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 well drilling in Block Deep Water Orange Basin (DWOB) off the West Coast of South Africa (see Figure 1).

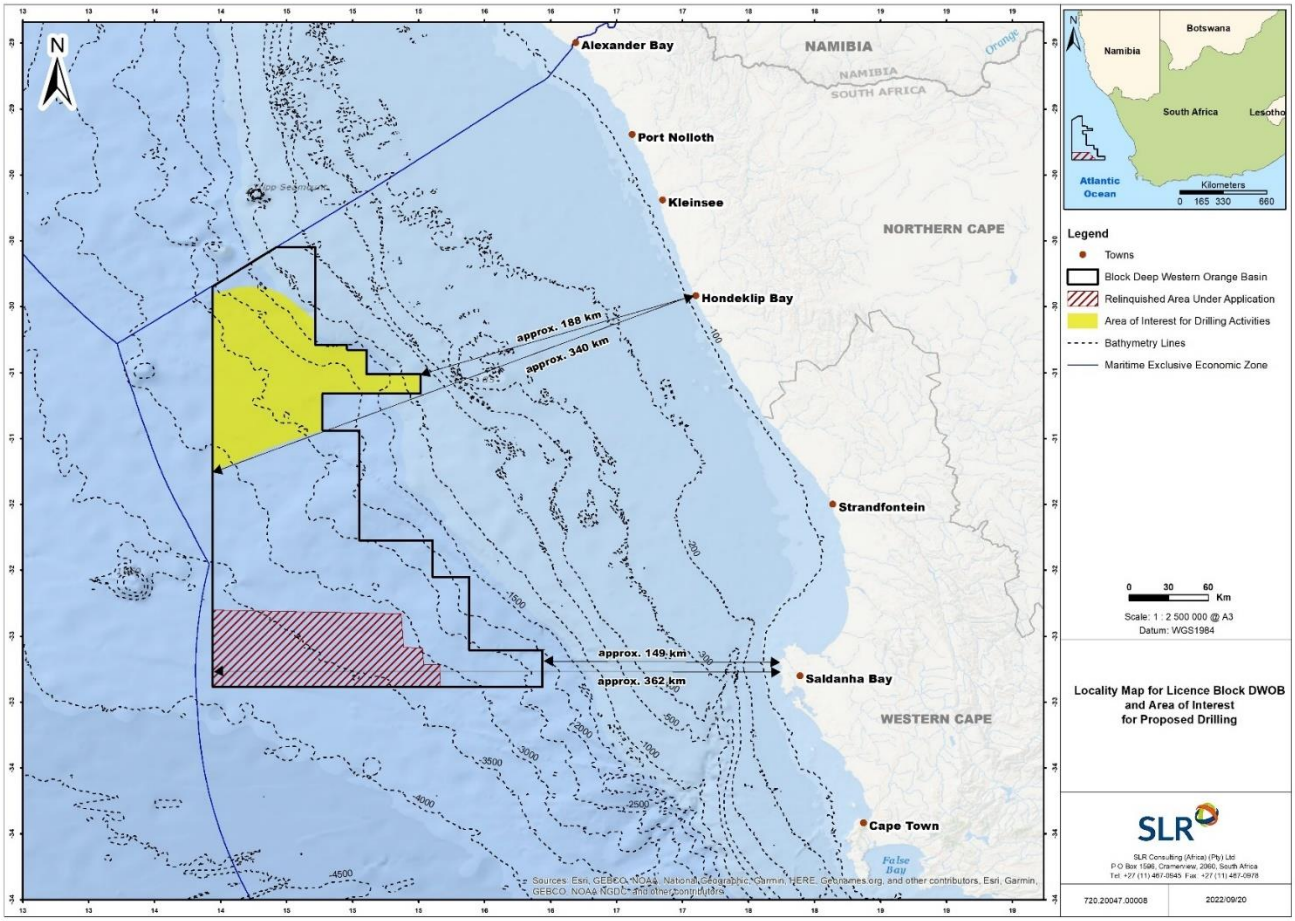

FIGURE 1: LOCALITY OF BLOCK DWOB AND THE AREA OF INTEREST FOR PROPOSED EXPLORATION DRILLING OFF THE WEST COAST

1.1 PROJECT BACKGROUND AND LOCATION

TotalEnergies EP South Africa B.V. (TEEPSA) and its partners hold an Exploration Right for the Deep Western Orange Basin (DWOB) Licence Block (12/3/343 ER), located off the West Coast of South Africa. TEEPSA is proposing to undertake various exploration activities within the DWOB Licence Block, including:

- Sonar bathymetry surveys throughout the year;
- Drop core sampling; and
- Exploration well drilling (including vertical seismic profiling).

TEEPSA proposes to drill one exploration well, and success dependent, up to nine additional wells in total within an Area of Interest within the Block (i.e., up to ten wells in total). The Area of Interest for exploration drilling is 9 711.21 km^2 in extent and is located offshore roughly between Port Nolloth and Hondeklip Bay, approximately 188 km from the coast at its closest point and 340 km at its furthest, in water depths between 1000 m and 3000 m. The DWOB Licence Block itself, however, is located in water depths between 400 m and 3 900 m (see Figure 1).

The proposed project triggers a number of listed activities in terms of the Environmental Impact Assessment (EIA) Regulations 2014 (as amended), and as such requires an Environmental Authorisation before such activities can commence. TEEPSA, as the Operator of the Block, is the applicant for the Environmental Authorisation.

SLR Consulting (South Africa) (Pty) Ltd (SLR) has been appointed as the independent Environmental Assessment Practitioner 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 draft Scoping Report is distributed for a 30-day comment period from **4 November to 5 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 impacts identified for further investigation in the Assessment Phase.

Copies of the full report are available for review on the SLR website (**https://www.slrconsulting.com/en/public-documents/TEEPSA-DWOB**), a data free website (**https://slrpublicdocs.datafree.co/en/public-documents/TEEPSA-DWOB**) and at various locations (refer to specific details in the I&AP notification letter). In addition, the Non-technical Summary is available for collection at various locations (refer to the I&AP notification letter). The Non-technical Summary are also available on the above-mentioned websites as a document and audio recording. Any comments should be sent to SLR at the address, WhatsApp / SMS numbers or e-mail shown below. For comments to be included in the final Scoping Report, comments should reach SLR by **no later than 5 December 2022**.

SLR Consulting (South Africa) (Pty) Ltd

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Stakeholders are also invited to attend public information-sharing meetings. Specific details of these meetings are provided in the I&AP notification letter.

2 ESIA PROCESS

In terms of the EIA Regulations 2014 (as amended), the proposed project requires Environmental Authorisation as it triggers the following listed activities:

- Listing Notice 1 (R.983 of 2014 as amended): 14, 17, 19A.
- Listing Notice 2 (R.984 of 2014 as amended): 4, 6, 7, 14, 18.

The ESIA process will thus be undertaken in compliance with the requirements of the National Environmental Management Act (No. 107 of 1998) and the EIA Regulations 2014 (as amended). The Department of Mineral Resources and Energy (DMRE) is the competent authority that is responsible for the granting or refusing of an Environmental Authorisation, while the Department of Forestry, Fisheries and Environment (DFFE) remains the appeal authority for such an authorisation. In terms of Section 70 of the Mineral and Petroleum Resources Development Act, 2002 (No. 28 of 2002) (as amended), various duties pertaining to petroleum exploration and production have been designated to Petroleum Agency of South Africa (PASA), as such PASA will review the ESIA documents and make a recommendation to DMRE.

The overall ESIA Process consists of two phases, namely the Scoping Phase and Impact Assessment Phase.

2.1 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, potential impacts and their mitigation for further investigation and assessment, and to develop the plan of study for the Impact Assessment Phase, including technical / specialist studies to be conducted.

