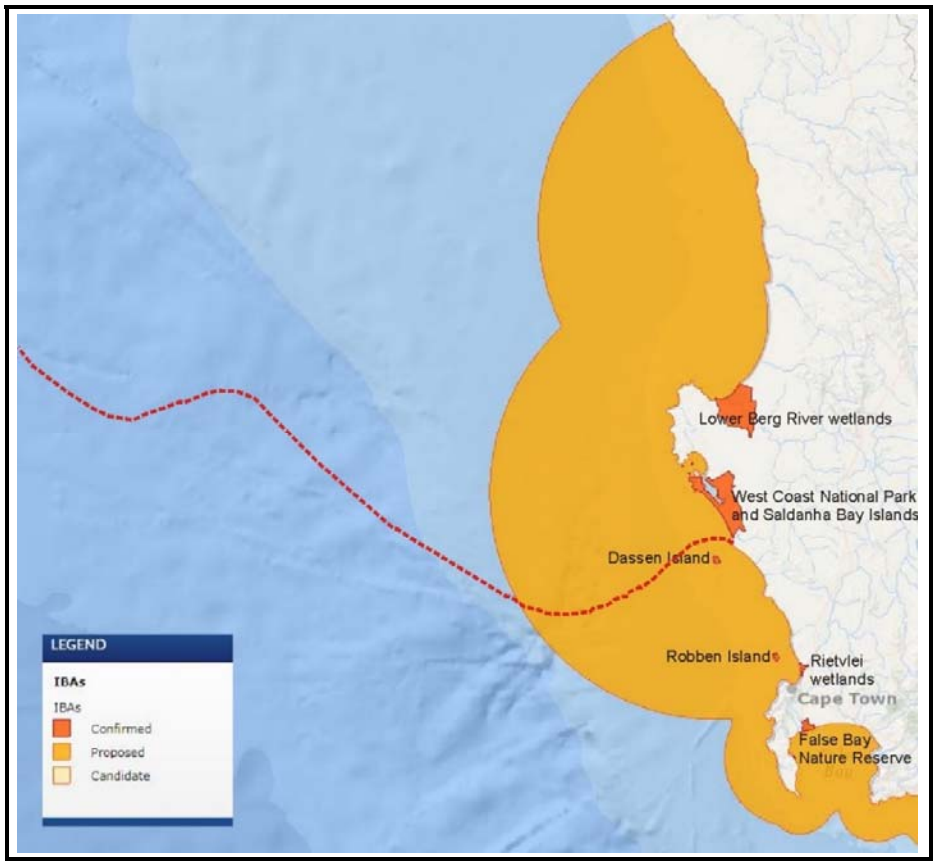


Figure 16 The 2AFRICA(West) Cable System (Yzerfontein landing) in relation to coastal and marine IBAs

6.1.5 Offshore fishing industry

The South African offshore commercial fishing industry is an important contributor to the economy, with the wholesale value of production in 2017 estimated at almost R9.8 billion. The primary fisheries in terms of highest economic value are the demersal (bottom) trawl and long-line fisheries targeting the Cape hakes (*Merluccius paradoxus* and *M. capensis*). Secondary species include a large assemblage of demersal fish of which monkfish (*Lophius vomerinus*), kingklip (*Genypterus capensis*) and snoek (*Thyrsites atun*) are the most commercially important.

6.1.5.1 Demersal Trawl

The demersal trawl fishery comprises an offshore and inshore fleet.The wholesale value of catch landed by the inshore and offshore demersal trawl sectors, combined, during 2017 was R3.9 billion, or 40.5% of the total value of all fisheries combined.

The offshore fishery is comprised of 45 vessels operating from most major harbours on both the West and South Coasts. On the West and South-West Coasts, these grounds extend in a continuous band along the shelf edge between the 200 m and 1,000 m bathymetric contours although most effort is in the >300 m to 600 m depth range. Trawl nets are generally towed parallel to the depth contours (thereby maintaining a relatively constant depth) in a north-westerly or south-easterly direction. Trawlers also target fish aggregations around bathymetric features, in particular seamounts and canyons, where there is an increase in seafloor slope and in these cases the direction of trawls follow the depth contours. The deep-sea sector is prohibited from operating in waters shallower than 110 m or within five Nm of the coastline.

The inshore fishery consists of 31 vessels, which operate on the South Coast mainly from the harbours of Mossel Bay and Port Elizabeth. Inshore grounds are located on the Agulhas Bank and extend towards the Great Kei River in the east. Vessels also target sole close inshore between Struisbaai and Mossel Bay, between the 50 m and 80 m isobaths. Hake is targeted further offshore in traditional grounds between 100 m and 200 m depth in fishing grounds known as the Blues located on the Agulhas Bank.

The activity of the fishery is restricted by permit condition to operating within the confines of a historical “footprint” – an area of approximately 57 300 km2 and 17 000 km2 for the offshore and inshore fleets, respectively. Figure 17 shows an overview of the spatial distribution of demersal trawling activity in relation to the proposed cable route within the EEZ.

Figure 18 shows the demersal trawling activity in the vicinity of the proposed 2AFRICA (West) Cable System (Yzerfontein landing). The proposed cable route traverses into shallower waters just south of the submarine feature referred to as Cape Canyon. Demersal trawling takes place across the cable route alignment at a depth range of 200 m to 700 m. Within this area, the fishery operates continuously throughout the year.

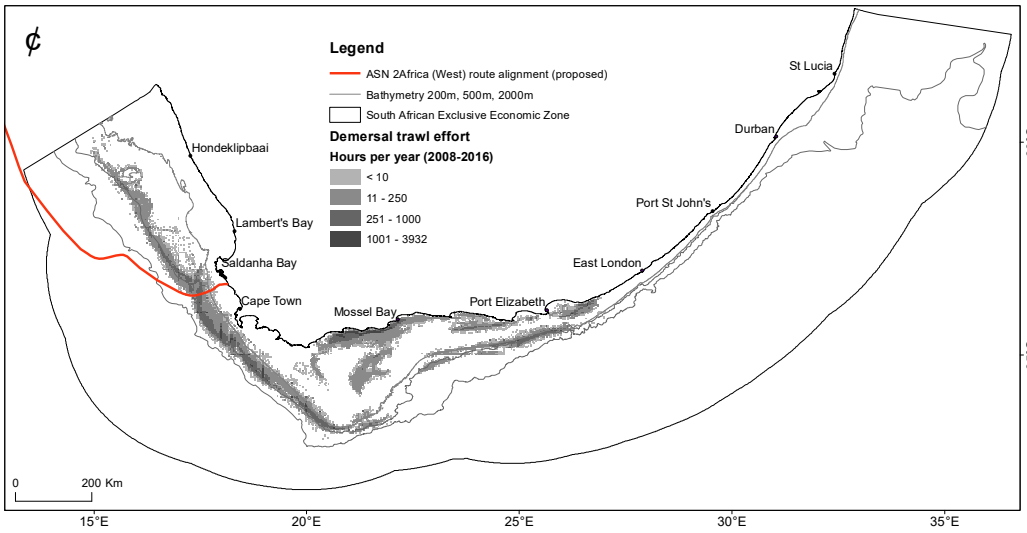


Figure 17 Overview of the spatial distribution of fishing effort expended by the demersal trawl sector within the South African EEZ and in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein. (*Source - Capmarine, 2021*).

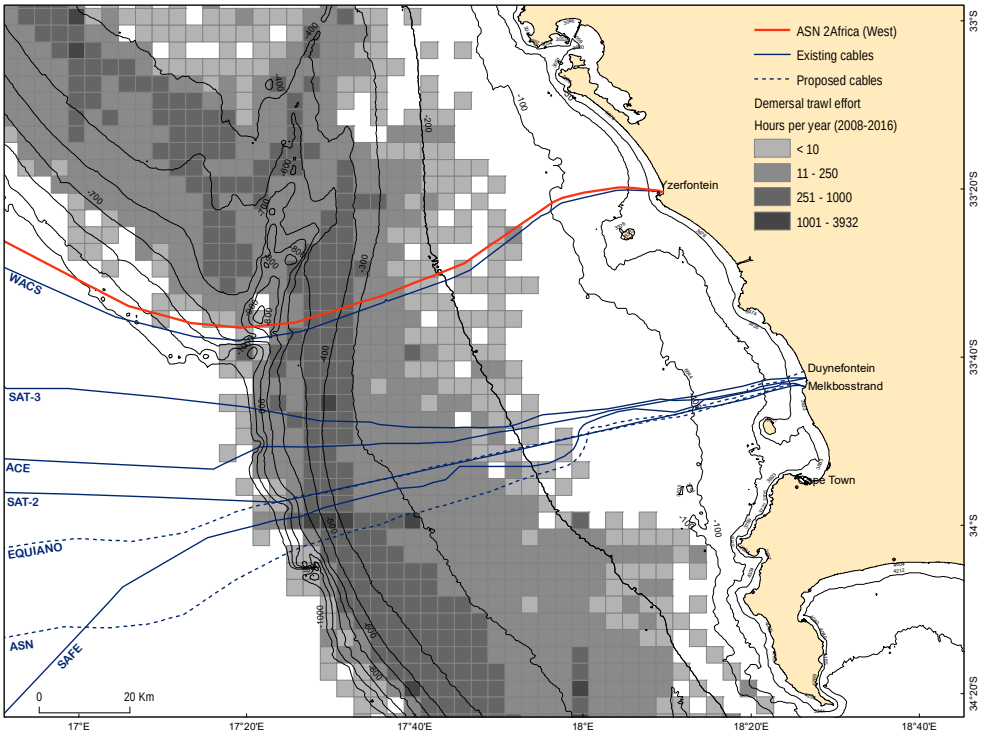


Figure 18 Spatial distribution of fishing effort expended by the demersal trawl sector in relation to the proposed 2AFRICA (West) Cable System (Yzerfontein landing). Existing submarine cables in the area are also shown. (*Source - Capmarine, 2021*).

6.1.5.2 Mid-Water Trawl

This sector includes 6 vessels and 34 rights holders which target adult horse mackerel (*Trachurus capensis*) of which a total catch of 19,555 tons were landed in 2019. Mid-water trawl is defined as any net which can be dragged by a fishing vessel along any depth between the seabed and the surface of the sea without continuously touching the bottom. In practice, mid-water trawl gear does occasionally come into contact with the seafloor. Mid-water trawling gear configuration is similar to that of demersal trawlers, except that the net is manoeuvred vertically through the water column.

The fishery operates predominantly on the edge of the Agulhas Bank, where shoals are found in commercial abundance. Figure 19 shows the spatial extent of grounds fished by mid-water trawlers within the EEZ and Figure 20 shows effort expended in relation to the proposed Yzerfontein cable routing. The fishery operates continuously throughout the year, with no clear seasonality. A 500 m exclusion zone around the cable route would cover 25 km^2 (0.15%) of midwater trawl fishing ground.

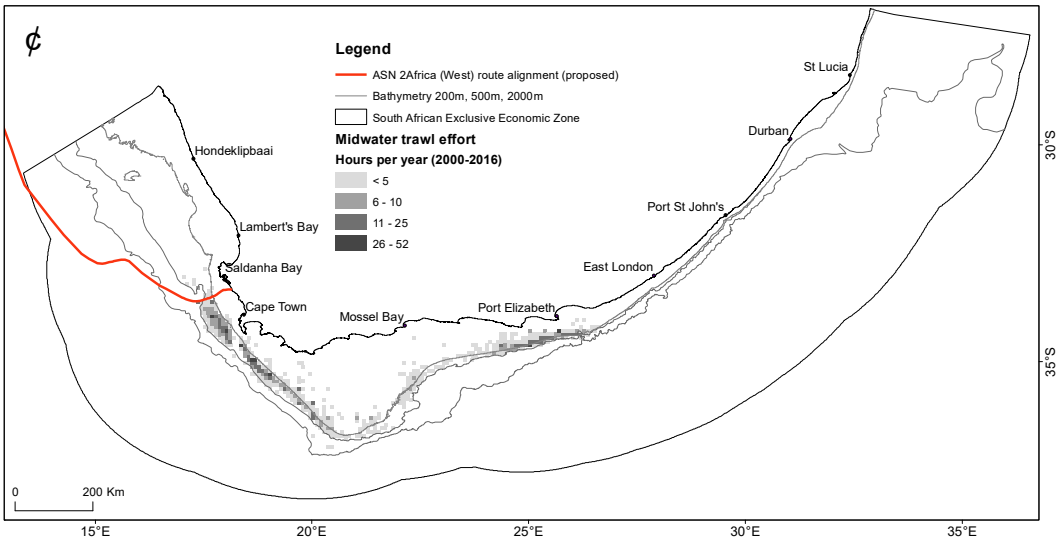


Figure 19 Overview of the spatial distribution of fishing effort expended by the mid-water trawl sector targeting horse mackerel within the South African EEZ and in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein. (*Source - Capmarine, 2021*)

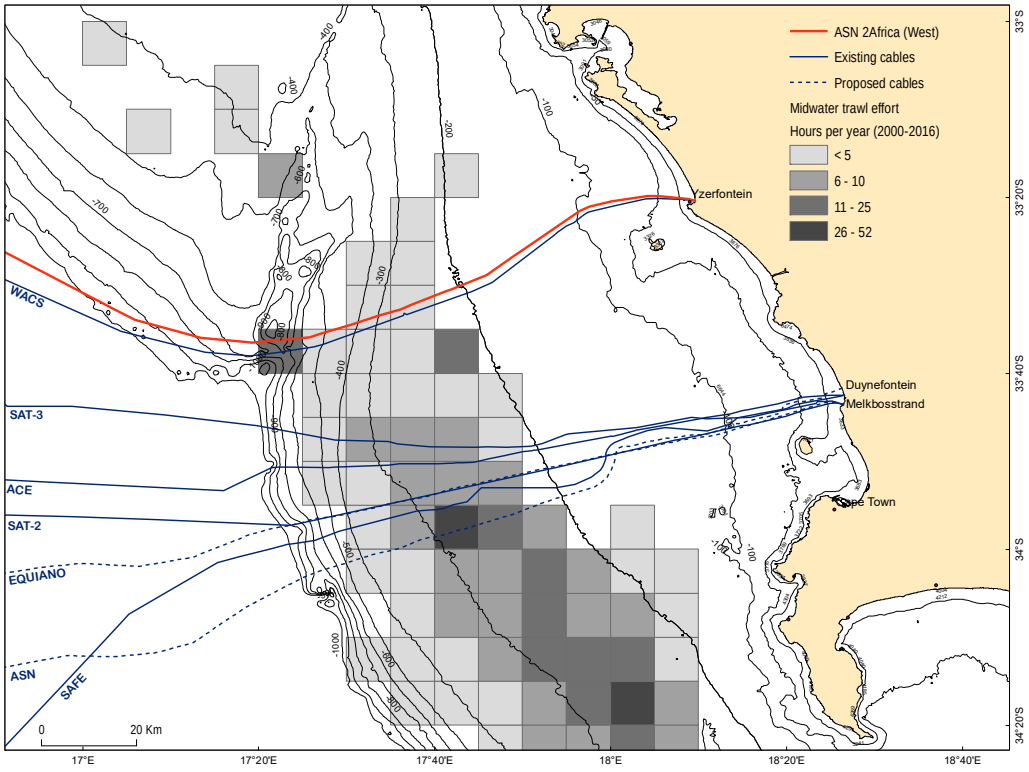


Figure 20 Spatial distribution of fishing effort expended by the mid-water trawl sector in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein. Effort is shown as the number of fishing hours at a gridded resolution of 5x 5 minutes (resolution of approximately 85 km^2). (*Source - Capmarine, 2021*)

6.1.5.3 Demersal Longline

Like the demersal trawl fishery, the target species of the longline fishery is the Cape hakes, with a small non-targeted commercial by-catch that includes kingklip. In 2017, 8,113 tons of catch was landed with a wholesale value of R319.2 Million, or 3.2% of the total value of all fisheries combined. Landings of 8,230 tons were reported in 2018. A demersal longline vessel may deploy either a double or single line which is weighted along its length to keep it close to the seafloor.

Currently 64 hake-directed vessels are active within the fishery, most of which operate from the harbours of Cape Town and Hout Bay. Fishing grounds are similar to those targeted by the hake-directed trawl fleet. The hake longline footprint extends down the west coast from approximately 150 km offshore of Port Nolloth (15°E, 29°S). It lies inshore to the south of St Helena Bay moving offshore once again as it skirts the Agulhas Bank to the south of the country (21°E, 37°S). Along the South Coast the footprint moves inshore again towards Mossel Bay. The eastern extent of the footprint lies at approximately (26°E, 34.5°S). Lines are set parallel to bathymetric contours, along the shelf edge up to the 1,000 m depth contour in places. The more patchy nature of effort in the north western extents of the footprint and the eastern edge of the Agulhas Bank may be attributed to proximity to fishing harbours.

Figure 21 shows the spatial extent of demersal longline grounds within the South African EEZ and Figure 22 shows the amount of fishing effort in relation to existing cables and the proposed

2AFRICA (West) Cable System (Yzerfontein landing) Demersal longline activity may occur across the proposed routing at a seafloor depth range of 150 m to 1,000 m.

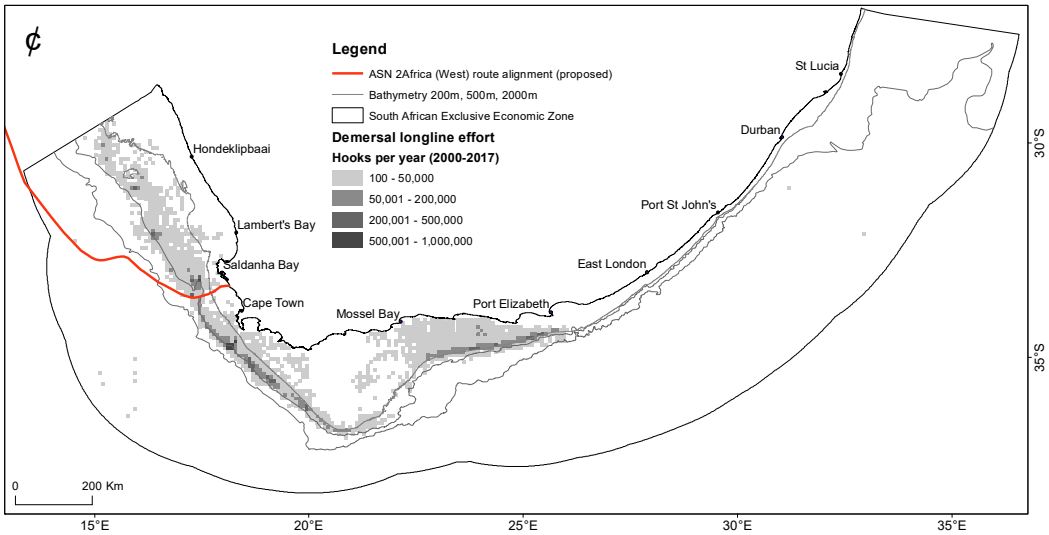


Figure 21 An overview of the spatial distribution of fishing effort expended within the South African EEZ by the demersal longline sector and in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein. (*Source - Capmarine, 2021*).

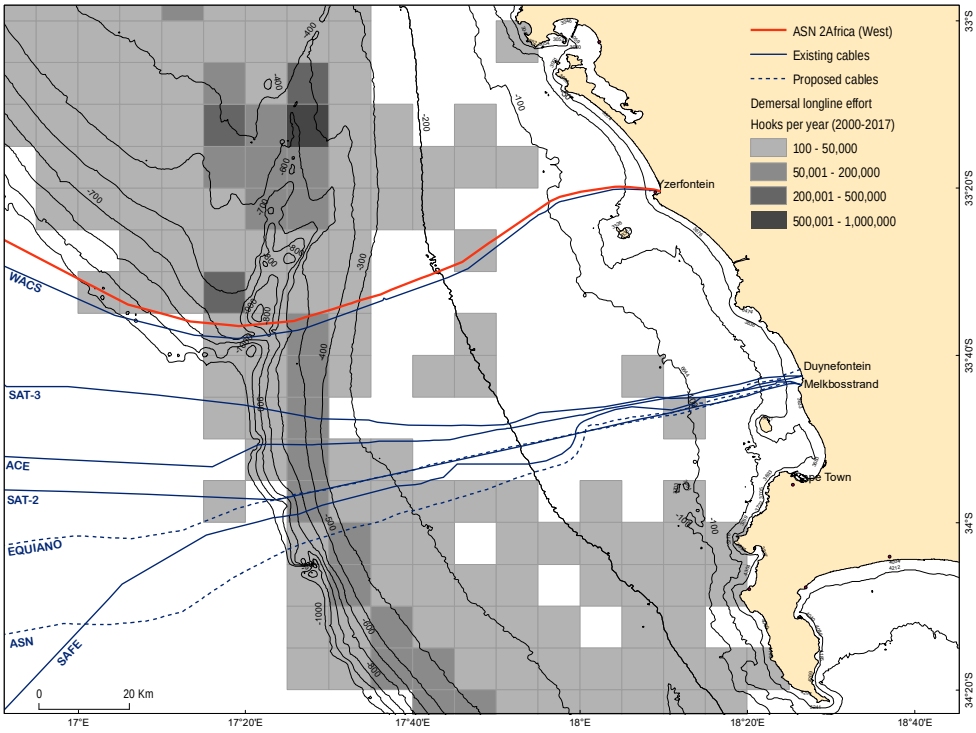


Figure 22 Spatial distribution of fishing effort expended by the longline sector targeting demersal fish species in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein. Effort is shown as the number of hooks set at a gridded resolution of 5x 5 minutes (each grid block covers an area of approximately 85 km^2). (*Source - Capmarine, 2021*).

6.1.5.4 Small Pelagic Purse-Seine

The pelagic-directed purse-seine fishery targeting pilchard (*Sardinops sagax)*, anchovy (*Engraulis encrasicolus*) and red-eye round herring (*Etrumeus whitheadi*) is the largest South African fishery by volume (tons landed) and the second most important in terms of economic value. The targeted species are surface-shoaling and once a shoal has been located the vessel will steam around it and encircle it with a large net, extending to a depth of 60 m to 90 m. It is important to note that after the net is deployed, the vessel has no ability to manoeuvre until the net has been fully recovered on board and this may take up to 1.5 hours. The majority of the fleet operate from St Helena Bay, Laaiplek, Saldanha Bay and Hout Bay with fewer vessels operating on the South Coast from the harbours of Gansbaai, Mossel Bay and Port Elizabeth.

Figure 23 shows the spatial extent of fishing grounds within the South African EEZ and Figure 24 shows fishing grounds in relation to the proposed cable route landing at Yzerfontein.

Fishing activity may occur across the proposed routing at a seafloor depth range of up to 1,000 m; however, the majority of fishing effort is centred inshore of the 100 m depth contour. The proposed cable routing passes through eight commercial fisheries grid blocks, the combined landings recorded within these blocks amounted to 2.9% of the total landings recorded by the fishery and 2.6% of the overall effort expended by the fishery.

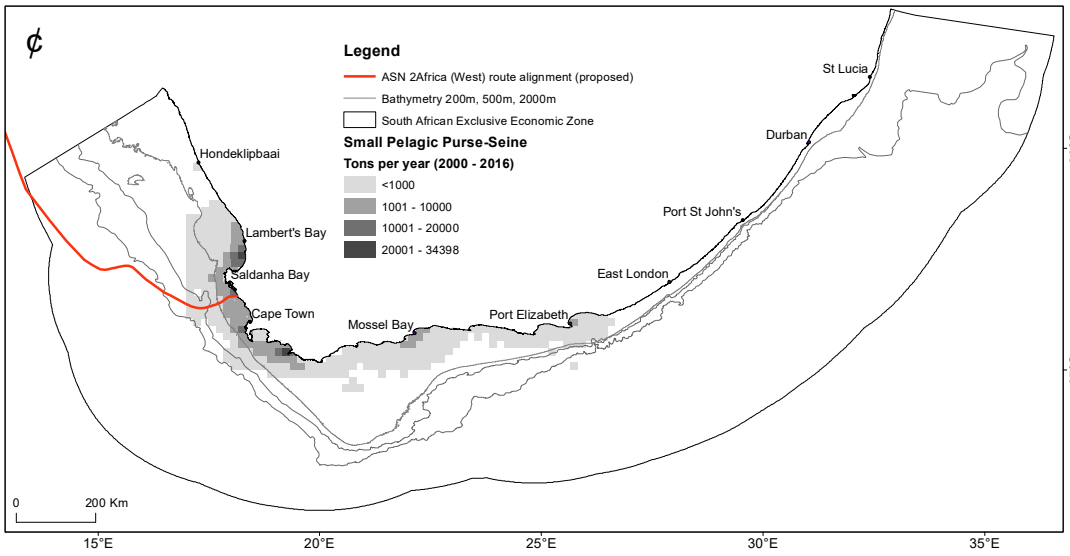


Figure 23 An overview of the spatial distribution of catch reported by the purse-seine sector targeting small pelagic species in the South African EEZ and in relation to the proposed 2AFRICA (West) cable system landing at Yzerfontein. (*Source - Capmarine, 2021*).

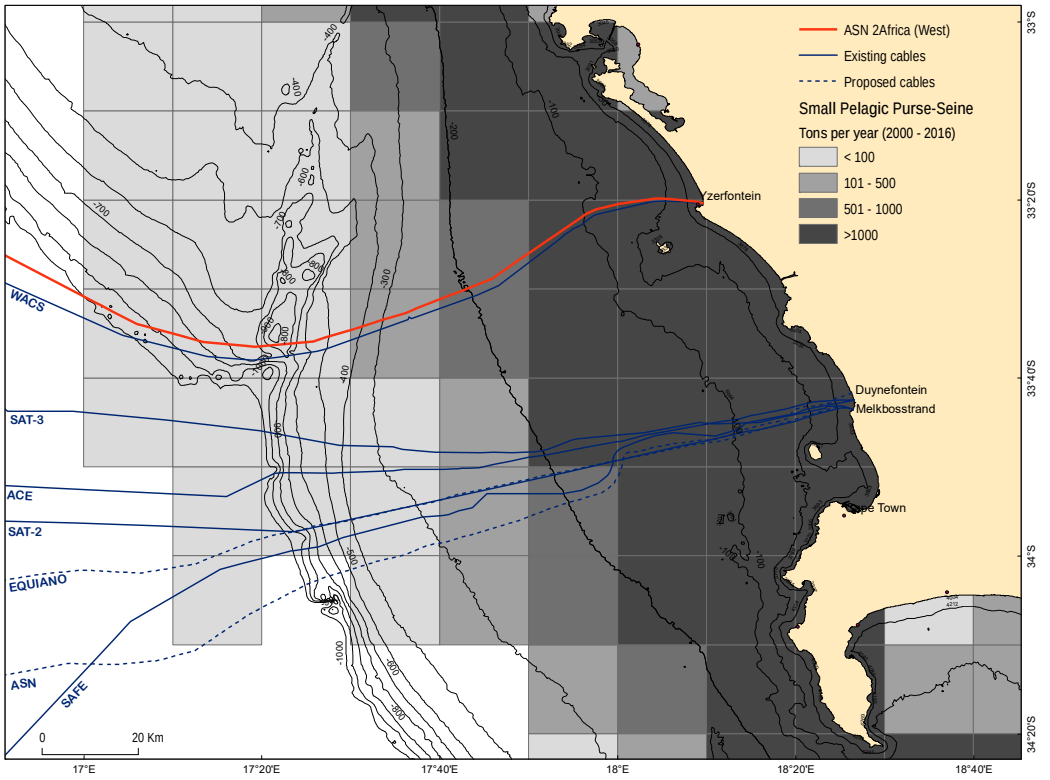


Figure 24 Spatial distribution of catch landed by the purse-seine sector targeting small pelagic species in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein. Catch is shown in tons per year at a gridded resolution of 10x 10 minutes. (*Source - Capmarine, 2021*).

6.1.5.5 Large Pelagic Longline

Highly migratory tuna and tuna-like species are caught on the high seas and seasonally within the South African EEZ by the pelagic longline and pole fisheries. Targeted species include albacore (*Thunnus alalunga*), bigeye tuna (*T. obesus*), yellowfin tuna (*T. albacares*) and swordfish (*Xiphias gladius*). The total number of active long-line vessels within South African waters is 22, 18 of which fished in the Atlantic (West of 20°E) during 2017. These were exclusively domestic vessels, with three Japanese vessels fishing exclusively in the Indian Ocean (East of 20°E) during 2017 (DAFF, 2018). Gear consists of monofilament mainlines of between 25 km and 100 km in length which are suspended from surface buoys and marked at each end. As gear floats close to the water surface it would present a potential obstruction to surface navigation as well as a snagging risk to the gear array towed by the seismic survey vessel. Lines are usually set at night, and may be left drifting for a considerable length of time before retrieval, which is done by means of a powered hauler at a speed of approximately one knot. During hauling, vessel manoeuvrability is severely restricted. In the event of an emergency, the line may be dropped and hauled in at a later stage.

