EXECUTIVE SUMMARY

1. INTRODUCTION

This Executive Summary provides a synopsis of the Draft Scoping Report (DSR) prepared as part of the Environmental and Social Impact Assessment (ESIA) process that is being undertaken for an application to undertake exploration and appraisal well drilling in Block 2912 off the southern coast of Namibia (see Figure 1).

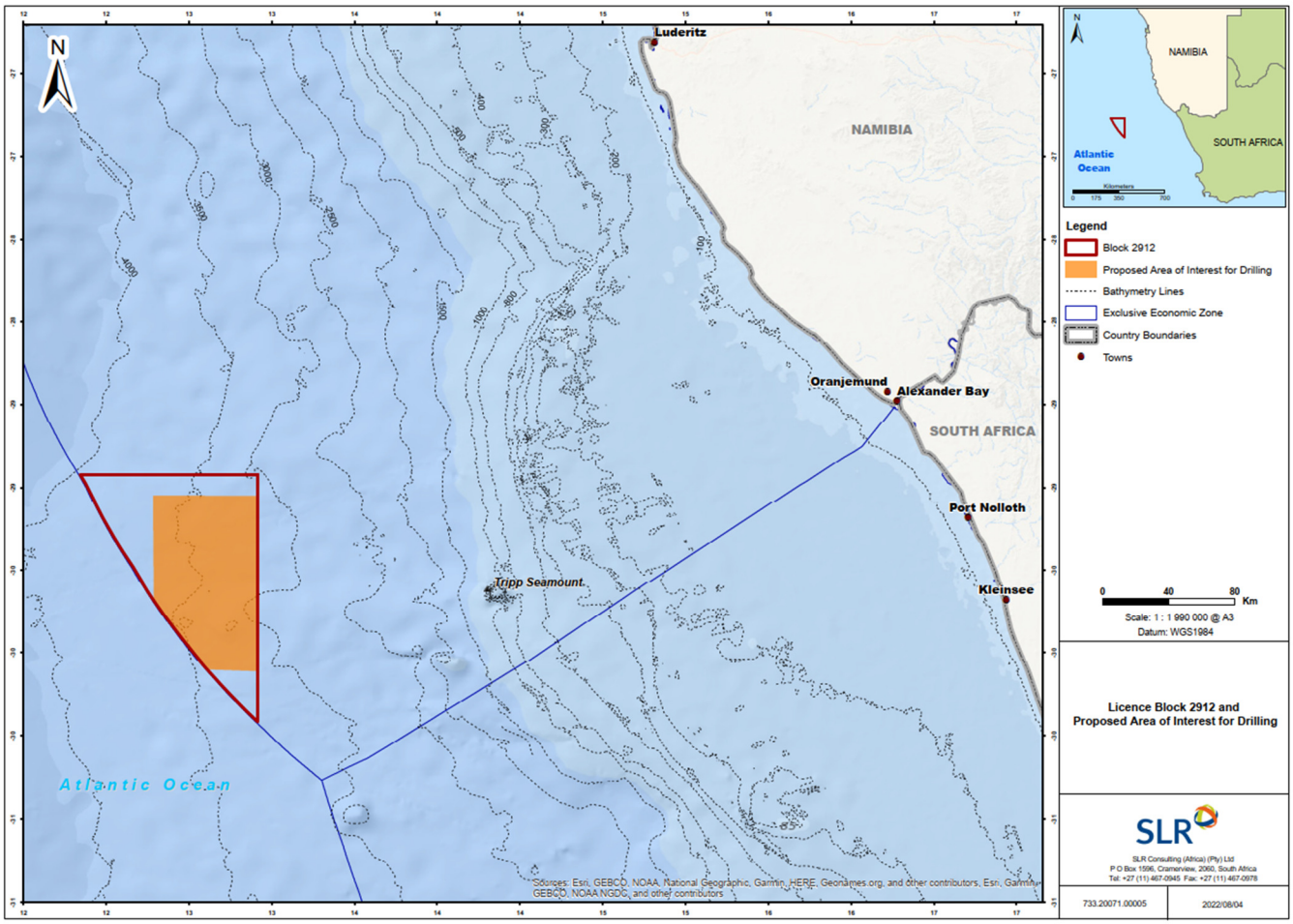

Figure 1: Location of Licence Block 2912 and the area of interest for the proposed exploration and appraisal activities off the South Coast of Namibia

1.1 PROJECT BACKGROUND AND LOCATION

TotalEnergies E&P Namibia B.V. ("TEEPNA") is the holder of two Exploration Licences for Blocks 2912 and 2913B, located in the deep-water Orange Basin off the coast of southern Namibia. Block 2912 is located the furthest offshore (290 km at its closest point) in water depths of 2 940 m to 3 800 . Block 2913B is located immediately to the east (240 km offshore at its closest point) in water depths ranging from approximately 2 600 m to 3 300 m.

TEEPNA currently holds two Environmental Clearance Certificates (ECC) for exploration activities in these two blocks. This includes an ECC to undertake a 3D seismic survey across both Blocks 2912 and 2913B (issued in June 2021) as well as an ECC for exploration and appraisal well drilling in Block 2913B (renewal issued in September 2022).

TEEPNA is now applying to undertake further exploration and appraisal activities within an area of interest in Block 2912. The proposed activities include the following:

- Drilling in a focused area within the block, including:
  - Exploration and/or appraisal wells (up to 10);
  - Vertical Seismic Profiling (VSP);
  - Well testing; and
  - Abandonment of wellheads in the deep offshore.
- Sonar bathymetry surveys.
- Seafloor sampling and coring surveys.

SLR Environmental Consulting (Namibia) (Pty) Ltd ("SLR") has been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake a full Scoping and EIA process for the proposed additional exploration activities (hereafter collectively referred to as "Environmental and Social Impact Assessment" or "ESIA" process).

1.2 OPPORTUNITY TO COMMENT AND ATTEND PUBLIC INFORMATION-SHARING MEETINGS

This DSR is distributed for a 30-day comment period from **15 November to 16 December 2022**. It provides an opportunity for Interested and Affected Parties (I&APs) to comment on any aspect of the proposed project and the potential impact identified for further investigation in the Assessment Phase.

Copies of the full report are available on the SLR website (**http://www.slrconsulting.com/en/public-documents/teepna-2912**). Hard copies are available at the Walvis Bay Municipality, Lüderitz Information Centre (Bismarck Street) and the Lüderitz Town Council (90 Bay Road). A Non-technical Summary is also available on request from SLR and at the above link.

Any comments should be sent to SLR at the address, WhatsApp / SMS number or e-amil shown below. For comments to be included in the final Scoping Report (FSR), comments should reach SLR by no later than **16 December 2022**.

SLR Environmental Consulting (Namibia) (Pty) Ltd

Attention: Stephanie Strauss

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Stakeholders are also invited to attend public information-sharing meetings in Windhoek, Walvis Bay and Lüderitz, as well as online (MS Teams). Specific details of these meetings have been provided in the I&AP notification letter.

After completion of the comment period, the FSR will be submitted to the Ministry of Mines and Energy (MME): Directorate of Petroleum Affairs for review, who will then forward it to the Ministry of Environment, Forestry and Tourism (MEFT): Department of Environmental Affairs (DEA) for a decision.

2. ESIA PROCESS

The ESIA process consists of two phases (namely Scoping and Impact Assessment) and a series of steps to ensure compliance with the Environmental Impact Assessment (EIA) Regulations, 2012 (see Figure 2). The ESIA is currently in the Scoping Phase.

The purpose of the Scoping Phase is to communicate the scope of the proposed project to I&APs, to consider project alternatives, to identify the environmental and social aspects, and potential impacts for further investigation and assessment, and to develop the terms of reference for specialist studies to be conducted in the Impact Assessment Phase. The Scoping Phase involves a process of:

- Notifying I&APs of the proposed project and the steps of the ESIA process;
- Creating an opportunity for I&APs to interact with the ESIA project team; and
- Providing adequate information for I&APs to comment on in order to ensure that all key environmental and social issues are identified.