Key steps (excluding public consultation) that were undertaken during the Scoping Phase are summarised below:

- A pre-application meeting was held with PASA on 6 September 2022 to inform them of TEEPSA's proposed project and application for Environmental Authorisation, as well as to obtain agreement on the ESIA process.
- An Application Form for Environmental Authorisation and DFFE National Screening Tool were compiled and submitted to PASA.
- Specialist inputs into the description of the receiving (baseline) environment were provided by a marine ecologist, fisheries specialist and a social scientist.
- Preparation of this draft Scoping Report in fulfilment of Appendix 2 of the EIA Regulations 2014 (as amended), which presents detailed information on the proposed project and the receiving environment, identifies potential impacts and mitigation, describes the impact assessment approach and outlines the plan of study for the ESIA, including scope of the technical / specialist studies.
- Completion of the Scoping Phase will involve:
  - An update of the draft Scoping Report to final version with stakeholder comments appended in a Comments and Responses Report; and
  - Submission of the final Scoping Report to PASA for consideration and review. PASA will then make a recommendation on the acceptance or rejection of the report to DMRE, who will make the final decision. If the report is accepted, the project will proceed to the Impact Assessment Phase.

2.2 IMPACT ASSESSMENT PHASE

In fulfilment of Appendix 3 of the EIA Regulations 2014 (as amended), the tasks that will be undertaken during this phase are summarised below:

- *Technical Modelling and Specialist Studies*: Three technical and five specialist studies will be commissioned to assess the key potential impacts and identify mitigation measures. These include:
  - Technical Modelling Studies:
    - Drilling Discharges Modelling.
    - Oil Spill Modelling.
    - Underwater Noise Modelling.
  - Specialist Studies:
    - Marine Ecology Impact Assessment.
    - Fisheries Impact Assessment.
    - Socio-Economic Impact Assessment.
    - Cultural Heritage Impact Assessment.
    - Climate Change and Air Emissions Impact Assessment.

  In addition to those listed above, an independent peer review of the Drilling Discharges and Oil Spill Modelling studies will be undertaken.
- *Compilation of ESIA Report*: An ESIA Report, including an Environmental and Social Management Programme (ESMP) will be compiled based on the technical / specialist findings and other relevant information. The draft ESIA Report will be released for a 30-day review and comment period, including I&AP information feedback sessions.
- All registered I&APs will be notified of all public participation opportunities. All comments received will be incorporated and responded to in a Comments and Responses Report. The final ESIA Report will be submitted to PASA for consideration and review.
- *Decision and Appeal Period*: After review of the final ESIA, PASA will provide a recommendation to DMRE on whether or not to grant an Environmental Authorisation. After DMRE issues its decision, all I&APs on the project database will be notified of the outcome of the application and the reasons for the decision. A statutory appeal period in terms of the National Appeal Regulations, 2014 (GN No. R993) will follow the issuing of the decision, which allows for any registered I&AP to submit an appeal within 20 days of the date of notification of the decision.

3 PUBLIC PARTICIPATION

The requirements of the public participation process are set out in Chapter 6 of the EIA Regulations 2014 (as amended) and will be, as a minimum, adhered to during the current ESIA process. In addition, the public participation process will follow the public participation guidelines in terms of EIA Regulations (DEA 2017). The public participation steps that were undertaken during the Scoping Phase are summarised below:

- *Stakeholder Identification:* A preliminary I&AP database was compiled based on TEEPSA's existing databases for its South African offshore licence blocks, input from the Fisheries Specialist, DFFE and Civil Society Organisations, and additions from the Cultural Heritage baseline data collection.

- *Pre-Application Meeting with PASA:* A meeting was held with PASA on 6 September 2022 to provide notification of the proposed project and TEEPSA's intent to submit an application for Environmental Authorisation, as well as to consult on the ESIA process and PASA requirements.
- *Notification and Registration Letters*: All I&APs included on the initial project database were notified of the proposed project, application for Environmental Authorisation and ESIA process by means of a notification / registration letter (available in English, Afrikaans, IsiXhosa and Setswana).
- *Advertising:* Newspaper advertisements were placed in various local and regional newspapers in English, Afrikaans, IsiXhosa and Setswana.
- *Site notices*: Site notices (in English, Afrikaans, isiXhosa and Setswana) are to be placed at various locations in coastal towns /cities between Port Nolloth and Cape Town. The placement of the site notices are to target locations used for small-scale and recreational fishing and coastal tourism.
- Radio Announcements: Radio adverts will be aired to notify coastal users, including vulnerable and disadvantaged communities, of the proposed project, ESIA process, availability of the Draft Scoping Report and planned public meetings.
- *Availability of Scoping Report*: The draft Scoping Report has been released for a 30-day review and comment period from 4 November to 5 December 2022.
    - Reports have been made available on the SLR website, data free website (no data costs) and at various public venues.
    - Notification letters via e-mail were sent to all I&APs registered on the database with the Non-technical Summary (in English). The Non-technical Summary is also available in Afrikaans, isiXhosa and Setswana. Locations where the draft Scoping Report and Non-technical Summary have been placed for review are indicated in the I&AP notification letter.
    - In order to facilitate engagement during the Scoping phase and access to the draft Scoping Report, a cell phone number has been provided in all notifications indicating that SLR can be contacted via SMS or WhatsApp messaging.
- *Information-sharing Meetings: Various meetings (focus group and public) are planned during the draft Scoping Report disclosure period.*
- *I&AP comments and responses*: all issues raised by I&APs during the public participation process will be consolidated into a Comments and Responses Report which will be attached as an appendix to the final Scoping Report.

4 NEED AND DESIRABILITY

South Africa, like the rest of the world, is vulnerable to the climate change. There is thus global concern of the need to reduce Greenhouse Gas (GHG) emissions and achieve carbon neutrality by 2050. South Africa has a high dependency on fossil fuels and, as one of the top 20 global GHG emitters, will need to make substantial emission cuts. However, the rapid transition to carbon neutrality presents a potential risk to economic growth and sustainable development if not managed properly. South Africa is committed to a "just" transition to a net-zero carbon economy and climate resilient society (as per South Africa's Low-Emission Development Strategy and draft Nationally Determined Contribution), whereby the need to reduce emissions is balanced with the need to grow the economy, create jobs and develop skills, so that the needs of vulnerable groups are addressed.

The COVID-19 pandemic has deepened the economic crisis in South Africa and as a result, inequality is expected to widen and poverty to deepen. There is a drive from National Government to stimulate development and grow the economy of South Africa with a strong focus on job creation in all sectors, whilst protecting the environment. In order to facilitate this economic growth and reduce dependency on imported fuel products, there is a critical need to ensure that there is sufficient, stable capacity in the country's energy supply by diversifying the primary energy sources within South Africa. In this regard, South Africa needs to balance the three core dimensions of what has been defined as the "energy trilemma": (1) affordability and accessibility, (2) energy security, and (3) environmental sustainability. In weighing up these core dimensions, the South African Government policy currently supports exploration for indigenous oil and gas resources and currently promotes the use of natural gas as part of the energy mix in the short- to medium-term up to 2030 (as per the Integrated Resource Plan (IRP) 2019).

The use of fossil fuels is, however, not aligned with other National and International policies and plans, which identify the need to reduce the reliance on fossil fuels for South Africa (and worldwide) to reduce its GHG emissions and meet its commitments in this regard. Notwithstanding the above, natural gas is included in the energy mix of the country to serve as a transition or bridge on the path to carbon-neutrality from 2050 onwards (as per the Paris Agreement) and provide the flexibility required to complement renewable energy sources (as per the IRP 2019). The "Just Transition and Climate Pathways Study" (NBI, 2021) concludes that a lack of gas supply threatens South Africa's decarbonisation strategy because the synfuels, power and industrial sectors would rely on carbon-intensive fuels (e.g., coal and diesel) for longer. In addition to the use of natural gas for electricity generation, the many other uses (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.

It is acknowledged that the proposed exploration project would not result in the production of oil and gas, but rather the generation of information on 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 gas resources would be better understood. The proposed exploration project, as contemplated (i.e. not considering possible production), has no direct influence on South Africa'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 exploration project will not necessarily change how fossil fuels are used in South Africa and has no direct influence on GHG emissions that would arise from the consumption of fossil fuels. These aspects are influenced by South Africa's energy and climate change related policies, the financial costs of the various energy sources, and consumer choices in this regard.