The fishery operates extensively within the South African EEZ, primarily along the continental shelf break and further offshore. Fishing effort within the South African EEZ and in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein is shown in Figure 25 and Figure 26 respectively.

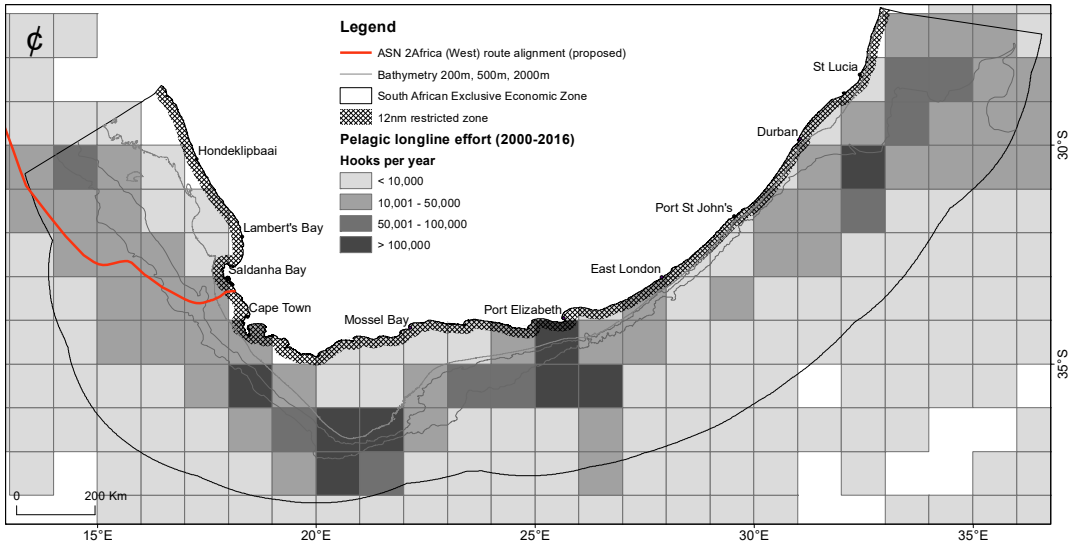


Figure 25 An overview of the spatial distribution of fishing effort expended by the longline sector targeting large pelagic fish species in the South African EEZ and in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein. Effort is shown at a 1° grid resolution (60 x 60 nautical minutes). (*Source - Capmarine, 2021*).

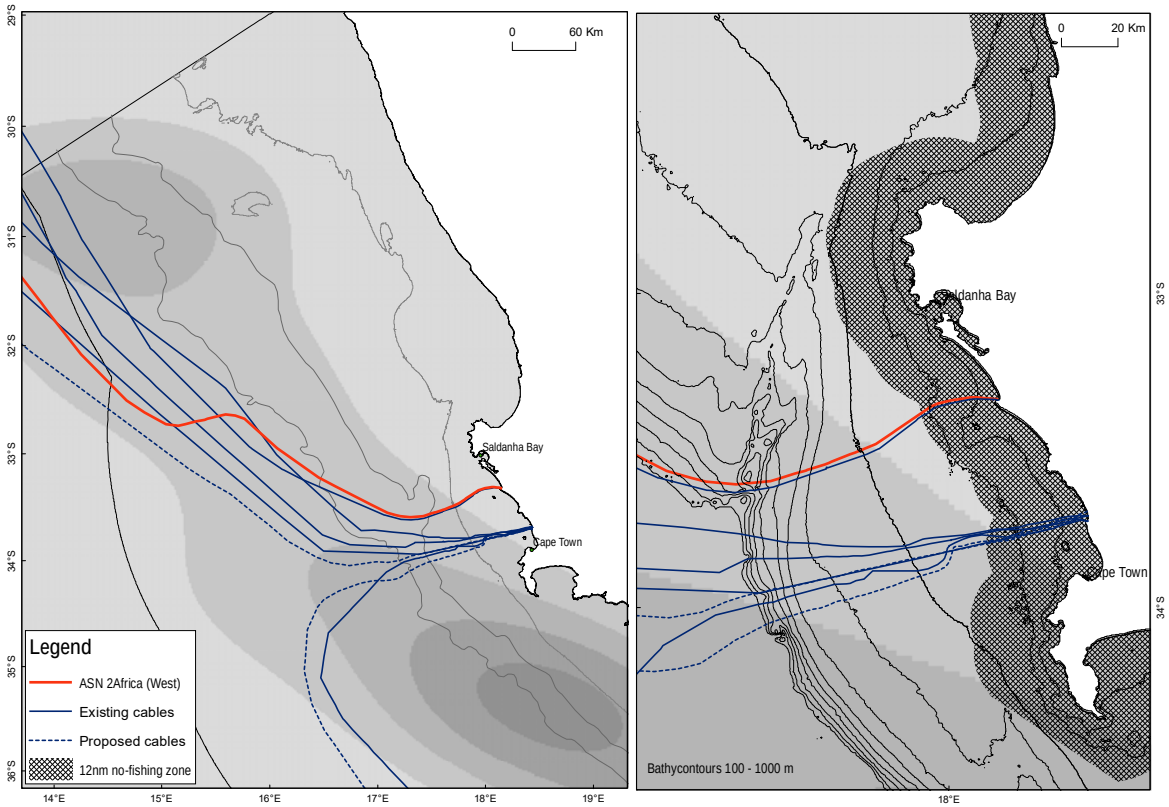


Figure 26 Spatial distribution of fishing effort expended by the long-line sector targeting large pelagic fish species in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein. Effort is shown on a relative scale (Note: a 12 Nm coastal exclusion to fishing). (*Source - Capmarine, 2021*).

6.1.5.6 Tuna Pole

Poling for tuna is predominantly based on the southern Atlantic longfin tuna stock also referred to as albacore (*T. alalunga*). Other catch species include yellowfin tuna, bigeye tuna, skipjack tuna (*Katsuwonus pelamis*), snoek and yellowtail. The active fleet consists of approximately 92 pole-and-line vessels (also referred to as "baitboat"), which are based at the ports of Cape Town, Hout Bay and Saldanha Bay. Vessels normally operate within a 100 Nm radius of these locations with effort concentrated in the Cape Canyon area (South-West of Cape Point), and up the West Coast to the Namibian border with South Africa. Tuna swimming near the surface are caught with hand-held fishing poles.The nature of the fishery and communication between vessels often results in a large number of vessels operating in close proximity to each other at a time. The vessels fish predominantly during daylight hours and are highly manoeuvrable. However, at night in fair weather conditions the fleet of vessels may drift or deploy drogues to remain within an area and would be less responsive during these periods.

Fishing activity occurs along the entire West Coast beyond the 200 m bathymetric contour. Activity would be expected to occur along the shelf break with favoured fishing grounds including areas north of Cape Columbine and between 60 km and 120 km offshore from Saldanha Bay. Figure 27 shows the extent of fishing on the within the South African EEZ and Figure 28 shows the tuna pole catch between 2007 and 2016 in the vicinity of the proposed 2AFRICA (West) Cable System (Yzerfontein landing).

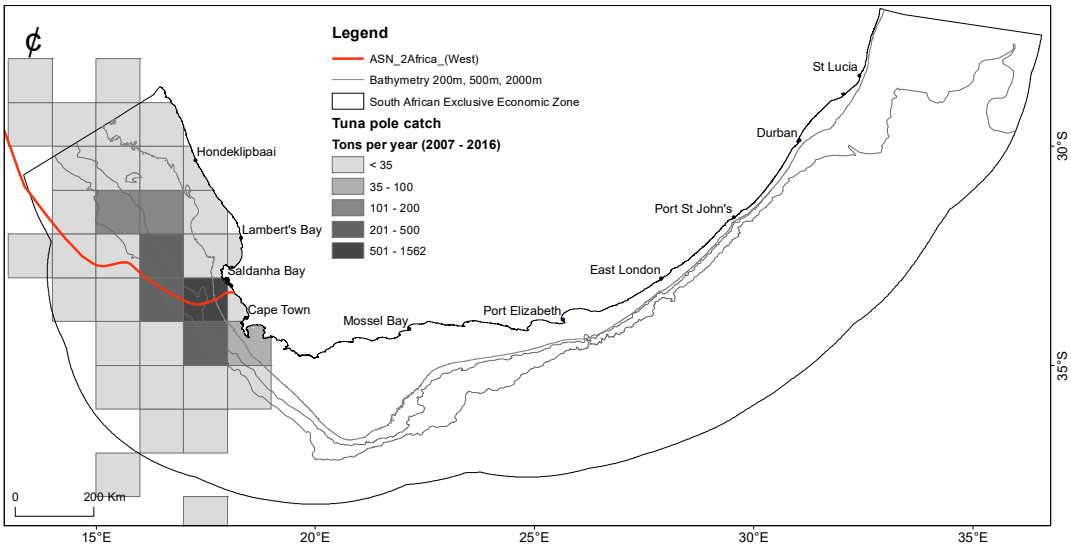


Figure 27 An overview of the spatial distribution of fishing effort expended by tuna pole sector targeting large pelagic fish species in the South African EEZ and in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein. (*Source - Capmarine, 2021*).

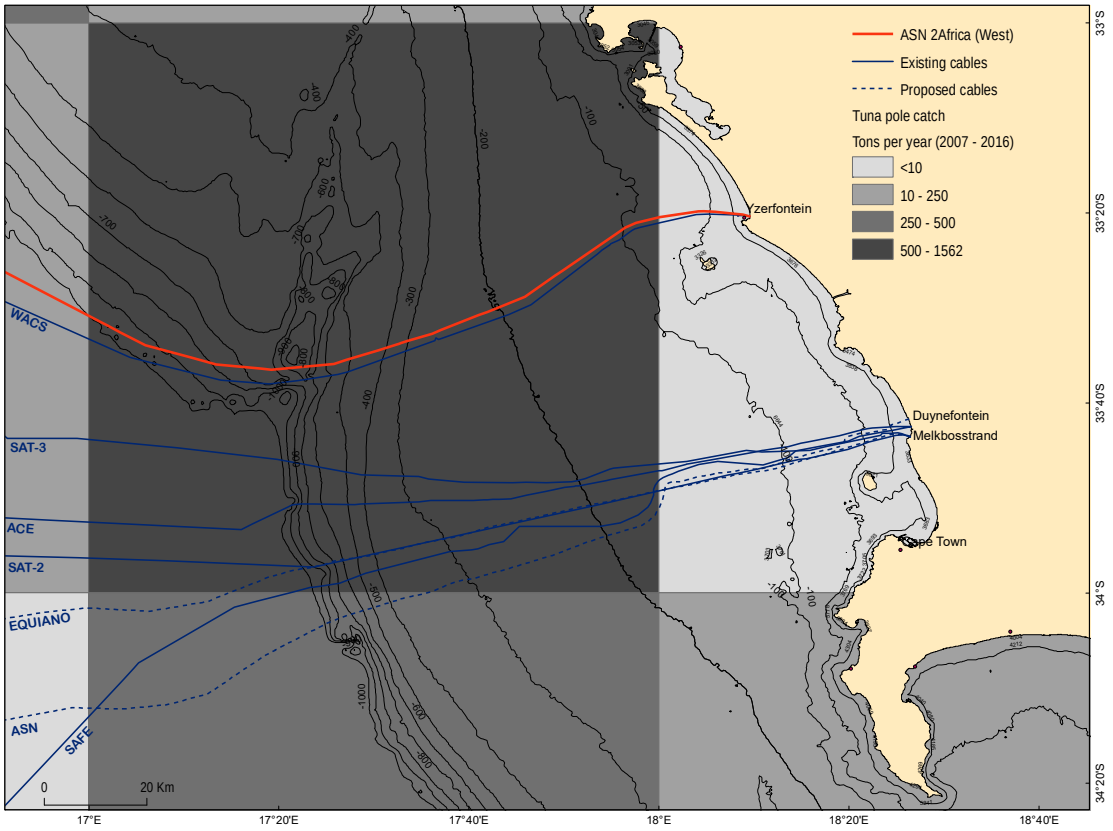


Figure 28 An overview of the spatial distribution of catch landed by the tuna pole sector targeting large pelagic fish species in the South African EEZ and in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein. (*Source - Capmarine, 2021*).

6.1.5.7 Traditional Linefish

The traditional line fishery is the country's third most important fishery in terms of tonnage landed and economic value. It is a long-standing, nearshore fishery based on a large assemblage of different species using hook and line, but excludes the use of longlines. Within the Western Cape the predominant catch species is snoek (*Thyrsites atun*) while other species such as Cape bream (hottentot) (*Pachymetopon blochii)*, geelbek (*Atractoscion aequidens)*, kob (*Argyrosomus japonicus)* and yellowtail (*Seriola lalandi)* are also important. The traditional line fishery is a boat-based activity and has since December 2000 consisted of 3450 crew operating from 455 commercial vessels. DEFF proposed an increase in the apportionment of TAE to small-scale fishing from 13% to 50% commencing in 2021 in order to boost economic possibilities for coastal communities.

Crew use hand line or rod-and-reel to target approximately 200 species of marine fish along the full 3 000 km coastline, of which 50 species may be regarded as economically important. Most of the catch (up to 95%) is landed by the Cape commercial fishery, which operates on the continental shelf from the Namibian border on the West Coast to the Kei River in the Eastern Cape. Figure 29 shows the spatial extent of traditional linefish grounds at a national scale and Figure 30 shows linefish catch in relation to the proposed cable routing at Yzerfontein.

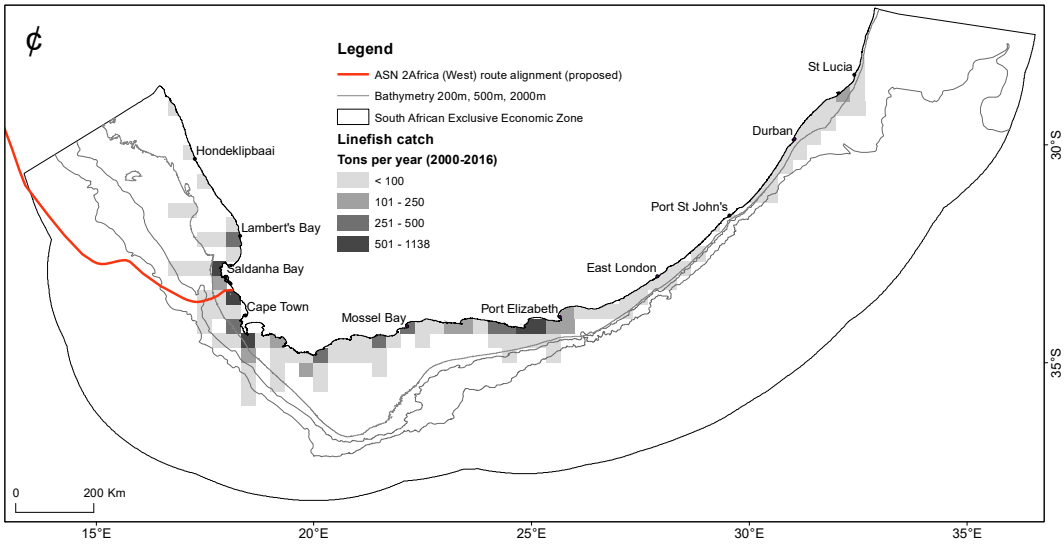


Figure 29 An overview of the spatial distribution of catch taken by the line-fish sector in the South African EEZ and in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein. (*Source - Capmarine, 2021*).

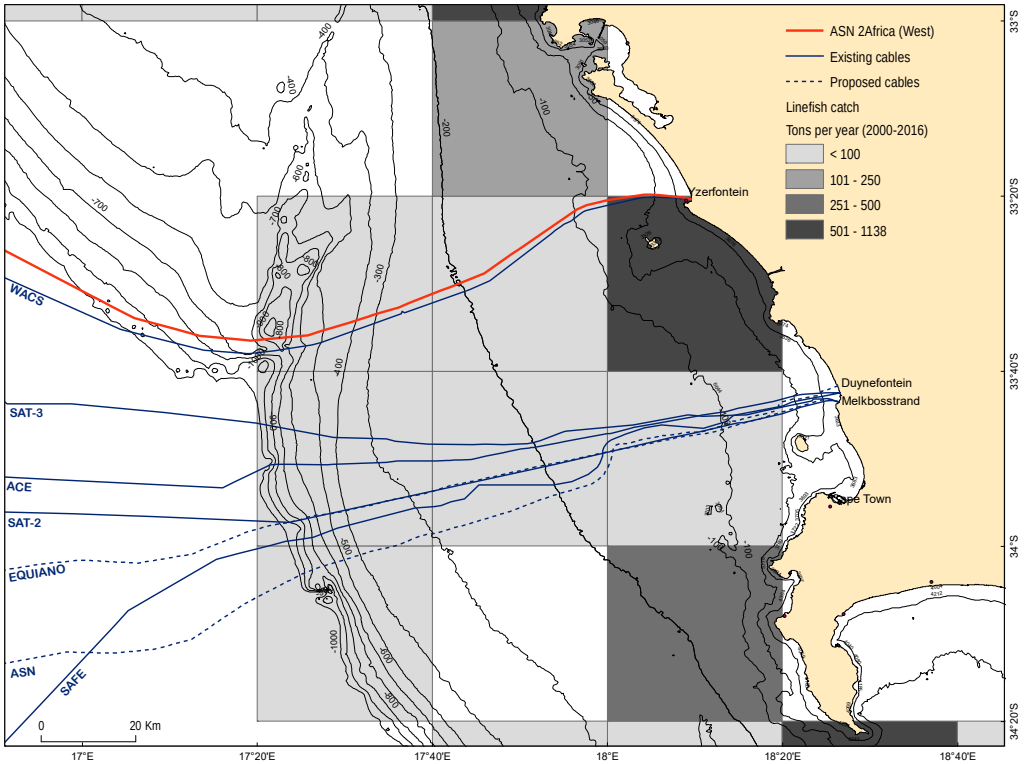


Figure 60 Spatial distribution of catch by the linefish sector in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein. Data is shown as tons per year at a gridded resolution of 20x20 minutes). (*Source - Capmarine, 2021*).

6.1.5.8 West Coast Rock Lobster

The West Coast rock lobster *Jasus lalandii* is a valuable resource of the South African West Coast and consequently an important income source for West Coast fishermen. The resource occurs inside the 200 m depth contour along the West Coast from Namibia to East London on the East Coast of South Africa. The fishery is composed of four sub-sectors – commercial nearshore, commercial offshore, small-scale and recreational fishing, all of which have to share from the same global Total Allowable Catch (TAC). The offshore sector is comprised of trap boats that operate at a depth range of approximately 30 m to 100 m and the nearshore sector makes use of hoopnets to a maximum fishing depth of about 30 m. Fishing grounds stretch from the Orange River mouth to east of Cape Hangklip in the South-Eastern Cape. The offshore sector makes use of traps consisting of rectangular metal frames covered by netting, which are deployed from trap boats, whilst the inshore fishery makes use of hoop nets deployed from small dinghies. Traps are set at dusk and retrieved during the early morning.

Figure 31 shows rock lobster catch by management zone for the commercial offshore sector between 2006 and 2016, in relation to the proposed 2AFRICA (West) Cable System (Yzerfontein landing). The proposed cable routing crosses management area 6 (Saldahna Bay) subarea 2 (Abrahamskraal – Vondeling) and management area 7 (Dassen Island) subarea 1 (Dassen). The combined catch and effort within these areas amounted to 22.6% and 25.3% of the total catch and effort figures reported on a national scale. Although the cable passes through these management areas, fishing gear is likely to be set around Dassen Island which is situated approximately 8 km to the south of the proposed cable routing and fishing activity is unlikely to be disrupted along the exclusion route.

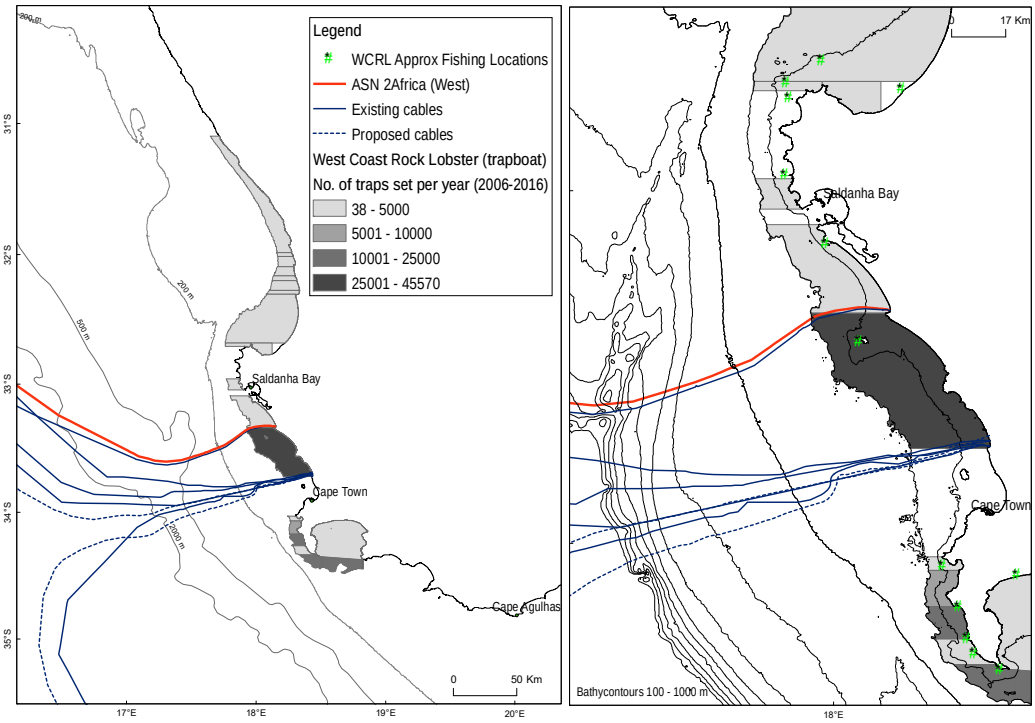


Figure 61 An overview of the spatial distribution of traps set by the West Coast rock lobster trapboat fishery in the South African EEZ and in relation to the proposed 2AFRICA (West) Cable System (Yzerfontein landing). (*Source - Capmarine, 2021*).

6.1.5.9 Small-Scale Fisheries

The term small-scale is usually used to distinguish between capital intensive commercial fisheries and low technology, labour intensive fishing activities (Sowman, 2006). Small-scale fishers fish to meet food and basic livelihood needs, and may also directly be involved in fishing for commercial purposes. These fishers traditionally operate on nearshore fishing grounds, using traditional, low technology or passive fishing gear to harvest marine living resources on a full-time, part-time or seasonal basis. Fishing trips are usually of short-duration and fishing/harvesting techniques are labour intensive[13].

Small-scale fishers are an integral part of the rural and coastal communities in which they reside, and this is reflected in the socio-economic profile of such communities. In the Eastern Cape, KwaZulu-Natal and the Northern Cape, small scale fishers live predominantly in rural areas while those in the Western Cape live mainly in urban areas. A small-scale fishing right is the right to catch different species of fish in the near shore. These rights are allocated to communities and not to individuals. More than 270 communities have registered an Expression of Interest with the Department. The location of these coastal communities and the number of fishers per community are shown in Figure 32.

Approximately 10,000 small-scale fishers have been identified around the whole coast, 16 of which are registered at the Yzerfontein fishing community. The small scale fishery rights cover the nearshore area (defined in section 19 of the MLRA as being within close proximity of shoreline). These in reality are unlikely to extend beyond 3 nm from the coast.

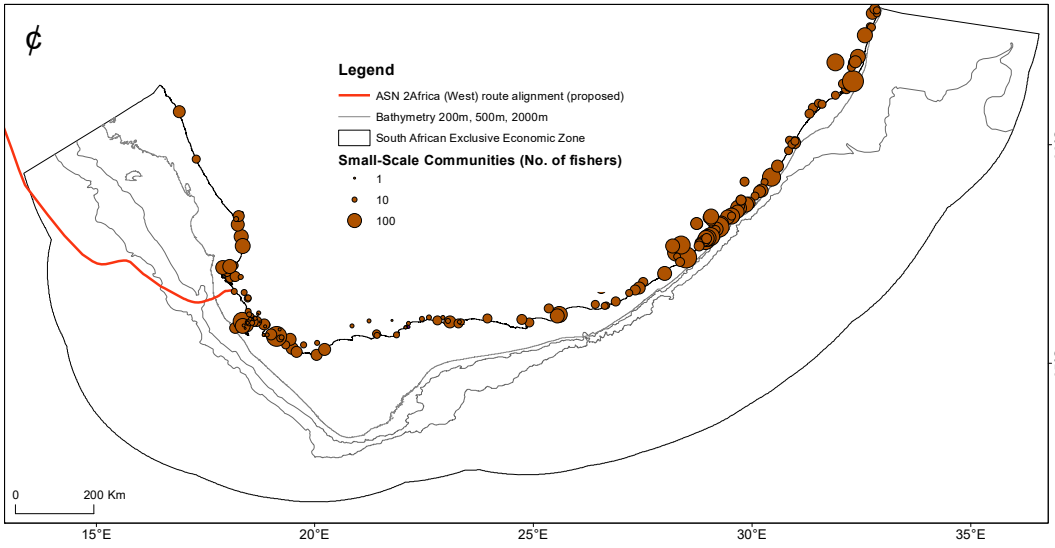


Figure 62 Overview of spatial distribution of small-scale fishing communities and number of participants per community along the South African coastline and in relation the proposed cable route. (*Source - Capmarine, 2021*).

13 The equipment used by small scale fishers includes rowing boats in some areas, motorized boats on the south and west coast and simple fishing gear including hands, feet, screw drivers, hand lines, prawn pumps, rods with reels, gaffs, hoop nets, gill nets, seine/trek nets and semi-permanently fixed kraal traps.

6.1.5.10 Summary of seasonality of catches for commercial fishing sectors

The seasonality of each of the main commercial fishing sectors that operate within the South Africa EEZ is indicated in Table 10. Also presented is the relative intensity of fishing effort on a month-by-month basis.

Table 10: Summary table showing seasonal variation in fishing effort expended by each of the main commercial fisheries sectors operating in West Coast South African waters.

Sector	Targeted Species	Fishing Intensity by Month within South African Exclusive Economic Zone (EEZ) H = high; M = Low to Moderate; N = None											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Demersal Trawl	Deepwater hake and shallow-water hake	H	H	H	H	H	H	H	H	H	H	H	H
Midwater Trawl	Horse mackerel	H	H	H	H	H	H	H	H	H	H	H	H
Demersal Longline	Shallow-water hake	M	M	M	H	H	H	H	H	H	H	H	H
Small Pelagic Purse-Seine	Anchovy, sardine, Red-eye round herring	M	H	H	H	H	H	H	H	H	H	H	M
Pelagic Longline	Yellowfin tuna, big eye tuna, Swordfish, southern bluefin	M	M	M	H	H	H	H	H	H	H	H	H
Tuna Pole	Albacore	H	H	H	H	H	M	M	M	M	M	H	H
Traditional Linefish	Snoek, Cape bream, geelbek, kob, yellowtail, Sparidae, Serranidae, etc	H	M	M	M	M	M	M	M	M	M	M	H
West Coast Rock Lobster	*Jasus lalandii*	M	M	M	M	M	M	M	M	M	N	M	M

6.1.6 Offshore mining and exploration concessions holders

Approximately 98% of South Africa's EEZ is subject to a right or lease for offshore oil and gas exploration or production[14]. The Petroleum Agency South Africa (PASA) is responsible for the 'promotion and regulation of offshore exploration and production' and maintains a national database of petroleum exploration and production. Over the past decade (since 2006) this database has shown a rapid increase in the application and grant of offshore rights and leases. The South African government has also actively promoted offshore oil and gas exploration through Operation Phakisa, which seeks to support the rapid development of the offshore oil and gas sector by "*creating an environment that promotes exploration*".

The following offshore lease areas are crossed by the marine cable, starting from the Namibian EEZ to the landing point on the West coast of South Africa at Yzerfontein (as shown in Figure 33):

- OK Energy
- Sezigyn
- Ricocure
- Anadarko PetroSA
- Rhino Oil (located in Territorial waters)

Concession holders have been notified of the proposed 2AFRICA (West) Cable System (Yzerfontein landing) during the environmental authorisation process.