The stakeholder engagement process being undertaken is detailed in Chapter 4 of the DSR.

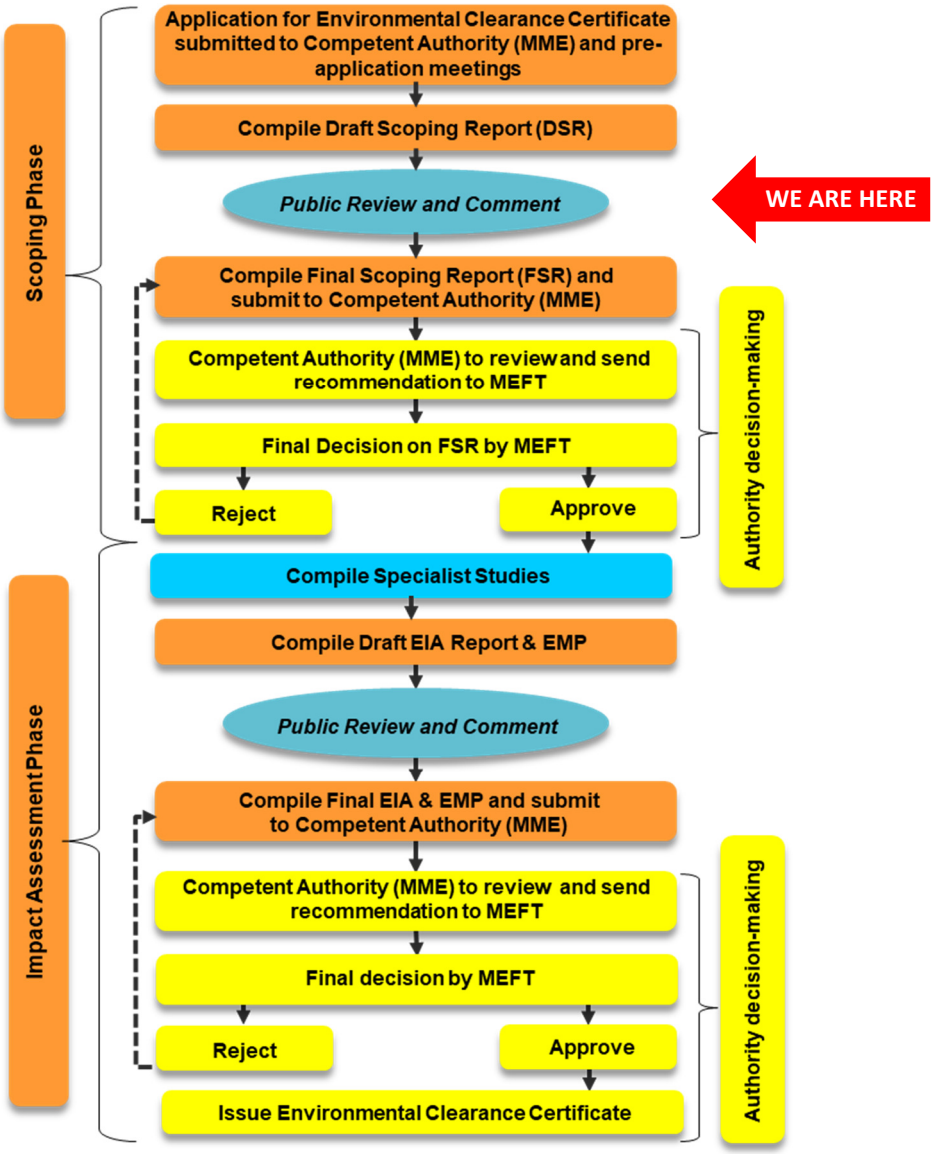

Figure 2: Namibian ESIA Process

3. NEED AND DESIRABILITY

Namibia, like the rest of the world, is vulnerable to climate change, which will have an impact on water resources and food production, and increase the vulnerability of impoverished communities, amongst others. There is thus global concern of the need to reduce GHG emissions and achieve carbon neutrality by 2050. However, the rapid transition to carbon neutrality presents a potential risk to economic growth and sustainable development if not managed properly. Namibia is committed to a just transition to a net-zero and climate resilient society.

The policy compatibility review suggests that Namibian policy, specifically Namibia's National Energy Policy, currently promotes the country's exploration potential and investments in the oil and gas sector. Policy is also broadly aimed towards improving socio-economic welfare through the sustainable utilisation of the country's natural resources. NDP5 plans to achieve economic progression by developing value added industrialisation, substituting imports for locally produced goods, creating value-chains of production, and to accelerate SME development. Although Namibian policy is increasingly focussed on beneficiation and the creation of downstream opportunities, it is still recognised that upstream industries involving resource extraction play a key role in the overall goal of realising the full potential which the country's resources can offer, even more so after the recent deep water finds by TEEPNA and Shell off southern Namibia.

The overall conclusion is that the proposed project will be largely compatible with key socio-economic policies and plans, provided environmental and other risks can be adequately mitigated. The use of natural gas until 2050 is also in line with international policy, which recognises the need for fossil fuels in the energy mix in the pathway to net-zero emissions by 2050.

The need and desirability for the proposed project is economic and strategic in nature. The purpose of the project is to develop Namibia's natural resources to the benefit of the people of Namibia and the project stakeholders. The project will need to do so in a safe, environmentally sound and commercially viable manner. If successful, the production stage of the project will contribute to the Namibian economy and will have a positive impact in reducing the Namibia balance of payments with respect to energy. Income to the government from the production stage of the project will facilitate economic development and growth, further benefiting Namibia directly from the project and indirectly through development of supporting and related enterprises. Should there be a substantial hydrocarbon find in Block 2912, the project could continue onto the development phase, which would generate employment and training opportunities directly in the offshore oil and gas industry. For this relatively short-term drilling campaign, the project will generate opportunities indirectly through service, supply and support industries.

Although the exploration for and use of hydrocarbons is largely aligned with key socio-economic policies and plans, it is not aligned with other National and International agreements, laws policies and plans (e.g. Namibia's Climate Change Policy Framework, Updated NDC), which identify the need to reduce the reliance on fossil fuels and for the global community, including Namibia, to reduce its GHG emissions and meet international law obligations and commitments. Notwithstanding the above, the use use of natural gas is seen as necessary to serve as a transition on the path to a carbon-neutral goal (as per the Paris Agreement) and provide the flexibility required to complement renewable energy sources. Should a substantial gas resource be found in Namibia, it would contribute to the energy transition goals. In addition to the use of natural gas for electricity generation, the many other uses of hydrocarbons (e.g. transportation fuels, asphalt, and feedstocks for making chemicals, polyurethane, solvents, plastics and other synthetic materials) will also need to see adaptation and mitigation during this transition period. TEEPNA acknowledges that climate change is a significant issue for its business and is committed to reducing its GHG emissions.

It is acknowledged that the proposed exploration project would not result in the production of oil or gas, but rather the confirmation of a possible indigenous resources. By gaining a better understanding of the extent, nature and economic feasibility of extracting these potential resources, the viability of developing indigenous oil and gas resources would be better understood. The proposed exploration project, as contemplated (i.e. not considering possible production), has no direct influence on Namibia's reliance on fossil fuels and whether consumers use more or less oil or gas, nor on which types of fossil fuels contribute to the country's energy mix. The proposed project will not necessarily change how fossil fuels are used in Namibia and has no direct influence on GHG emissions that would arise from the consumption of fossil fuels. These aspects are influenced by Namibia's energy and climate change related policy, the financial costs of the various energy sources and consumer choices in this regard. The National strategic policy issues relating to energy and climate change fall beyond the scope of this project ESIA.

The proposed exploration project will potentially lead to Namibia optimising its own indigenous resources to provide for its identified oil and gas needs until the 2050 deadline to achieve carbon neutrality, rather than having to mainly import, as at present.