The proposed exploration project will potentially lead to South Africa optimising its own indigenous resources to provide its identified oil and gas needs until the 2050 deadline to achieve carbon neutrality, rather than having to mainly import, as at present. It won't necessarily change how fossil fuels are used in the short- to medium-term in the transition towards the goal of carbon neutrality by 2050. These National strategic policy issues relating to energy and climate change fall beyond the scope of this exploration project ESIA.

5 PROJECT DESCRIPTION

5.1 OVERVIEW OF PROPOSED PROJECT ACTIVITIES

The key components and activities of the proposed exploration activities are summarised in Table 1. Additional details regarding the proposed activities are provided in subsequent sections.

TABLE 1: SUMMARY OF KEY PROJECT COMPONENTS

Licence Block No.:	Deep Western Orange Basin (DWOB) Licence Block
Exploration Right No.:	12/3/343 ER
Exploration and Appraisal Well Drilling	
Number of exploration and appraisal wells	10 wells
Size of Area of Interest for proposed exploration drilling	9 711.21 km^2
Well depth (below seafloor)	Variable depending on depth of resource which is not currently known. A notional well depth of 3 500 m is assumed for the ESIA
Water depth range	• Water depth range of area of interest: 500 m to 3 500 m • Water depth range of most probable prospect(s): 1 000 m to 3 000 m

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

Commencement of drilling and anticipated timing	Commencement is not confirmed, but possibly between first quarter of 2024 (Q1 2024) and fourth quarter of 2024 (Q4 2024) to drill first well.
Proposed drilling fluids (muds)	Water-based Muds (WBM) will be used during the first (riserless) drilling stage and Non-Aqueous Drilling Fluid (NADF) during the second (risered) drilling stage.
Drilling and support vessels	• Semi-submersible drilling unit or drillship • Three support vessels during mobilisation, riserless and demobilisation periods. Two during the risered 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[1]	Possibly, if hydrocarbons are discovered– up to 2 Drill Stem Tests (DST) per appraisal well, with each test taking up 2 days to flow and flare, 24-hours a day
Logistics base	Port of Cape Town, but alternatively at the Port of Saldanha

[1] In the petroleum industry, flaring occurs during well testing to dispose of oil or gas in a safe and reliable manner through combustion in an open flame.

Logistics base components	Office facilities, laydown area, mud plant
Support facilities	Crew accommodation in Cape Town
Staff requirements:	• Specialised drilling staff supplied as part of the hire of drilling unit • Additional specialised international and local staff at logistics base
Staff changes	Rotation of staff every three to four weeks with transfer by helicopter to shore
Drop core sampling	
Purpose	Sampling of seabed sediment
Method	• Piston core • Box core
Number	20 cores
Duration	4 weeks
Location	Water depth < 3 500 m (no specific target identified)
Safety Zone	500 m
Sonar Surveys	
Purpose	Investigate the structure if the ocean bed sediments
Method	• Multi beam echo-sounder (70-100 kHz) • Single beam echo-sounder (38-200 kHz) • Sub-bottom profiler (2-16 kHz)
Duration/Extent	4 weeks/approximately 15 000 km^2
Location	Not confirmed but localised areas within the whole block
Safety zone	500 m

5.2 PRE-DRILLING SURVEYS

Pre-drilling surveys may be undertaken prior to drilling in order to confirm baseline conditions at the drill site and to identify and delineate any geo-hazards that may impact the proposed exploration drilling operations. Pre-drilling surveys may involve sonar surveys and sediment sampling.

5.2.1 SEABED CORING

Coring is undertaken to collect sediment samples in order to characterise the structure of the seafloor and for laboratory geochemical analyses. One of the main objectives is to determine if there is any naturally occurring hydrocarbon seepage at the seabed. TEEPSA is proposing to undertake coring within the Licence Block in water depths of less than 3 500 m. The duration of the sampling programme would be approximately 4 weeks and up to 20 samples would be taken.

5.2.2 SONAR SURVEYS

There are a number of different sonar surveying tools used for investigating the structure of the ocean bed sediment layers. For the planned sonar surveys, TEEPSA intend to use a multi beam echo-sounder, a single beam echo-sounder and/or a sub bottom profiler.

The selected equipment would be hull mounted on the survey vessel to image the seabed and the near surface geology. Although this type of survey typically does not require the vessel to tow any cables, it is "restricted in its ability to manoeuvre" due to the operational nature of this work.

Typical multi-beam echo sounders emit a fan of acoustic beams from a transducer at frequencies ranging from 40 kHz to 100 kHz and typically produces sound levels in the order of 230 dB re 1 µPa at 1 m. A typical sub-bottom profiler emits an acoustic pulse from a transducer at frequencies ranging from 2 kHz to 16 kHz (38 to 200 kHz for a single beam echo-sounder).

The proposed sonar surveys would be undertaken in specific areas across the Licence Block with a cumulative footprint of approximately 15 000 km². It is anticipated that the data acquisition operation would take in the order of four weeks to complete.

5.3 EXPLORATION AND APPRAISAL WELL DRILLING

5.3.1 LOCATION, TIMING AND DURATION

- *Location:* The Area of Interest has been selected based on the analysis of available data. This area is 9 711.21 km^2 in extent and is located offshore roughly between Port Nolloth and Hondeklip Bay, approximately 188 km from the coast at its closest point and 340 km at its furthest, in water depths between 1 000 m and 3 000 m (see Figure 1).
- *Anticipated timing:* Commencement is not confirmed, but possibly between the first quarter of 2024 (Q1 2024) and third quarter of 2024 (Q3 2024) to drill 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).

5.3.2 DRILL UNIT, VESSEL SUPPORT AND ONSHORE LOGISTICS BASE

- *Drilling Unit*: TEEPSA is proposing to utilise a semi-submersible drilling unit or a drill-ship, both with dynamic positioning system 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 Cape Town International Airport.
- *Logistics base:* The primary onshore logistics base will most likely be located at the Port of Cape Town (preferred option), or alternatively at the Port of Saldanha.

5.3.3 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) 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 wellbore), 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 2).
    - *Initial (riserless) drilling stage:* At the start of drilling, a 36 or 42 inch hole will be drilled approximately 70 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 1 070 m. These initial hole sections will be drilled using seawater (with viscous sweeps) and Water Based Muds (WBMs). All cuttings and WBM from this initial drilling stage will be discharged directly onto the seafloor adjacent to the wellbore.
    - *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 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, 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.