6.1.7 Offshore marine telecommunications and marine pipelines infrastructure

Figure 34 shows the proposed 2AFRICA (West) Cable System (Yzerfontein landing) in relation to other existing cables. According to the marine survey report (Fugro, 2020b), the proposed 2AFRICA (West) Cable System (Yzerfontein landing) will cross 3 in service and 5 out of service and one planned cable. Telkom SA, as one of the operators of other marine telecommunication cable systems running on the same west coast route (SAT-3/WASC/SAFE and WACS), has an interest in the proposed 2AFRICA (West) Cable System (Yzerfontein landing) from an operational and risk perspective. MTN is a member of the International Cable Protection Committee (ICPC) and, as such, there are a number of guidelines and standards to abide by to ensure that new cable systems do not negatively impact on existing marine telecommunications systems. Therefore, MTN must abide by the conditions stipulated by the ICPC to ensure no negative impacts are experienced by existing marine cable operators. As per the recommendations of the ICPC, MTN will engage directly with all affected marine cable operators to reach a formal agreement with regards to the installation and operation of the 2AFRICA (West) Cable System to be landed at Yzerfontein.

According to Fugro, the proposed cable route landing at Yzerfontein crosses no pipelines.

14 https://www.seafoodsource.com/news/environment-sustainability/proposed-oil-exploration-raises-concerns-from-south-africa-s-fishing-industry

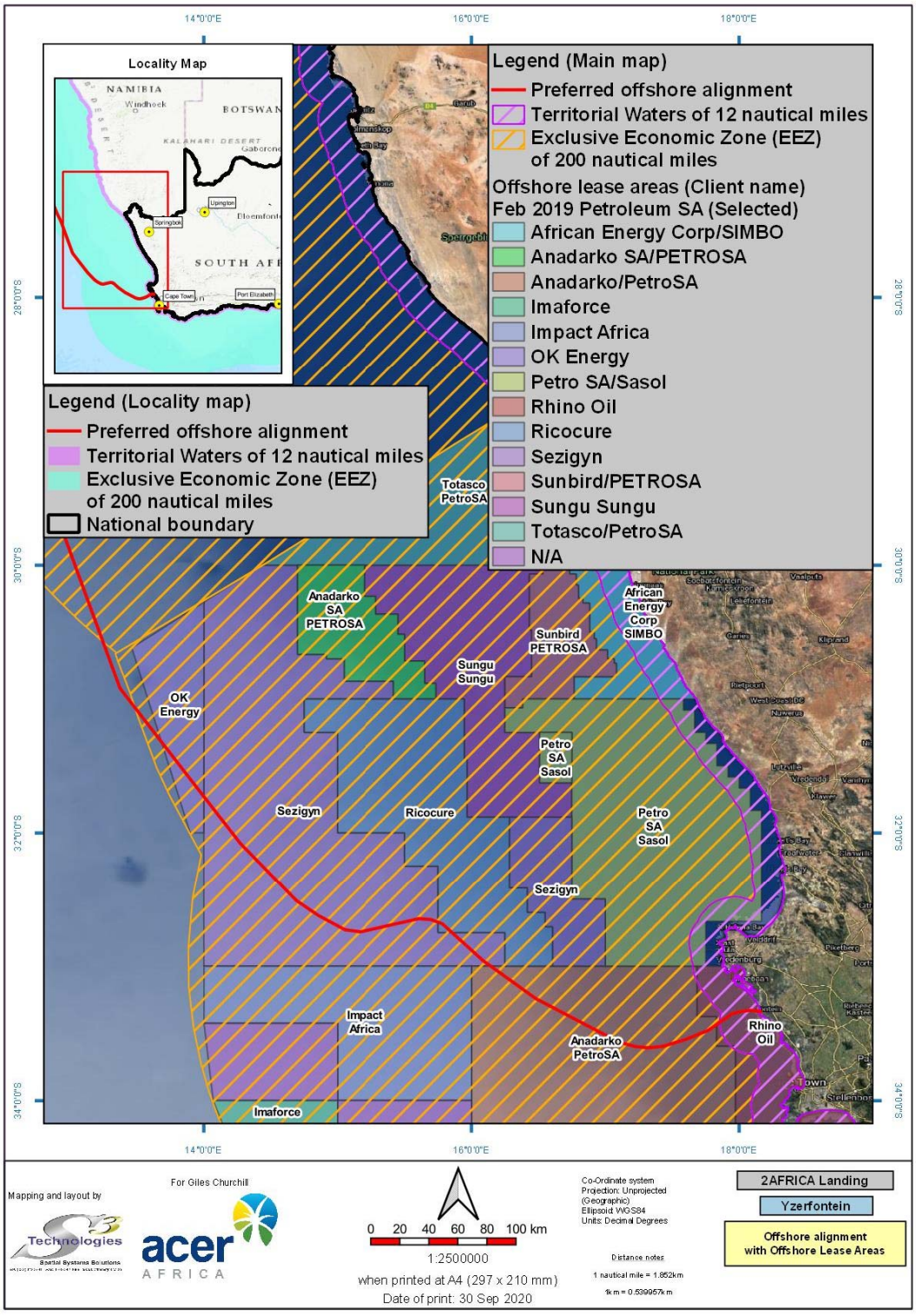


Figure 33 Offshore Oil and Gas lease areas in relation to the proposed 2AFRICA (West) Cable System (Yzerfontein landing)

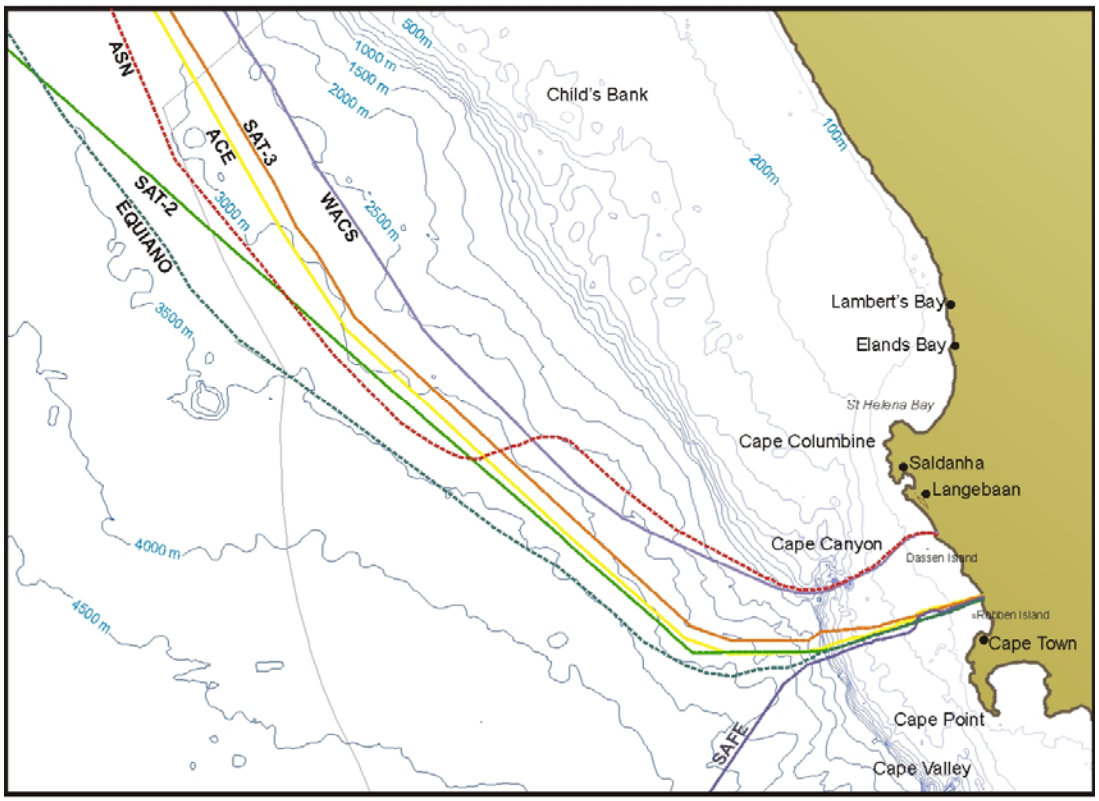


Figure 34 Map indicating proposed route of the 2AFRICA (West) Cable System (Yzerfontein landing) (red dashed line) in relation to other existing subsea cables and bathymetric features off the Western Cape. The routing of the proposed Equiano Cable is also illustrated.

6.1.9 Shipping and ports

South Africa is positioned on a major shipping route and has 8 commercial ports and 44 non-commercial harbours (CSIR, 2016). The Port of Cape Town and Saldanha both lie on the west coast of South Africa. A large number of vessels in transit navigate along the west coast on their way around the southern African subcontinent. There are several smaller fishing harbours on the West Coast including at Yzerfontein, Saldanha, Lamberts Bay and St Helena Bay.

6.1.10 Other beneficial uses of the marine environment

Other users of the marine environment include marine diamond mining, and the intake of feed-water for mariculture, fish processing or diamond-gravel treatment (Figure 1). Most of these are located north of the proposed 2AFRICA (West) Cable System (Yzerfontein landing) route alignment and should in no way be affected by installation of the cable system. Recreational use of the offshore areas is negligible.

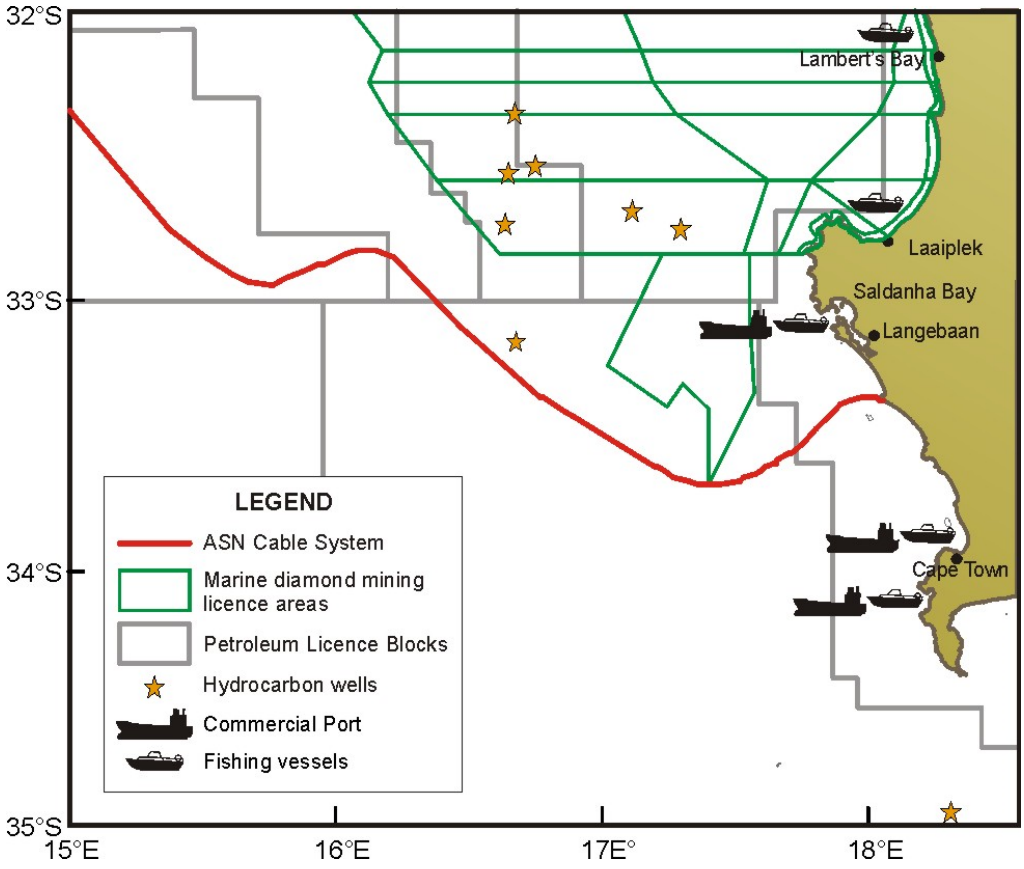


Figure 1 Project-environment interaction points on the West Coast, illustrating the petroleum licence blocks and location of existing hydrocarbon wells, marine diamond mining concessions and ports for commercial and fishing vessels in relation to the proposed 2AFRICA (West) Cable System (Yzerfontein landing)

6.2 Beach and terrestrial environment

6.2.1 Conservation categories as per Western Cape Biodiversity Spatial Plan (2107)

Figure 36 provides an overview of the conservation categories in the land portion of the study area, referenced from the Western Cape Biodiversity Spatial Plan (2017) (WCBSP). The WCBSP is the product of a systematic biodiversity planning assessment that delineates Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) which require safeguarding to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services, across terrestrial and freshwater realms. These spatial priorities are used to inform sustainable development in the Western Cape Province. This product replaces all previous systematic biodiversity planning products and sector plans with updated layers and features.

The coastal foredune, beach and section of the inter-tidal zone are classified as an Ecological Support Area (ESA2), which means that these areas are not essential for meeting biodiversity targets, but they play an important role in supporting the functioning of Protected Areas or Critical Biodiversity Areas and are often vital for delivering ecosystem services.

The section of dune located seawards of the vegetated foredune, and the section of the vegetation located within the caravan park are classified as “Other Natural Areas” (ONA). This means the area is not currently identified as a priority, but they retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although not prioritised, they are still an important part of the natural ecosystem.

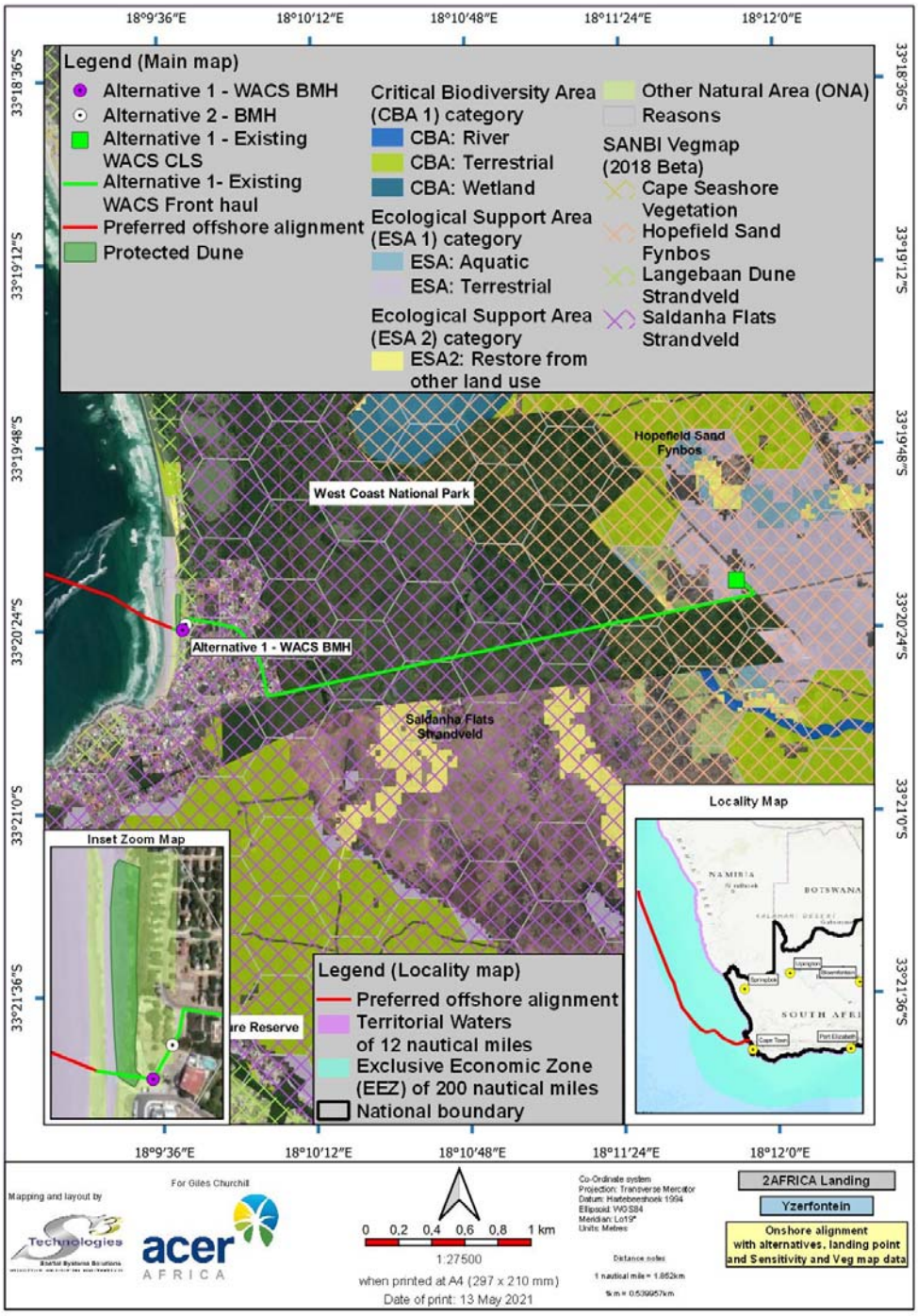


Figure 36 Environmental Sensitivity Map showing vegetation types and areas of conservation

6.2.2 Ecological drivers

The key ecological drivers in coastal ecosystems and of relevance to this project include:

- The natural oceanic wave climate.
- Wind.
- Mobility of sand.
- Nearshore sand circulation, and offshore sediment transport.
- The deposition and decomposition of organic material.
- Colonisation of dune by beach and strandveld vegetation.

6.2.3 Yzerfontein beach and coastal dunes

Yzerfontein's coastline has both rocky and sandy white beaches. The "16-Mile Beach" stretches from the rocky headland at Yzerfontein to the land mass which forms the barrier between the Langebaan lagoon and the sea (within the West Coast National Park). 16 Mile Beach, which starts just north of the main beach at Yzerfontein, is the longest uninterrupted sandy beach on the coastline of South Africa.

Yzerfontein Main Beach is a wide embayment bound to the south by Yzerfonteinpunt (Figure 37). This deep crenulate bay sweeps northwards, backed by a rocky cliff, devoid of beach in the south, but as one progresses northwards, a steep dune and beach arises. The bay is interspersed with occasional rocky shelves and outcrops that play a significant role in sediment transport dynamics.

Inshore circulation patterns and sediment transport processes within the crenulate bay at Yzerfontein are complex and variable. Yzerfonteinpunt, and associated rocky islands and promontories, serve to interrupt sediment transport in the immediate vicinity, as sediment influx through the littoral drift from the south, is captured and diverted offshore by these features.

The shoreline and dune cordon at the landing site comprises of a narrow, but dissipative beach, which is backed by a mix of very steep dunes and at some points, rocky cliffs, as well as seawalls and related sea defence structures.

Breaker height, wave period and grain size are fundamental drivers of beach state and it is evident that both the prevailing natural features, in particular the Yzerfonteinpunt and Meeurots (an offshore island feature) are drivers of the state of the shoreline at the proposed point of the cable landing. These features give rise to a sheltered inshore environment under most conditions, which has been further reinforced to establish a small harbour facility. A wave shadow is evident within the bay, where diffracted waves entering the bay undergo destructive interference, that focusses on the opposite shore, just to the north of the cable landing site. However, constructive wave interference is evident and this phenomenon serves to focus incoming wave energy onto the shoreline in and around the cable landing point. This focus sets up an inshore rip current which sees sediment being moved along the beach and offshore at a rocky promontory located just to the north of main access and proposed landing point. As a result, the shoreline around the landing point is subject to erosion. Such erosion has been met by the establishment of a sea wall or sea defence rip rap. Such structures have served to abate erosion, at select points, however they have exacerbated erosion at other points that are not subject to protection and it can be anticipated that further protection measures may be required along the beach to protect infrastructure.

Figure 37 Aerial photograph showing features and coastal dynamics at site of cable landing, Yzerfontein.

6.2.4 Terrestrial ecosystems and vegetation types

The main terrestrial habitats that could potentially be affected by the proposed project are beach and sand dune habitats associated with Cape Seashore Vegetation, occurring near the transition to Langebaan Dune Strandveld (see Figure 36). Both of these vegetation types have been classified as ecosystem types of Least Concern, according to the National List of Threatened Ecosystems[15] and the more recent National Biodiversity Assessment-2018, as well as the Western Cape State of Biodiversity Report .These vegetation types are described as follows:

- **Langebaan Dune Strandveld:** The landscape and vegetation of the Langebaan Dune Strandveld ecosystem is described as, “Flat to slightly undulating old coastal dune systems and stabilised inland duneveld supporting closed, evergreen, up to 2 m tall, sclerophyllous shrub-land with prominent annual herbaceous flora occurring in gaps (and forming spectacular displays, especially after good rain in late winter)”.
- **Cape Seashore Vegetation**: “Beaches, coastal dunes, dune slacks and coastal cliffs of open grassy, herbaceous and to some extent also dwarf-shrubby (sometimes succulent) vegetation, often dominated by a single pioneer species. Various plant communities reflect the age of the substrate and natural disturbance regime (moving dunes), distance from the upper tidal mark and the exposure of dune slopes (leeward versus seaward).”

6.2.5 Vegetation on site

The only terrestrial habitat that would really be affected by the preferred routing option for the 2AFRICA cable landing at Yzerfontein (Alternative 1) is the beach. Beaches are hostile environments for plants and these areas are typically largely without plant life. Vegetation only starts to become observable on the foredune at the upper edge of the beach, which is not present along the proposed route, due to transformation of the dune by a seawall (Plate 16).

Plate 16 **No vegetation is present along the proposed cable route alignment at Yzerfontein Beach, where the foredune is transformed by a seawall for erosion control (left photo). The vegetated dune cordon further north will not be affected (right photo).**

[15] As contained in Government Notice 1002 of December 2011, promulgated in terms of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004).

6.2.6 Freshwater resources and wetlands

The closest known wetland to the proposed cable landing/s at Yzerfontein, as captured on National Wetland Map Version 5 (NWM5)[16], is the Rooipan wetland complex located more than 500 m to the north (Figure 38) This wetland feature was also mapped, but less accurately, by NFEPA project (Nel et al. 2011). During the fieldwork that was undertaken for the current study, it was confirmed that there are no wetlands or other watercourses located in close proximity to the proposed cable routings that could be affected by the proposed activities. As such, no Water Use Authorisation is required in terms of Sections 21(c) or (i) of the National Water Act (Act No. 36 of 1998).

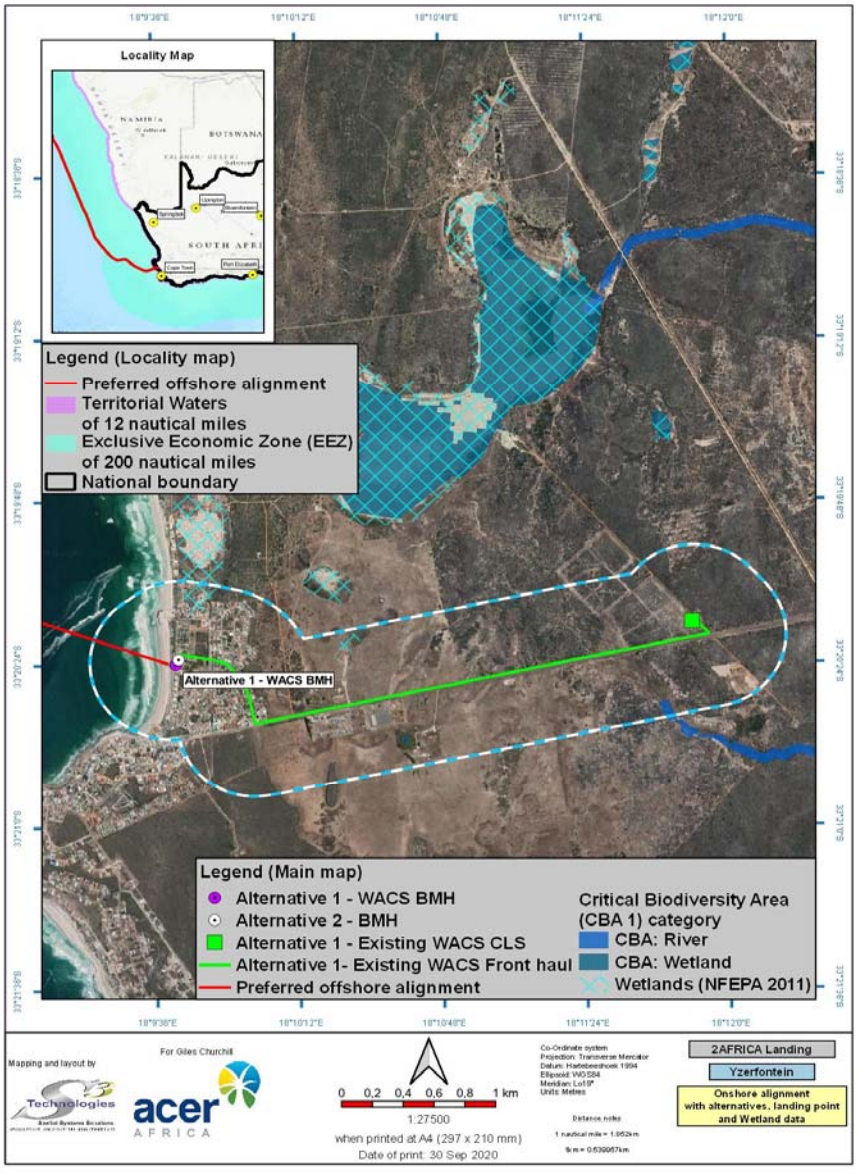


Figure 38 Onshore alignment showing wetlands within 500m

[16] NWM5 was produced as part of the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) and was used in the Inland Aquatic Ecosystems component of NBA-2018 (Van Deventer *et al*. 2019).

6.2.7 Fauna

6.2.7.1 Mammals

Although the site falls within or near the edge of the distribution range of several terrestrial mammals, the high degree of transformation within the study area means that only species tolerant of human activities are likely to be encountered. Species which are known to be located in the general area include Yellow Mongoose, Bat-Eared Fox, Small Grey Mongoose and Black Backed Jackal (http://www.nature-reserve.co.za/wildlife-West-coast-national-park.html). One listed terrestrial mammal species is described as potentially occurring within the study area, viz. the Honey Badger (*Mellivora capensis*); however, their presence at the site is highly unlikely given the extensive transformation of most habitats within the study area.

6.2.7.2 Reptiles and amphibians

Several venomous snakes are known to occur within the study area, particularly the Puff Adder (*Bitis arietans arietans*) and Cape Cobra (*Naja nivea*), which are encountered frequently at the WACS CLS site outside Yzerfontein. However, the extent of habitat that would be affected by the proposed development will be minimal.

The diversity and occurrence of amphibians within the project area is relatively low, given the relatively dry climate. The DEFF Screening Report produced during Scoping (refer to the Scoping Report) identified one terrestrial animal species of medium sensitivity that could be present in the study area, namely the invertebrate *Bullacris obliqua.* This is a grasshopper from the family *Pneumoridae*, which are nocturnal, short-horned grasshoppers commonly known as "bladder grasshoppers". *Bullacris obliqua* is listed as Vulnerable on the IUCN Red List of Threatened Species 2018. According to the terrestrial and freshwater ecosystems specialist report (Appendix B), the dune vegetation in the study area does not support the host plant for this species so it is unlikely that *Bullacris obliqua* is present.

6.3 Climate

6.3.1 Prevailing climate

The Western Cape has a semi-arid Mediterranean climate, which is strongly influenced by the cold Benguela Current and coastal winds. The town of Yzerfontein has an approximate elevation of 25 m above sea level and is located on the Atlantic Ocean coastline which plays a large role in the prevailing climatic conditions. Yzerfontein's climate is classified as warm and temperate. Being in a winter rainfall area, Yzerfontein receives its rain from April to October. Average rainfall is approximately 355 mm per annum and average daily temperatures range between 20°C during the summer months (November – February) and 14°C during the winter months (June – August) (https://en.climate-data.org/africa/south-africa/Western-cape/yzerfontein-23414/).

6.3.2 Climate change

According to information provided in the Beach and Coastal Dune Dynamics specialist report (Appendix B), a significant background factor affecting the Western Cape coastline is that of climate change, giving rise to increasing storminess, coupled with sea level rise and with expectations of increasing aridity, reduced winter rainfall periods, and more severe storm

events. Sea level rise, which according to recorded data varies between 0.42 and 1.87 mm/year, is expected to result in inundation along low lying areas of the West Coast and increasing erosion of soft coastlines, in particular dune forms, as well as beach erosion. In turn, saline intrusion into sub-surface, freshwater systems is likely to have a more latent but significant impact on the state and structure of coastal dunes.

6.4 Topography and geology

The project area is characterised by plains and a moderate to low relief, with gentle slopes (<5% gradient) occurring over more than 80% of the region.

Yzerfontein is well known for its saltpans from which commercially traded salt is produced. On Yzerfontein pan, Afmine operates a crushing and washing plant (Yzerfontein mine) where gypsum is produced for agricultural and cement uses (http://www.yzerfontein.info/nature/geology/geology.html). The surface geology along the coast at Yzerfontein is characterised by the following:

- The Springfontyn and Witzand Formations within the Sixteen Mile Beach and Dune Complex between Yzerfontein and Kreefbaai. as well as the beach and dune complex between Yzerfontein and Grotto Bay.
- The Malmesbury Group meta-sediments form the rocky coastline between Bokpunt and Grotto Bay, while the gabbros of the Yzerfontein Suite form the headland at Yzerfontein.