4. PROJECT DESCRIPTION

4.1 OVERVIEW OF PROPOSED PROJECT ACTIVITIES

The key components of the proposed exploration and appraisal activities are summarised in Tables 1 and 2.

Table 1: Summary of Key Pre-drilling Survey Components

Seabed Sediment Coring	
Method	• Piston core • Box corer
Number	20 cores
Duration	4 weeks
Location	Water depth < 2 940 m. No specific target identified yet
Safety Zone	500 m
Sonar Surveys	
Purpose	To investigate the structure of the ocean bed sediment layers
Method	• Multi beam echo-sounder (70-100kHz) • Single beam echo-sounder (38-200kHz) • Sub bottom profiler (2-16kHz)
Duration/Extent	4 weeks / target areas to be identified at a later stage
Location	Water depth from 2 940 to 3 500 m. Specific location not confirmed, but localised areas within the block.
Safety Zone	500 m

Table 2: Summary of key drilling project components

Purpose	To confirm and test the presence and quality of hydrocarbon resources
Number of exploration and appraisal wells	Up to 10 wells
Size of Area of Interest for proposed exploration drilling	5 206 km^2

Well depth (below seafloor)	Variable depth of 1 500 to 3 500. A notional well depth of 3 500 m is assumed for the ESIA
Water depth range	• Water depth range of area of interest: 2 940 to 3 700 m

Duration to drill each well	• Mobilisation phase: up to 45 days
	• Drilling phase:
	  ○ Exploration well: Up to three months
	  ○ Appraisal well: Up to four months
	• Well abandonment: up to 15 days
	• Demobilisation phase: up to 10 days

Commencement of drilling and anticipated timing	Commencement is not confirmed, but possibly between fourth quarter of 2023 (Q4 2023) and second quarter of 2024 (Q2 2024) to drill first well
Proposed drilling fluids (muds)	Water-based Muds (WBM) will be used during the riserless drilling stage and Non-Aqueous Drilling Fluid (NADF) during the risered drilling stage (closed loop system)
Drilling and support vessels	• Semi-submersible drilling unit or drillship • Three support vessels during mobilisation and two during the risered drilling phase. These vessels will be on standby at the drilling site, as well as moving equipment and materials between the drilling unit and the onshore base
Operational safety zone	Minimum 500 m around drilling unit
Flaring	If hydrocarbons are discovered, one Drill Stem Test (DST) will be performed. If a production logging tool (PLT) is used, test would run 246 h / 10,25 days (+ 4 days build up). Without PLT, the test could run 218 hours / 9,1 days (+ 4 days build up).
Logistics base	Lüderitz
Logistics base components	Office facilities, laydown area, mud plant
Support facilities	Crew accommodation in Lüderitz
Staff requirements:	• Specialised drilling staff supplied with hire of drilling unit • Additional specialised international and local staff at logistics base
Staff changes	Rotation of staff every four weeks with transfer by helicopter to shore

4.2 LOCATION, TIMING AND DURATION

- *Location:* The Area of Interest has been selected based on the results of previous seismic investigations. This area is 5 206 km^2 in extent and is located offshore of southern Namibia close to the South African border, approximately 350 km southwest of Lüderitz and 340 km west-southwest of Oranjemund at its closest point, in water depths between 2 940 m and 3 700 m (see Figure 1).
- *Anticipated timing:* Commencement is not confirmed, but possibly between the third quarter of 2023 (Q3 2023) and second quarter of 2024 (Q2 2024) to drill the first well.
- *Drilling duration:* It is expected that it would take approximately three to four months to complete the physical drilling and testing of each well (excluding mobilisation and demobilisation).

4.3 DRILL UNIT, VESSEL SUPPORT AND ONSHORE LOGISTICS BASE

- *Drilling Unit*: TEEPNA is proposing to utilise a drillship (as used for the drilling of the Venus X-1 well in the adjacent Block 2913B in 2021). The use of a semi-submersible drilling unit might also be considered in future, depending on vessel availability. Both vessels have dynamic positioning systems suitable for the deep-water harsh marine environment. A temporary 500 m safety zone around the drilling unit will be enforced at all times during operation.
- *Support vessels*: The drilling unit is expected to be supported by up to three support vessels and helicopter transfers between the drilling unit and Lüderitz.
- *Logistics base:* The primary onshore logistics base will most likely be located at the Port of Lüderitz.

4.4 DRILLING OPERATION

- *Final Drilling Site Selection:* Site selection will be based on further detailed analysis of the seismic and pre-drilling survey data and the geological target. A Remote Operating Vehicle (ROV)[1] will be used to finalise the well position based on, *inter alia,* the presence of seafloor obstacles or the presence of any sensitive features that may become evident.
- *Drilling Sequence or Stages:* A well will be created by drilling a hole into the seafloor with a drill bit attached to a rotating drill string, which crushes the rock into small particles, called "cuttings". After the hole is drilled, casings of steel pipe (which provide structural integrity to the newly drilled hole), are placed in the hole and permanently cemented into place. The diameter of the well decreases with increasing depth. Drilling is undertaken in two stages, namely the riserless and risered drilling stages (see Figure 3).
    - *Initial (riserless) drilling stage:* At the start of drilling, a 36 or 42 inch hole will be drilled approximately 96 m deep and the conductor pipe will be run into the hole and cemented into place, after which a low pressure wellhead will be placed on top of the conductor. Further sections are then drilled to diameter of 26 inches to a depth of approximately 870 m. These initial sections of the hole will be drilled using seawater (with viscous sweeps[2]) and Water Based Muds (WBMs). All cuttings and WBM from this initial drilling stage will be discharged directly onto the seafloor adjacent to the hole.
    - *Risered drilling stage:* This stage commences with the lowering of a Blow-Out Preventer (BOP) and installing it on the wellhead, which seals the well and prevents any uncontrolled release of fluids (e.g. oil, gas or condensate) from the well (a 'blow-out'). A lower marine riser package is installed on top of the BOP which isolates the drilling fluid and cuttings from the environment creating a "closed loop system". Drilling is continued by lowering the drill string through the riser, BOP and casing, and rotating the drill string. During the risered drilling stage, should the WBMs not be able to provide the necessary characteristics required to safely drill the well, a low toxicity Non-Aqueous Drilling Fluid (NADF) will be used. In instances where NADFs are used, cuttings will be treated to reduce oil content and discharged overboard.

[1] A ROV is a small, unmanned, highly manoeuvrable underwater machine that is used to explore underwater features / seafloor while being operated by someone at the water surface

[2] Sweep is a special drilling fluid, formulated to transport cuttings from the hole.