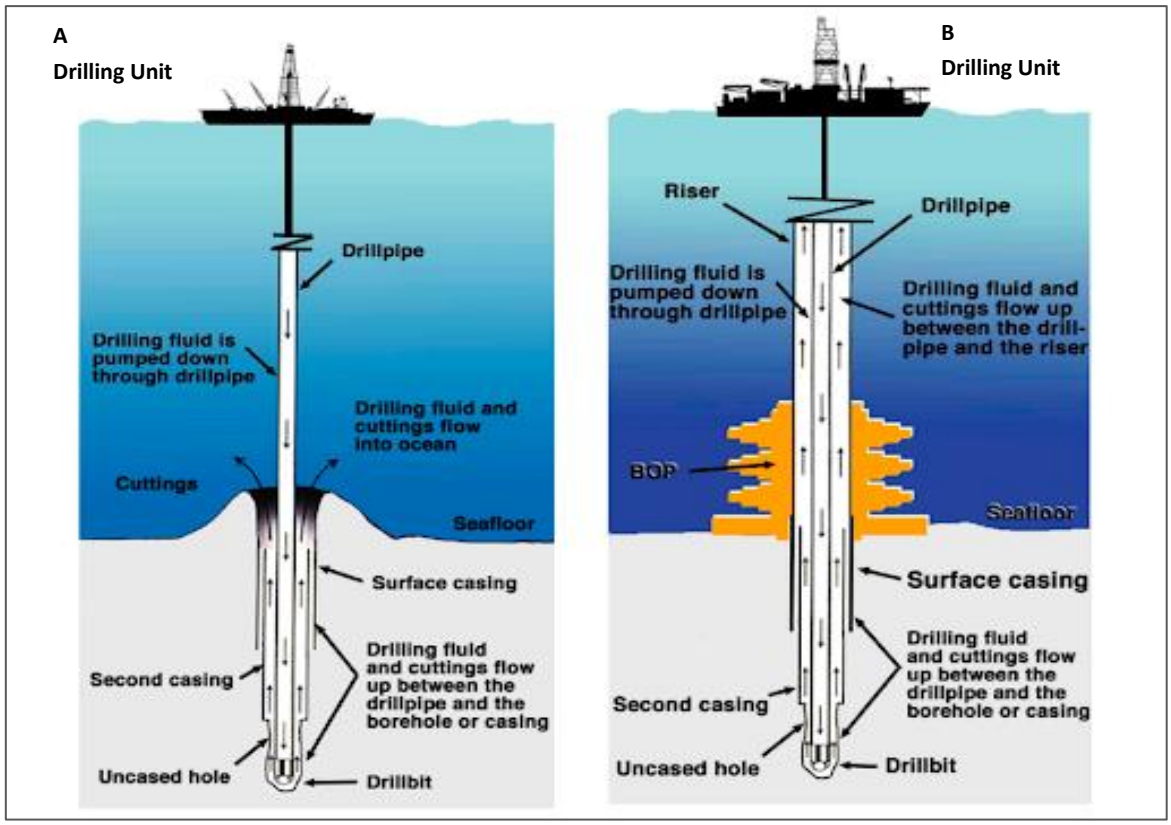

FIGURE 2: DRILLING STAGES: (A) RISERLESS DRILLING STAGE; AND (B) RISERED DRILLING STAGE

- *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 rocks. 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 and for forward planning of the drill bit during drilling. 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.
- *Well (flow) testing*: This is undertaken to determine the economic potential of any discovery before the well is abandoned or suspended. 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 discharged overboard or transferred to shore for treatment and disposal.
- *Well Sealing and Plugging*: Once drilling and logging are completed, the exploration 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 deemed safe to do so based on a risk assessment. Where it is deemed to be safe, the wellhead will be left and fitted with an over-trawlable abandonment cap. Monitoring gauges to monitor pressure and temperature may be installed under the over-trawlable cap on wells where TEEPSA 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.

5.3.4 EMERGENCY RESPONSE

TEEPSA 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 TEEPSA's Oil Spill Contingency Plan (OSCP) and Blow-Out Contingency Plan (BOCP).

6. RECEIVING ENVIRONMENT

6.1 GEOPHYSICAL CHARACTERISTICS

The water depths in Block DWOB range from approximately 400 m to 3 900 m, whereas within the Area of Interest for proposed exploration drilling water depths range from 1 000 m to 3 000 m. Offshore sediments in Block DWOB are dominated by muds and sandy muds. However, the occurrence of hard grounds is likely.

Major bathymetric features on the continental shelf of the West Coast includes (Figure 3): Orange River Cone (or Shelf) and Child's Bank, situated approximately 150 km offshore at about 31°S, and approximately 75 km east of the licence block. The closest seamount to Block DWOB is Tripp Seamount, a geological feature approximately 25 km to the north of the licence block, which rises from the seabed at 1 000 mbsl to a depth of 150 mbsl. It is a roughly circular feature with a flat apex that drops steeply on all sides.

6.2 BIOPHYSICAL CHARACTERISTICS

Winds are one of the main physical drivers of the nearshore Benguela Region. Most winds in summer come from the south to south-south-east. Winter remains dominated by southerly to south-easterly winds, but the closer proximity of the winter cold-front systems results in a significant south-westerly to north-westerly component. Most of the West Coast is classified as exposed, experiencing strong wave action. Winter swells are strongly dominated by those from the south and south-south-west. During the summer there is a slightly more pronounced southerly swell component and swells tend to be smaller on average.

Block DWOB is primarily located within the Southern Benguela system with the North East Portion infringing on the Bottom Poleward Current. A major feature of the Benguela Current is coastal upwelling, however, Block DWOB is located well offshore of these upwelling events. This upwelling is associated with extremely high seasonal production of phytoplankton and zooplankton, and can result in low-oxygen water moving up onto the inner shelf and into nearshore waters.

6.3 BIOLOGICAL OCEANOGRAPHY

The seabed communities in Block DWOB lie within the within the Namaqua sub-photic and continental slope biozon, and is characterised by a limited variety of ecosystem types. The majority of Block DWOB is characterised by Southeast Atlantic Lower Slope habitat, with some representation by Southeast Atlantic Mid and Upper Slope, and Cape Basin Abyss habitats. The Area of Interest for proposed exploration drilling is dominated by ecosystems rated as 'Least Concern' (Figure 4).

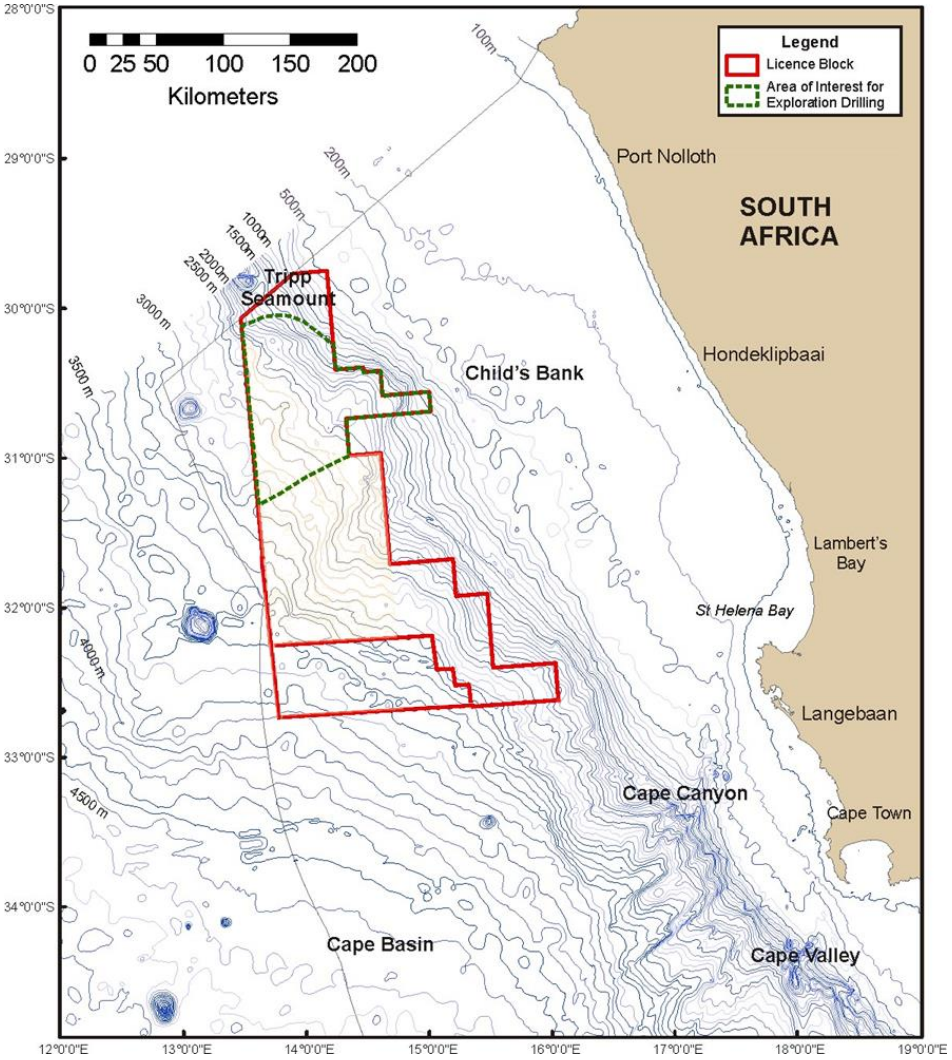

FIGURE 3: MAP INDICATING LOCATION OF THE DWOB LICENCE AREA IN RELATION TO BATHYMETRIC FEATURES OFF THE WEST COAST.