6.5 Socio-economic overview of the receiving environment

6.5.1 National Development Planning

In South Africa, the Presidential Infrastructure Coordinating Commission (PICC) launched SIP 15: Expanding Access to Communication Technology. This is led by the Department of Communications and supported by the Department of Public Enterprises and Department of Science and Technology. SIP 15 aims to ensure universal service and access to reliable, affordable and secure broadband services by all South Africans, prioritising rural and under-serviced areas and stimulating economic growth. This project, although not registered with the South African Government as a SIP project, will support SIP 15.

6.5.2 Key institutions and role-players and affected property

Yzerfontein is located in Ward 5 of the Swartland Local Municipality, which is part of the West Coast District Municipality, located in the Western Cape province of South Africa. The coastal zone between the high-water mark of the sea and residential areas at Yzerfontein is under the administration of the Department of Public Works. CapeNature is a key roleplayer with respect to biodiversity and conservation issues at Yzerfontein, as well as to obtain a Sea Shore lease Permit. Yzerfontein lies adjacent to the West Coast National Park, which is managed by SanParks.

Property details are provided in Appendix C.

6.5.3 Yzerfontein history and population

At the time of the first European settlement in the Cape, the area at Yzerfontein was occupied by the Khoi tribe. They visited the area mainly on a seasonal basis with their cattle for grazing. The original Yzerfontein town was established in 1935 when a portion of the farm Yzerfontein no. 560 was divided into almost 330 erven (Swartland Municipality, 2018). By the 1990s, an additional 1,523 erven had been proclaimed. Since then, Yzerfontein has grown into the present day small coastal town. The town of Yzerfontein is especially popular amongst retirees, holiday makers and tourists and has a permanent population of approximately 2,170 residents.

6.5.4 Demographics and socio-economic profile

The economy of Yzerfontein is based on local tourism and residential developments, such as holiday and retirement homes (Swartland Municipality, 2018). Some small commercial ventures operate within the town, but these are limited to shops to provide basic needs (supermarket, hardware shops, etc.), restaurants, cafes and several guest houses. Generally, the business sector is weakly developed due to the limited size of the local market and the seasonal nature of tourism. A summary of the demographic profile of the residents of Yzerfontein is provided overleaf (Swartland Municipality, 2018).

According to the Swartland Local Economic Recovery Pan (Draft; September 2020) the economy of the Swartland municipal area is driven by the finance, manufacturing and trade sectors, which accounted for 21.0%, 20.5% and 14.8% of Gross Value Added (GVA) in 2019 respectively. Although these three sectors are also strong contributors to employment, the agriculture sector by far dominates as the leading contributor to employment in the region, with 25.3% of all employment in the region being concentrated in this sector.

The overall impact of COVID-19 and the resultant lockdown on the economy is likely to be quite harsh, with the Swartland GVA contracting by 12.6% by the end of the first year (year 1) after lockdown; for the same period the Swartland employment will see a contraction of 8.2%. The second - year (year 2) post lockdown will see the economy (GVA) recovering, although still 5.1% lower than its 2019 pre-lockdown level. In year 2 post COVID-19 lockdown, similar to the economy, employment also makes a significant recovery, but also not yet enough to get to pre-lockdown employment levels.

The sectors where GVA will be hardest hit by the lockdown restrictions over the initial 12-month period is tourism (84.1%), construction (40.7%), mining (20.1%) and transport and telecoms (17.1%). In terms of employment, the majority of job losses will come from the tourism (60.0%), construction (25.9%) and the informal sector (12.7%) (Swartland Municipality; September 2020).

Over 80 % of the population of Yzerfontein comprises whites (Table 11), which can be expected given that the town is a sought-after retirement town. Similarly, the low percentage of other population groups indicates few opportunities in terms of jobs and economic development. Most towns within South Africa and the Western Cape have higher coloured, Asian and black populations where job opportunities are available. This trend is supported by the age distribution of people residing in Yzerfontein, where over 62% of the population are aged 50 and older (Swartland Municipality, 2018) (Table 12).

Table 11: Demographics of Yzerfontein

Demographics of Yzerfontein		
Population Group	**Number**	**%**
Black African	187	8.6
Coloured	105	4.9
Indian or Asian	10	0.4
White	1,782	82.1
Other	86	4
Total	2,170	100

Table 12: Age Distribution within Yzerfontein

	Age Distribution within Yzerfontein								
Age (Years)	**0-9**	**10-19**	**20-29**	**30-39**	**40-49**	**50-59**	**60-69**	**70-79**	**80+**
Number	158	99	124	246	198	466	514	301	67
Percentage	7.2 %	4.5 %	5.7 %	11.3 %	9.1 %	21.5 %	23.7 %	13.9 %	3.1 %

6.5.5 Access to services

Ward 5 of the Swartland Municipality has several service deficits which need to be remedied, including the following (Swartland Municipality, 2018):

- **Sewerage:** At present, Yzerfontein has no formal wastewater treatment works as well as no water borne sewer system. Residences and businesses within the town make use of septic tank and soak away systems for sewage treatment.
- **Water:** Water is supplied to the town; however, water quality is not good. The municipality has identified the need for secondary chlorination at the supply reservoir.
- **Road network**: The town of Yzerfontein has a formal tarred road network; however, the municipality has acknowledged that there is a backlog in the resealing program and that roads within the town are deteriorating.
- **Electricity**: At present, electricity supply to the town is directly from Eskom and is insufficient to meet demand. However, this can be improved only if Eskom upgrades the supply capacity, something which is subject to Eskom network expansion.

6.5.6 Tourism activities

Yzerfontein main attraction is the vast stretch of unspoiled beach and its access to surrounding areas within the West Coast National Park MPA.

6.6 Cultural Heritage

The marine portion of the cable route to the BMH is under the jurisdiction of the South African Heritage Resources Agency (SAHRA). SAHRA is the relevant heritage authority for all heritage resources located below the high-water mark of the sea up to a distance of 24 Nm seaward whilst the terrestrial portion of the cable route inland of the BMH falls under the jurisdiction of Heritage Western Cape. South Africa's record of maritime and underwater cultural heritage resources is based on a mix of information derived from historical documents and other

secondary sources, and from very limited primary sources such as geophysical data and other field-based observations and site recordings (Gribble; 2019).

6.6.1 Submerged prehistoric archaeological resources

As described in the heritage specialist report (Appendix B), although there have, to date, been no studies of submerged prehistory in the study area, the archaeological evidence for a Later Stone Age hominin presence on the West Coast is plentiful, while the important Earlier Stone Age sites of Duinefontein 1 and 2, approximately 5 km north of the cable landfall area, have produced Acheulean stone tools in association with animal bone, deposited between 200,000 and 400,000 years ago, around palaeo-pans or lakes that developed in hollows within a large dune field, where hominins[17] were hunting or scavenging animals.

During periods of lower sea level, similar palaeo-pans and palaeo-river channels are likely to have been present on the exposed continental shelf of the West Coast. Together with ancient river courses, these water sources, which are today buried under modern seabed sediment, would have been an important focus for hominin activity on the exposed continental shelf. As described above, the handaxes found within the seabed of Table Bay in the 1980s were the same age and type as those at Duinefontein 1 and 2 and there is thus a clear potential for the occurrence of ancient, submerged archaeological material in association with such seabed features within the area to be affected by the 2AFRICA (West) Cable System (Yzerfontein landing).

6.6.2 Palaeontological features and fossil material

In terms of palaeontological potential within the study area, extensive cemented crusts or “hardgrounds” formed on formations exposed at the seabed and eroded and reconsolidated during glacial sea level oscillations. These have produced a wide array of multiphase phosphorite nodules and phosphatic shell casts of various ages. The bones and teeth of sharks and other fishes, the skulls of extinct whale species and the occasional remains of land-living animals that roamed the ice age exposed shelf are also phosphatized and reworked into the latest, loose sediments on the seabed.

6.6.3 Maritime archaeological resources

South Africa has a rich and diverse underwater cultural heritage. Strategically located on the historical trade route between Europe and the East, South Africa’s rugged and dangerous coastline has witnessed more than its fair share of shipwrecks and maritime dramas in the last 500 years. At least 2400 vessels are known to have sunk, grounded, or been wrecked, abandoned or scuttled in South African waters since the early 1500s. This does not include the as yet unproven potential for shipwrecks and other sites that relate to pre-European, Indian Ocean maritime exploration, trade and interactions along the South African coast.

Regarding historical shipwrecks, the specialist heritage assessment indicates that there are no recorded wrecks within the study area or within approximately 8,5 km of the 2AFRICA (West) Cable System (Yzerfontein landing).

One important world War II shipping casualty which is recorded in the EEZ in the vicinity of the cable route is the German U-boat U-1769, sunk on October 1942. Although outside the remit

17 A primate of a taxonomic tribe (*Hominini*), which comprises those species regarded as human, directly ancestral to humans, or very closely related to humans.

of the Act, this wreck must be treated as a war grave and if encountered must be avoided and the find reported to SAHRA.

The cable design and engineering surveys undertaken by Fugro Germany Marine identified a number of sidescan sonar and magnetic anomalies in and on the seabed of the cable corridor. The bulk of these were geological but a handful humanly-derived debris was noted although their nature was not possible to discern in the available data.

7 ENVIRONMENTAL ASSESSMENT PROCESS AND METHODOLOGY

7.1 Scoping

Scoping was undertaken between February 2020 and March 2021. The primary product of Scoping was the FSR. An important part of the FSR was the Plan of Study for Impact Assessment, which provided information on which specialist studies would be undertaken, what would be investigated within each specialist study, how the investigations would be conducted, how potential impacts would be assessed, and impact significance determined, public participation activities, and applicable time lines.

7.2 Impact Assessment

The aim of the Impact Assessment was to investigate the environmental issues and concerns that were identified during Scoping. The technical and public participation processes continued to interact at important stages to ensure that both processes built towards a comprehensive investigation of the issues identified. The main activities during this phase were to:

- Undertake focused scientific studies to assess the issues of concern.
- Maintain ongoing communication and participation with stakeholders.
- Integrate the findings into an EIA Report, inclusive of mitigation measures to ameliorate the effects of negative impacts and optimise positive ones.
- Prepare an EMPr.

7.2.1 Technical process

To provide scientifically sound information in regard to the various issues raised, a number of specialist studies were commissioned. Where applicable, specialists were encouraged to interact and share information to inform the assessment of potential impacts. To address the key issues, each specialist was tasked with assessing the possible impact from their angle of expertise. An integrated approach was adopted to consider direct, secondary and cumulative impacts wherever applicable.

Importantly, technical information on certain project components and activities were fed into this EIA process from other project team members who did not necessarily form part of the EIA specialist study group. In addition, the EAP took into consideration information from other existing documentation, for example, spatial planning documents. Thereafter, the findings (along with relevant input from the public participation process described in Chapter 8) were integrated by the EAP to provide a comprehensive understanding of the issues and associated potential impacts.

An important component of the DEIAR is the associated EMPr. The EMPr (Appendix F) outlines the mitigation and monitoring measures for avoiding or minimising negative impacts and optimising benefits during project implementation. In this regard, the EMPr provides a critical link between mitigation measures described in the DEIAR and their actual implementation.

7.3 Specialist Studies and Terms of Reference

The specialist studies were undertaken by professionals regarded as experts in their specific disciplines. Arising from Scoping and the distillation of issues and associated potential impacts, the need for the following specialist studies was identified:

- ❑ Vegetation and Ecological Specialist Study
- ❑ Fisheries Specialist Assessment.
- ❑ Wetlands Specialist Study
- ❑ Marine Ecology Specialist Assessment.
- ❑ Beach and Coastal Dune Dynamics Assessment.
- ❑ Heritage Assessment.

The results of the specialist studies were used by the EAP when undertaking the integrated assessment. The outcomes of integration and assessment have been documented in this DEIAR, which will be released in the public domain for comment. Comments on the DEIAR will be considered and included in the Final EIAR for submission to DFFE .

Terms of reference for the different specialist studies are outlined below.

7.3.1 Vegetation and Ecological Specialist Study

The appointed specialist must provide an assessment of the potential impact that the 2AFRICA (West) Cable System and related infrastructure will have on the biodiversity of the area (vegetation and terrestrial fauna). With this in mind, the specialist study should identify and discuss the following key aspects.

1. What are the potential impacts on vegetation arising from the proposed 2 AFRICA (West) Cable System and associated construction activities?

   Specifically, the Biodiversity Assessment must address the following primary elements:

   - ❑ Description of the vegetation present, the relevant and important characteristics and components thereof, including ecological functioning, which may be affected by the proposed 2AFRICA (West) Cable System or which may affect the proposed development during site establishment, construction, operation and maintenance and/or decommissioning.
   - ❑ The assessment must consider the terrestrial environment within the development footprint as well as the terrestrial environment directly adjacent to the proposed cable servitude and construction footprints.
   - ❑ Identification of species of conservation importance, including Red Data/CITES and TOPS species potentially affected by the proposed project.
   - ❑ The impact of the development must be assessed in terms of compliance with approved relevant Environmental Management Framework's (EMF) management priorities.
   - ❑ Identify and GPS significant sites that should be conserved, indicate on a suitable map, and motivate why they should be conserved.
   - ❑ Identify the likely risks and impacts (negative and/or positive, including cumulative impacts if relevant) and their significance, which the proposed activity/infrastructure may have on vegetation assemblages and vice versa during site establishment, construction, operation and maintenance and/or decommissioning. Recommend mitigation measures for enhancing positive impacts and avoiding or mitigating negative impacts and risks (to be implemented during the design, construction, operation and/or decommissioning phases), for inclusion in an Environmental Management Programme.
   - ❑ The identification of permit requirements as related to the removal and/or destruction of vegetation and specific plant species (all protected tree species

within the proposed cable servitude must be counted and their position recorded to facilitate permit application processes).
- ❑ Address specific issues and concerns raised by stakeholders during the public review phase of the EIA process (an Issues and Responses Report will be provided to specialists).
- ❑ Discuss any other sensitivities and important issues from your specialist perspective that are not identified in these terms of reference.

2. What are the potential impacts on terrestrial fauna and ecology arising from the proposed 2AFRICA (West) Cable System and associated construction activities?

- ❑ Animal species identification, including an indication of dominant species, rare and endangered species (Red Data species), and exotic and invader species.
- ❑ Animal species and their habitats.
- ❑ Assessment of the habitat condition for the animals.
- ❑ Desktop study to determine the probability of occurrence of any fauna of concern within these identified habitats.
- ❑ Determine the state of health of the ecosystem by taking into consideration all aspects concerning the natural resources.
- ❑ Recommend mitigation measures to ameliorate the negative impacts of the proposed development on the natural environment to be included in the Environmental Management Programme.
- ❑ The impact of the development must be assessed in terms of compliance with approved relevant Environmental Management Framework's (EMF) management priorities.
- ❑ Address specific issues and concerns raised by stakeholders during the public review phase of the EIA process (an Issues and Responses Report will be provided to specialists).

3. What are the potential impacts on avifauna (offshore and onshore) arising from the proposed 2AFRICA (West) Cable System and associated construction activities?

- ❑ Undertake a desktop study to identify bird species likely to occur in the study area, including an indication of dominant species, rare and endangered species (Red Data species), and exotic and invasive species.
- ❑ Describe the bird species and their habitats.
- ❑ Conduct an assessment of the significance and potential impact of the proposed project on avifaunal species (focus should be on the marine environment).
- ❑ Develop mitigation measures to prevent or reduce the impacts.
- ❑ Make recommendations as to the extent of monitoring that needs to be undertaken, if any.
- ❑ Recommend mitigation measures to ameliorate the negative impacts of the proposed development on the avifauna to be included in the EMPr.
- ❑ Address specific issues and concerns raised by I&APs during the public review phase of the EIA process (a Comments and Responses Report will be provided to specialists).
- ❑ Discuss any other sensitivities and important issues from the specialist perspective that are not identified in the terms of reference.

7.3.2 Fisheries Specialist Study

The appointed specialist must provide an assessment of the potential impact that the 2AFRICA (West) Cable System and related infrastructure will have on the trawling industry based on the alignment selected. With this in mind, the specialist study should identify and discuss the following topics:

- Determine the actual number of trawls (all types but more importantly bottom) per annum over the proposed 2AFRICA (West) Cable alignment and depict how and from what source of information this was calculated as well as the accuracy of the data.
- Typically, at what depths are the bottom trawls along the proposed 2AFRICA (West) Cable alignment?
- Provide details of un-trawlable seabed areas along the proposed cable alignment.
- Provide a detailed explanation of the key methods of how trawls are recorded and clearly depict the accuracy of these recordings.
- Assess the current trawling logs and investigate whether the existing cable alignments and their exclusion zones are avoided by trawling vessels specifically the WACS Cable System.
- Provide a brief comment on the impact of the proposed 2AFRICA (West) Cable System alignment and its potential significance to the trawling industry/grounds and also propose an alternate solution with less impact if any. This comment on significance should cover aspects such as the relative percentage of the trawling grounds impacted and/or if the proposed alignment is likely to have any impact on trawling in terms of increased operational costs.
- Address specific issues and concerns raised by relevant stakeholders during the public review phase of the EIA process (an Issues and Responses Report will be provided to all identified specialists).
- Discuss any other sensitivities and important issues from a fisheries industry perspective that are not identified in these terms of reference.

In addition, the following maps should be generated and be included in the specialist report:

- Provide a map of trawl data over the last five years showing trawls across the proposed 2AFRICA (West) cable alignment including the existing WACS cable. The map legend should include trawl numbers for each year assessed and specific areas of catches.
- Establish the extent of trawling activities in between the cables with separation of surface and bottom trawls.

7.3.3 Wetlands Specialist Study

The appointed specialist must provide a brief assessment of the potential impact that the 2AFRICA (West) Cable System and associated infrastructure will have on wetlands within the 500 m of the project area.

With this in mind, the specialist study should identify and discuss the following key aspects.

1. What are the potential impacts on wetlands arising from the proposed 2AFRICA (West) Cable System, associated infrastructure and construction activities?

   The necessity for a Wetland Delineation and Functional Assessment to identify and evaluate all wetlands within 500 m of the proposed development footprint will be discussed with the wetland specialist prior to commissioning. Should it be agreed that

such a detailed investigation is required, the assignment must address the following primary elements:

- The delineation of the outer edge of the temporary zone of wetlands in accordance with: A practical field procedure for identification and delineation of wetlands and riparian areas (DWAF, 2006).
- Determination of all wetland boundaries (viz. the edge of the temporary wetness zone in each case).
- Determination of ecological buffers as stipulated by both National (DWS) and Provincial legislation.
- Mapping of the wetlands and their respective buffer zones at an appropriate scale.
- The impact of the development must be assessed in terms of compliance with approved relevant Environmental Management Framework's (EMF) management priorities.
- Functional assessment using methods outlined in Wet-Ecoservices (Kotze et al., 2005). This will comprise a desktop and infield assessment scoring the ecosystem services that the wetlands supply, which will allow for more informed planning and decision making.
- Description of the current state of the wetlands and riparian zones (specifically focusing on Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS)) using the Wet-Health tool (Macfarlane et al., 2007). In addition to the PES and EIS, the overall impact of all activities that affect hydrological, geomorphological or vegetation health must be calculated as this is a requirement for the water use licensing process.
- Address specific issues and concerns raised by stakeholders during the public review phase of the EIA process (an Issues and Responses Report will be provided to specialists).

For wetlands that are not within the development footprint but are within 500 m of the proposed development, it is only necessary to assess the wetland if the proposed development will impact on one of the four main wetland drivers, viz. habitat, biota, flow and water quality.

7.3.4 Beach and Coastal Dune Geomorphology Specialist Study

The appointed specialist must provide an assessment of the potential impact that the 2AFRICA (West) Cable System and associated infrastructure will have on beach and coastal dune geomorphological dynamics within the project area.

The specialist study should identify and discuss the following key aspects.

1. What are the potential impacts of the proposed 2AFRICA (West) Cable System on the primary dune, beach and beach dynamics, in particular, areas of sensitive vegetation, such as the primary dunes and beach access points?
2. What measures can be applied to rehabilitate, mitigate and manage these impacts in order to optimise environmental integrity at the proposed cable landing points?
3. How should the dunes in question be rehabilitated and what measures are required to ensure dune stability and functionality (i.e. outline a specific action plan)?

The objectives of the dune and coastal dynamics specialist study are to:

- Provide a description of the primary dunes and dune belt present at Yzerfontein and the relevant and important characteristics and components thereof, including dune dynamics.
- Identify and describe the components, characteristics and natural processes of the coastal environment that may be affected by the proposed development (during pre-construction, construction, operation, maintenance and/or decommissioning), from the perspective of coastal dynamics and dune stability.
- Identify and describe the components of the development that may be affected by the environment (during pre-construction, construction, operation, maintenance and/or decommissioning), from the perspective of coastal dynamics and dune stability.
- The assessment must consider the 2AFRICA (West) Cable System development footprint from the intertidal zone up to the existing WACS BMH located approximately 20 m inland from the primary dunes. Particular attention should be paid to proposed development activities on the primary dunes and near the beach/dune interface.
- Identify the likely risks and impacts (negative and/or positive, including cumulative impacts if relevant) and their significance, which the proposed activity/infrastructure may have on relevant environmental components and processes, and vice versa during site establishment, construction, operation and maintenance and/or decommissioning. Make recommendations on alternatives where additional alternatives could be implemented to avoid negative impacts.
- Recommend mitigation measures for enhancing positive impacts and avoiding or mitigating negative impacts and risks (to be implemented during the design, construction, operation and/or decommissioning phases), for inclusion in an Environmental Management Programme (EMPr).
- Identify key impacts that should be monitored as part of ongoing management of the site, and simple methods of monitoring these impacts.
- Identify and delineate by GPS co-ordinates, significant areas that should be conserved or rehabilitated, indicate on a suitable map, and motivate why they should be conserved or rehabilitated.
- Discuss any other sensitivities and important issues from a specialist perspective that are not identified in these terms of reference.
- Address specific issues and concerns raised by stakeholders during the public review phase of the EIA process (an Issues and Responses Report will be provided to specialists).

7.3.5 Marine Ecology Assessment

This specialist study is intended to be undertaken in a phased manner.

1. A desktop assessment of the potential impact that the 2AFRICA (West) Cable System landing at Yzerfontein and related infrastructure will have on the Marine Benthic Environment based on the alignment selected. In this context, the specialist study should identify and discuss the following topics.

    a) An introduction with a brief project overview, study approach, methodology, and assumptions and limitations.
    b) A description of the marine environment of the project area, focusing on the benthic invertebrate communities based on available literature and previous experience.
    c) A description of the potential impacts of the project on the benthic invertebrate fauna, followed by an assessment of the significance of these impacts using the assessment criteria provided (it must be noted that marine telecommunications

cables once installed have a legislated 500 m buffer either side of the cable where no fishing/trawling or anchoring of vessels may take place).

2. At this point in the assessment, the specialist must advise whether existing literature and experience need to be supplemented by site investigations:

- ❑ If yes, the cost and time required for these investigations must be approved by ACER.
- ❑ If no or after the site investigations have been completed, the assessment can continue addressing the following as supplementary to 1(a)(b)(c) above:

  a) A detailed motivation why site investigations were deemed unnecessary.
  b) The assessment of impacts must take into account the spatial scale, intensity, duration, etc. of the impacts and include recommendations for mitigation of impacts.
  c) Address specific issues and concerns raised by stakeholders during the public review phase of the EIA process (an Issues and Responses Report will be provided to specialists).
  d) Discuss any other sensitivities and important issues from a Marine Benthic perspective that are not identified in these terms of reference.

7.3.6 Heritage Specialist Study

The appointed specialist must provide an assessment of the potential impact that the 2AFRICA (West) Cable System and related infrastructure will have on heritage resources within the marine and terrestrial environments. With this in mind, the specialist study should identify and discuss the following key aspects.

1. What are the potential impacts on heritage resources arising from the proposed landing of the 2AFRICA (West) Cable System, and associated construction and operational activities?

Specifically, the Heritage Impact Assessment (HIA) must address the following primary elements:

- ❑ The identification and assessment of potential impacts on cultural heritage resources, including historical sites arising from the construction and operation of the proposed 2AFRICA (West) Cable System.
- ❑ The early identification of any red flag and fatal flaw issues or impacts.
- ❑ Information must be provided on the following:
  - Results of an overview survey of the project area, and the identification of cultural heritage resources that may be affected by the proposed project or which may affect the proposed project during construction and operation.
  - Recommended mitigation measures for enhancing positive impacts and avoiding or minimizing negative impacts and risks (to be implemented during design, construction and operation).
- ❑ Address specific issues and concerns raised by stakeholders during the public review phase of the EIA process (an Issues and Responses Report will be provided to specialists).
- ❑ Formulation of a protocol to be followed by MTN for the identification, protection or recovery of cultural heritage resources during construction and operation, including a list of all necessary permit applications, which may be required.
- ❑ The impact of the development must be assessed in terms of compliance with approved relevant Environmental Management Framework's (EMF) management priorities.

- The identification and assessment of any paleontological aspects or findings arising from the construction and operation of proposed 2AFRICA (West) Cable System.
- The identification of mitigation measures for enhancing benefits and avoiding or mitigating negative impacts and risks (to be implemented during design, construction and operation of the proposed project).

In compliance with Section 38 of the National Heritage Resources Act 25 of 1999 (NHRA), a Phase 1 HIA must address the following key aspects:

- The identification and mapping of all heritage resources in the area affected.
- An assessment of the significance of such resources in terms of heritage assessment criteria set out in the regulations.
- An assessment of the impact of the development on heritage resources.
- An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development.
- The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources.
- If heritage resources will be adversely affected by the proposed development, the consideration of alternatives.
- Plans for mitigation of any adverse effects during and after completion of the proposed development.

7.4 Other documentation

In addition to the specialist studies, the EAP made use of existing information contained within the City of Cape Town Integrated Development Plans and the Spatial Development Frameworks to address subjects such as social and socio-economic impacts.

The City of Cape Town's "Maintenance and Management Plan: Dunes and Beaches" (Version 001, dated 17 November 2017) has been referred to, to ensure that the mitigation measures proposed for the beach construction component of the project comply with the generic guidelines in this plan.

It is recommended that the project planners take the following documents into account in their risk management planning:

- City of Cape Town's Shipping Incident Disaster Management Plan.
- South Africa's Oil Spill Contingency Plan.

7.5 Integration, impact description and assessment conventions

Considering the specialist findings and information from other sources, the EAP assessed all identified impacts (positive and negative), using the following assessment conventions to determine their significance:

- **Direct impacts** are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

- **Indirect impacts** of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include the potential impacts that do not manifest

immediately when the activity is undertaken, or which occur at a different place as a result of the activity.

- **Cumulative impacts** are those that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

- **Nature** – the evaluation of the nature of the impact. Most negative impacts will remain negative, however, after mitigation, significance should reduce:
  - Positive.
  - Negative.

- **Spatial extent** – the size of the area that will be affected by the impact:
  - Site specific.
  - Local (limited to the immediate areas around the site; <2 km from site).
  - Regional (would include a major portion of an area; within 30 km of site).
  - National or international.

- **Duration** – the timeframe during which the impact will be experienced:
  - Short-term (0-3 years or confined to the period of construction).
  - Medium-term (>3-10 years).
  - Long-term (the impact will only cease after the operational life of the activity).
  - Permanent (beyond the anticipated lifetime of the project).

- **Intensity** – this provides an order of magnitude of whether or not the intensity (magnitude/size/frequency) of the impact would be negligible, low, medium or high:
  - Negligible (inconsequential or no impact).
  - Low (small alteration of systems, patterns or processes).
  - Medium (noticeable alteration of systems, patterns or processes).
  - High (severe alteration of systems, patterns or processes).

- **Frequency** – this provides a description of any repetitive, continuous or time-linked characteristics of the impact:
  - Once off (occurring any time during construction).
  - Intermittent (occurring from time to time, without specific periodicity).
  - Periodic (occurring at more or less regular intervals).
  - Continuous (without interruption).

- **Probability** – the likelihood of the impact occurring:
  - Improbable (very low likelihood that the impact will occur).
  - Probable (distinct possibility that the impact will occur).
  - Highly probable (most likely that the impact will occur).
  - Definite (the impact will occur).

- **Irreplaceability** – of resource loss caused by impacts:
  - High irreplaceability of resources (the project will destroy unique resources that cannot be replaced).
  - Moderate irreplaceability of resources (the project will destroy resources, which can be replaced with effort).
  - Low irreplaceability of resources (the project will destroy resources, which are easily replaceable).