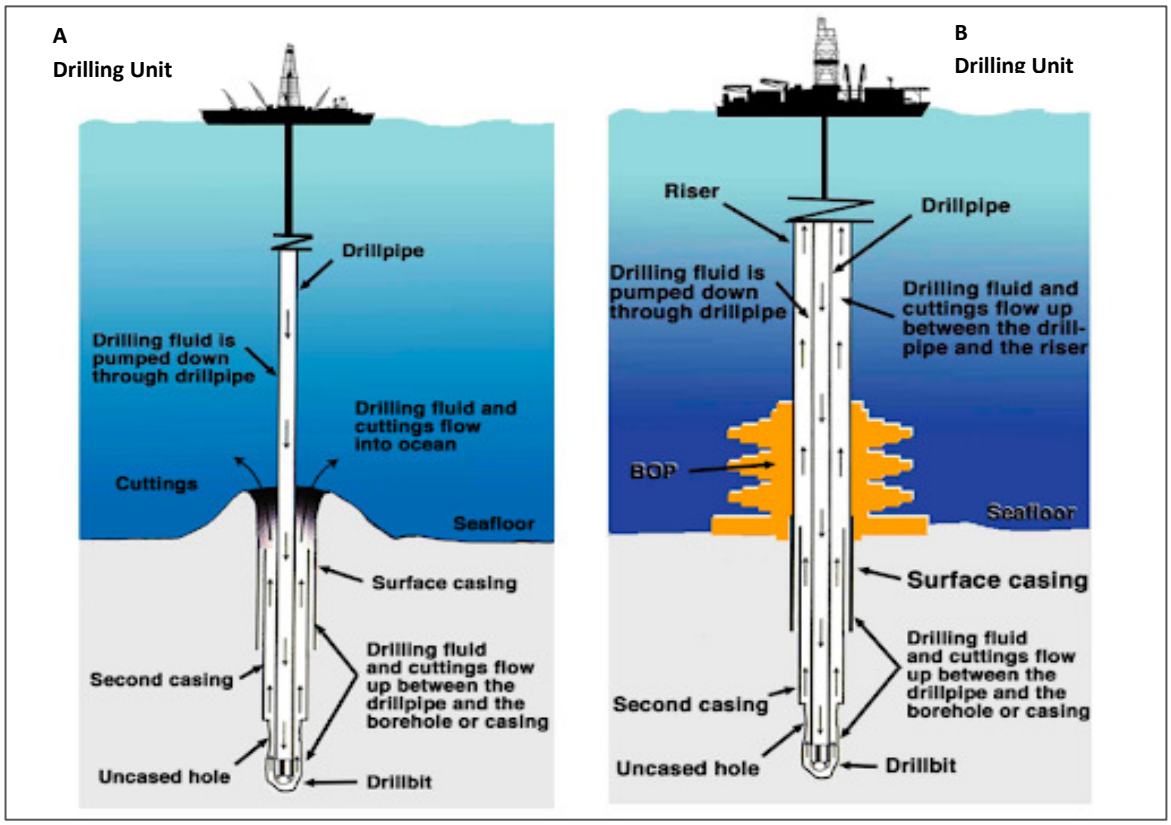

Figure 3: Drilling stages: (a) riserless drilling stage; and (b) risered drilling stage

- *Well Logging*: Once the target depth is reached, the well will be logged and possibly tested. Well logging involves the evaluation of the physical and chemical properties of the rocks in the sub-surface, and their component minerals, including water, oil and gas, to confirm the presence of hydrocarbons and the petrophysical characteristics of the rock through which the hole has been drilled. Vertical Seismic Profiling (VSP) is an evaluation tool that is used when the well reaches target depth to generate a high-resolution seismic image of the geology in the well's immediate vicinity. The VSP images are used for correlation with surface seismic images. VSP uses a small airgun array, which is operated from the drilling unit. During VSP operations, receivers are positioned in a section of the borehole and the airgun array is discharged at intervals. This process is repeated for different stations in the well and may take up to nine hours to complete. TEEPNA is proposing to undertake one VSP operation per well, which would be scheduled towards the end of the drilling operations.
- *Well (flow) testing*: This is undertaken to determine the economic potential of any discovery before decommissioning where the well is abandoned (i.e. a well that is permanently sealed with no intension of coming back later) or suspended (i.e. a well that is safely secured with the intention to come back later for further testing or production). One test would be undertaken per exploration well if a resource is discovered and up to two tests per appraisal well. Each test may take up to seven days to complete (5 days of build-up and 2 days of flowing and flaring). If water from the reservoir arises during well flow testing, these would be separated from the oily components and treated onboard to reduce the remaining hydrocarbons from these produced waters. Treated produced water will then either be discharged overboard or transferred to an onshore facility for treatment and disposal.

- *Well Sealing and Plugging*: Once drilling and logging are completed, the well(s) will be sealed with cement plugs, tested for integrity and abandoned according to international best practices.
- *Demobilisation:* The intention is to abandon the wellheads on the seafloor if it is deemed safe to do so based on a risk assessment. Where it is deemed to be safe, the wellhead will be left in place on the seafloor. Due to the water depth and no trawl fishing taking place in the area, it is proposed to leave the wellhead in place without installing over trawlable protective equipment. Monitoring gauges to monitor pressure and temperature may be installed on wells where TEEPNA will return in the future for appraisal / production purposes. A final clearance survey check will be undertaken using an ROV, after which the drilling unit and supply vessels will demobilise from the offshore licence area.

4.5 EMERGENCY RESPONSE

TEEPNA has contract agreements with global response companies to use globally advanced capping stacks in the event of a well blow-out. Capping stacks are designed to shut-in an uncontrolled subsea well in the unlikely event of a blow-out. One capping stack is located in Saldanha and others in the UK and Singapore. The mobilisation of these and other incident response equipment and services will be contained in TEEPNA's Oil Spill Contingency Plan (OSCP) and Blow-Out Contingency Plan (BOCP).

5. RECEIVING ENVIRONMENT

5.1 GEOPHYSICAL CHARACTERISTICS

The continental shelf off southern Namibia is variable in width. Off the Orange River the shelf is wide (230 km) narrowing to the north and reaching its narrowest point (90 km) off Chameis Bay, before widening again to 130 km off Lüderitz. In the south, the Orange Bank (Shelf or Cone), offshore of the Orange River, comprise three low mounds rising to about 160 m on the outer shelf. North of Chameis Bay, the shelf becomes a stepped feature, with a low step having an elevation between roughly 400 - 450 m below mean sea level. Tripp Seamount, which rises from the seabed at approximately 1 000 m to a depth of 150 m, is located approximately 120 km to the east of Block 2912.

The baseline survey undertaken in the adjacent Block 2913B identified that the seabed is characterised by homogeneous poorly to very poorly sorted fine to medium silts (muddy sands), which comprised between 81.5% and 94.4% of the sediments. The remaining sediment is a coarser component (>500 µm) comprising predominantly relic biogenic materials from foraminifera. Gravels were absent. The Total Organic Carbon (TOC) content of the sediments is comparatively low, suggesting that the carbon flux from near surface productivity is not strong. This would be expected from sediments in areas far offshore of the highly productive coastal upwelling.

5.2 BIOPHYSICAL CHARACTERISTICS

The climate of the Namibian coastline is classified as hyper-arid with typically low, unpredictable winter rains and strong predominantly south-easterly winds. Winds are one of the main physical drivers of the nearshore Benguela Region, both on an oceanic scale, generating the heavy and consistent south-westerly swells that impact this coast, and locally, contributing to the northward-flowing longshore currents, and being the prime mover of sediments in the terrestrial environment. Average annual precipitation ranges from 16.4 mm at Lüderitz to 51.5 mm at Oranjemund. Coastal fog is a regular occurrence, which may affect helicopter operations between the exploration vessels and the Lüderitz airport.

The Namibian coastline is strongly influenced by the Benguela Current system. It is characterised by coastal upwelling of cold nutrient-rich water and is an important centre of plankton production, which supports a global reservoir of biodiversity and biomass of sea life.

The wave regime along the southern African West Coast shows no strong seasonal variation with virtually all swells throughout the year coming from the south-west to south direction. In winter there is a slight increase in swell from south-west to south direction.

5.3 BIOLOGICAL OCEANOGRAPHY

Biogeographically, the study area falls into the cold temperate Namaqua Bioregion, which extends from Sylvia Hill, north of Lüderitz in Namibia to Cape Columbine. Block 2912 is located in the offshore Namib Biozone, which extends beyond the shelf break onto the continental slope and into abyssal depths. The coastal, wind-induced upwelling characterising the Namibian coastline, is the principle physical process that shapes the marine ecology of the central Benguela region. The Benguela system is characterised by the presence of cold surface water, high biological productivity, and highly variable physical, chemical and biological conditions.

The seabed communities in the licence area lie within the Namaqua sub-photic and continental slope biozones, which extend from the shelf edge into the abyss. Benthic habitat types in Block 2912 are considered 'Least Threatened' (see Figure 4). Substantial shelf areas in the productive Benguela region could potentially be capable of supporting rich, cold water, benthic, filter-feeding communities. Such communities would also be expected with topographic features such as Tripp Seamount some 120 km to the east of Block 2912.