Source: Pisces

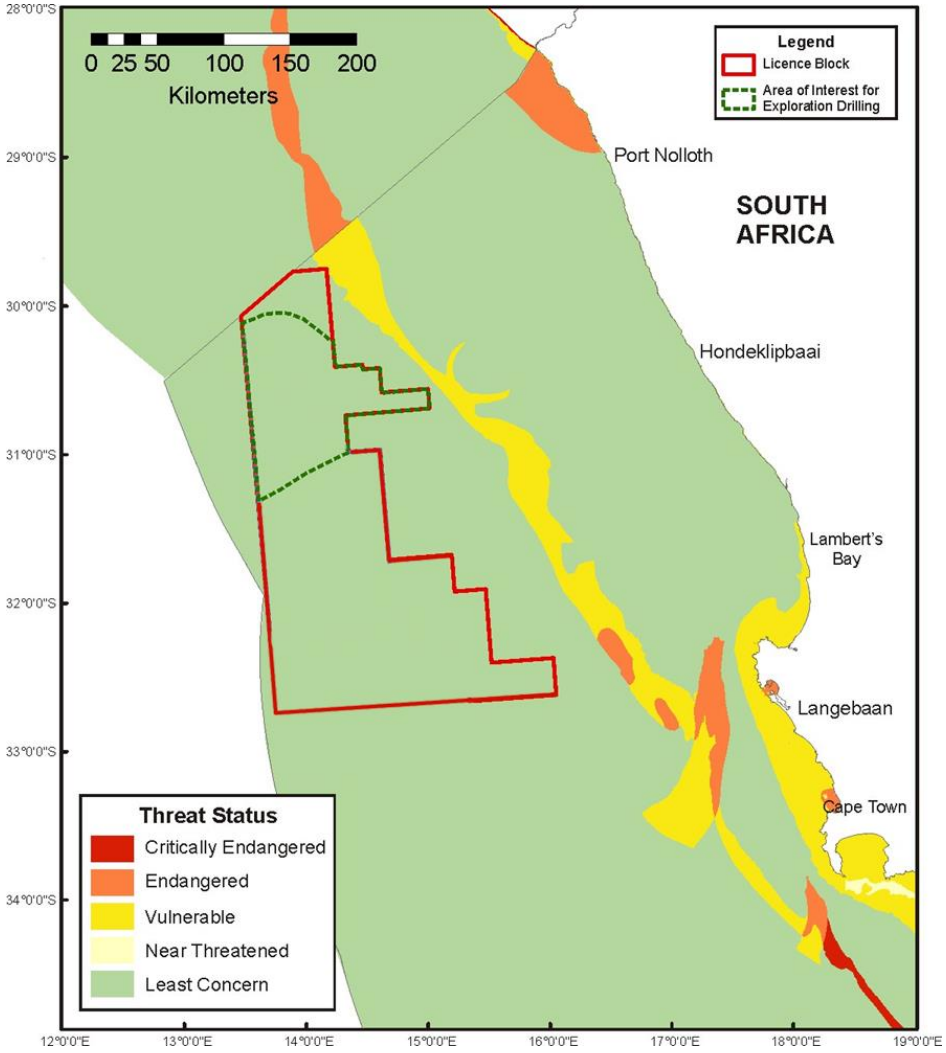

FIGURE 4: DWOB BLOCK AND THE AREA OF INTEREST IN RELATION TO ECOSYSTEM THREAT STATUS FOR COASTAL AND OFFSHORE BENTHIC AND PELAGIC HABITAT TYPES ON THE WEST COAST.

Adapted from Sink *et al.* 2019

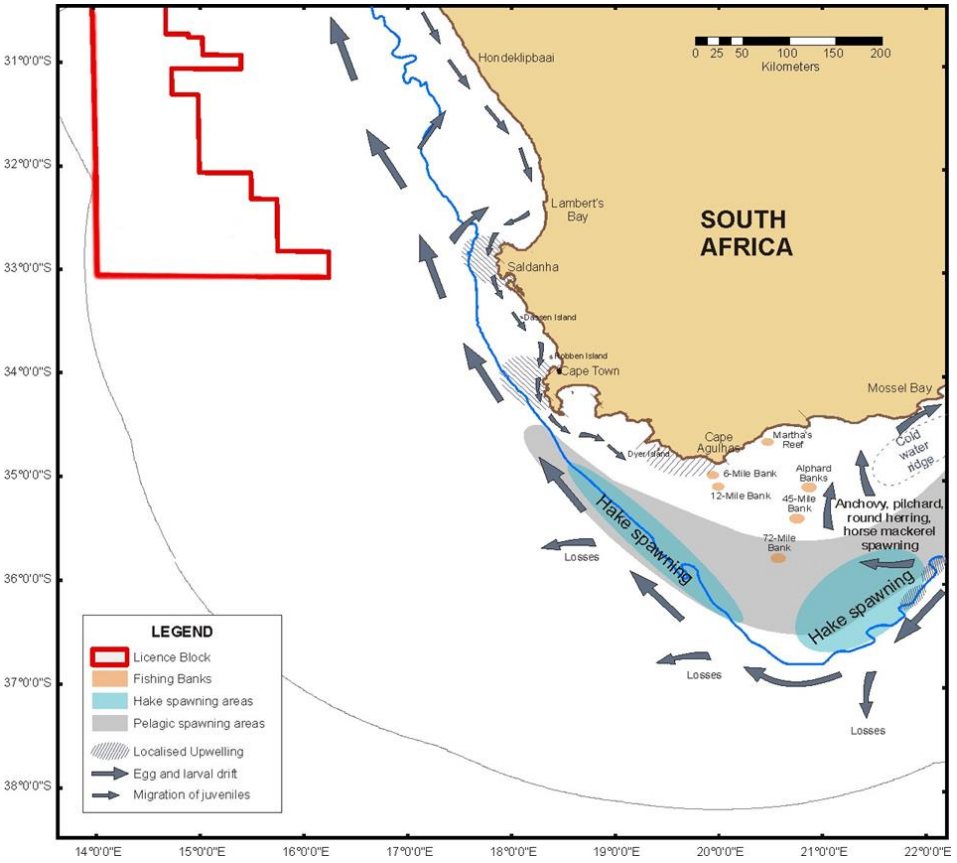

FIGURE 5: DWOB (RED POLYGON) IN RELATION TO MAJOR SPAWNING, RECRUITMENT AND NURSERY AREAS IN THE SOUTHERN BENGUELA REGION.