- **Reversibility** – the degree to which the impact can be reversed/the ability of the impacted environment to return/be returned to its pre-impacted state (in the same or different location):
  - Impacts are non-reversible (impact is permanent).
  - Low reversibility.
  - Moderate reversibility of impacts.
  - High reversibility of impacts (impact is highly reversible at end of project life).

- **Significance**[18] – the significance of the impact on components of the affected environment (and, where relevant, with respect to potential legal infringement) is described as:
  - Low - the impact will not have a significant influence on the environment and, thus, will not be required to be significantly accommodated in the project design.
  - Medium - the impact will have an adverse effect or influence on the environment, which will require modification of the project design, the implementation of mitigation measures or both.
  - High - the impact will have a serious effect on the environment to the extent that, regardless of mitigation measures, it could block the project from proceeding.

- **Confidence** – the degree of confidence in predictions based on available information and specialist knowledge:
  - Low.
  - Medium.
  - High.

[18] This excludes positive impacts on the environment. In these cases, the level of significance should be denoted as Low**, Moderate** or High**.

8 PUBLIC PARTICIPATION PROCESS

The public participation process was designed to comply with the requirements of the EIA Regulations (Sections 41 to 44 of GNR 326) and NEMA. Important elements are:

- The manner in which I&APs were notified of the application for environmental authorisation. This includes on-site notice boards, giving written notice to landowners, letters, Background Information Documents (BID) and advertisements in the media (Section 41).
- Opening and maintaining a register containing the names and addresses of I&APs. These include all persons who have submitted comments, attended meetings, and are organs of State who have jurisdiction in the assessment process, and all those who have requested that they be placed on the register as registered I&APs (Section 42).
- Registered I&APs are entitled to comment, in writing, on all written submissions made to the competent authority by the applicant or the EAP managing the application, and to bring to the attention of the competent authority any issues, which that party believes may be of significance when the application is considered for authorisation (Section 43).
- The comments of registered I&APs and responses thereto must be recorded and included with the reports submitted to the competent authority (Section 44).

Public participation in an EIA process aims to provide sufficient and accessible information to I&APs, in an objective manner, to assist them to:

- During the Scoping Phase.
  - Identify issues of concern and provide suggestions for enhanced benefits and alternatives.
  - Contribute local knowledge and experience.
  - Verify that their issues have been considered.

- During the Impact Assessment.
  - Verify that their issues have been considered either by the EIA Specialist Studies, or elsewhere.
  - Comment on the findings of the DEIAR, including the measures that have been proposed to enhance positive impacts and reduce or avoid negative ones.

All relevant public participation documentation is provided in Appendix D.

Due to the Covid-19 National State of Disaster and Lockdown in the country, the Department of Environment, Forestry and Fisheries requires Environmental Assessment Practitioners to undertake public participation in innovative ways that respect social distancing and other measures to contain the spread of the Corona virus. A public participation process was compiled to comply with the "Directions regarding measures to address, prevent and combat the spread of COVID-19 relating to National Environmental Management Permits and Licenses" in Government Notice (GN) No. 650 dated 5 June 2020. This process was approved by DEFF on **23 November 2020.**

8.1 Notification of the application

Stakeholders were informed of MTN's intention to apply for environmental authorisation via a BID, media advertisements and on-site notice board. The application was also posted on ACER's website for stakeholder review.

8.2 Identification and registration of Interested and Affected Parties (I&APs)

Key stakeholders and other I&APs were identified, and their contact details incorporated into a project database. They included representatives of a variety of sectors, as shown in Table 13. A copy of the stakeholder database is provided in Appendix D.

Table 13 Sectors of society represented by I&APs on the direct mailing list

Government (National, Provincial and Local)
Parastatals (Eskom, SAMSA, Transnet National Ports Authority)
Representative Associations: ❑ Yzerfontein Rate Payers Association ❑ South African Deep Sea Trawling Industry Association ❑ Offshore Mining Concession Holders ❑ Conservation Organisations ❑ Tourism Organisations
Non-Governmental Organisations
Landowners and Local Residents Associations
Conservation Authorities and Conservation Groups
Business and Industry

While consultation has taken place with representatives of different sectors of society, special efforts have been made to obtain the contributions of all people who may be directly affected by the proposed project. These efforts will be on-going for the duration of the EIA.

8.3 Project announcement

The opportunity to participate in the EIA[19] was announced as follows:

- ❑ Advertisements in local and provincial newspapers:
  - Cape Times on the 28 October 2020.
  - Swartland Joernaal on the 28 October 2020.
- ❑ A BID was compiled and emailed to all key stakeholders on the 28 October 2020. All I&APs who registered following the project announcement adverts were also sent the BID for their records. Hard copies of the BID were posted to all government departments and other relevant commenting authorities.
- ❑ Notifications by telephone.
- ❑ Placement of on-site notice boards at the preferred cable landing site (photos of the onsite notice are provided in Appendix D).

[19] All relevant project documents were loaded onto ACER's website at the applicable time and were available for public review.

8.4 Obtaining and dealing with comments from I&APs

During Scoping, the following opportunities were provided to I&APs to contribute comments:

- Completing and returning Registration and Comment Sheets.
- Providing comments telephonically or by email.
- During the Scoping Report public review periods, one on one meetings (telephonic or via Zoom) were held with key stakeholders to address particular concerns.

Responses in writing or by telephone were provided directly to I&APs where relevant, and/or in the Comments and Responses Report circulated with the FSR and DEIAR (see below).

8.5 Comments and Responses Report and summary of issues raised

Issues and concerns raised by I&APs to date, and responses thereto, have been captured in a Comments and Responses Report (CRR) provided in Appendix E. To date, the comments received from I&APs and relevant authorities relate to the following topics:

- Stakeholder registration details.
- Acknowledgements of receipt of documents.
- Requests for documents.
- Approval (from DFFE Integrated Environmental Authorisations) of the plan for public participation.
- Various comments from I&APs and commenting authorities relating to:
  - Applicable legislation, permit and lease requirements.
  - The landing site and cable position.
  - Request to monitor excavations for geological research purposes.
  - Information requested from Maritime Safety, to be provided 72 hours prior to the cable landing.
  - Public access, health and safety.
  - Risk to WACS cable.
  - Effect on Critical Biodiversity Areas.
  - Effect of climate change.
  - Ecological impacts within the Coastal Protection Zone (CPZ).
  - Impacts on the littoral active zone of Yzerfontein beach.
  - Scheduling of construction periods.
  - Specialist studies.
  - Potential impact on trawling blocks/ the fishing industry.
  - Relevant information on shipwrecks from SAHRA.
  - Heritage Western Cape requirements.
  - Use of the National Coastal and Marine Spatial Biodiversity Plan for updated data.
  - Terms of reference for specialist input.

8.6 Draft and Final Scoping Report

The purpose of the Draft Scoping Report (DSR) and FSR was to enable I&APs and authorities to verify that their contributions had been captured, understood and correctly interpreted. The issues identified by I&APs and by the environmental technical specialists were used to define the terms of reference for the specialist studies for this impact assessment.

The availability of the DSR for public comment was advertised on 15 January 2021 as follows:

- Notification letters were sent to all registered I&APs.
- Notices were placed at strategic points (local shops, library, etc.) within and around Yzerfontein notifying the public of the availability of the DSR for review and comment.

The DSR was made available at the Yzerfontein Municipal Offices within the study area for public review (with a 30-day comment period, 15 January to 15 February 2021) and was posted on ACER's website. A reminder to comment was sent to registered I&APs on 03 February 2021.

Comments submitted during this period were taken into account when finalising the Scoping Report. They were included in the Final CRR which was submitted to DEFF with the FSR on 25 February 2021. I&APs were notified of the submission and an electronic copy of the FSR was uploaded to the ACER website for review and comment by I&APs.

DEFF approved the FSR on 01 April 2021, allowing the Impact Assessment to follow in accordance with the Plan of Study.

8.7 Draft Environmental Impact Assessment Report and Environmental Management Programme

The DEIAR and accompanying EMPr has been made available for public and authority review at appropriate and accessible local public venues and by placing documentation on ACER's website. Following the 30-day public review period, the DEIAR and EMPr will be amended according to comments received, and then finalised along with the Final CRR. The final documents will be submitted to DFFE for decision making and I&APs will be notified accordingly.

8.8 Notification of I&APs of DFFE 's decision making

Once DFFE has issued (or refused) an environmental authorisation on the proposed project, registered I&APs will be notified via post or email of the decision, including details on the appeal procedure.

9 SUMMARY OF SPECIALIST STUDY FINDINGS

The specialist studies produced by each specialist are listed in Table 14 and contained in Appendix B, as referenced. Note that while separate terms of reference were compiled (refer to Section 7.3), the Wetlands and Vegetation/Ecology specialist studies were combined into a single report. The reports on Avifauna and Marine Mammals were commissioned as additional overview reports for the use of all of the 2AFRICA landings in South Africa, in response to comments raised by OC. They are therefore additional to the Plan of Study for Impact Assessment as outlined in the FSR for the 2AFRICA (West) Cable System (Yzerfontein landing).

The approach, findings and conclusions of the specialist reports, as they apply to the selected alternatives that are assessed in this EIA, are summarised below. Note that the environmental baseline referenced from specialist reports, where applicable, has been included in Chapter 6 of this report.

Table 14 Specialist studies and specialists

	Specialist Study	Specialist	Organisation
1	Compliance Statement for Terrestrial and Freshwater Ecosystems (Appendix B1)	Mr D. Ollis and Paul Emms	Inland Waters Consultancy in association with Capensis
2	Commercial Fisheries Specialist Study (Appendix B2)	David Japp and Sarah Wilkinson	Capricorn Marine Environmental (Pty) Ltd (CapMarine)
3	Beach and Coastal Dune Dynamics Impact Assessment (Appendix B3)	Mr Simon Bundy	SDP Ecological & Environmental Services
4	Marine Ecology Assessment (Appendix B4)	Dr Andrea Pulfrich	Pisces Environmental Services (Pty) Ltd
5	Maritime Archaeological Impact Assessment (Appendix B5)	Mr John Gribble	ACO Associates cc
6	A review of the potential effects of submarine telecommunications cables on marine mammals in Southern Africa (Appendix B6)	Mr Simon Elwen	Sea Search Research and Conservation
7	Submarine Telecommunications Cables Environmental Impact Assessment. Generic Avifaunal Impact Assessment (Appendix B7)	Jon Smallie	WildSkies Ecological Services (Pty) Ltd

9.1 Terrestrial and freshwater ecosystems

9.1.1 Introduction

The report (Appendix B1) deals with impacts of the 2AFRICA (West) Cable System (Yzerfontein landing) on terrestrial and freshwater ecosystems (meeting the two terms of reference initially compiled for vegetation and wetlands, respectively). This report was compiled to meet the minimum criteria for reporting on the terrestrial and aquatic biodiversity themes as required in terms of the relevant protocols published in Government Notice No. 320 of 20 March 2020 (Government Gazette No. 43110).

9.1.2 Approach

The following tasks were undertaken:

- Review of available documentation,
- Application of the DEFF national web-based environmental screening tool.
- Desktop-based mapping of potentially affected terrestrial and freshwater ecosystems.
- Site visit (on 4 February 2021) to visually inspect both alternatives.
- The dominant plant species were identified and noted, based on visual observations, and high-resolution photographs were taken to assist with post-fieldwork identification of observed species. Geographical coordinates were also recorded for each photograph and observation point.
- Wetland identification and delineation was undertaken according to standard field-based procedures (after DWAF 2005).
- Identification of potential impacts on terrestrial and/or aquatic (freshwater) biodiversity, and formulation of recommended mitigation measures for identified impacts.
- Compilation of a report which includes all the minimum criteria for reporting on the terrestrial and aquatic biodiversity themes as required in terms of the relevant protocols published in Government Notice No. 320 of 20 March 2020 (*Government Gazette* No. 43110).

9.1.3 Findings

The main terrestrial habitats that would potentially be affected by the proposed project are beach and sand dune habitats associated with Cape Seashore Vegetation, occurring near the transition to Langebaan Dune Strandveld. Both of these vegetation types have been classified as ecosystem types of Least Concern. However, it is primarily the beach that will be impacted by project activities. The site affected by the cable route to the BMH has no vegetation or freshwater ecosystems, and is not an important habitat for non-marine fauna.

The specialist study confirmed that there are no wetlands or other watercourses located in close proximity to the proposed cable route that could be affected by the proposed activities. As such, no Water Use Authorisation is required in terms of Sections 21(c) or (i) of the National Water Act (Act No. 36 of 1998).

The 2AFRICA (West) Cable System (Yzerfontein landing) will result in very few to no impacts on terrestrial ecosystems, freshwater ecosystems or non-marine fauna, largely because the selected landing alternative would involve the use of existing WACS infrastructure.

Mitigation measures from this specialist report have been carried across to Section 10.2 of this report and incorporated into the EMPr (Appendix F), as relevant.

9.1.4 Conclusion

The potential impacts of the proposed 2AFRICA (West) Cable System (Yzerfontein landing) (preferred landing site - Alternative 1) on vegetation, wetlands (and other watercourses) and non-marine fauna will be negligible. The proposed project is therefore, considered to be acceptable from a non-marine ecological perspective and should be granted Environmental Authorisation.

9.2 Fisheries Assessment

9.2.1 Introduction

The report (Appendix B2) provides an assessment of the potential impacts of the 2AFRICA (West) Cable System (Yzerfontein landing) on the commercial fishing industry.

9.2.2 Approach

The applicable legislation specifying safety and exclusion zones around submarine cables and cable laying vessels was outlined. An overview of South African fisheries was provided and thereafter a detailed description of those fisheries whose fishing grounds coincide with the proposed cable routing. For each of these fishing sectors, the report identified (where the information was available):

- Target species.
- Wholesale economic value of the sector.
- Nominal catch.
- The vessels, gear, methods and timing involved in the fishing activity and the way in which this may impact or be impacted by the proposed cable.
- The location and extent of the fished areas in relation to the proposed cable.
- An estimation of the fishing effort affected by the exclusion zones applied during installation and operation of the cable, in relation to the overall effort recorded by the sector.
- Possible mitigation.

Taking the above into account, the report identified and assessed the potential impacts of each stage of the cable installation (survey, installation and operation) on affected fishing sectors.

9.2.3 Findings

9.2.3.1 Exclusion zones

Under the Convention on the International Regulations for Preventing Collisions at Sea (COLREGS, 1972, Part A, Rule 10), a vessel that is engaged in cable laying is defined as a “vessel restricted in its ability to manoeuvre” which requires that power-driven and sailing vessels give way to a vessel restricted in her ability to manoeuvre. Furthermore, under the Marine Traffic Act, 1981 (No. 2 of 1981), a vessel used for the purpose of cable laying falls under the definition of an “offshore installation” and as such it is protected by a 500 m safety zone. It is an offence for an unauthorised vessel to enter the safety zone. In practice a 1,500 m exclusion zone will be requested around the cable laying vessel during cable installation.

Once installed, a subsea cable is protected by a 500 m exclusion zone on either side of the cable, and it is an offence for any anchoring or trawling within this zone.

9.2.3.2 Commercial fisheries which intersect with the marine cable alignment

As described in detail under the description of the receiving environment (Section 6.1.5), fishing activity for the following commercial fishing sectors overlaps to varying extents with the proposed 2AFRICA (West) Cable System (Yzerfontein landing) marine cable alignment:

- ❑ Demersal Trawl
- ❑ Mid-Water Trawl
- ❑ Demersal Longline
- ❑ Small Pelagic Purse Seine
- ❑ Large Pelagic Purse Seine
- ❑ Tuna Pole
- ❑ Traditional Linefish
- ❑ West Coast Rock Lobster
- ❑ Small Scale Fisheries

Of the above sectors, the biggest players in terms of fishing effort and wholesale value of production are the **demersal trawl** (targeting hake) and the **pelagic purse-seine** (targeting anchovy, sardine, and herring), as illustrated in Figure 39.

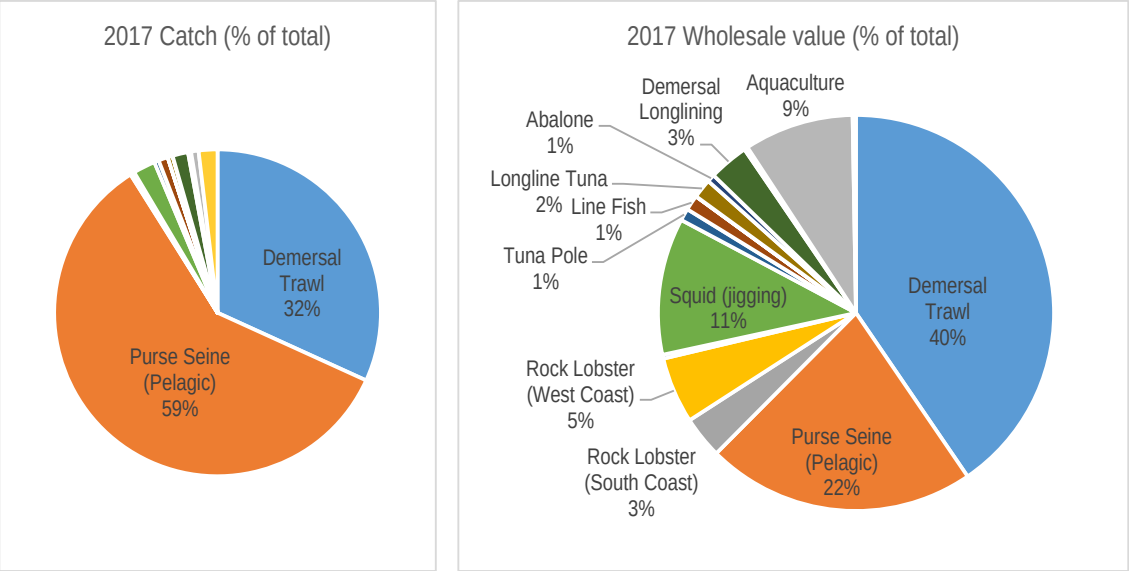


Figure 39 Pie chart showing percentage of landings by weight (left) and wholesale value (right) of each commercial fishery sector as a contribution to the total landings and value for all commercial fisheries sectors combined (2017). Source: DEFF, 2019, cited in CapMarine, 2021).

As explained and illustrated by the figures shown in Section 6.1.5 of this report, various fisheries have operations that will overlap with the proposed cable route. The demersal trawl fishery would be affected by the proposed project mainly due to its operation directly on the seabed and the trawling grounds overlapping with areas of the proposed cable alignment. The purse-seine fishery does not directly make contact with the seabed (nets extend to a depth of 60 m to 90 m) however its area of operation overlaps with areas of the proposed cable alignment. The large pelagic longline utilizes gear which can make contact with the seabed and its area of operation overlaps with areas of the proposed cable alignment. The other fishing sectors mentioned above would also be affected by the proposed project as their operations overlap with part of the proposed marine cable alignment and in some cases, the gear used may occasionally make contact with the seabed.

9.2.3.3 Potential impacts of the project on fisheries

The causes of potential impacts of the project on the fishing industry were identified as:

- Noise emissions generated during geophysical survey activities which may harm or temporarily displace fish.
- Temporary exclusion from fishing ground during geophysical survey and cable-laying operations.
- Long-term exclusion of anchoring and trawling around the cable.

NOISE EMISSIONS DURING THE GEOPHYSICAL SURVEY

The presence and operation of the survey vessel will introduce a range of underwater noises into the surrounding water column that may potentially contribute to and/or exceed ambient noise levels in the area.

Elevated noise levels could impact marine fauna by:

- Causing direct physical injury to hearing or other organs, including permanent or temporary threshold shifts in hearing.
- Masking or interfering with other biologically important sounds (e.g. communication, echolocation, signals and sounds produced by predators or prey).
- Causing disturbance to the receptor, resulting in behavioural changes or displacement from important feeding or breeding areas.

Should the above negatively affect populations of target species, this may in turn negatively impact the catch of commercial fisheries. However, due to the short-term duration and the low intensity of noise generated by the acoustic equipment utilized during geophysical surveys, the specialist report considers the significance of the impact to be very low. No mitigation measures are possible or considered necessary for the generation of noise by the geophysical survey methods proposed. The impact is highly reversible, as any disturbance of behaviour that may occur as a result of survey noise would be temporary. While there is little scope for mitigation, the assessment indicates that the overall impact of temporary exclusion is of very low significance.

TEMPORARY EXCLUSION FROM FISHING GROUND DURING GEOPHYSICAL SURVEY AND CABLE-LAYING OPERATIONS DUE TO TEMPORARY SAFETY ZONE AROUND VESSELS

By law, vessels engaged in surveying as well as vessels engaged in laying of subsea cables are protected by a 500 m safety zone. The demersal trawl, midwater trawl, demersal longline, small pelagic purse-seine, large pelagic longline, tuna pole, traditional linefish and West Coast rock lobster trap sectors have historically operated across the proposed Yzerfontein cable route and are all currently active to a lesser or greater degree.

All unauthorised vessels would be excluded from entering the safety zone. The implementation of the safe operational zone will effectively exclude fishing vessels from portions of their fishing grounds when the vessels are on site. The temporary exclusion of fisheries from the safety zone will effectively reduce fishing grounds, which in turn could potentially result in a loss of catch and/or displacement of fishing effort (direct negative impact).

For all fishing sectors, the impact is considered to be short-term (limited to the duration of the survey and cable laying operations) with the extent being localised. The intensity of the impact on each sector will be based on the proportion of fishing effort and catch within the affected area, relative to total effort and catch reported by each sector. The intensity of the impact is

assessed to be low for all sectors. While there is little scope for mitigation, the assessment indicates that the overall impact of temporary exclusion is of very low significance.

EXCLUSION FROM FISHING GROUND DUE TO PERMANENT EXCLUSION ZONE AROUND CABLE

Once installed, a subsea cable is protected by a 500 m exclusion zone on either side of the cable, and it is an offence to anchor or trawl within this zone. The proposed project therefore presents an impact on the fishing industry via exclusion to the demersal trawl or demersal longline operations.

The majority of the proposed cable routing falls offshore of the demersal trawl fishing grounds. Where the cable routing traverses shallower water, from a seabed depth of 700 m to 200 m, trawling activity could be expected to take place across a 60 km section of the cable. Figure 40 shows the location of a sample of trawl tracks as well as trawling effort in relation to existing cables and the proposed cable routing. Note that although trawl tracks are shown to cross the existing cables, trawling with gear on the seabed is unlikely as skippers would lift gear off the seabed to avoid potential contact with the cables.

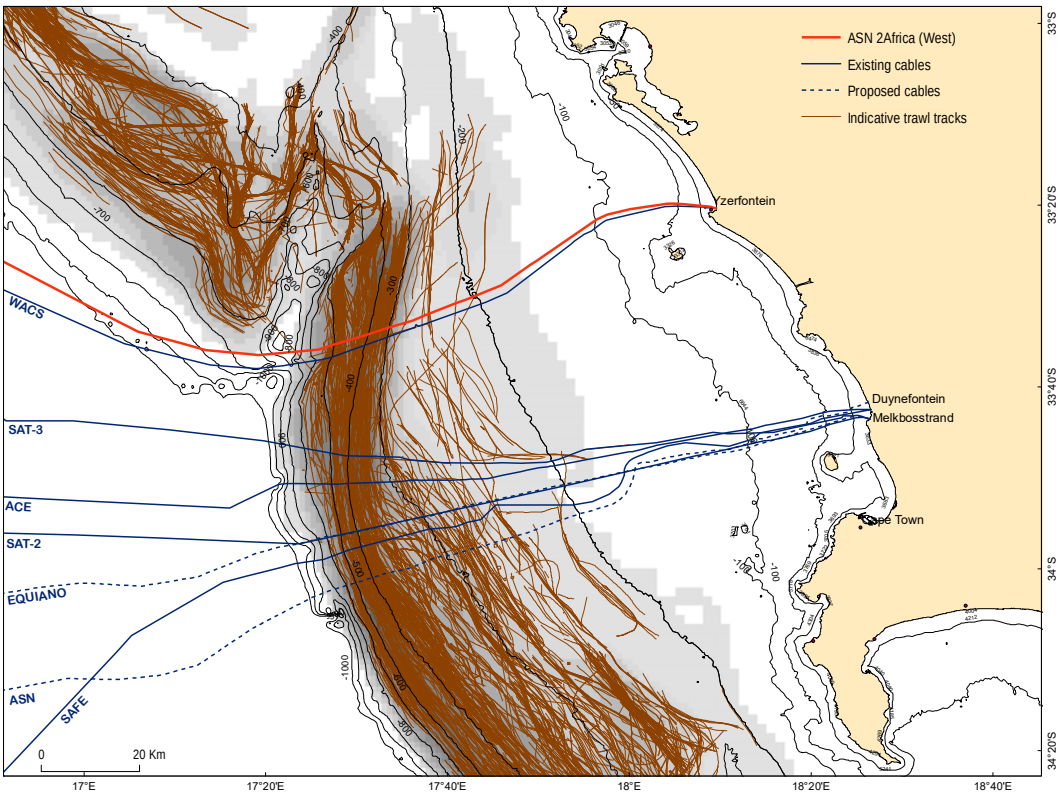


Figure 40 Spatial distribution of fishing effort expended by the demersal trawl sector in relation to the proposed 2AFRICA (West) cable landing at Yzerfontein. Indicative trawl tracks are shown in relation to the proposed and existing cables.

Over the period 2008 to 2016, an average of 91 trawls per year (or 288 fishing hours) were recorded within a distance of 1 Nm of the proposed cable routing at Yzerfontein. The amount of hake caught within the area was 373 tons per year or 0.3% of the overall effort recorded by the sector. A 500 m safety and exclusion zone around the cable route would cover 60 km^2 (0.1%) of demersal trawl fishing ground.

Based on the high levels of effort recorded in the area, the probability that the impact would occur is definite and the duration of the impact would be long-term (for the duration of the operational lifespan of the cable). The intensity of the impact is considered to be medium (where fishing may continue in a modified way). Mitigation potential is low and the overall significance of permanent exclusion is considered to be low.

Mitigation measures from this specialist report have been carried across to Section 10.3 of this report and incorporated into the EMPr (Appendix F), as relevant.

9.2.4 Conclusion

The report concludes with a summary table listing a significance of very low or low, for each of the identified project impacts on affected fisheries, before and after the implementation of mitigation measures ((Table 15).

Table 15 Summary of the impacts on fisheries of each of the identified project activities.

Ref:	Potential Impact Source	Project Phase	Impact Significance	
			Pre-Mitigation Impact	Residual Impact
1	Noise Effects on Catch Rates during Geophysical Survey (multi-beam echo sounder, side-scan sonar, sub-bottom profiler)	Pre-Installation	Very Low	Very Low
2	Temporary Exclusion Zone around Geophysical Survey Vessel	Pre-Installation	Very Low	Very Low
3	Temporary Exclusion Zone around Cable-Laying Vessel	Installation	Very Low	Very Low
4	Permanent Exclusion Zone around Cable	Operation Demobilisation	Low	Low

9.3 Beach and Coastal Dune Dynamics

9.3.1 Introduction

The report (Appendix B3) provides an assessment of the potential impacts of the 2AFRICA (West) Cable System (Yzerfontein landing) on the beach and dune cordon, within and adjacent to the proposed landing point.

9.3.2 Approach

The investigation utilised desk-top assessments and field reconnaissance to investigate various selected parameters and to identify biophysical factors associated with the area that may be considered drivers that determine the status and ecological function of the beach and dune cordon. In addition, the investigation considers the ecological impacts that may arise within the dune system from the establishment of the cable, the most appropriate routing for the cable, as well as mitigation and management measures that may be employed during and post the installation phase.

9.3.3 Findings

Main Beach and adjacent portions of shoreline are subject to intermittent erosion, partly due to the focus of incoming waves at a point central to the crenulate bay formation. Intrusion and stabilization of the sand sharing system of the coast by urban infrastructure has also served to exacerbate such erosion. The response to erosion has been to establish a sea wall and other forms of defence, which effectively dysfunctionalises the beach-dune interface. These actions, in synchrony with ongoing climate change and related factors, have seen ongoing erosion along the shore where the cable is proposed for landing. The relic frontal dune, immediately north of the cable landing point is presently an overly steep dune, with intermittent undercutting by higher tidal inundation.

The frontal dune cordon, where not significantly altered by urban development, presents typical Langebaan Dune Strandveld. At the point of the proposed cable landing, the dune has been cleared and subject to excavation, effectively placing much of this portion of the dune in an early seral[20] state.

Given the above, the selected landing alternative (Alternative 1) is the most prudent approach as it bypasses the dune cordon and this route would have low to very low coastal eco-morphological impacts and ramifications. Sound management during the laying of the cable will see little impact on natural systems at the landing point. Where disturbance does arise, it is clear that the affected natural areas are of little ecological value, while measures to remediate any untoward disturbance can be easily implemented.