As the preferred spawning grounds of numerous commercially exploited fish species are located off central and southern Namibia (see Figure 5), their eggs and larvae form an important contribution to the ichthyoplankton in the region. Phytoplankton, zooplankton and ichthyoplankton abundance in Block 2912 is expected to be low.

Due to the cold temperate nature of the region, the fish fauna off the Namibian coast is characterised by a relatively low diversity of species compared with warmer oceans. However, the upwelling nature of the region results in huge biomasses of specific species that supports a commercially important fishery.

The Namibian coastline sustains large populations of breeding and foraging seabird and shorebird species. Most of the seabird species breeding in Namibia feed relatively close inshore (10-30 km). Cape gannets, however, are known to forage up to 140 km offshore and African penguins have also been recorded as far as 60 km offshore. As Block 2912 is located approximately 290 km offshore at its closest point, encounters with pelagic seabirds is most likely.

Five species of turtles occur off Namibia. However, only the leatherback and loggerhead turtles are likely to be encountered within the survey area, but their abundance is expected to be low.

Thirty-three species of whales and dolphins are known or likely to occur in Namibian waters. The distribution of cetaceans in Namibian waters can largely be split into those associated with the continental shelf and those that occur in deep, oceanic water. Importantly, species from both environments may be found in the continental slope (200 to 2 000 m) making this the most species-rich area for cetaceans.

The Cape fur seal is the only seal species that has breeding colonies along the Namibian coast. The colonies closest to Block 2912 are at Van Reenen Bay and Baker's Bay approximately 290 km inshore and to the northeast of the north-eastern corner of the Blocks, in the Tsau//Khaeb (formally known as the Sperrgebiet) National Park.

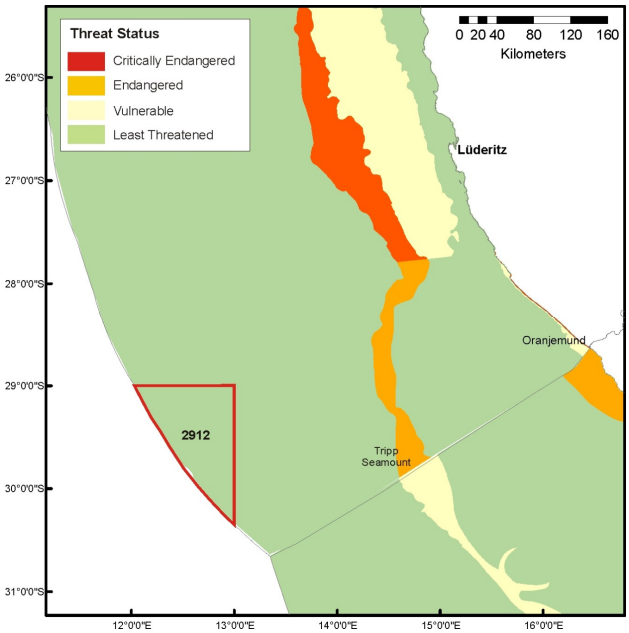

Figure 4: Block 2912 in relation to benthic ecosystem threat tatus

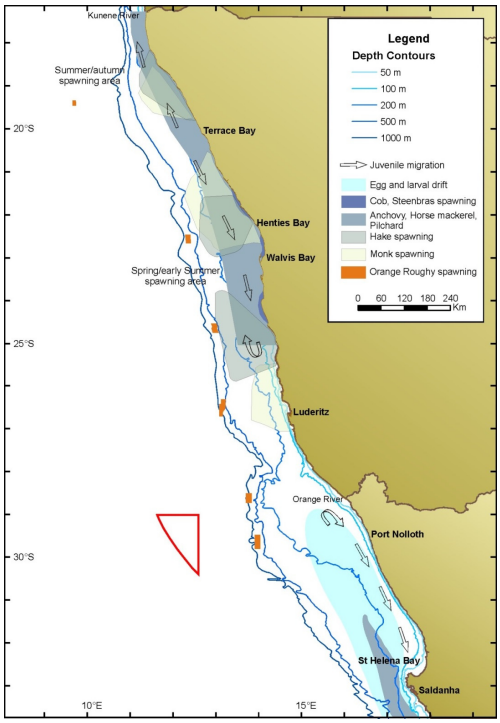

Figure 5: Block 2912 in relation to major fish spawning areas

5.4 MARINE PROTECTED AREAS AND OTHER CONSERVATION AREAS

Inshore of Block 2912, the coastline of Namibia is part of a continuum of protected areas that stretch along the entire Namibian coastline from Southern Angola into Namaqualand in South Africa. Recently proclaimed as the Namib-Skeleton Coast National Park, it incorporates four terrestrial Management Areas, namely the Skeleton Coast National Park, the Dorob National Park, the Namib-Naukluft National Park and the Tsau//Khaeb (Sperrgebiet) National Park.

All three of the designated coastal Ramsar sites in Namibia (including Walvis Bay Wetland, Sandwich Harbour and Orange River Mouth) fall within the broader project area. Block 2912 lies offshore of a proposed marine Important Bird Area (IBA).

The Namibian Islands' Marine Protected Area (NIMPA) lies inshore and north-eastwards of Block 2912, with the closest point (southern boundary of the NIMPA) being over 260 km away (see Figure 6).

Block 2912 does not overlap with any Ecologically or Biologically Significant Areas (EBSA), which have been identified as being of high priority for place-based conservation measures under the Convention of Biological Diversity (see Figure 6). In addition to EBSAs, Ecological Support Areas (ESAs) have been identified. Although these areas do not meet the EBSA criteria they reflect secondary priority conservation areas with special attributes that support a healthy and functioning marine ecosystem. One of these ESAs extends roughly through the centre of Block 2912 in an east-west direction (see Figure 6).

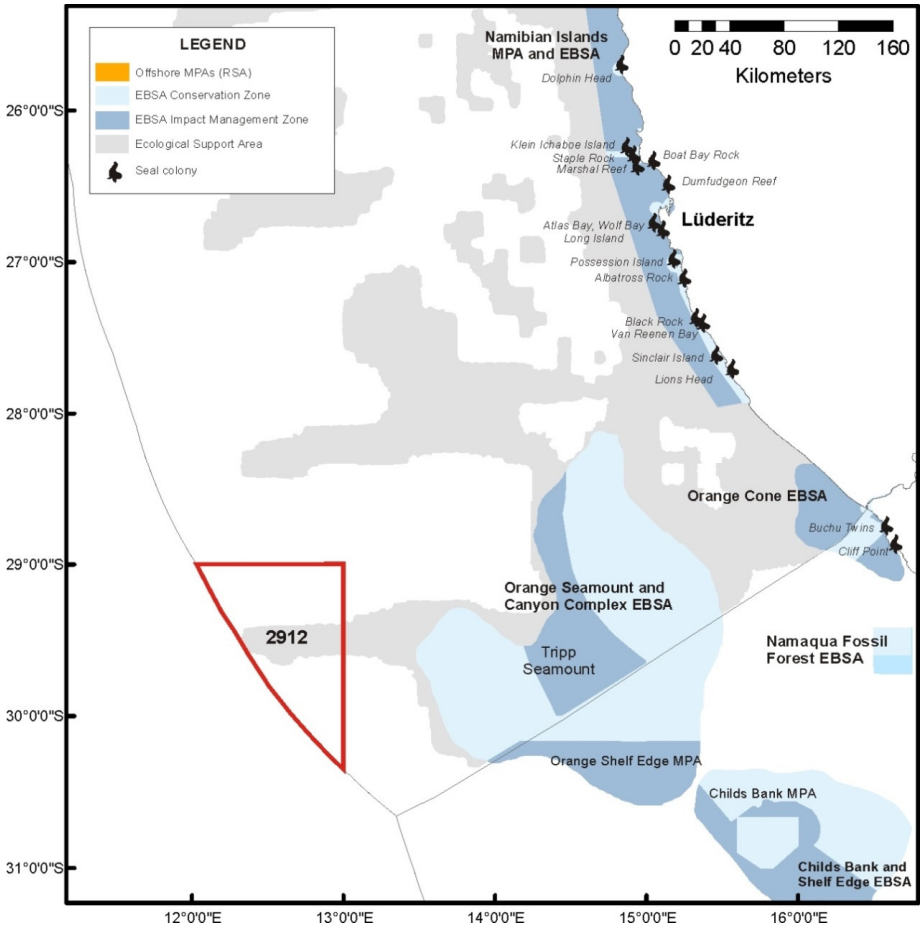

Figure 6: Block 2912 in relation to EBSAs, Ecological Support areas and the location of seal colonies.