Adapted from Crawford et al. 1987; Hutchings 1994; Hutchings et al. 2002

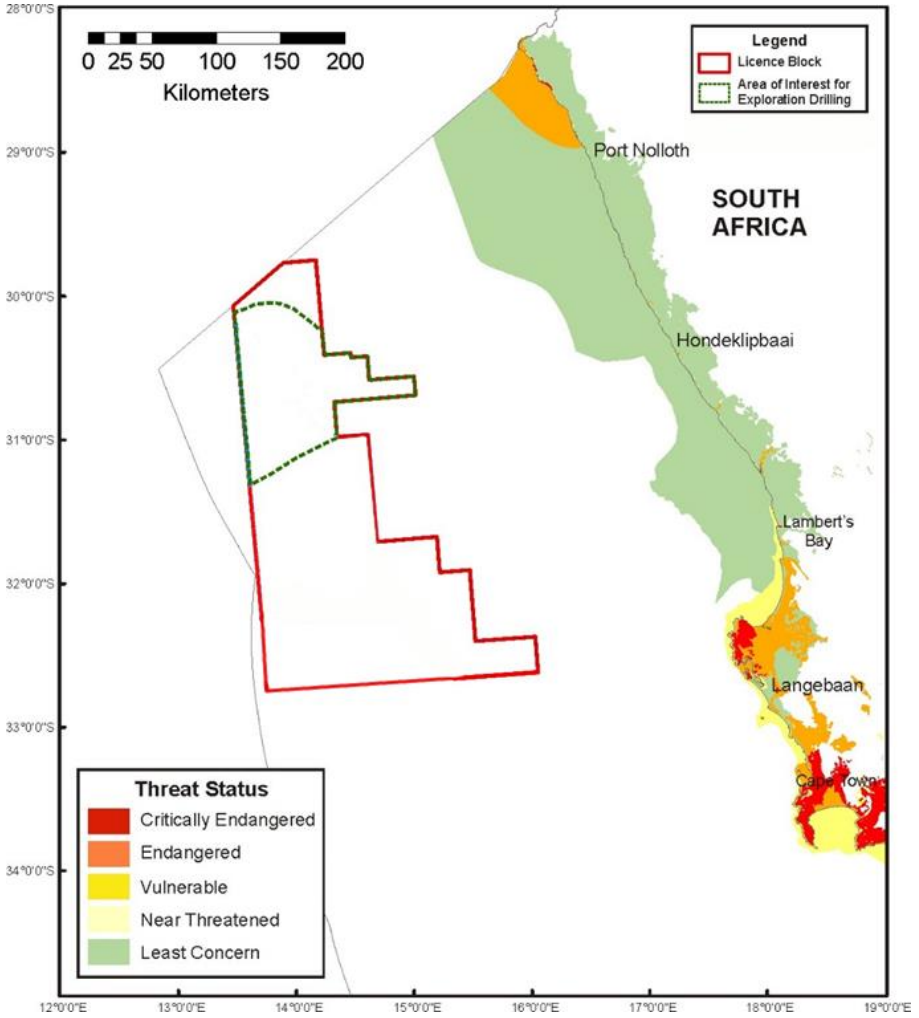

FIGURE 6: BLOCK DWOB AND THE AREA OF INTEREST IN RELATION TO THE SPATIAL DISTRIBUTION OF THREATENED COASTAL ECOSYSTEM TYPES ALONG THE WEST COAST

Adapted from Harris et al. 2019

Various pelagic and demersal fish species are known to spawn in the inshore regions of the southern Benguela (see Figure 5). Ichthyoplankton abundance in the offshore waters of the Area of Interest for proposed exploration drilling are, however, expected to be low.

Small pelagic species include the sardine/pilchard, anchovy, chub mackerel, horse mackerel and round herring. These shoaling species generally occur within the 200 m contour and thus unlikely to be encountered within the Area of Interest for proposed exploration drilling. The fish most likely to be encountered on the shelf, beyond the shelf break and in the offshore waters of the Area of Interest for drilling are the large migratory pelagic species, including various tunas, billfish and sharks.

Three species of turtle occur along the South-West Coast, with the Leatherback being the most likely to be encountered in the offshore waters of west South Africa. Their abundance in the study area is unknown but expected to be low. Loggerhead and Green turtles are expected to occur only as occasional visitors.

Most of the pelagic seabird species in the region reach highest densities offshore of the shelf break (200 – 500 m depth), and are therefore likely to occur in the proposed Area of Interest for proposed exploration drilling, with highest population levels during their non-breeding season (winter). Fifteen species of seabirds breed in southern Africa, including Cape Gannet, African Penguin, African Black Oystercatcher, four species of Cormorant, White Pelican, three Gull and four Tern species. The closest breeding islands to the Area of Interest for proposed exploration drilling Bird Island in Lambert's Bay, the Saldanha Bay islands, Dassen Island, Robben Island and Seal Island approximately 200 km, 150 km, 175 km, 200 km and 250 km to the east and southeast of the southern section of the Deep Western Orange Basin Block, respectively.

Thirty-five species or sub-species/populations of cetaceans (whales and dolphins) are known or likely to occur in the waters of the South-West Coast. The most common species within Block DWOB are likely to be the long-finned pilot whale, common dolphin, sperm whale and humpback whale.

The Cape fur seal is the only species of seal resident along the West Coast. The closest breeding colonies to the Area of Interest for the proposed exploration drilling are at Bucchu Twins, Cliff Point, Kleinzee, Strandfontein Point and Cape Columbine located between 150 km and 250 km inshore of Block DWOB.

The coastline of the project's Area of Influence is characterised by a mixture of intertidal sandy beaches and rocky shores, but also estuaries and rocky subtidal habitats and kelp beds. The macrofaunal communities of sandy beaches are generally ubiquitous throughout the southern African West Coast region, being particular only to substratum type, wave exposure and/or depth zone. Biological communities of the rocky sublittoral habitat can be broadly grouped into an inshore zone from the sublittoral fringe to a depth of about 10 m dominated by flora, and an offshore zone below 10 m depth dominated by fauna. Along the West Coast, rainfall is relatively high, and this contributes to a higher density of estuarine systems along this portion of the coastline. The spatial distribution of threatened coastal ecosystem types in the broader project area is illustrated in Figure 6.

6.4 MARINE PROTECTED AREAS AND OTHER CONSERVATION AREAS

Although Block DWOB overlaps with Orange Shelf Edge MPA (MPA), the Area of Interest for proposed exploration drilling avoids the MPA (Figure 7). Block DWOB also overlaps with one Ecologically or Biologically Significant Area (EBSA) (namely the Orange Seamount and Canyon Complex EBSA) but the Area of Interest for proposed exploration drilling also avoids this area.

Building on from the EBSAs, the National Coastal and Marine Spatial Biodiversity Plan identifies Critical Biodiversity Areas (CBAs), Ecological Support Area (ESAs) and accompanying sea-use guidelines. **The Area of Interest for proposed exploration drilling does not overlap with mapped CBA 1 and CBA 2 areas** (Figure 7).

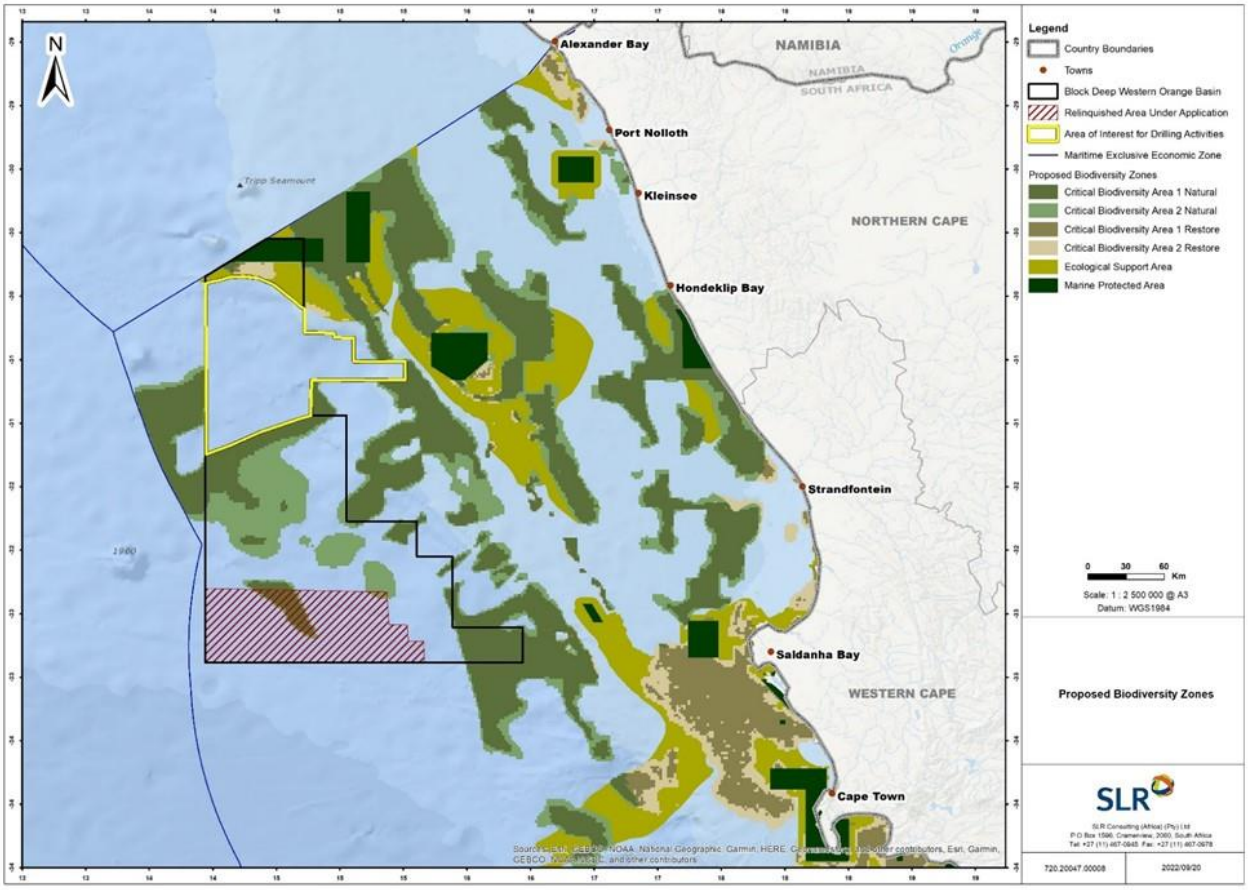

FIGURE 7: BLOCK DWOB AND AREA OF INTEREST IN RELATION TO CRITICAL BIODIVERSITY AREAS (CBAS) AND ECOLOGICAL SUPPORT AREAS (ESAS).