Mitigation measures from this specialist report have been carried across to Section 10.4 of this report and incorporated into the EMPr (Appendix F), as relevant.

20 A **seral** community is an intermediate stage found in ecological succession in an ecosystem advancing towards its climax community. These can also be described as the pioneer community.

9.3.4 Conclusion

The point of the proposed cable landing at Yzerfontein has been shown to be an eroding portion of coastline that has been subject to various anthropogenic impacts, many of which are designed to redress the evident erosion. As such the site can be considered to be a highly altered system. It is also clear that erosion and further disturbance of the system may be exacerbated under a changing climate and maritime regime, with a vacillating beach environment and further erosion of the frontal dune anticipated.

The specialist supports the selected landing site[21] as the most prudent approach. The proposed alternative meets with an existing cable and concrete walkway at the point of landing and therefore will have little further impact on the dune cordon and the associated environment.

9.4 Marine Ecology Assessment

9.4.1 Introduction

The report (Appendix B4) was compiled as a desktop study and provides an assessment of the potential impacts of the 2AFRICA (West) Cable System (Yzerfontein landing) on the marine environment.

9.4.2 Approach

The specialist adopted a 'desktop' approach. The landing site at Yzerfontein is characterized by a stretch of dissipative sandy beach, no different from other similar beaches in the southern Benguela, and which have been adequately described in the scientific literature. A detailed site investigation was thus not deemed necessary and no new data were collected. The study provides a description of the natural baseline environment in the marine study area based on a review and collation of existing information and data from the scientific literature, and various internal reports. The information for the identification of potential impacts on benthic communities was drawn from various scientific publications, and information sourced from the Internet. The report identified and assessed the potential impacts of each stage of the cable installation (survey, installation and operation) on benthic habitat, marine fauna and water and sediments. All identified marine impacts were summarised, categorised and ranked in impact assessment tables, which have been translated into the impact assessment tables in Chapter 10 of this DEIAR, as applicable.

9.4.3 Findings

9.4.3.1 Sensitive areas encountered along the marine cable route alignment

The route of the proposed 2AFRICA (West) Cable System (Yzerfontein landing) passes through a number of ecologically sensitive areas, with differing levels of protection, including:

- The West Coast National Park MPA.
- EBSA associated with the Cape Canyon and associated Islands, Bays and Lagoons and situated between Cape Canyon and Robben Island MPAs.

21 As compared with the Alternative 2, which has been discarded as a feasible option and not assessed in this EIA report.

- CBA1 and CBA2 areas in terms of the new National Coastal and Marine Spatial Biodiversity Plan (2020).
- Threatened ecosystems (ranging from well protected to not protected).
- The proposed marine IBA (Bird Island / Dassen Island / Heuningnes river and estuary system / Lower Berg river wetlands).

9.4.3.2 Disturbance of the coastal zone

Installation of the subsea cable through the surf-zone and across the beach would require the subsea cable to be buried to sufficient depth to ensure it is not exposed during seasonal variation of the beach levels. Excavated material would be disposed of onto the beach and into the surf-zone down-current of the construction site. Subtidal trenching would result in the mobilisation and redistribution of sediments in tidal currents and the littoral drift. This would result in localised increased suspended sediment concentrations in the water column. Where burial cannot be achieved and additional cable protection is required, an articulated split-pipe may be used to maximise cable security. The trenching and cable burial process would result in disturbance of high shore, intertidal and shallow subtidal sandy beach habitats and their associated macrobenthic communities through displacement, injury or crushing. Mobile organisms such as fish and marine mammals, on the other hand, would be capable of avoiding the construction area. Any shorebirds feeding and/or roosting in the area would also be disturbed and displaced for the duration of construction activities. On a high-energy coastline the recovery of the physical characteristics of intertidal and shallow subtidal unconsolidated sediments to their pre-disturbance state following trenching and cable burial will occur within a few tidal cycles under heavy swell conditions and will typically result in subsequent rapid recovery of the invertebrate epifaunal and infaunal communities to their previous state. If, following the disturbance, the surface sediment is similar to the original surface material, and if the final long-term beach profile has similar contours to the original profile, the addition or removal of layers of sand does not have enduring adverse effects on the sandy beach benthos.

9.4.3.3 Disturbance of nearshore benthic habitats

Trenching of the subsea cable in the littoral zone beyond 10-15 m depth would result in the mobilisation and redistribution of sediments in tidal currents and the littoral drift. This would result in localised increased suspended sediment concentrations in the water column. Where burial cannot be achieved and additional cable protection is required, an articulated split-pipe may be used to maximise cable security. Within the wave-base (0 – 50 m), the subsea cable and/or articulated split-pipes may be held in place with saddle clamps at specific locations. This would require drilling into the bedrock to secure the clamps. The subsea cable burial and/or securing process would result in disturbance of subtidal unconsolidated sediments and their associated macrobenthic communities through displacement, injury or crushing. Although recovery is site specific and dependent on different modes of cable burial and varied sediment environments, studies have shown that on the inner and middle shelf, recovery of benthic communities following cable burial by plough typically occurs within 1-2 years and conclude that the physical presence of the cable and the disturbance caused by its burial had little effect on the benthic communities along the cable route.

9.4.3.4 Disturbance of offshore habitats

The grapnel used during the PLGR, and the subsea cable plough and/or tracked jet-trenching/burial ROV implemented during subsea cable laying would result in the disturbance and turnover of unconsolidated sediments along a swath of seabed. The plough blade disturbs

a swath of seabed ≤1 m wide but potentially extending to a depth of 3 m. Jetting techniques create a trench typically ≤1 m wide, however sediment disturbance is extensive and redeposition can spread to hundreds of metres from the trench, with plumes of the suspended mud fractions potentially extending to 2 km from the cable route, thereby creating a larger impact footprint.

As the cable is typically only 25 mm to 50 mm in diameter, the disturbance associated with laying it on top of the sediment or consolidated substrate is limited to the footprint of the cable itself and any protective encasing material. Impacts associated with placing the cable directly onto the seabed include crushing, damaging or displacement of organisms. Unless cables traverse habitats supporting vulnerable slow-growing species (e.g., glass sponges, deep-water corals), the loss of substratum would be temporary as the cable itself would provide an alternative substratum for colonising benthic communities or provide shelter for mobile invertebrates. Once the cable has been laid, the affected seabed areas around the cable would with time[22] be recolonised by benthic macrofauna, with the encrusting epifauna resembling that inhabiting natural reefs in the area. Recovery time will vary depending on the type of benthic community, and is usually much slower in deeper areas, sometimes taking more than 10 years to fully recover. The impacts associated with cable burial are, however, a once-off disturbance, with affected communities able to recover naturally following the cable installation. Where the subsea cable is exposed, colonisation of the cable would commence within a few weeks. Studies from elsewhere have determined that benthic macro- and mega-fauna within 0–100 m of trenched and surface-laid cables showed negligible changes in abundance and distribution following cable installation.

9.4.3.5 Increase in noise

During installation of the subsea cable shore-crossing, noise and vibrations from excavation machinery may have an impact on surf-zone biota, marine mammals and shore birds in the area. The noise generated will, however, be localised and of short duration and mobile animals will be able to move out of the noise affected area.

Further offshore, underwater noise generated during subsea cable installation could affect a wide range of fauna; from benthic invertebrates and demersal species residing on the seabed along the subsea cable route, to those invertebrates and vertebrates occurring throughout the water column and in the pelagic habitat near the surface. Due to their hearing frequency ranges, the taxa most vulnerable to noise disturbance are turtles, pelagic seabirds, large migratory pelagic fish, and both migratory and resident cetaceans.

The cumulative impact of increased background anthropogenic noise levels in the marine environment is an ongoing and widespread issue of concern. The sound level generated by the subsea cable laying vessel and subsea apparatus would fall within the hearing range of most fish and marine mammals and would be audible for considerable ranges (in the order of tens of kms) before attenuating to below threshold levels. However, the noise is not considered to be of sufficient amplitude to cause direct physical injury or mortality to marine life, even at close range. The underwater noise may, however, induce localised behavioural changes or masking of biologically relevant sounds in some marine fauna. As much of the cable route is aligned with the main offshore shipping lanes that pass around southern Africa, the vessel noise component of the ambient noise environment is expected to be significant along the cable route. The noise generated by the cable laying vessel would be no different from that of other vessel traffic throughout the oceans, and from the point of vessel operations no specific mitigation (e.g.,

22 The time taken will vary depending on the benthic community and can take many years. Recovery rates are usually slower in deep water than in shallower areas

avoidance of marine mammal migration periods) is therefore deemed necessary when the vessel is in high seas waters.

9.4.3.6 Increased turbidity

The disturbance and turnover of sediments during the pre-lay grapnel run and during trenching will result in increased suspended sediments in the water column and physical smothering of biota by the re-depositing sediments. The effects of elevated levels of particulate inorganic matter and depositions of sediment have been well studied, and are known to have marked, but relatively predictable effects in determining the composition and ecology of intertidal and subtidal benthic communities. Increased suspended sediments in the surf-zone and nearshore can potentially affect light penetration and thus phytoplankton productivity and algal growth, whereas further offshore it can load the water with inorganic suspended particles, which may affect the feeding and absorption efficiency of filter-feeders. The increased occurrence of turbidity plumes near the surface can also affect the feeding success of visual predators. However, due to the rapid dilution and widespread dispersion of settling particles, any adverse effects in the water column would be ephemeral and highly localised. Any biological effects on nectonic and planktonic communities would be negligible. Turbid water is a natural occurrence along the Southern African coast, resulting from aeolian and riverine inputs, resuspension of seabed sediments in the wave-influenced nearshore areas and seasonal phytoplankton production in the upwelling zones.

9.4.3.7 Physical presence of subsea cable

Although the cable is typically only 20 mm – 200 mm in diameter, its presence and that of any protective steel sleeves or concrete mattresses effectively reduces the area of seabed available for colonisation by macrobenthic infauna in seabed sediments. The subsea cable itself and any protective covering, however, would serve as an alternative substratum for colonising benthic communities or provide shelter for mobile invertebrates and demersal fish (artificial reef effect). Assuming that the hydrographical conditions around the subsea cable and repeaters would not be significantly different to those on the seabed, a similar community to that typically found on hard substrata in the area can be expected to develop over time. The presence of subsea infrastructure (namely cable and repeaters) can therefore alter the community structure in an area, and effectively increase the availability of hard substrate for colonisation by sessile benthic organisms, thereby locally altering and increasing biodiversity and biomass, potentially also attracting mobile macro- and megafauna who utilize the biofouling community as a food source. Although no direct mitigation measures are possible, the negative impact of the subsea cable presence on marine biota is considered to be of low significance. Designated cable protection zones with suitable habitats may in fact help to maintain and improve biodiversity and species abundance, and therefore act as *de facto* marine reserves or sanctuaries, although this concept has yet to be proven.

9.4.3.8 Potential impacts associated with emissions from the cable (e.g. heat, electromagnetic fields, leachate)

HEAT DISSIPATION

While high and medium voltage seabed power transmission cables can emit heat, the voltage associated with telecommunication cables (for powering the repeaters) is very low, and any associated heat emissions are understood to be negligible. Although the potential consequences of this thermal radiation on benthic organisms has not yet been investigated in situ, the narrow footprint of the cables and the expected low temperature differences suggest that impacts are likely to be negligible.

SOUND EMISSIONS

Under normal operations, fibre optics cables do not emit any audible sound. During the laying of the cable, it does vibrate as a result of regular vortex shedding as it descends through the water column. At ~10 Hz, this is a low frequency phenomenon and well below the hearing frequencies of marine fauna. Once the cable comes to rest on the seabed the sound ceases. In areas of high wave or current action on the continental shelf, cables can be exposed and undermined. Where undermining is significant, the suspended cable can vibrate or strum under the water motions. This sound would likewise be of low frequency and would not be of sufficient amplitude to cause auditory or non-auditory trauma in marine animals. The sound is expected to attenuate rapidly to below ambient levels.

ELECTRIC AND ELECTROMAGNETIC FIELDS

Fibreoptics cables carry a constant direct current of 1 - 1.6 Amperes to power the underwater repeaters. There is no external electric field associated with the power on the inner conductor as the polyethylene insulation ensures that the electric field remains only within the cable insulation. The direct current in the inner conductor does, however, set up a stationary magnetic field in the form of concentric rings emanating from the cable. The magnetizing force produced by this field diminishes with increasing radius from the cable such that at a distance of 1 m from the cable, the electromagnetic field (EMF) would be in the order of 0.32 micro Tesla. This is two orders of magnitude lower than the typical magnetic flux densities of the earth, which range from 30 microTesla at the equator to 60 microTesla at the magnetic poles. Animals with the capacity to detect and use constant geomagnetic fields are thus likely to only detect the signal within close proximity to the source (within centimetres).

The marine environment is by no means devoid of electric and magnetic fields. Organisms use internal electric potentials and signals for a wide variety of biological functions (e.g., orientation or prey detection), and in some cases can perceive very small electric and magnetic fields. Perturbations from external electric and magnetic fields on such physiological systems need not necessarily have detrimental biological effects, as the magnitude of the effect will depend on the field intensities and exposure times to them, their frequency content, modulation, etc. A wide variety of taxa are sensitive to electromagnetic fields. Elasmobranchs and chimaerids are the taxa most likely to detect the electrical fields produced by fibre-optic cables because their electroreceptive organs are sensitive to stimuli in the very low frequency range from 0.125 Hz to 8.0 Hz.

The injection of a low frequency electrical signal from the land station is known as ‘toning’ and is undertaken to aid in cable location in the event of a fault or when a safe distance needs to be kept from a cable during other marine work. Toning has been used for many years on submarine cables throughout the world, and no adverse effects on marine life have been reported.

LEACHING OF CONTAMINANTS

Modern deep-water fibre-optic cables are composed of hair-like glass fibres, a copper power conductor and steel wire strength member, all of which are sheathed in high-density polyethylene. Where extra protection is required, as for areas of rocky seabed or strong wave and current action, additional steel wire armour is added. No anti-fouling agents are used. The cable-grade polyethylene used for the sheath is essentially inert in seawater. Oxidation, hydrolysis, and mineralization processes for polyethylene are extremely slow, with the total conversion to carbon dioxide and water estimated to take centuries. The effects of ultraviolet light, the main cause of degradation in most plastics, are minimized using light-stabilized materials, burial of the cable into the seabed and the natural reduction in light penetration through the photic zone. Where the cable is located on the energetic continental shelf and

mechanical abrasion of the cable's plastic sheathing by fine-grained particles is possible, the cable is either armoured or buried.

A study investigating potential leachates of copper, iron and zinc from the conductors and galvanized steel armour, identified that only zinc passed into the seawater, yielding concentrations of less than 6 mg/l for intact cables and less than 11 mg/l for cut cables with exposed wire armour ends[6]. The amount of leaching declined after ~10 days. Although this is above the recommended BCLME water quality guideline value of 5 µg/l (CSIR 2006), dilution of leachates by the surrounding water would be rapid and any negative effects on marine organisms are likely to be highly localised. Although zinc is an essential food element and occurs as Zn^{II} in dissolved form, it is listed amongst the 129 priority pollutants by the US Environmental Protection Agency as it can have lethal and sub-lethal effects at concentrations as low as 170 µg/l, particularly on the egg and larval stages of marine invertebrates.

9.4.3.9 Pollution and accidental spills

Trenching during installation of the shore-crossing of the subsea cable will involve excavation and construction activities. There would thus be potential for or accidental spillage or leakage of fuel, chemicals or lubricants, litter, inappropriate disposal of human wastes and general degradation of ecosystem health on the shoreline. Any release of liquid hydrocarbons has the potential for direct, indirect and cumulative effects on the marine environment through contamination of the water and/or sediments. These effects include physical oiling and toxicity impacts to marine fauna and flora, localised mortality of plankton, pelagic eggs and fish larvae, and habitat loss or contamination. Many of the compounds in petroleum products have been known to smother organisms, lower fertility and cause disease in aquatic organisms. Hydrocarbons are incorporated into sediments through attachment to fine-grained particles, sinking and deposition in low turbulence areas. Due to differential uptake and elimination rates, filter-feeders, particularly mussels, can bioaccumulate organic (hydrocarbons) contaminants.
During construction, litter can enter the marine environment. Marine litter is a cosmopolitan problem, with significant implications for the environment and human activity all over the world. Marine litter travels over long distances with ocean currents and winds. It originates from many sources and has a wide spectrum of environmental, economic, safety, health and cultural impacts. It is not only unsightly, but can cause serious harm to marine organisms, such as turtles, birds, fish and marine mammals.

9.4.3.10 Collisions with and entanglement by marine fauna (including seabirds)

Vessel traffic can affect large cartilaginous fish species, turtles and marine mammals by direct collisions or propeller injuries. The potential effects of vessel presence on turtles and cetaceans include behavioural disturbance, physiological injury or mortality. Most lethal and serious injuries are caused by larger vessels and most vessel strikes occur on the continental shelf and when vessels are moving with speeds in excess of 10 knots. Given the slow speed of the vessels during surveying, the pre-lay grapnel run and the cable installation, ship strikes with marine mammals and turtles are unlikely, and should the impact occur, it would be very infrequent.

Entanglement of whales with old telegraph cables occurred during the telegraph era (1850s to 1950s) at sites where cables had been repaired on the edge of the continental shelf or on the adjacent continental slope in water depths down to 1,135 m. With improved design, laying and maintenance techniques, since development of the coaxial submarine cables in the 1950s and into the fibre-optic era in the early 1980s, no further entanglements with marine mammals have

been recorded. Furthermore, as the cable would be buried along much of its length on the continental shelf, entanglements are highly unlikely.

As much of the cable would be installed in the offshore marine environment, the strong operational lighting used to illuminate the survey and cable vessels may disturb and disorientate pelagic seabirds feeding in the area. Operational lights may also result in physiological and behavioural effects of fish and cephalopods as these may be drawn to the lights at night where they may be more easily preyed upon by other fish and seabirds. The response of marine organisms to artificial lights can vary depending on a number of factors such as the species, life stage and the intensity of the light. Considering the extensive distributions and low numbers of pelagic seabirds likely to be encountered in the offshore environment, the likelihood of collisions would be low.

9.4.3.11 Cumulative impacts

The proposed cable route, where possible, avoids sensitive reef areas and environments such as MPAs, but will pass through the Cape Canyon and Associated Islands EBSA. Consequently, impacts will mostly affect communities in unconsolidated habitats, which are less sensitive to disturbance and recover more quickly than those inhabiting hard grounds. Cumulative impacts are therefore less likely. The greatest possibility of cumulative impacts is where the proposed cable route meets those of other existing subsea cables, particularly as it passes through the Cape Canyon and at the Yzerfontein shore crossing. These cumulative impacts are, however, assessed to be of low to very low significance as in reality the total cumulative impacted area at any one time would be minimal, due to the natural recovery of nearshore benthic communities of unconsolidated habitats over the short- to medium term. In other words, the benthic habitats disturbed during the installation of the existing cables in the 'cable corridor' passing through the Cape Canyon and associated EBSA, are likely to have already fully recovered, and so additional impacts in the same general area through routing of the proposed 2AFRICA (West) Cable System (Yzerfontein landing) subsea cable will unlikely be significant.

9.4.3.12 Marine impact assessment summary

Potential impacts of the project on the marine environment include:

- Physiological injury or behavioural disturbance of marine fauna caused by noise.
- Potential injury to marine mammals and turtles through vessel strikes.
- Disturbance of sediments and associated fauna.
- Elimination of biota in the cable's structural footprint
- Physical presence of the cable providing an alternative substratum for colonising benthic communities or resulting in faunal attraction to fish and mobile invertebrates.
- Temporary loss of benthic habitat and associated sessile communities in the coastal zone.
- Possible temporary impacts on adjacent habitat health due to turbidity.
- Temporary disturbance of marine biota.
- Possible impacts to marine water quality and sediments through hydrocarbon pollution or contamination by other waste.
- Potential impacts associated with emissions from the cable (e.g. heat, electromagnetic fields, leachate)
- Pollution of the beach and sea due to accidental spills and litter.
- Collisions with and entanglement by marine fauna.
- Cumulative impacts.

A summary of the assessment of impacts is provided below:

- Any behavioural or physiological impacts on marine fauna (including avifauna) due to noise from the geophysical survey and cable installation onshore and offshore would be localised, of low intensity and fully reversible. Mitigation potential is very low. **The impact of increased noise on marine fauna during the cable survey and cable installation is considered of VERY LOW significance both without and with mitigation.**
- Disturbance and destruction of sandy beach biota during trench excavation and subsea cable installation would be temporary, once-off and highly localised. The impacts on benthic communities as a result of cable installation through the littoral zone would be of medium intensity. Impacts would be short-term as communities within the wave-influenced zone are adapted to frequent natural disturbances and recover relatively rapidly. **The potential impacts of the cable's shoreline crossing on benthic organisms is deemed to be of LOW significance without mitigation.**
- The impacts of trenching and increased suspended sediments on benthic communities in nearshore benthic habitats within and beyond the surf-zone would be of medium intensity. Impacts would be once-off and highly localised. Impacts would be expected to endure over the short-term only as communities within the wave-influenced zone are adapted to frequent natural disturbances and recover relatively rapidly. **The potential impacts of cable installation on benthic organisms in the nearshore environments is consequently deemed to be of LOW significance without mitigation.**
- The potential direct impacts of crushing and sediment disturbance on benthic organisms in offshore habitats would be of medium intensity and once off (unless cable repair is necessary). Benthic impacts will be highly localised along the length of the subsea cable route. Impacts would be limited to the medium-term only as recolonisation of disturbed sediments from adjacent areas would occur within a year, but full recovery to functional similarity can take longer (medium- to long-term).The change in habitat from unconsolidated sediments to the hard substratum of the cable itself would, however, be permanent. Although the subsea cable route passes through offshore benthic habitats identified as 'endangered' (Cape Upper Canyon) and 'vulnerable' (Cape Lower Canyon, Southern Benguela Sandy Shelf Edge, and Cape Rocky Mid-Shelf Mosaic) the loss of resources would be low and impacts would be partially reversible as unconsolidated habitat will be replaced by hard substratum in areas where the cable is not buried. Furthermore, the proportion of vulnerable habitat affected by the subsea cable installation can be considered negligible in relation to the available habitat area[5]. **Consequently, the potential impacts on benthic organisms of cable installation across the continental shelf and abyss is deemed to be of LOW significance without mitigation.**
- Disturbance and injury to marine biota due to construction noise or noise generated by the vessel and cable plough is deemed of low magnitude within the immediate vicinity of the construction site/subsea cable route, with impacts persisting over the short-term only. In both cases impacts are fully reversible once construction and subsea cable installation operations are complete. **Without mitigation, the direct impacts of construction and vessel noise on marine biota are therefore assessed to be of VERY LOW significance, respectively.**
- Elevated suspended sediment concentrations due to trenching and burial activities associated with the subsea cable installation is deemed of low intensity and would extend locally around the subsea cable route and down-current of the shore-crossing, with impacts persisting only temporarily. Within the wave-base at least, marine biota are typically adapted to periods of elevated turbidity and as suspended sediment concentrations would remain at sub-lethal levels, the loss of resources would be low and impacts would be fully reversible. Mitigation potential is very low. **The impact of**

increased turbidity on marine biota is therefore assessed to be of VERY LOW significance without mitigation.

- The physical presence of subsea infrastructure (namely cable and repeaters) can alter the community structure in an area, and effectively increase the availability of hard substrate for colonisation by sessile benthic organisms, thereby locally altering and increasing biodiversity and biomass, potentially also attracting mobile macro- and megafauna who utilize the biofouling community as a food source. Designated cable protection zones with suitable habitats may in fact help to maintain and improve biodiversity and species abundance, and therefore act as de facto marine reserves or sanctuaries, although this concept has yet to be proven. The impacts on marine biodiversity through the physical presence of the subsea cable would be of medium intensity and highly localised along the cable itself. As the subsea cable would likely be left in place on the seabed beyond decommissioning of the project, its impacts would thus be permanent. No direct mitigation measures, other than the no-project alternative, are possible. There is no feasible potential for mitigation. **The potential impacts on marine biota due to the physical presence of the cable is deemed to be of LOW significance without mitigation.**
- Based on available information in the literature, the impacts on marine fauna through the generation of heat, sound, EMFs and leachates by the submarine cable would be of negligible intensity and highly localised along the cable itself. As the subsea cable would be in operation for up to 25 years, the impacts would persist over the long-term. No direct mitigation measures, other than the no-project alternative, are possible. **The potential impacts on marine biota, caused by heat dissipation, sound emissions, electric fields, electromagnetic fields and/or leaching of contaminants directly from the cable, are deemed to be of VERY LOW significance without mitigation.**
- Potential hydrocarbon spills and pollution in the intertidal and shallow subtidal zone during installation of the subsea cable are deemed of medium intensity within the immediate vicinity of the construction site, with impacts persisting over the short- to medium-term. Impacts of pollution and accidental spills would be direct, indirect and cumulative. As the coastal habitats at the shore crossing have been identified as ‘vulnerable’ (Southwestern Cape Mixed Shore) the loss of resources could potentially be medium, with impacts being only partially reversible in the worst-case scenario. Mitigation potential is high. **Pollution and accidental spills on the shoreline during the construction phase is probable and the impact is therefore assessed to be of MEDIUM significance.**
- Given the slow speed of the vessels during surveying, the pre-lay grapnel run and the cable installation, ship strikes with marine mammals and turtles are unlikely, and should the impact occur it would be very infrequent. Entanglement with the marine cable is improbable. The likelihood of collision by seabirds as a result of operational lights is low. However, in the event of a collision or entanglement, the impact is deemed of low intensity and would be site specific to the vessel/cable location. Injury through collision and/or entanglement would persist over the short term and considering the slow vessel speed would likely remain at sub-lethal levels. Mitigation potential is medium. **Although this direct impact could result in a medium loss of resources, collision with or entanglement of marine fauna is assessed to be of LOW significance without mitigation.**
- The proposed cable route, where possible, avoids sensitive reef areas and environments such as MPAs, but will pass through the Cape Canyon and Associated Islands EBSA. Consequently, impacts will mostly affect communities in unconsolidated habitats, which are less sensitive to disturbance and recover more quickly than those inhabiting hard grounds. Cumulative impacts are therefore less likely. The greatest possibility of cumulative impacts is where the proposed ASN cable route meets those of other existing subsea cables, particularly as it passes through the Cape Canyon and at the Yzerfontein

shore crossing. **These cumulative impacts are, however, assessed to be of LOW to VERY LOW significance.**

Mitigation measures from this specialist report have been carried across to Section 10.2 of this report and incorporated into the EMPr (Appendix F), as relevant.

9.4.4 Conclusion

Installation of the cable will potentially result in localised disturbance of the upper beach and intertidal and shallow subtidal sandy habitats, as well as unconsolidated seabed beyond the surf-zone and across the shelf.

The impacts associated with cable burial are a once-off disturbance, with affected communities able to recover naturally following the cable installation. A single impact such as a cable burial, is preferred to continuous, multiple or recurring impacts such as those associated with, for example, a demersal trawl. The specialist report concludes that, if all environmental guidelines and appropriate management and monitoring recommendations advanced in the report are implemented, there is no reason why the proposed installation of the 2AFRICA (West) Cable System (Yzerfontein landing) should not proceed.

9.5 Heritage Assessment

9.5.1 Introduction

The HIA report (Appendix B5) provides an assessment of the potential impacts of the 2AFRICA (West) Cable System (Yzerfontein landing) on heritage resources. It deals principally with the marine portion of the cable system located between the outer edge of the contiguous zone (a minimum of 24 Nm offshore) to the high-water mark, which is the extent of the jurisdiction of SAHRA. The terrestrial portion of the cable route inland of the BMH falls under the jurisdiction of Heritage Western Cape, but because it will use the existing WACS cable landing infrastructure and cable sleeves, does not trigger the relevant section of the NHRA (Section 38(1)). According to HWC, therefore, no heritage assessment for that portion of the route is required.

9.5.2 Approach

The HIA aims to identify heritage resources which may be impacted during the construction, operation and decommissioning phases of the project, assess their significance and provide recommendations for mitigation. The report therefore includes the following:

- A desk-top level literature review to assess the potential for maritime archaeological sites, and submerged pre-colonial sites along the route of the cable system.
- A comment from a palaeontologist regarding the potential for impacts to palaeontological features arising from the installation of the cable system.
- A review of the geophysical survey reports for the cable system for seabed anomalies that may represent heritage resources.

The results of the studies listed above are integrated in the HIA report along with an assessment of the sensitivity and significance of any heritage resources, an evaluation of the potential impacts of the project on these resources and recommendations for measures to mitigate any negative impacts.

9.5.3 Findings

The heritage receptors defined for the impact assessment are:

- Submerged prehistoric archaeological resources.
- Palaeontological features and fossil material.
- Maritime archaeological resources, mostly historical shipwrecks.