5.5 SOCIO-ECONOMIC ENVIRONMENT

6.5.1 Fishing

Information on the spatial distribution and catch effort of the commercial fishing sectors that operate off the coast of Namibia are provided below. Of these fisheries, only the large pelagic longline sector overlaps with Block 2912. The only other sector operating in the vicinity is the tuna pole sector that marginally overlaps with the adjacent Block 2913B (see Figures 7 and 8).

- Large pelagic longline: Fishing effort is widespread predominantly along the shelf break between 500 m depth to beyond the 2 000 m isobath. Thus, grounds used by the pelagic longline fishery coincide with the licence block (see Figure 7).
- Tuna pole: Aggregations of tuna are known to occur near Tripp Seamount (approximately 120 km east of Block 2912). No tuna pole activity has been recorded in the block, with minimal effort expended in the adjacent Block 2913B (see Figure 8).
- Demersal trawl: This fishery operates between depths of 200 m and 850 m. The demersal trawl grounds are situated 125 km eastward of the block. There is thus no overlap.
- Mid-water trawl: Fishing occurs mainly between the 200 m and 500 m isobaths towards the shelf break. Although the main commercial fishing grounds are situated approximately 400 km northward of the licence block, incidental fishing has been recorded 200 km north east of the block. There is thus no overlap.
- Deep-water trawl: This fishery is currently closed.

- Small pelagic purse-seine: Fishing activity is localised around ports and inshore of the 200 m isobaths. The fishing grounds targeted by the purse-seine fleet are largely located off and to the north of Walvis Bay. The main commercial fishing grounds are situated at least 480 km northward of the licence block, and the closest fishing activity recorded 150 km east of Block 2912 is incidental. There is thus no overlap.
- Demersal longline: Demersal long-lining is expected to occur in similar areas used by the hake-directed trawling. Fishing grounds are situated 100 km eastward of Block 2912 and there is no overlap.
- Traditional line-fish: This fishery is limited in extent to around the Port of Walvis Bay and does not operate much further than 12 nm offshore due to the operational range of vessels operating within this fishery, which is inshore and 300 km north-east of Block 2912 in the vicinity of Lüderitz.
- Deep-sea crab: Fishing grounds are located at least 780 km to the north of Block 2912 and there is thus no overlap.
- Rock lobster: Fishing grounds for this sector are situated well inshore of Block 2912.

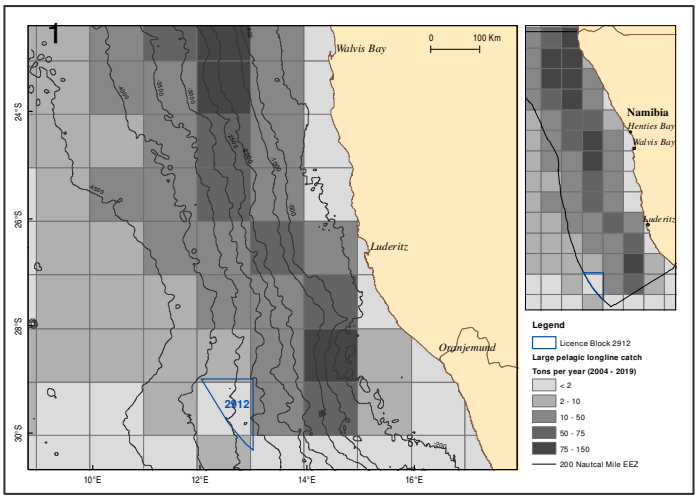

Figure 8 Pelagic Longline Effort (2004 – 2019)
Source: CapMarine, 2022

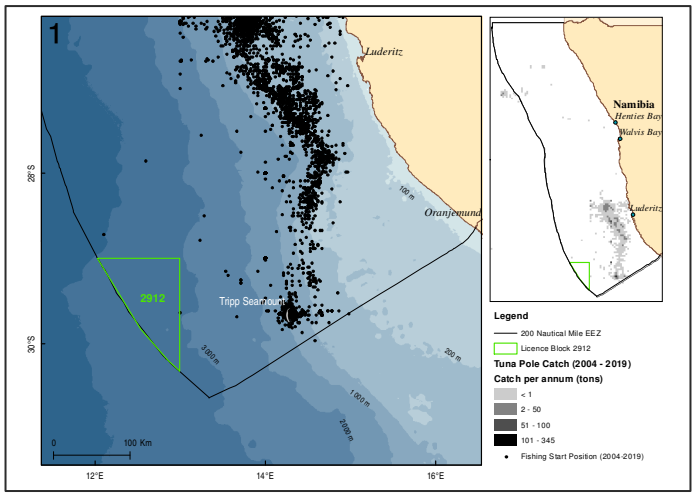

Figure 9 Tuna Pole Effort (2004 – 2019)
Source: CapMarine, 2022

6.5.2 Shipping

Most international shipping traffic is located on the outer edge of the continental shelf. Traffic inshore of the continental shelf along the West Coast largely comprises fishing and mining vessels, especially off the coast of Oranjemund, which is inshore of the licence block. Block 2912 is located on the western boundary of the main traffic routes that pass around southern Africa.

6.5.3 Oil and Gas Exploration and Mining

Previous exploration activities undertaken in Block 2912 included a 2D seismic survey. This survey was undertaken by TGS (previously Spectrum) over the area in 2019. This data (1 097 km) was purchased and analysed by TEEPNA. Based on the analysis of this data, TEEPNA had undertaken a drilling campaign in the adjacent Block 2913B in 2020 and is now proposing to undertake further exploration drilling in Block 2912.

Marine diamond mining is currently limited to the southern half of the Namibian offshore, well inshore of Block 2912.

6. ENVIRONMENTAL AND SOCIO-ECONOMIC SCREENING AND KEY IMPACTS

6.1 ENVIRONMENTAL AND SOCIAL INTERACTION MATRIX

The environmental and social interaction matrix prepared for the proposed project is presented in Table 3. The Matrix provides a list of the project activities and allows for easy checking of interaction against components of the receiving environment. It also indicates potential impacts considered as insignificant, that have been screened out and will not be further assessed.

6.2 KEY ENVIRONMENTAL AND SOCIAL IMPACTS

The significant issues identified during the Scoping Phase that will be assessed by specialists are described below.

6.2.1 Impacts on Marine and Coastal Ecology

The proposed exploration activities could result in the following potential impacts on marine and coastal ecology:

- Localised reduction in air quality due to emissions from the combustion of diesel fuel for generators and other machinery used to power the drilling operations and support vessels, aviation fuel for aircrafts and helicopters, and well flow testing (flaring);
- Localised reduction in water quality due to drilling discharges;
- Localised reduction in water quality due to normal discharges, as per MARPOL requirements, to the marine environment from a variety of sources, including deck drainage, machinery space drainage, sewage and galley wastes from the drilling unit and support vessels;
- Localised disturbance of and / or behavioural changes to marine and coastal fauna due to increased ambient noise and lighting from the pre-drilling surveys, drilling unit, support vessels and helicopter operations;
- Localised disturbance of and / or behavioural changes to marine fauna due to increased underwater noise from vessels, pre-drilling surveys, drilling and VSP;
- Sediment disturbance due to sediment sampling, drilling activities and placement of infrastructure on the seafloor;
- Smothering and biochemical effects (e.g., direct toxicity and bioaccumulation) on relatively immobile or sedentary benthic species due to the discharge of cuttings, drilling fluid and cement during well drilling;
- Increased biodiversity and biomass on wellhead due to hard substrate habitat available for colonisation by benthic organisms;
- Introduction of alien invasive marine species through international vessels and equipment transfer and ballast water discharge; and
- Local and regional impacts on water quality, marine fauna and oiling of coastal habitats (including MPAs) and seabirds due to accidental oil spills during the proposed exploration drilling (normal operations, e.g., bunkering at sea), as well as the unlikely event of a large blow-out.