Adapted: Harris et al. 2022

Block DWOB does not overlap with any current or proposed coastal and marine Important Bird Areas (IBA). Five RAMSAR sites occur within the Project's indirect area of influence. Although much of the West Coast of South Africa has not yet been assessed with respect to its relevance as an Important Marine Mammal Areas (IMMAs), the coastline from the Olifants River mouth on the West Coast to the Mozambiquan border overlaps with three declared IMMAs, none of which overlap with the area of interest for proposed exploration drilling.

6.5 SOCIO ECONOMIC ENVIRONMENT

The project's area of influence encompasses the entire approximate coastline that extends between Cape Town, Western Cape and extends into the Northern Cape. The significant key populated areas include the City of Cape Town Municipality and Saldanha Bay. The Namakwa District Municipality is located further from major metropolitan areas or major towns and is sparsely populated with much smaller coastal towns. Tourism is a central economic activity for the Western Cape playing an important role in the economy of many of the towns along this coastal area. However, tourism market in the Northern Cape Province is less developed.

Information on the spatial distribution and catch effort of the commercial fishing sectors that operate off the West Coast are given below. Of these fisheries, only one overlaps with the proposed Area of Interest, namely the large pelagic longline fishery.

Figure 8 shows the spatial extent of pelagic longline fishing grounds in relation to the licence block and Area of Interest for proposed exploration drilling. Over the period 2017 to 2019 (cumulative local and foreign fleets), an average of 149 lines per year were set within DWOB yielding 191 tonnes of catch. This is equivalent to 7.14% of the overall catch and 8.36% of the overall effort reported nationally by the sector. Fishing activity takes place over the entire Area of Interest for proposed exploration drilling but is concentrated towards the shelf break. Over the period 2017 to 2019, an average of 68 lines per year were set within the area of Intrest yielding 84 tonnes of catch. This is equivalent to 3.14% and 3.84% of the overall catch and effort, respectively.

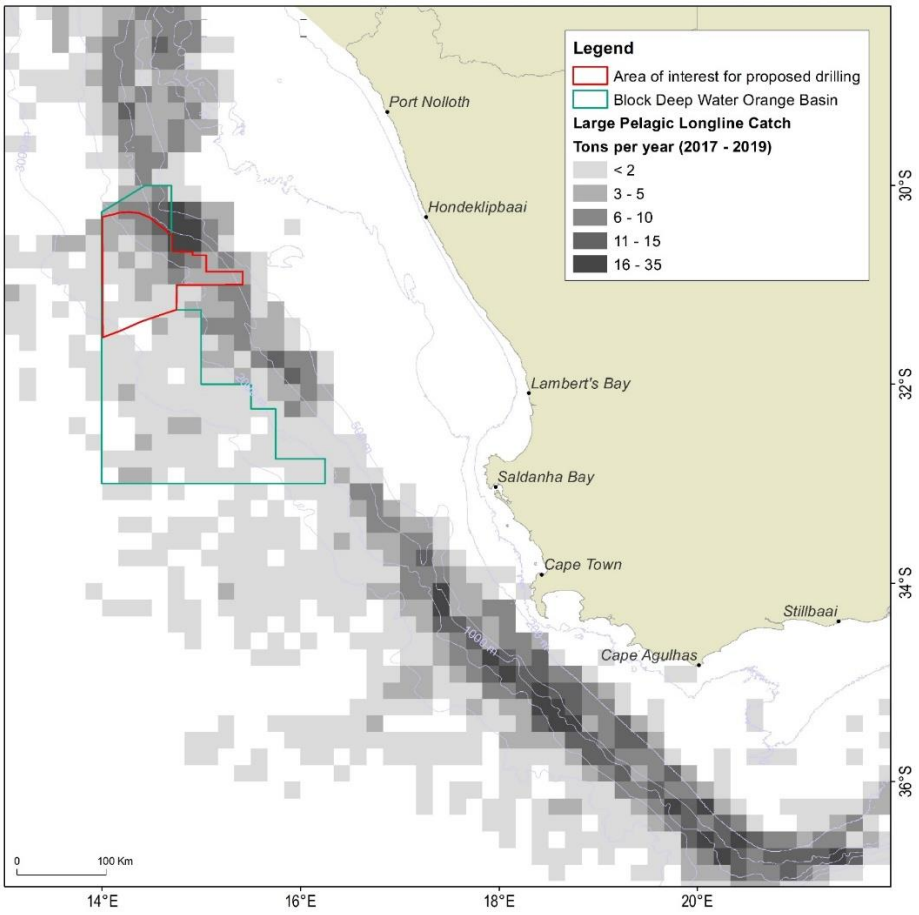

FIGURE 8: BLOCK DWOB AND AREA OF INTEREST IN RELATION TO THE SPATIAL DISTRIBUTION OF PELAGIC LONGLINE CATCH (2017-2019)

Source: CapMarine

South Africa has also embarked on a process of developing a Small-Scale Fisheries (SSF) sector aimed in part to compensate previously disadvantaged fishing communities that have been displaced either politically, economically or by the development of large-scale commercial fisheries. SSF resources are managed in terms of a community-based co-management approach that aims to ensure that harvesting and utilisation of the resource occurs in a sustainable manner. The SSF is to be implemented along the coast in series of community co-operatives. Applicants for small-scale fishing rights must have a historical involvement in traditional fishing operations and show a historical dependence on deriving the major part of their livelihood from traditional fishing operations. In the Northern Cape, communities are grouped into the Namakwa district, comprising the Richtersveld and Kamiesberg local municipalities and there are 103 registered fishers in the province. Between Saldanha Bay and Cape Agulhas, 68 communities have been registered for small-scale fishing rights, these co-operatives comprise a total of 2 031 fishers. These communities are unlikely to range beyond 3 nautical miles (5.6 km) from the coastline, well in shore of the Area of Interest.

There are various mariculture, aquaculture, ranching and coastal harvesting operations relating to a number of different species that occur off the West Coast (including white mussels, oysters, abalone and seaweed). These all occur along the coast inshore of the Area of Interest for proposed exploration drilling. Demersal research trawls and pelagic research surveys have previously been undertaken in the proposed Area of Interest for proposed exploration drilling.

A significant amount of ship traffic can be expected to pass through the inshore portion of Block DWOB. Figure 9 shows Block DWOB and Area of Interest in relation to existing wells (exploration, appraisal and production), submarine cables and offshore ammunition dumps. No ammunition dumps occur within Block DWOB. Four submarine cables pass through the Block DWOB; although only three pass through the Area of Interest for proposed exploration drilling. No wells have been previously drilled within Block DWOB.

7 ENVIRONMENTAL AND SOCIO-ECONOMIC SCREENING AND KEY IMPACTS

7.1 ENVIRONMENTAL AND SOCIAL INTERACTION MATRIX

The environmental and social interaction matrix prepared for the proposed project is presented in Table 2.
The matrix provides a list of the project activities and allows for easy checking of interaction against components of the receiving environment.
For a more detailed review of project activities and potential impact refer to the Aspects and Impacts Register in Section 8.2 of the main report.