These have been described in Section 6.6 of this EIA report and in more detail in the specialist report.

9.5.3.1 Submerged prehistoric archaeological material

The report finds that where submerged prehistoric archaeological material potential has survived post-glacial marine transgression, it will form part of the sedimentary make-up of the seabed and may be impacted by interventions on and in the seabed. The small footprint of the seabed intervention that will result from the installation of the cable system, however, makes the potential for direct impacts on submerged prehistoric archaeological material in the study area unlikely. The nature of the proposed seabed intervention, namely the burial of the cable in the seabed within the area covered by this assessment suggests that indirect impacts, which manifest themselves after and/or downstream of the activity are also unlikely.

9.5.3.2 Paleontological features and fossil material

The multiphase phosphorite nodules and phosphatic shell casts of various ages and fossil material that has been reworked into the latest, loose sediments on the seabed could potentially be disturbed by cable laying operations. Although the seabed plough method of cable burial on the shelf means that it is not possible to perform palaeontological mitigation as seabed materials are not brought up to the vessel for inspection and sampling, the limited subsurface seabed disturbance entailed in burying the cable by seabed plough, means that direct palaeontological impacts are considered to be negligible.

Where the cable crosses the shoreface and beach sands, the water jetting and trench digging may encounter reworked marine and terrestrial fossil bones and teeth, but the probability is unlikely given the widely scattered occurrence and the small, narrow volume of the excavation. This impact is therefore considered to be low to negligible.

The Velddrif Formation shelly deposits which may be encountered comprise a predominantly extant shell fauna which is of low palaeontological sensitivity. Given the small volume which will be affected, and the availability of Velddrif Formation exposures at many places along the coast, the impact may be considered negligible.

The nature of the proposed seabed intervention also suggests that indirect impacts, which manifest themselves after and/or downstream of the activity are likely to be negligible.

No mitigation is required or proposed in respect of submerged prehistoric archaeology or palaeontology in the Deep and Shallow Water portions of the cable route where installation will be burial by plough as it is extremely unlikely that sites or material will be affected by the installation of the cable and also impossible to mitigate any disturbance.

9.5.3.3 Maritime archaeological resources

No wrecks have been identified within the 1 km study area buffer around the proposed cable alignment or within less than 8 km of the route. The seabed surveys recorded no wrecks but did note the presence along the route of a possibly humanly-derived debris. None of these contacts could be more accurately described on the basis of available data. It is therefore not known whether any of these anomalies represent historical shipwrecks or related material. The small footprint of the seabed intervention and the potential for seabed debris to damage the cable plough, which means that these contacts are likely to be carefully avoided during cable installation, suggests that the potential for direct impacts on maritime archaeological sites or material in the study area is negligible. The nature of the proposed seabed intervention suggests that indirect impacts, which manifest themselves after and/or downstream of the activity and can take the form of, for example, seabed scour, are unlikely to affect any of the handful of known wrecks in vicinity of the cable system.

Mitigation measures from this specialist report have been carried across to Section 10.5 of this report and incorporated into the EMPr (Appendix F), as relevant.

9.5.4 Conclusion

The HIA concludes that the proposed installation of the 2AFRICA (West) Cable System (Yzerfontein landing) raises no red flags, contains no fatal flaws and is unlikely to have any impact on known or unknown maritime and underwater cultural heritage resources. It is, therefore, considered acceptable.

9.6 Avifauna Assessment

9.6.1 Introduction

This report (Appendix B6) is a generic, desktop assessment of the potential impacts of the construction and operation of marine fibre optic cable systems on avifauna in South Africa, prepared by WildSkies (2021). This assessment was commissioned following comments raised by DEFF – O&C with regards to possible impacts on offshore avifauna. The findings can be applied to all of the 2AFRICA landings on the West and East coasts of South Africa.

9.6.2 Approach

The investigation utilised desk-top assessments and a review of available literature to investigate and identify factors associated with the installation and operation of subsea cables and their potential impacts on seabirds associated with South Africa's EEZ and coastline. In addition, the investigation identified mitigation and management measures that may be employed during and post installation.

9.6.3 Findings

South African waters boast a rich diversity of seabirds and shorebirds, many of which occur in the area affected by the proposed 2AFRICA (West) Cable System (Yzerfontein landing). The 2018 'State of South Africa's Birds' (Taylor & Peacock, 2018) states that "seabirds have declined faster than any other group of birds and now account for a third of all threatened species". Reasons for the poor conservation status of seabirds include slow reproductive rates;

dependence on islands for breeding (and consequent vulnerability to disturbance and introduced predators); direct mortality through interaction with fishery activities; and competition between seabirds and fisheries.

Three main impacts of the subsea cable installations on birds were identified, along with general mitigation measures, as described below.

- **Offshore habitat destruction** during installation of the marine cable is an indirect impact most likely to affect seabird prey base and is likely to be of low significance given the limited development footprint and short construction period. The onshore and near-shore components of the cable system have a very small footprint and are generally located on sandy beaches (to facilitate cable burial) and not the more ecologically sensitive rocky shorelines. Although work within this zone is normally completed within a week, the site should be carefully managed to ensure that no unnecessary impacts occur. Particularly sensitive bird areas should be avoided when planning cable landing sites and include avoiding MPAs, IBAs, sensitive onshore areas and any islands.
- **Disturbance effects** will be limited, if breeding sites are not impacted on, as cable installation moves relatively quickly (up to 20 kilometres of cable laid per day). As described above, the onshore and near-shore activities will be extremely limited spatially and temporally, and any impacts on shore birds should be minor and short lived. Disturbance will therefore be a localised and temporary effect. Breeding areas for sea and shorebirds should be avoided, to minimise impacts.
- Since no food will be available to sea birds during cable installation or during the pre-lay grapnel run, **possible incidental mortality of seabirds striking the cable laying vessel** will be of low significance. Birds may approach the vessel to investigate but will not spend extended periods close to the ship or congregate in large numbers (since no food is available). Further, since no feeding behaviour will be induced, birds will not be distracted (which is thought to contribute to their collision and entanglement at fishing vessels) whilst in flight close to the ship. Lighting on board project vessels should be kept to a minimum in order to reduce the risk of attracting and disorientating seabirds.

Mitigation measures from this specialist report have been carried across to Section 10.2 of this report and incorporated into the EMPr (Appendix F), as relevant. Refer also to the recommendations above.

9.6.4 Conclusion

In general, the significance of anticipated impacts of submarine telecommunications cables projects on seabirds and shorebirds is low, provided the cable avoids particularly sensitive bird areas such as MPAs, IBAs, sensitive onshore areas and any islands.

9.7 Marine Mammal Assessment

9.7.1 Introduction

This report is a generic, desktop assessment of the potential impacts of the construction and operation of marine fibre optic cable systems on marine mammals in Southern African waters, prepared by Sea Search (2021) (Appendix B7). This assessment was commissioned following comments raised by DEFF-O&C with regard to possible impacts of marine telecommunications cable projects on marine mammals. These findings can be applied to all of the 2AFRICA landings on the West and East coasts of South Africa.

9.7.2 Approach

The investigation utilised desk-top assessments and a review of available literature to investigate and identify factors associated with the installation and operation of telecommunications cable systems around South Africa which could potentially impact on marine mammals. In addition, the investigation identified mitigation and management measures that may be employed during and post installation.

9.7.3 Findings

Submarine telecommunications cables have been laid across the ocean floor since the mid-1800s, with over a million kilometres of cable now deployed worldwide. Given that the laying of the cable is relatively brief in comparison to other human activities floor such as mining and trawling and the fact that the footprint of the cable is narrow (up to 8 m for the actual cable but a few km for initial acoustic/benthic surveys), the impacts of benthic destruction and modification is not thought to impact marine mammals in any measurable way. The main impacts of the cable laying process which might affect marine mammals have been identified as follows:

- Avoidance of noise and masking of vocalisations by general ship noises and depth sounders.
- Potential startle responses of marine mammals to multi-beam echosounders, which could lead to mass stranding events.
- Entanglement of cetaceans in the cable is possible during deployment or once laid but has not been recorded in over 30 years. This is thought to be a result of modern materials and cable laying methods (including shallow water burial) and thus, entanglement is not regarded as a threat.

Given that most marine mammals occur in South Africa's water throughout the year, the timing of installation is not considered to be of great importance, however based on the data available, the months of June – October tend to be more important to vulnerable species such as Fin Whales, Blue Whales and Sei whales.

Mitigation options for these activities are limited but include ensuring use of well-maintained ships and equipment to minimize noise production from engines. Switching off non-essential sonar systems, and cautious use of multi-beam echosounders. Avoidance of peak whale seasons.

It is recommended that the vessel appoint a suitably trained crew member with relevant experience in marine mammal identification as a Marine Mammal / Protected Species Observer (MMO/PSO), to ensure no mammals are within the potential impact zone of sonars, cables or noise pollution.

10 ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

The key issues identified during Scoping and carried through to the Impact Assessment are formulated as seven[23] key questions:

- What are the potential social and socio-economic impacts associated with the construction and operation of the proposed 2AFRICA (West) Cable System (Yzerfontein landing)?
- What impacts will the construction and operation of the 2AFRICA (West) Cable System (Yzerfontein landing) have on the natural environment (terrestrial vegetation, wetlands, fauna, and avifauna)?
- What impacts will the construction and operation of the 2AFRICA (West) Cable System (Yzerfontein landing) have on the marine environment including MPA's?
- What impacts will the construction and operation of the 2AFRICA (West) Cable System (Yzerfontein landing) have on the fishing industry?
- What impact will the construction and operation of the 2AFRICA (West) Cable System (Yzerfontein landing) have on the beach and dune cordon at Yzerfontein?
- What impact will the construction of 2AFRICA (West) Cable System (Yzerfontein landing) have on cultural and heritage resources, including any paleontological resources (if any are identified during the study)?
- What cumulative impacts will result from the construction of the 2AFRICA (West) Cable System (Yzerfontein landing)?

Potentially significant impacts associated with each of the above issues are discussed and assessed in the sections below. Where relevant, significance ratings have been assigned to impacts, according to the assessment conventions (Section 7.5), and presented in Impact Assessment tables (Table 16 to Table 21). The tables assess the significance of expected impacts before mitigation, as well as after application of the recommended mitigation measures (in Chapter 10 and in the EMPr), as applicable.

Note that mitigation measures may be repeated, where they apply to multiple phases of the project.

10.1 What are the potential social and socio-economic impacts associated with the construction and operation of the proposed 2AFRICA (West) Cable System (Yzerfontein landing)?

In the broader planning context, the project contributes to the goal of promoting economic development, job creation and improved livelihoods, through better access to improved telecommunications networks. The Yzerfontein cable landing will, however, render limited areas of the seabed permanently unavailable to the Oil and Gas industry. During installation, there is also potential to negatively impact other existing cables if not well managed. At the local level, social and socio-economic impacts of the project will be minor.

During the construction/installation phase, social and socio-economic impacts (both positive and negative) are of medium and low significance after management/mitigation. During operation, they are also of medium and low significance after management/mitigation (Table 16).

23 The FSR framed the issues initially as eight questions, however impacts on wetlands have been combined with impacts on the natural environment (flora, fauna and avifauna), resulting in seven issues for assessment.

10.1.1 Boost to economic development (nationally and internationally)

The proposed 2AFRICA/GERA (West) Cable System (Yzerfontein landing) will provide additional and affordable international bandwidth which will support the country's economic development initiatives locally and abroad.

While expanding access to communication technology will be done primarily through broadband infrastructure roll-out, this requires a national backbone connected to the rest of the world. In this case, the proposed 2AFRICA/GERA (East) Cable System supports SIP 15 via its international connectivity, capacity and speed.

10.1.2 Impacts on existing marine telecommunications cables and submarine pipelines

The proposed 2AFRICA (West) Cable System (Yzerfontein landing) will follow a similar alignment to, and in some cases cross, several other marine telecommunication cable systems running on the same West Coast route. MTN will abide by the guidelines and standards of the ICPC, which are in place to ensure safety of existing marine telecommunications systems. Therefore, it is not anticipated that the 2AFRICA (West) Cable System (Yzerfontein landing) will negatively impact on existing marine telecommunications cables.

The proposed route crosses no pipelines.

10.1.3 Impacts on Oil and Gas exploration concession areas

It is doubtful that there will be any direct impacts on the concession holders during the installation of the proposed 2AFRICA (West) Cable System (Yzerfontein landing). However, if the concession holders do decide to commence exploration at a later date, they will have to abide by the legislated buffer zone either side of the cable as defined in the Marine Traffic Act (Act No. 2 of 1981) read together with the Maritime Zones Act (Act No. 15 of 1994).

10.1.4 Improved/increased opportunities for education and job creation (during operation)

In improving and facilitating communications and economic development in South Africa, the project is anticipated to contribute positively towards education and job creation in the country, thus assisting to improve livelihoods.

10.1.5 Increased employment opportunities and opportunities for local business and SMMEs (during installation)

Since the landing of the marine cable onto shore is a specialised activity, and no land based infrastructure will need to be constructed, very few temporary jobs will be available during the installation phase. Local businesses and accommodation facilities may benefit from the project team temporarily staying in the area.

10.1.6 Community safety

The movement of vehicles and heavy machinery on the beach, as well as excavation and other installation activities, could pose a safety risk to beach goers if they are not kept away from the working area.

10.1.7 General disruption and nuisance impacts for residents and visitors

Because installation on land is of such short duration (less than 1 month) and no construction of infrastructure is required, relatively little disturbance to surrounding infrastructure, residents, visitors and other beach users is expected. As there is a vast expanse of beach in this area, beach goers will be able to access other parts of the beach during the period where the construction site is cordoned off.

The shore end landing will create additional noise and temporary visual impact and change the sense of place on the beach, but this will be of very limited duration.

During operation/maintenance of the cable, the impacts on beach infrastructure and beach and sea users will be negligible, as maintenance activities will be very infrequent and more likely to be required offshore.

Should decommissioning of the cable involve removal of the cable from the beach, similar (but less intense) impacts to cable installation, are anticipated.

10.1.8 Mitigation measures

10.1.8.1 During planning and design

- MTN to implement the guidelines and standards of the ICPC.
- MTN to engage directly with offshore concession holders and to draw up a Memorandum of Understanding (MoU) (if required) which outlines the rights, obligations and roles and responsibilities of both parties in terms of the installation and operation of subsea infrastructure.

10.1.8.2 During installation

- Installation should preferably be timed to occur outside of peak holiday seasons (December, January and April). (However, this will need to be weighed up against avoiding migration seasons for whales and other scheduling factors affecting the project).
- Where possible, make use of local labour/SMME's and use local goods and services.
- Cordon off work areas that pose a risk to the public and ensure that alternative access to the beach is provided.
- Construction vehicles must obey regulated speed limits, lights will be switched on at all times and no large vehicles will use the roads at dawn, dusk, at night or in heavy mist conditions to reduce the risk of accidents with other vehicles and pedestrians.
- Practice good housekeeping to limit negative visual impacts and leave the site clean and free of waste of any kind.

Table16 Assessment of potential socio-economic and social impacts resulting from the proposed 2AFRICA (West) Cable System (Yzerfontein landing)

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Boost to economic development (operation)	Unmitigated	Positive	National/ Inter-national	Long-term	Low	Continuous	Low	Medium	Highly Probable	Medium	High
	Mitigated	Positive	National/ Inter-national	Long-term	Low	Continuous	Low	Medium	Highly Probable	Medium	High
Improved educational and job opportunities (operation)	Unmitigated	Positive	National/ Inter-national	Long-term	Low	Continuous	Low	Low	Highly Probable	Low	High
	Mitigated	Positive	National/ Inter-national	Long-term	Medium	Continuous	Low	Low	Low	Medium	High
Increased employment and business opportunities (installation)	Unmitigated	Positive	Regional	Short-term	Negligible	Once-off	Low	N/A	Probable	Low	High
	Mitigated	Positive	Regional	Short-term	Low	Once-off	Low	N/a	Probable	Low	High
Impacts on O&G concession areas (operation)	Unmitigated	Negative	Local	Permanent	Low	Once-off	Low	Low	Probable	Low	Medium
	Mitigated	Negative	Local	Permanent	Low	Once-off	Low	Moderate	Probable	Low	Medium
Impacts on existing tele-communications	Unmitigated	Negative	Site-specific	Short-term	Medium	Once-off	Low	Medium	Improbable	Medium	Medium
	Mitigated	Negative	Site-specific	Short-term	Negligible	Once-off	Low	High	Improbable	Low	Medium

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
cables (installation)											
Community safety risks	Unmitigated	Negative	Local	Short-term	Low	Once-off	N/A	High	Probable	Low	High
	Mitigated	Negative	Local	Short-term	Low	Once-off	N/A	High	Probable	Low	High
General disruption and nuisance impacts (installation)	Unmitigated	Negative	Local	Short-term	Low	Once-off	N/A	High	Highly Probable	Low	High
	Mitigated	Negative	Local	Short-term	Negligible	Once-off	N/A	High	Highly Probable	Low	High

10.2 What impacts will the construction and operation of the 2AFRICA (West) Cable System (Yzerfontein landing) have on the natural environment (flora, fauna and avifauna)?

The 2AFRICA (West) Cable System (Yzerfontein landing) will have no negative impacts on terrestrial ecosystems of conservation value. No vegetation or wetland habitat is present on site and consequently there will be no impact on terrestrial fauna.

With regard to the marine environment, while the project passes through the proposed Bird Island / Dassen Island / Heuningnes river and estuary system / Lower Berg river wetlands – Marine IBA, the impact of the project on avifauna will be of low significance before and after mitigation. While the project passes through the Cape Canyon and Associated Islands EBSA , as well as CBA1 and CBA 2 areas, the impact of the project on these ecologically important areas will be of low significance. The potential negative impacts of the project on marine flora and fauna on shore, nearshore and offshore, are all of low significance before and after mitigation (noting the potential for mitigation is limited), with the exception of accidental pollution, which would be of medium significance before mitigation and low significance after mitigation. The cable will afford a section of the seabed long term protection due to the exclusion of anchoring and trawling 500 m either side of the cable, which is considered a positive impact of medium significance (Table 17).

10.2.1 Impact on threatened terrestrial ecosystems or areas of conservation significance

The installation of the cable across the beach to the WACS BMH will have no impact on terrestrial vegetation, wetland or other freshwater ecosystems and, therefore, will not impact negatively on any threatened terrestrial ecosystems or ecological support areas.

10.2.2 Loss of, or disturbance to terrestrial vegetation and wetlands (flora and fauna)

The installation of the cable across the beach to the WACS BMH will have no impact on terrestrial vegetation, wetland or other freshwater ecosystems, Consequently, the project will not impact on any important natural habitat for terrestrial fauna.

10.2.3 Disturbance to avifauna (seabirds and shorebirds)

The loss of bird foraging areas through disturbance and destruction of sandy beach biota during trench excavation and subsea cable installation will not be significant, due to the small area affected and the rapid recovery after cable installation. Disturbance of shore birds by noise and installation activities on the beach will be of short duration and low intensity, and can be avoided as birds are mobile and will be able to temporarily avoid the disturbed zone. No breeding sites on shore will be affected along the cable alignment for the proposed 2AFRICA (West) Cable System (Yzerfontein landing). The potential impact of the project on shore birds is considered to be of low significance.

The risk of seabird mortalities through collision or entanglement with vessels and gear, or disorientation form lighting, is low, as detailed in the specialist findings (Section 9.4.3). The possible incidental mortality of seabirds as a result of the cable installation is anticipated to be of low significance.

10.2.4 Loss of, or disturbance to, sandy beach biota in the coastal zone

As detailed in the specialist findings (Section 9.4.3.2), disturbance and destruction of sandy beach biota will result during trench excavation and subsea cable installation across the surf zone and beach, but recovery will be rapid. The impacts on benthic communities in the coastal zone is considered to be of low significance.

10.2.5 Loss of, or disturbance to marine flora and fauna

10.2.5.1 Marine flora

During the survey of the marine cable alignment, no indications of seagrass or kelp beds were observed (Fugro, 2020b). However, should marine flora be disturbed by installation of the cable, it is anticipated that it would re-establish after the cable is buried and therefore the cable would have no significant impact on marine flora.

10.2.5.2 Benthic organisms in sandy beach, littoral zone, nearshore and offshore habitats

The seashore, littoral zone and the seabed will be disturbed by pre-installation and installation activities along the route alignment of the marine cable, which will injure or crush benthic invertebrates in their path. Cable burial will disturb sediments, and may affect benthic organisms by smothering or by turbidity plumes which alter light conditions and concentrations of suspended particles in the water column. As indicated in the specialist findings (Section 9.4.3) affected benthic communities will recover over time and the impacts of the project on benthic organisms is deemed to be of low significance.

10.2.5.3 Disturbance/injury of marine fauna due to noise

Physiological injury or behavioural disturbance of marine fauna can be caused by noise. However, as detailed in the specialist findings (section 9.4.3), the nature of the noise resulting from installation and maintenance activities, as well as from the cable itself during operation, will result in impacts that are considered to be of very low significance, both without and with mitigation.

10.2.5.4 Effect of increased turbidity on marine biota

Pre-installation and installation activities along the route alignment of the marine cable will result in a localised and temporary increase in sediment concentration near the seabed and in the water column. Increased turbidity in the water can affect marine biota in various ways; however, as detailed in the specialist findings (Section 9.4.3), turbid water is a natural occurrence on this coastline and the biota are adapted accordingly. The impact of increased turbidity on marine biota, as a result of the 2AFRICA (West) Cable System (Yzerfontein landing) is considered to be of low significance.

10.2.5.5 Artificial reef effect due to presence of the cable

The physical presence of the cable on the seabed may have an “artificial reef” effect. As described in the specialist findings (Section 9.4.3), where not buried, the cable will provide a substrate for colonisation by sessile benthic organisms, thereby locally altering the composition

of the benthic biota community. Although no direct mitigation measures are possible, the negative impact of the subsea cable presence on marine biota is considered to be of low significance. It is possible that the cable protection zones with suitable habitats may in fact act as marine sanctuaries, and as a result, have a positive effect on marine biodiversity and species abundance.

10.2.5.6 Pollution

Pollution by hydrocarbons and other litter is possible during the preinstallation and installation phases of the project and can have a variety of negative impacts on the health of marine organisms. Pollution is preventable, however, by good housekeeping and environmental management during preinstallation and installation. Once the cable is in place, there is no further risk of pollution other than if repairs to the cable are required. With mitigation, the effect of pollution on marine biota, as a result of cable installation, is anticipated to be of low significance.

10.2.5.7 Collisions with and entanglement by marine fauna

As indicated in the findings of the marine specialist report, the likelihood of large marine mammals colliding with the survey or cable laying vessels or becoming entangled with the cable is low.

10.2.5.8 Effects of cable" emissions" on marine biota

As discussed in this report, heat dissipation, electric fields and electromagnetic fields emanating from the cable are of such low magnitude that their potential impacts on marine life are considered negligible.

10.2.5.9 Long term protection due to exclusion zone

The long-term impacts of the marine telecommunications cable on the benthic environment (both fauna and flora) are expected to be positive due to the implementation of the legislated buffer zone, which protects this environment from disturbance due to bottom trawling activities, mineral exploration and the anchoring of vessels.

10.2.6 Impact on marine protected areas and threatened marine ecosystems

Although most of the cable route falls within offshore habitats considered by the 2018 National Biodiversity Assessment as of ‘least concern’, the cable does pass through portions of the inner and outer continental shelf on the West Coast rated as ‘vulnerable’ (Cape Rocky Midshelf Mosaic, Cape Sandy Inner Shelf and Cape Lower Canyon) and ‘endangered’ (Cape Upper Canyon). The cable will avoid MPAs but will pass through the Cape Canyon and Associated Islands EBSA and will pass through CBA1 and CBA2 areas as defined in the recent National Coastal & Marine Spatial Biodiversity Plan (Version 1). Rocky substrates are avoided as far as possible in order to achieve cable burial.

As indicated in the specialist findings (Section 9.4.3) and in the sub-sections above, the identified impacts on the coastal zone, the marine benthic habitats and associated biota, fish, marine mammals, seabirds and shorebirds are all considered to be of low significance. The

protection provided either side of the cable after installation, is considered to be positive. Accordingly, the negative impact on the marine protected areas and threatened marine ecosystems through which the cable will pass, is anticipated to be of low significance.

10.2.7 Mitigation measures

10.2.7.1 General

- Align routing of cable as closely as possible to the routes of existing or de-commissioned cables (even when traversing an MPA), thereby avoiding the impact of as yet undisturbed ecosystem types.
- Plan routing of proposed cable to as far as practicably possible avoid sensitive benthic habitats in the coastal and nearshore zone.
- Ensure that constant monitoring for the presence of marine mammals and turtles is maintained by a ship's staff member designated as a Marine Mammal Observer (MMO). The observation post must keep a record of sightings, recording date, time, coordinates and approximate distance. This is particularly important should cable installation across the continental shelf be scheduled during the whale migration period (beginning of June to end of November).
- Should a cetacean become entangled in towed gear, contact the South African Whale Disentanglement Network formed under the auspices of DEFF to provide specialist assistance in releasing entangled animals.

10.2.7.2 During geophysical surveys

Although surveying of the cable alignment has been completed, should any further survey work be required along the cable alignment, the following mitigation measures must be implemented by the survey vessel:

- Onboard MMOs should conduct visual scans for the presence of cetaceans around the survey vessel prior to the initiation of any acoustic impulses.
- Pre-survey scans should be limited to 15 minutes prior to the start of survey equipment.
- “Soft starts” should be carried out for any equipment of source levels greater than 210 dB re 1 µPa at 1 m over a period of 20 minutes to give adequate time for marine mammals to leave the area.
- Terminate the survey if any marine mammals show affected behavior within 500 m of the survey vessel or equipment until the mammal has vacated the area.
- Avoid planning geophysical surveys during the movement of migratory cetaceans (particularly baleen whales) from their southern feeding grounds into low latitude waters (beginning of June to end of November), and ensure that migration paths are not blocked by sonar operations. As no seasonal patterns of abundance are known for odontocetes occupying the proposed exploration area, a precautionary approach to avoiding impacts throughout the year is recommended.
- Ensure that passive acoustic monitoring (PAM) is incorporated into any surveying taking place at night or between June and November.
- A dedicated MMO and PAM operator should be appointed to ensure compliance with mitigation measures during seismic geophysical surveying. The MMO can be either an independent MMO or a suitably trained crew member.

10.2.7.3 During cable installation

- If cable installation across the continental shelf is scheduled during the whale migration period (beginning of June to end of November), consideration will be required from the cable-laying vessel to appoint a suitably trained crew member as a dedicated MMO with experience in seabird, turtle and marine mammal identification and observation techniques, to carry out daylight observations of the subsea cable route and record incidence of marine mammals, and their responses to vessel activities. Data collected should include position, distance from the vessel, swimming speed and direction, and obvious changes in behavior (e.g., startle responses or changes in surfacing/diving frequencies, breathing patterns). Both the identification and the behavior of the animals must be recorded accurately.
- Should a cetacean become entangled in towed gear, contact the South African Whale Disentanglement Network to provide specialist assistance in releasing entangled animals.

10.2.7.4 During construction phase of the proposed cable shore-crossing

- Obtain a vehicle access permit from DFFE -OC prior driving in the coastal zone.
- While shore bird breeding is not anticipated to be an issue in Yzerfontein, due to the transformed nature of the dunes at the landing site, the ECO must check the affected area on the shoreline for nests of birds, prior to installation. If found, nests must be cordoned off and avoided as far as possible.
- Schedule construction associated with the cable shore crossing to avoid whale migration (June to November) periods.
- Restrict disturbance of the intertidal and subtidal areas to the smallest area possible. Once the shore crossing is finalised and the associated construction site is determined, the area located outside of the site should be clearly demarcated and regarded as a 'no-go' area.
- All construction activities in the coastal zone must be managed according to a strictly enforced EMPr.
- Ensure that contracted construction personnel are aware of, and adhere to, the requirements of the EMPr.
- Keep heavy vehicle traffic associated with construction in the coastal zone to a minimum.
- Restrict vehicles to clearly demarcated access routes and construction areas only. These should be selected under guidance of the local municipality.
- Maintain vehicles and equipment to ensure that no oils, diesel, fuel or hydraulic fluids are spilled.
- For equipment maintained in the field, oils and lubricants must be contained and correctly disposed of off-site.
- Good housekeeping must form an integral part of any construction operations on the beach from start-up.
- Ensure regular collection and removal of refuse and litter from intertidal areas.
- There is to be no vehicle maintenance or refueling on the beach.
- Ensure that all accidental diesel and hydrocarbon spills are cleaned up accordingly.
- No mixing of concrete in the intertidal zone.
- Regularly clean up concrete spilled during construction.
- No dumping of construction materials, excess concrete or mortar in the intertidal and subtidal zones or on the seabed.