Table 2: Environmental and social interaction matrix

Project Phase		Resource / Receptors / Project Activities	Sensitive receptors in the receiving environment																	
			Physical and Biological											Socio-economic						
			Water Column (incl. Water Quality, Noise and Turbidity)	Atmosphere (including Air Quality and Noise)	Seabed Sediment and Profile	Fish and Plankton Communities	Benthic Habitats and Communities	Coastal / Marine birds	Turtles and Marine Mammals	Seabed Features and Seamounts	Nearshore Habitats and Communities	Protected Areas and other designated sensitive areas	Alien marine species	Fishing	Maritime Heritage / Cultural Heritage	Marine Traffic / Navigation	Public Health and Safety	Infrastructure and Services	Settlements, Tourism, Recreation, Sense of Place	Employment & Income
Planned Activities (Normal Operation)																				
Pre-drilling surveys		Presence and operation of survey vessels															SO	SO	SO	
		Appointment of local service providers																		
		Sonar surveys																		
		Seabed drop core sampling																		
Well drilling	Mobilisation	Onshore logistics base (including liquid mud plant)																		
		Appointment of specialist service providers and staff																		
		Procurement, importation and transportation equipment & materials																		
		Accommodation rental and local spend (e.g., food and supplies)																		
		Transit of drilling unit and supply vessels to drill site																		
		Discharge of ballast water																		
	Operation	Presence and operation of drilling unit and support vessels (incl. waste management, water intake, air emissions and routine discharges to sea)															SO	SO	SO	
		Lighting from drill vessel																		
		Operation of helicopters																		
		Well drilling (including ROV site selection, installation of conductor pipes; wellhead, BOP and riser system, well logging and plugging)													SO		SO			
		Discharge of drill cuttings and drilling fluid and residual cement																		
		Vertical Seismic Profiling (VSP)																		
		Well (flow) testing and flaring incl. the possible discharge of treated produced water																		
	Demobilisation	Abandoned wellheads on seafloor																		
		Demobilisation of drilling unit and supply vessels															SO			
		Demobilisation of logistics base, services and work force																		
Unplanned Activities (Emergency Event)																				
All		Faunal strike / collisions																		
		Accidental hydrocarbon spills / releases (minor) (e.g. vessel accident, bunkering and pipe rupture)															SO			
Operation		Dropped objects / lost equipment																		
		Loss of well control / Blow-out																		

Colour key:

	No interaction	SO	Screened out		Minor negative interaction		Moderate / major negative interaction		Positive interaction

How the issues will be addressed in the ESIA:

A marine ecology impact assessment will be commissioned to assess the potential impacts on the marine and coastal environment during normal drilling operations and upset conditions (small accidental spills and large blow-out).

Input obtained from the technical modelling studies will be used to assess the potential impacts related to increased underwater noise, the discharge of drill cuttings and associated muds, as well as accidental oil spills on the marine ecosystem and biota, including sensitive marine areas.

The drilling discharges and oil spill modelling studies will use the available metocean data to model the following:

- The dispersion and concentration of drilling cuttings and associated mud discharges to determine the thickness, extent and toxicity of deposited material on the seabed and in the water column; and
- The trajectory, extent and fate of an unlikely large oil spill due to a well blow-out.

The underwater noise modelling study will aim to, *inter alia*, describe the likely background noise levels, determine noise transmission loss with distance from the drill site, and zones of impact relating to permanent or temporary injury and behavioural disturbance.

6.2.2 Impacts on Commercial and Small-Scale Fisheries

During normal operations, the proposed exploration activities could potentially affect fishing activities, as a result of fishing exclusion from the 500 m operational safety zones around the drilling unit; increased underwater noise disturbance during drilling and VSP activities, the abandonment of the wellheads on the seafloor. These activities could have an impact on commercial fisheries that operate in the area through the reduction in catch rates and/or an increase in fishing effort.

An oil spill can also result in several impacts on fishing (unplanned event), including:

- Exclusion of fisheries from polluted areas and displacement of targeted species from normal feeding / fishing areas, both of which could potentially result in a loss of catch and / or increased fishing effort;
- Mortality of animals (including eggs and larvae) leading to reduced recruitment and loss of stock (e.g., mariculture); and
- Gear damage due to oil contamination.

How the issues will be addressed in the ESIA:

A fisheries impact assessment will be commissioned to, *inter alia*, determine the fishing effort and catch of all fisheries operating off the coast of Namibia within the Project's area of influence. It will also assess the impact that the proposed project will have on these sectors during normal drilling operations and upset conditions (small accidental spills and large blow-out) with input from the technical modelling studies.

The fisheries impact assessment includes consideration of broad economic risks and impacts of the proposed exploration operations on key fishing sectors. The level of information that will be provided on the economic aspects of potential impacts of normal operations on key fishing sector receptors is considered to be adequate to inform the assessment of impacts and to inform decision-making in this regard.

6.2.3 Impacts on the Socio-Economic Environment

The proposed exploration activities could potentially result in some limited socio-economic positive impacts. Given the isolated nature of the exploration area and short duration, the potential for direct socio-economic negative impacts from normal operations is considered negligible outside of the short-term disruption of commercial fisheries. More direct localised impacts are possible in relation to: (i) onshore operations at Lüderitz, (ii) movement of support vessels and helicopters from the logistics base to the drilling site, as well as (3) in the unlikely event of a well blow-out or vessel collision.

Possible socio-economic impacts may include:

- Alteration in sense of place and cultural / spiritual reliance on the sea. Exploration operations may be perceived to result in changes to the natural environment and/or the local sense of place, as well as links to area or items of cultural, spiritual or ritual significance.
- Pressure on local services and facilities. The use of local service providers and suppliers, while considered an economic benefit, may also result in increased pressure on local providers or facilities if they do not have sufficient capacity to support the exploration or other activities. This may include both public services (hospitals, clinics, and emergency responses), as well as private services (accommodation, transport and others), but also consumption of products (i.e. food, consumables, etc.).
- Reduction in income and livelihood related to short-term disruption of commercial fisheries.
- Impact on local tourism, recreation and recreational fishing, and commercial shipping. The implementation of the safe operational zone around the drilling unit, as well as movement of the support vessel between the drill area and port, will effectively exclude vessels from portions of the drilling area at any one time. Thus, their presence presents a potential risk of interference with commercial, recreational and fishing boats and other marine recreational activities.
- Potential collision hazards with lost equipment drifting on the surface or in the water column, which may pose a public health and safety risk.
- An unlikely large oil spill (unplanned event) can also result in several socio-economic impacts, including:
    - Alteration of the coastline in terms of aesthetic and landscape appeal (sense of place).
    - Alteration of the coastline in terms of value with regard to spiritual, cultural and ritual importance.
    - Alteration of the coastline that supports a variety of commercial and private recreational and tourism activities.
    - Reduction in recreational activities, and small-scale and commercial fishing in the region, including all forms of near-shore and offshore fishing (e.g., exclusion areas for fishing, non-consumption due to toxicity, decline in recruitment of fish stocks).
    - Reduction in income for secondary and tertiary sectors that support tourism, recreational, fishing, and other coastal economies.
    - Pressure on national, regional, and local public services and facilities as part of any shoreline responses.
    - National, regional, and local collapse in public trust and increase in conflict related to environmental and social impacts from major spills.
    - Impacts on national GDP and economic growth.