7.2 KEY ENVIRONMENTAL AND SOCIAL IMPACTS

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

7.2.1 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);

TABLE 2: ENVIRONMENTAL AND SOCIAL INTERACTION MATRIX

Project Phase	Project Activities / Resource / Receptors	Water Column (incl. Water Quality, Noise and Turbidity)	Atmosphere (including Air Emissions, Noise, Lighting)	Seabed Sediment and Profile	Fish & Plankton Communities	Benthic Habitats and Communities	Coastal/marine birds	Turtles and Marine Mammals	Seabed Features and Seamounts	Nearshore Habitats and Communities	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
		Sensitive receptors in the receiving environment																	
		Physical and Biological											Socio-Economic						
Planned Activities (Normal Operation)																			
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 or exchange of ballast water																		
Operation	Presence and operation of drilling unit and support vessels (including waste management, water intake, air emissions and routine discharges to sea)															SO	SO	SO	
	Lighting from drill vessel																		
	Operation of helicopters																		
	Drop-core sampling operations, including the deployment of sampling tools																		
	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)/sonar acquisition																		
	Well (flow) testing and flaring including the possible discharge of treated produced water																		
Demobilisation	Abandonment of well on sea floor																		
	Demobilisation of drill unit & 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																		

Key:

	No Interaction		Minor Negative Interaction		Moderate-/ High Negative Interaction		Positive	SO	Screened Out

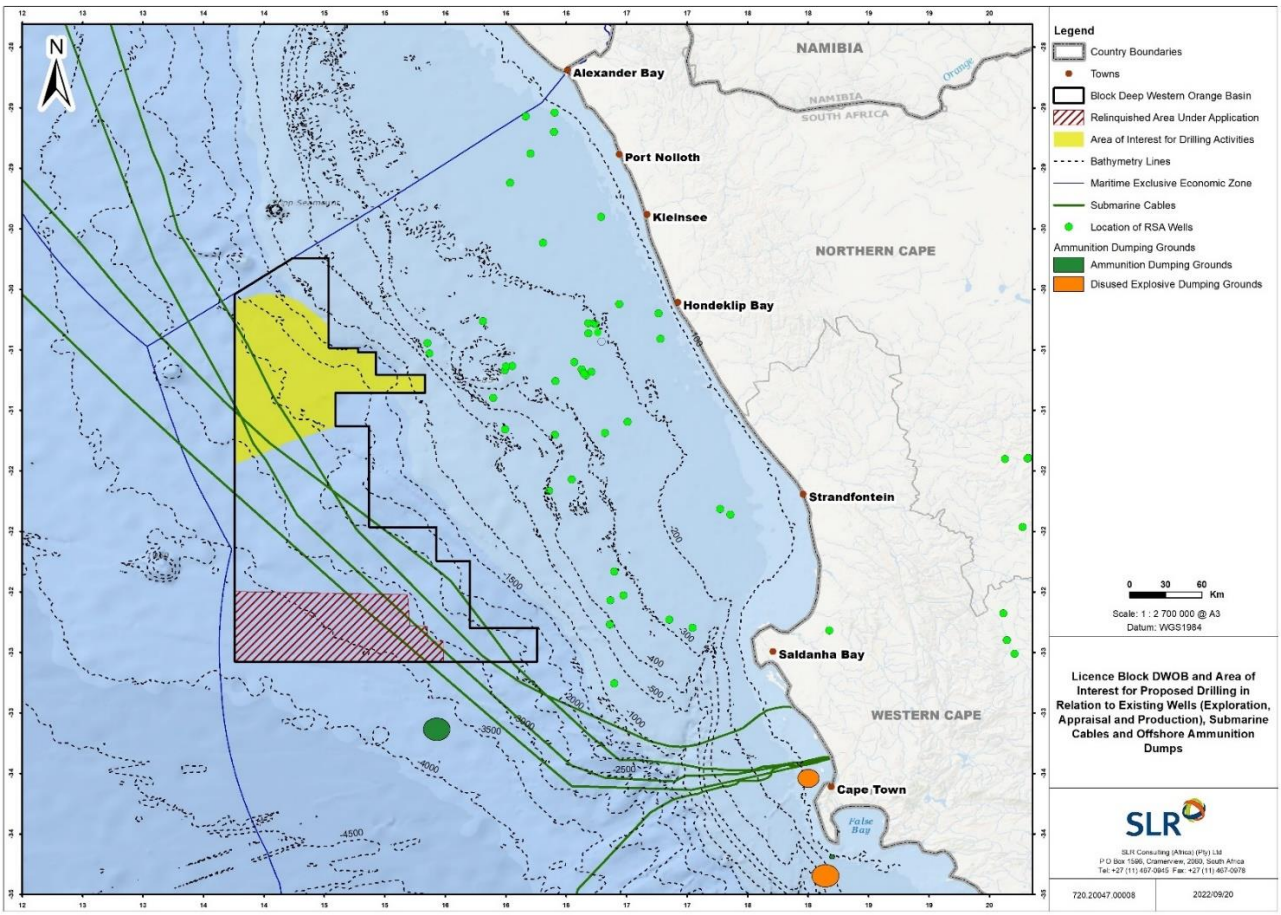

FIGURE 9: BLOCK DWOB AND AREA OF INTEREST IN RELATION TO MARINE INFRASTRUCTURE ALONG THE WEST COAST.

- Localised reduction in water quality due to drilling discharges;
- Localised reduction in water quality due to normal discharges, as per the International Convention for the Prevention of Pollution from Ships (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 exploration vessels/drilling unit, support vessels and helicopter operations;
- Localised disturbance of and / or behavioural changes to marine fauna due to increased underwater noise from vessels, drilling, sonar and VSP;
- Sediment disturbance due to 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.

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 (including large blow-out). Input obtained from the technical modelling studies (refer to Section 2.2 above) 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.

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 survey area, and zones of impact relating to permanent or temporary injury and behavioural disturbance.

7.2.2 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, coring, sonar 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 South Africa 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 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.

7.2.3 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 either the Port of Cape Town or Saldanha, (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 negative 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 survey / 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 Cape Town or Saldanha.

How the issues will be addressed in the ESIA:

A Socio-Economic Impact Assessment (SIA) will be 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 additional exploration activities (normal operations) and an unplanned event (such as a well blow-out) on key economic sectors. The level of information that will 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 the cultural and spiritual beliefs of key coastal 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 upset conditions on the stated variables (culture, spiritual aspects and religion).

7.2.4 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 GHG emissions. These impacts are described further below:

- The release of gaseous pollutants, principally sulphur oxides (SO_x), 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 CO2 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.

7.3 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 summarised in Table 3 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. Refer to Chapter 9 of the main report for the Plan of Study for the Impact Assessment.

TABLE 3: 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 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	Seabed sampling	• Physical seabed disturbance on benthic fauna.	• Pre-drilling sampling surveys (with ROV) and implement buffer around sensitive hardgrounds and vulnerable habitats.
1.6	Drilling 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.
1.7	Generation of underwater noise from drilling and vessel activity and VSP	• 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.

No.	Project Activity	Predicted Impacts	Preliminary Mitigation Measures / Project Controls
		• Displacement of fish and fishing.	• Stakeholder engagement and notification. • Navigational warning. • Fisheries Liaison Officer (FLO). • Grievance management.
1.8	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.
1.9	Well abandonment on seafloor	• Interference with trawling activities or fishing equipment.	• Over-trawlable abandonment cap. • Survey and accurately charted wellheads with the SAN Hydrographer.
1.0	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.
1.11	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).	• TEEPSA local content policy. • Manage community expectations. • Stakeholder engagement.
1.12	Normal operations	• Alteration in sense of place and cultural / spiritual reliance on the sea.	• Stakeholder engagement. • Implement a ritual event/s that permits engagement with ancestral spirits and nature to alleviate potential and future negative impacts of non-consultation and poor cultural/nature respect.
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. • Implement, where necessary, a ritual event/s. • Grievance management.