- After completion of construction activities remove all artificial constructions or created shore modifications from above and within the intertidal zone.
- No accumulations of excavated intertidal sediments should be left above the high-water mark, and any substantial sediment accumulations below the high-water mark should be levelled.

Table 3 Assessment of potential impacts of the proposed 2AFRICA (West) Cable System (Yzerfontein landing) on the natural environment (flora, avifauna and fauna)

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Impact on terrestrial areas of conservation value	N/A (no impact)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A (no impact)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Loss/ disturbance of terrestrial vegetation and wetlands	N/A (no impact)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A (no impact)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Disturbance of avifauna (seabirds and shorebirds)	Unmitigated	Negative	Site-specific to National/ Inter-national	Short-term	Low	Once-off	Moderate	High	Highly Probable	Low	High
	Mitigated	Negative	Site-specific to National/ Inter-national	Short-term	Low	Once-off	Moderate	High	Highly Probable	Low	High

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Loss/ disturbance of sandy beach biota	Unmitigated	Negative	Local	Short-term	Medium	Once-off	Low	High	Definite	Medium	High
	Mitigated	Negative	Local	Short-term	Medium	Once-off	Low	High	Definite	Low	High
Loss/ disturbance of marine flora	Unmitigated	Negative	Site-specific	Short-term	Low	Once-off	Low	High	Probable	Low	Medium
	Mitigated	Negative	Site-specific	Short-term	Low	Once-off	Low	High	Probable	Low	Medium
Loss/ disturbance of marine benthic organisms	Unmitigated	Negative	Site-specific	Short to medium-term	Medium	Once-off	Low	High	Definite	Low	High
	Mitigated	Negative	Site-specific	Short to medium-term	Medium	Once-off	Low	High	Definite	Low	High
Disturbance/ injury of marine fauna due to noise	Unmitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Probable	Low	High
	Mitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Probable	Low	High
Impact of increased turbidity on marine biota	Unmitigated	Negative	Local	Short-term	Low	Intermittent	Low	High	Probable	Low	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Artificial reef effect on marine biota	Unmitigated	Neutral	Site-specific	Long-term to permanent	Medium	Once-off	Low	Moderate	Definite	Low	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pollution effects on marine biota	Unmitigated	Negative	Site-specific	Short to medium term	Medium	Intermittent	Medium	Moderate	Probable	Medium	High
	Mitigated	Negative	Site-specific	Short -term	Low	Once-off	Low	High	Improbable	Low	High
Injury of large marine fauna and seabirds due to collision or entanglement	Unmitigated	Negative	Site-specific	Short -term	Low	Once-off	Medium	Moderate	Improbable	Low	High
	Mitigated	Negative	Site-specific	Short -term	Low	Once-off	Low	High	Improbable	Low	High
Effect of cable “emissions” on marine biota	Unmitigated	Negative	Site-specific	Long-term	Negligible	Intermittent to continuous	Low	High	Improbable	Low	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Impact on marine areas of conservation value	Unmitigated	Negative	Site-specific	Medium to long-term	Medium	Once-off	Low	Low	Definite	Low	High
	Mitigated	Negative	Site-specific	Medium to long-term	Medium	Once-off	Low	High	Definite	Low	High

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Long term protection of marine flora and fauna due to exclusion zone	Unmitigated	Positive	Local	Long-term	High	Continuous	N/A	N/A	Highly Probable	Low-Medium	Medium
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

10.3 What impacts will the construction and operation of the 2AFRICA (West) Cable System (Yzerfontein landing) have on the fishing industry?

The 2AFRICA (West) Cable System (Yzerfontein landing) will potentially negatively impact the following fisheries which operate in the same area as the proposed marine cable alignment, to a greater or lesser extent:

- Demersal Trawl
- Mid-Water Trawl
- Demersal Longline
- Small Pelagic Purse Seine
- Large Pelagic Purse Seine
- Tuna Pole
- Traditional Linefish
- West Coast Rock Lobster
- Small Scale Fisheries

The potential decline in catch rates due to noise disturbance is assessed as being of low significance. The potential effect on operational activities and decline in catch rates due to the temporary (1,500 m) exclusion zone around cable laying vessels is assessed as being of low significance. The long-term effect on operational activities due to the 500 m exclusion zone either side of the cable will negatively impact fishing sectors, most particularly the demersal trawl and demersal longline. The loss of fishing ground is estimated to be less than 0.1% of the total trawl grounds available in that area and overall, the significance of this impact is assessed as low. The potential for mitigation of identified impacts of the project on fisheries (other than the no-go option) is not possible. (Refer to Table 18).

10.3.1 Potential reduction in catch rates during geophysical survey as a result of noise

The elevated noise produced during the geophysical survey may negatively affect certain target species, resulting in a temporary decline in catch rates. The fishing sector most likely to be affected, is the small pelagic purse seine. However, as described in Section 9.2.3, due to the short-term duration and low intensity of the noise, the impact on catch rates for all sectors is considered to be of low significance. No mitigation measures are possible.

10.3.2 Temporary exclusion from fishing ground during cable-laying operations (1,500 m exclusion zone)

The temporary exclusion of fisheries from the safety zone will effectively reduce fishing grounds, which in turn could potentially result in a loss of catch and/or displacement of fishing effort for the Demersal Trawl, Mid-Water Trawl, Demersal Longline, Small Pelagic Purse Seine, Large Pelagic Purse Seine and Traditional Linefish sectors. Less likely to be affected are the Tuna Pole, West Coast Rock Lobster and Small-Scale Fisheries. However, the impact will be short term and for all sectors overall, is of low intensity and low significance.

10.3.3 Long-term exclusion of anchoring and trawling around the cable (500 m on either side of the cable)

The 500 m exclusion zone on either side of the cable will reduce the area of fishing grounds previously available to the demersal trawl or longline operations. Trawling would be excluded

either side of a 60 km section of the cable situated between 700 m and 200 m water depths (as shown in Figure 40).

Skippers would have to adapt their operations accordingly, as they would need to lift gear off the seabed when moving over the cable, to prevent risk of damage to both the cable and their own fishing gear.

As indicated in the specialist findings (Section 9.2.3), the area excluded from trawling represents a very low proportion (0.1%) of the total demersal trawl fishing ground used in the area. Fishing effort would need to be redirected away from this area to other areas where catches can be made. There is low potential for mitigation of the above impacts. The overall significance of the 2AFRICA (West) Cable System (Yzerfontein landing) is assessed as low.

It should be noted that fishing effort in this area is already limited by the WACS cable. By placing the proposed 2AFRICA (West) Cable System (Yzerfontein landing) near the WACS cable, the impacts mentioned above are confined to a limited spatial area, affording some level of mitigation. Cumulative impacts are discussed in section 10.6.6.

10.3.4 Mitigation measures

10.3.4.1 Prior to installation

- ❑ The fishing industry and key stakeholders should be notified prior to the commencement of cable installation. These include the SA Fishing Industry Association, DFFE , the South African Navy Hydrographic Office (SAN Hydrographer), SAMSA and Ports Authorities.

10.3.4.2 During installation

- ❑ For the duration of the installation phase of the operation, a navigational warning should be broadcast to all vessels via Navigational Telex (NAVTEX) and Cape Town radio.
- ❑ Once installed, the cable route must be surveyed and accurately charted with the SAN Hydrographer.
- ❑ Request, in writing, the SAN Hydrographer to broadcast a navigational warning via Navigational Telex (NAVTEX) and Cape Town radio for the duration of the survey operation.
- ❑ Timing: Many of the affected fisheries operate year-round and timing of the survey to avoid certain periods of peak fishing activity is therefore not considered to be advantageous to any of the sectors.
- ❑ Manage the lighting on the survey vessel to ensure that it is sufficiently illuminated to be visible to fishing vessels and compatible with safe operations.
- ❑ Implement a grievance mechanism in case of disruption to fishing or navigation.

Table 4 Assessment of potential impacts of construction and operation of the 2AFRICA (West) Cable System (Yzerfontein landing) on the fishing industry

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Reduction in catch rates due to noise emissions during geophysical survey	Unmitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Probable	Low	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Temporary exclusion of fisheries from within 1,500 m of the cable laying vessel	Unmitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Probable	Low	Medium
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Long term exclusion of anchoring and trawling around cable (500 m either side of the cable)	Unmitigated	Negative	Local	Long-term	Medium	Continuous	Low	High	Definite	Low	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

10.4 What impact will the construction and operation of 2AFRICA (West) Cable System (Yzerfontein landing) have on the beach and dune cordon at Yzerfontein?

The proposed alignment of the 2AFRICA (West) Cable System (Yzerfontein landing) across the beach to link with existing WACS infrastructure on land is the best practical option. The significance of potential negative impacts of the proposed Alternative 1 on drivers of coastal processes, sediment transport and habitat/ecomorphology of the beach and dunes will be low, both before and after mitigation (Table 19).

10.4.1 Alteration of drivers of coastal process, (e.g., Wind and wave)

The cable will align approximately shore perpendicular and lie at a point >1m below the surface, effectively having no impact on localised wind and wave regime. Some minor disruption of inter-tidal and supra-tidal wave regime may arise during the construction phase.

10.4.2 Interruption of sediment transport regime

Some minor perturbation is expected during construction during excavation of the beach and intertidal zone. Following cable burial and establishment, the sediment transport regime should rapidly reach a state of equilibrium.

10.4.3 Alteration of habitat/eco-morphology

The proposed landing site avoids the section of natural, vegetated dune cordon and, as it will be buried, will not alter natural habitat or eco-morphology.

10.4.4 Mitigation measures

- The cable should be buried within the beach to a depth >1m below the deflated beach state. While this state may be difficult to determine, the presence of a “shelly layer”, or evident differentiation in sediment grain diameter is a good indicator of suitable depth within the beach profile.
- Where disturbance of the vegetated dune arises, the affected area should be raked back to an angle of repose ~ 27°, stabilised using a geofabric and suitably planted with appropriate vegetation.
- An alternative pedestrian walkway should be established during the laying of the cable and possible restoration stage of the project.

Table 19 Assessment of potential impacts of construction and operation of the 2AFRICA (West) Cable System (Yzerfontein landing) on the beach and dune cordon

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Alteration of drivers of coastal process, (e.g. Wind and wave)	Unmitigated	Negative	Local	Short-term	Negligible	Once-off	Low	High	Improbable	Low	High
	Mitigated	Negative	Local	Short-term	Negligible	Once-off	Low	High	Improbable	Low	High
Interruption of sediment transport regime	Unmitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Highly Probable	Low	High
	Mitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Highly Probable	Low	High
Alteration of habitat/eco-morphology	Unmitigated	Negative	Local	Short-term	Negligible	Once-off	Low	High	Improbable	Low	High
	Mitigated	Negative	Local	Short-term	Negligible	Once-off	Low	High	Improbable	Low	High

10.5 What effects will the construction of 2AFRICA (West) Cable System (Yzerfontein landing) have on cultural and heritage resources, including any paleontological resources?

While there is potential for the project to negatively impact on submerged pre-historic archaeological resources and palaeontological resources, the likelihood is very low. The significance of the impact is assessed as medium. The potential for mitigation is low (other than the no -go option). Potential negative impacts on maritime archaeological resources (e.g. shipwrecks) are improbable. Should they occur, the significance is assessed as medium (refer to Table 20).

10.5.1 Disturbance or destruction of submerged pre-historic archaeological resources

There is the potential for the survival in submerged, seabed contexts of archaeological material and palaeo-environmental evidence forming part of the sedimentary make-up of the seabed. This could potentially be impacted by interventions on and in the seabed. However, the small footprint of the seabed intervention that will result from the installation of the proposed 2AFRICA (West) Cable System (Yzerfontein landing) makes the potential for direct impacts on submerged prehistoric archaeological material in the study area unlikely. The significance of the impact is considered to be medium, without mitigation.

10.5.2 Disturbance or destruction of palaeontological resources and fossil material

Specialist findings (Section 9.5.3) indicate that there is potential for disturbance or destruction of palaeontological resources due to excavation by the seabed plough, or disturbance of fossil material from water jetting across the shoreface. However the very small proportion of disturbed surface area and volume of material affected in relation to the area and volume potentially containing the resource, makes the likelihood of direct or indirect impact extremely low. There is little scope for mitigation. Due to the irreplaceability of the resource, the significance of the impact is considered to be medium, without mitigation.

10.5.3 Disturbance or destruction of maritime archaeological resources

Since no wrecks have been identified within the 1 km study area buffer around the proposed cable alignment or within less than 8 km of the route, the risk to these maritime archaeological resources (direct or indirect) is considered to be negligible. Due to the irreplaceability of the resource, the significance of the impact, should it occur, is considered to be medium.

10.5.4 Mitigation measures

- No mitigation is proposed in deep and shallow water.
- In inshore waters and on the beach crossing, it is recommended that an alert for the occurrence of submerged prehistoric archaeological material, be included in the EMPr for the project, specifically for the divers working in the shoreface and the operators excavating the trench in the beach and dune.
- Due to the dynamic nature of the environment, any possible archaeological or paleontological material encountered in these activities must be immediately collected by the diver or operator before it is lost. The ECO and/or the monitoring archaeologist must be informed and take custody of the find and obtain its context. All such finds must

be recorded, and their contextual information (a report) must be deposited at an SAHRA-approved institution.

- ❑ Any further geophysical data generated to support to installation of the cable system must be archaeologically reviewed for the presence of historical shipwrecks or related material.
- ❑ Should the data identify wreck material at or near the location of any portion of the cable, micro-siting of the cable and/or the possible implementation of an exclusion zone around the archaeological feature should be sufficient to mitigate the risks to the site.
- ❑ Should any maritime archaeological sites or material be accidentally encountered during laying the cable, work must cease in that area until the project archaeologist and SAHRA have been notified, the find has been assessed by the archaeologist, and agreement has been reached on how to deal with it.

Table 205 Assessment of potential impacts of construction and operation of the 2AFRICA (West) Cable System (Yzerfontein landing) on cultural and heritage resources, including any paleontological resources

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Disturbance or destruction of submerged pre-historic archaeological resources	Unmitigated	Negative	Site-specific	Short-term	Low	Once-off	High	Non-reversible	Improbable	Medium	Low
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Disturbance or destruction of palaeontological resources	Unmitigated	Negative	Site-specific	Short-term	Low	Once-off	High	Non-reversible	Improbable	Medium	Low
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Disturbance or destruction of maritime archaeological resources	Unmitigated	Negative	Site-specific	Short-term	Low	Once-off	High	Non-reversible	Improbable,	Medium	Low
	Mitigated	Negative	Site-specific	Short-term	Low	Once-off	High	Non-reversible	Improbable,	Medium	Low

10.6 What cumulative impacts will the construction of 2AFRICA (West) Cable System (Yzerfontein landing) have?

A cumulative impact is an incremental impact upon the environment that results from the impact of a proposed action when added to past, existing and reasonably foreseeable future actions which can be both positive and negative in nature.

The proposed 2AFRICA (West) Cable System (Yzerfontein landing) is a linear project hundreds of kilometres long, traversing various marine and terrestrial ecosystems and resulting also in indirect social/socio-economic impacts potentially throughout South Africa. As such, it is difficult to quantify the impacts. A qualitative assessment of cumulative impacts has been undertaken and considers the impacts of the proposed 2AFRICA (West) Cable System (Yzerfontein landing)together with impacts from the existing cables and planned fibre-optic marine cables off the West Coast of South Africa.

Along with other fibre optic cables landing on the West Coast and which improve telecommunications, the project is anticipated to contribute positively towards the social and socio-economic environment. Overall, the significance of negative cumulative impacts is assessed to be low and there are no cumulative impacts (negative) which are identified as fatal flaws.

10.6.1 Social and socio-economic impacts

The positive impacts associated with the proposed 2AFRICA (West) Cable System (Yzerfontein landing) will cumulatively add to the positive impacts of other fibre optic cable landings in South Africa, through additional bandwidth and internet connectivity availability to the country. This has the potential to unlock investment and advance socio-economic development and education.

There are several existing cable landings on the West Coast, in relatively close proximity. This has resulted in cables crossing each other and the risk of damage to existing cables when new cables are being installed, may accumulate. However, with appropriate protection and mitigation measures in line with ICPC guidelines and standards, the contribution of the 2AFRICA (West) Cable System (Yzerfontein landing) this risk is considered to be of low significance.

The increase in cables crossing Oil and Gas Concession areas will cumulatively exclude increased areas from potential future mining. Given the relatively small surface area taken up by the cables in contrast to the large areas of the exploration blocks, the contribution of the 2AFRICA (West) Cable System (Yzerfontein landing) to this cumulative impact, is considered to be of low significance.

Given the brief duration of the installation period for this project, the potential for this project to add cumulatively to disruption and nuisance impacts on the beach at the landing site is not significant.

10.6.2 Cumulative impacts on terrestrial and marine ecosystems

The proposed 2AFRICA (West) Cable System (Yzerfontein landing) makes use of the existing WACS infrastructure on land and in this way, minimises cumulative impacts on the terrestrial

environment (albeit, in the case of this project, terrestrial and freshwater ecosystems are not negatively impacted).

As discussed in the marine ecology specialist report (Appendix B4), the cumulative impact of increased background anthropogenic noise levels in the marine environment is an ongoing and widespread issue of concern. However, given that disturbance and injury to marine biota due to construction noise or noise generated by the vessel and cable plough is of low magnitude within the immediate vicinity of the construction site/subsea cable route, with impacts persisting over the short-term only, the contribution of the project to cumulative noise impacts in the marine environment is considered to be of low significance.

While the cable itself will remain in place over the long term, most of the negative impacts of the cable installation and operation on benthic organisms and other marine biota (as shown in Table 17) are once-off, and short term. With the exception of possible pollution events, all these impacts are of low significance before mitigation. In this light, the contribution of this project towards cumulative (negative) impacts of fibre optic cables on the marine ecology of the West Coast area is considered low, including cumulative impacts on the Cape Canyon and Associated Islands EBSA. Refer to Table 21.

10.6.3 Cumulative impacts on the fishing industry

A negative cumulative impact associated with the proposed development during the operational phase is the loss of fishing grounds to the deep-sea demersal trawling and long lining industry due to the exclusion zone to be implemented around the offshore cable alignment. The proposed 2AFRICA (West) Cable System (Yzerfontein landing) will add to the exclusion zone already in place for the WACS cable. The South African Deep-Sea Trawling Industry Association (SADSTIA) has expressed *"considerable concern about the Yzerfontein area, since these are intensely trawled blocks*". According to I&J, the 2AFRICA cable landing at would cross through one of their main hake trawling areas, running close to the already existing WACS cable.

By aligning the 2AFRICA (West) Cable System (Yzerfontein landing) in close proximity to the WACS cable landing at Yzerfontein, the disruption to demersal fishing operations will be minimised by being confined to a similar area. Trawling will still be able to take place over the alignment, although the gear will have to be lifted across the exclusion zone.

Annual fish quota allocations to the fishing industry are defined by the permits issued to the fisheries participants and, as such, it is envisaged that the proposed 2AFRICA (West) Cable System (Yzerfontein landing) will not impact on the amount of fish caught but rather the level of fishing effort expended in certain areas within the fishing grounds.

In light of the above, the cumulative impact of the 2AFRICA (West) Cable System (Yzerfontein landing) on the fishing industry is considered to be of low significance.

10.6.4 Cumulative impacts on the beach and coastal dunes at Yzerfontein

The assessment of impacts of the 2AFRICA (West) Cable System (Yzerfontein landing) on the beach and dune cordon has shown that impacts are of negligible to low intensity, once-off , short term and of low significance. The use of the existing WACS infrastructure reduces cumulative impacts on the landing site. The cumulative impact of the 2AFRICA (West) Cable System (Yzerfontein landing) on the beach and dunes at Yzerfontein is therefore considered to be of low significance.

10.6.5 Cumulative impacts on heritage (marine)

The disturbance or destruction of submerged pre-historic archaeological resources and palaeontological resources as a result of the 2AFRICA (West) Cable System (Yzerfontein landing) are improbable and the intensity of the impact on these resources would be low. No maritime archaeological resources such as wrecks have been identified along the proposed cable route. It could be argued that the knowledge that subsea cable surveys provide regarding presence of wrecks is a positive impact on heritage resources in general. Based on the likely direct and indirect impacts of the installation of seabed cables off the Cape West Coast, the cumulative negative impacts of the project on heritage resources, in combination with other systems already installed on the seabed, are likely to be of low significance.

10.6.6 Cumulative impacts associated with climate change

The impact of climate change on the terrestrial component of the proposed development has been included in the operational phase to ensure the ongoing monitoring of the response of the dynamic coastal system to increased storm surges and potential sea-level rise. The potential for increased beach erosion will need to be monitored, to ensure that the immediate area of the cable installation is not undermined. Should this occur, immediate remediation will be required, both for environmental reasons and to protect the cable.

Table 21 Assessment of potential cumulative impacts of the proposed 2AFRICA (West) Cable System (Yzerfontein landing)

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Cumulative social and socio-economic impacts (positive)	Unmitigated	Positive	National/ Inter-national	Long-term	Low	Continuous	Low	Low	Highly Probable	Medium	Medium
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cumulative social and socio-economic impacts (negative)	Unmitigated	Negative	Site specific to local	Short-term to permanent	Medium to low	Once-off	Low	Moderate to High	Highly probable to improbable	Medium to Low	Medium
	Mitigated	Negative	Site specific to local	Short-term to permanent	Low to Negligible	Once-off	Low	Moderate to High	Highly probable to improbable	Low	Medium
Cumulative ecological impacts (terrestrial environment)	N/A (no impact)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A (no impact)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cumulative ecological impacts (marine environment)	Unmitigated	Negative	Site specific to national/ international	Short-to long term	Low	-	-	-	Highly Probable	Medium	Medium
	Mitigated	Negative	Site specific to national/ international	Short-to long term	Low	-	-	-	Highly Probable	Low	Medium

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Long term protection of marine biota within cable exclusion zones (cumulative)	Unmitigated	Positive	Regional	Long-term	Medium	Continuous	N/A	High	Highly Probable	Medium	Medium
	Mitigated	Positive	Regional	Long-term	Medium	Continuous	N/A	High	Highly Probable	Medium	Medium
Cumulative impacts on demersal fishing	Unmitigated	Negative	Regional	Long-term	Medium	Continuous	Low	Moderate	Definite	Low	Medium
	Mitigated	Negative	Regional	Long-term	Low	Continuous	Low	Moderate	Definite	Low	Medium
Cumulative impacts on beach and coastal dunes	Unmitigated	Negative	Site-specific	Short-term	Low	-	Low	High	Probable	Low	Low
	Mitigated	Negative	Site-specific	Short-term	Low	-	Low	High	Probable	Low	Low
Cumulative impacts on heritage (marine)	Unmitigated	Negative	Site-specific	Short to medium-term	Medium	-	High	Non-reversable	Improbable	Low	Low
	Mitigated	Negative	Site-specific	Short to medium-term	Medium	-	High	Non-reversable	Improbable	Low	Low

11 ENVIRONMENTAL IMPACT STATEMENT

Taking the key issues and the assessment of associated potential impacts into account, a summary of the environmental impacts of the proposed activity, and their significance (after mitigation, where applicable) is provided below.

Social and socio-economic impacts
Overall, the project is expected to contribute positively to the goal of improving livelihoods for South Africans through the education and economic opportunities opened up as a result of access to improved telecommunications networks. While expanding access to communication technology will be done primarily through broadband infrastructure roll-out, this requires a national backbone connected to the rest of the world. In this case, the proposed 2AFRICA/GERA (East) Cable System supports SIP 15 via is international connectivity, capacity and speed. The significance of this positive impact is assessed as medium.

The Yzerfontein cable landing will render very limited areas permanently unavailable to some concession holders in the Oil and Gas sector. This needs to be dealt with via agreements between MTN and the affected rights holders, outside of this EIA process. During installation, there is potential to negatively impact other existing subsea telecommunications cables. However, this can be managed by adherence to international guidelines and standards. The project may cause minor nuisance impacts to the local community during the installation phase. In general, the negative social and socio-economic impacts are of low significance, after mitigation.

Impacts on terrestrial ecosystems, vegetation and fauna
The implementation of the proposed landing site will have no negative impacts on terrestrial ecosystems of conservation value. No vegetation or wetland habitat is present on site and consequently there will be no impact on terrestrial (non-marine) fauna.

Impacts marine ecosystems, vegetation, fauna and avifauna
While the 2AFRICA (West) Cable System (Yzerfontein landing) passes through the Cape Canyon and Associated Islands EBSA ,as well as areas classified as Critical Biodiversity Areas, the residual impacts of the project on the benthic environment will be of low significance. The potential negative impacts of the project on marine flora and fauna (small and large) on shore, nearshore and offshore, are all of low significance (after applying mitigation where feasible). Similarly, the impacts on seabirds and shorebirds will be of low significance.

The cable, once in place, will afford a section of the seabed long term protection due to the exclusion of anchoring and trawling 500 m either side of the cable, which is considered a positive impact of low to medium significance.

Impacts on fisheries
Several fisheries operating in the area will potentially be negatively affected by the 2AFRICA (West) Cable System (Yzerfontein landing). A potential decline in catch rates due to noise disturbance is assessed as being of low significance. The potential effect on operational activities and decline in catch rates due to the temporary (1,500 m) exclusion zones around survey and cable laying vessels is assessed as being of low significance. The long term effect on operational activities due to the 500 m exclusion zone either side of the cable will negatively impact fishing sectors, most particularly the demersal trawl and demersal longline as it affects a heavily trawled area. However, the cable will not prevent trawling from continuing in the area, as trawlers will lift gear as they pass over the cable. The loss of fishing ground is estimated to be 0.3% of the total trawl grounds available in that area and overall, the significance of this

impact is assessed as low. The potential for mitigation of identified impacts of the project on fisheries is very low.

Impacts on the beach and coastal dunes
The project will have little impact on the beach and coastal dunes. The significance of potential negative impacts on drivers of coastal processes, sediment transport and habitat/eco-morphology of the beach and dunes will be low, both before and after mitigation. The beach environment at the landing site is, however, subject to ongoing erosion which may be exacerbated by climate change.

Impacts on cultural heritage
While there is evidence of submerged pre-historic archaeological resources, palaeontological resources and maritime archaeological resources in the broader study area, the likelihood of the project negatively impacting these resources is very low. There are no recorded shipwrecks along the cable alignment. As the impacts would be non-reversable if they should occur, the significance of impacts on these cultural heritage resources is assessed as medium, (after applying mitigation, where possible).

Cumulative impacts
The impacts resulting from the proposed 2AFRICA (West) Cable System (Yzerfontein landing), as identified above, are both positive and negative and along with other existing or future cables in the area can have cumulative effects on the environment. However, the contribution of the project to negative cumulative impacts will be low.

The No Development Alternative
It is not anticipated that the No-Development Alternative would have any negative impacts of high significance. However, it would preclude the positive impacts which improved telecommunications would have on the country's socio-economic environment and would fail to support the country's SIP 15 goals.

12 CONCLUDING STATEMENT / RECOMMENDATION OF THE EAP

Based on the findings of the specialists and the assessment of key issues and associated impacts undertaken in this report, it is the professional opinion of the EAP that there are no fatal flaws associated with the proposed project and that the negative impacts resulting from the proposed 2AFRICA (West) Cable System (Yzerfontein Landing) can be mitigated to acceptable levels. Therefore, the project should be granted environmental authorisation by DFFE , conditional on compliance with the mitigation measures as recommended in this report and contained within the EMPr.

The project components to be authorised are the installation and operation of the marine cable, along the alignment as proposed, with the shore landing at Yzerfontein to link up to the existing WACS BMH. From there, the cable will link to the WACS CLS via existing underground ducting. The location and alignment of the proposed infrastructure is indicated in the table below and in relevant Figures in this report.

GPS Co-ordinates of the Alternative 1 infrastructure at Yzerfontein (approximate)		
Location	**Latitude**	**Longitude**
Start of marine cable	S 33° 6'8.51"	E 16°16'45.67"
Mid-point of marine cable	S 33 35’09.25”	E 17 11’02.40”
Landing Point on shore	S 33°20'23.54”	E 18° 9'38.35”
WACS Conduit Opening on Beach	S 33°20'23.64”	E 18° 9'38.94”
WACS BMH at Yzerfontein	S 33°20'23.91”	E 18° 9'41.12”
End of cable at WACS CLS	S 33° 20’12.92"	E 18°11'51.45"

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APPENDIX A: EAP *CURRICULUM VITAE.*

APPENDIX B: SPECIALIST REPORTS, *CURRICULUM VITAE* AND DECLARATIONS.

APPENDIX C: PROPERTY DETAILS

APPENDIX D: PUBLIC PARTICIPATION DOCUMENTATION

APPENDIX E: COMMENTS AND RESPONSES REPORTS

APPENDIX F: ENVIRONMENTAL MANAGEMENT PROGRAMME

APPENDIX G: SUPPORTING MAPS