Positive socio-economic impacts may include:

- Local employment income for service providers and suppliers: The exploration activities will result in limited local economic benefits due to the short-term and technical nature of the activity with respect to the use of local service providers or suppliers, which will result in direct and indirect positive impacts on employment and income. The demand for such local services will be largely limited to crew accommodation, meals, basic goods, and refuelling, provided at the onshore logistics base in Lüderitz.

How the issues will be addressed in the ESIA:

A Socio-Economic Impact Assessment (SIA) has been commissioned to, *inter alia*, provide an overview of the social context of the project and determine the potential socio-economic impacts and benefits associated with the proposed exploration drilling activities, including unplanned events. The SIA will draw on information provided by the related technical modelling studies (e.g., oil spill modelling) and specialist studies (e.g., commercial fishing).

The SIA will include consideration of broad socio-economic impacts of the proposed exploration activities (normal operations) and an unplanned event (such as a well blow-out) on key economic sectors. The level of information that will be provided on the economic aspects of potential impacts and benefits on environmental and social receptors is considered adequate to inform the assessment of impacts and to inform decision-making in this regard.

In addition, a cultural heritage assessment has been commissioned to investigate both tangible and intangible cultural heritage including spiritual beliefs of communities within the Project's indirect area of influence. The collection of primary field data, which commenced during the pre-application phase, will be used to assess the potential impacts related to both normal operations and unplanned events on the stated variables (culture, livelihood, spiritual and religious aspects).

6.2.4 Impacts on Air Quality and Climate Change

The well drilling activities will generate air emissions through the operation of the drilling unit; movement of vessels and helicopters, and the flaring of gas during well testing (if hydrocarbon resources are found). This will have localised air quality impacts and contribute towards greenhouse gas emissions. These impacts are described further below.

- The release of gaseous pollutants, principally sulphur oxides (SOx), nitrogen oxides (NOx), carbon dioxide (CO_2) and carbon monoxide (CO), together with lesser quantities of particulate matter (PM_{10}/$PM_{2.5}$) and volatile organic compounds (VOCs), from the project vessels, helicopters and well test have the potential to cause reductions in local air quality close to the emissions source, which in turn could have health effects (e.g., respiratory effects).
- Some of the gaseous pollutants released from the project vessels and helicopters could also contribute to global GHG emissions. The main effects of climate change (including increased temperatures, changing weather patterns and sea level rise) are related to increased atmospheric CO_2 concentrations.

How the issues will be addressed in the ESIA:

A climate change and air emissions impact assessment will be undertaken to establish a greenhouse gas and criteria pollutant emissions inventory, model the dispersion of the pollutants and evaluate the significance of GHG emissions and non-GHG criteria pollutant emissions.

6.3 SUMMARY OF KEY POTENTIAL IMPACTS AND PRELIMINARY MITIGATION MEASURES

A summary of key potential impacts and / or those likely to be of public concern is provided in Table 4 below, together with preliminary mitigation measures. There is currently insufficient information available for the assessment of impacts. Thus, these will be formally assessed by the specialists during the Impact Assessment Phase based on the technical modelling studies and their expertise.

Table 4: Summary of Key Impacts and Preliminary Mitigation

No.	Project Activity	Predicted Impacts	Preliminary Mitigation Measures / Project Controls
1.	**Normal Operations**		
1.1	Vessel operations and emissions to the atmosphere	• Contribution to greenhouse gases. • Reduction in local air quality, which in turn could have effects on health, etc.	• Optimise rig positioning, rig movement, survey vessel routes and the logistics (number of trips required to and from the onshore logistics base) in order to lower fuel consumption. • Optimise well test programme to reduce flaring as much as possible. • Use a high-efficiency burner when flaring to maximise combustion of the hydrocarbons.
1.2	Operational discharges to sea (e.g., grey water, sewage, deck drainage)	• Local reduction in water quality and physiological effects on marine fauna.	• Compliance with MARPOL standards for discharges to sea. • Implementation of Waste & Discharge / Maintenance management plans
1.3	Discharge of ballast water	• Introduction of alien invasive species and harmful aquatic pathogens to the marine ecosystem.	• Compliance with requirements of the 2004 International Convention for the Control and Management of Ships' Ballast Water and Sediments.
1.4	Helicopter operations and elevated airborne noise levels	• Disturbance of faunal species resulting in behavioural changes or displacement from important feeding or breeding areas • Disturbance / loss of sense of place.	• Minimum flying heights and flight paths to avoid sensitive habitats.
1.5	Drilling, coring and discharge of drill cuttings	• Physical seabed disturbance on benthic fauna during spudding. • Smothering of benthic fauna/habitats by cuttings. • Increased sea water turbidity and water quality contamination.	• Pre-drilling site surveys (with ROV) and implement buffer around sensitive hardgrounds and vulnerable habitats. • Usage of low-toxicity drilling fluids and cement. • Monitor discharges.
		• Alteration of the seabed in terms of value with regard to spiritual, cultural and ritual importance.	• Stakeholder engagement and notification. • Implement, where necessary, a ritual event/s.

1.6	Generation of underwater noise from drilling, vessel activity, VSP and sonar	• Disturbance of marine fauna, particularly whales and dolphins, from exploration area.	• Pre-shoot watch by Marine Mammal Observer (MMO), including Passive Acoustic Monitoring (PAM). • Implement 'soft start' to VSP activities for slow ramp up of power output. • "Soft-start" procedures. • Shut-downs for animals in mitigation zone.
		• Displacement of fish and fishing.	• Stakeholder engagement and notification. • Navigational warning. • Fisheries Liaison Officer (FLO). • Grievance management.
1.7	Temporary safety zone around drilling unit	• Exclusion of fishing activities within 500 m safety zones during operational activities. • Reduction in catch rates and/or an increase in fishing effort.	• Stakeholder / vessel notification. • Navigational warning. • Fisheries Liaison Officer (FLO). • Vessel lighting and safety signals.
1.8	Well abandonment on seafloor	• Interference with trawling activities or fishing equipment.	• Survey and accurately charted wellheads with the SAN Hydrographer.
1.9	Produced water discharge (if any)	• Local reduction in water quality and physiological effects on marine fauna.	• Onboard treatment of hydrocarbon component to <30 mg/l or ship to shore.
1.10	Procurement of local service providers and employment	• Procurement of local service providers for onshore base and helicopter transfers etc. • Employment of a limited number of staff (e.g., logistics base).	• Appointment of local service providers as far as possible. • TEEPNA local content policy. • Manage community expectations. • Stakeholder engagement.
2.	**Unplanned Events**		
2.1	Loss of equipment	• Potential disturbance and damage to seabed habitats and associated fauna within the equipment footprint. • Collision hazards for other vessels.	• Post drilling ROV survey. • Retrieve of lost objects / equipment, where practicable. • Notify SAN Hydrographer.
2.2	Vessel or equipment failure and bunkering of fuel	• Immediate detrimental effect on water quality, with the toxic effects	• Bunkering procedure. • Shipboard Oil Pollution Emergency Plan. • Emergency Response Plan. • Spill training and clean-up equipment.
2.3	Loss of well control / well blow-out	• Local and regional impacts on water quality, marine fauna and oiling of coastal habitats and marine fauna. • Exclusion of fisheries from polluted areas and gear damage. • Reduction in income for secondary and tertiary sectors that support tourism, recreational, fishing, and other coastal economies. • Alteration of the coastline in terms of value with regard to spiritual, cultural and ritual importance.	• Design and Technical Integrity. • Detailed Technical Risk Analysis. • Blow-out Preventer. • Well-specific response strategy and plans (Oil Spill Contingency Plan, Emergency Response Plan and Blow-Out Contingency Plan). • Cap and Containment Equipment. • Well-specific oil spill modelling. • Deploy and/or pre-mobilise shoreline response equipment. • Stakeholder engagement. • Grievance management.