SundaGas Banda
Unipessoal Lda

SGBU

Integrated Management System

Environmental Impact Statement (EIS) Drilling Activities: PSC TL-SO-19-16

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Revision Control

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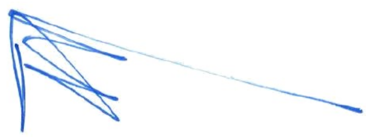
Proponents Authorisation and Endorsement of the EIS

SGBU is committed to good Industry practice and has rigorously undertaken the environmental permitting and approval process including the EIS and EMP documents. An EIS is one of the methods by which SundaGas demonstrates transparency and accountability in the planning and execution of an offshore project. Hence, SGBU endorses the contents of this report and will abide by all recommendations contained herein.

Role.	Name.	Digital Signature.	Date of Signing.
Chief Executive Officer & Managing Director. SundaGas Banda Unipessoal, Lda. andy.butler@sundagas.com	**Dr. Andy Butler**		09/02/2026

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Definitions and Abbreviations

Acronym	Definition
ADB	Asian Development Bank
AHT	Anchor Handling Tug
AMOSC	Australian Maritime Oil Spill Centre
AMSA	Australian Maritime Safety Authority
ANP	Autoridade Nacional do Petróleo
ANZG	Australian and New Zealand Guidelines
AOF	Absolute Open Flow
APORTIL	Autoridade Portuário Timor-Leste
ATSEA	Arafura & Timor Seas Ecosystem Action
ATS	Arafura and Timor Seas
BMSL	Below Mean Sea Level
BOD	Biological Oxygen Demand
BoM	Bureau of Meteorology
BOP	Blow Out Preventer
BTEXN	Benzene, Toluene, Ethylbenzene, Xylenes, and Naphthalene
CSO	Civil Society Organizations
CTD	Conductivity, Temperature, and Depth
DAFF	Department of Agriculture, Fisheries and Forestry
DEWHA	Department of the Environment, Water, Heritage and the Arts
DGV	Default Guideline Value
DNCPIA	Direcção Nacional do Controlo Polução e Impacto Ambiental
DST	Drill Stem Test
EBS	Environmental Baseline Survey
EDTL	*Eletrisidade de Timor-Leste/*Timor-Leste Electrical Company
EEZ	Exclusive Economic Zone
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EIS ESIA	Environmental Impact Statement Environmental and Social Impact Assessment
ENSO	El Niño-Southern Oscillation
EMP	Environmental Management Plan
ESD	Emergency Shut Down
FPSO	Floating Production, Storage and Offloading
G&G	Geotechnical and Geophysical
GHG	Green House Gases
GOTL	Government Of Timor-Leste

Acronym	Definition
GTL	Gas-to-Liquid
HAZID	Hazard Identification
HAZOP	Hazard and Operability Study
HSE	Health, Safety & Environment
HSEQ	Health, Safety, Environment, and Quality
IBAs	Important Bird Areas
IFC	International Finance Corporation
ILO	International Labour Organization
IOGP	International Association of Oil and Gas Producers
IUCN	International Union for Conservation of Nature
ITCZ	Inter-Tropical Convergence Zone
ITF	Indonesian Throughflow
INSTANT	International Nusantara Stratification and Transport Program
JPDA	Joint Petroleum Development Area
LFPR	Labour Force Participation Rate
LNG	Liquified Natural Gas
LOR	Limit of Reporting
LTMO	Low Toxicity Mineral Oil
MAF	Ministry of Agriculture and Fisheries
MD	Measured Depth
MDBRT	Measured Depth Below Rotary Table.
MFV	Monitoring Fishing Vessel
MODU	Mobile Offshore Drilling Unit
MoU	Memorandum of Understanding
MSL	Mean Sea Level
MPA	Marine Protected Areas
MuTek	MuTeknologi Software
NADF	Non-Aqueous Drilling Fluid
NE	Northeast
NOPSEMA	National Offshore Petroleum Safety and Environmental Management
NT	Northern Territory
NW	Northwest
OBM	Oil Based Mud
OCNS	Offshore Chemical Notification Scheme
OIW	Oil-in-Water
OOC	Oil-on Cuttings
OSCP	Oil Spill Contingency Plan
OTL	*Oras Timor-Leste*

Acronym	Definition
PAH	Polycyclic Aromatic Hydrocarbon
PESKAS	"Peskas" is a digital application and platform developed for monitoring and managing small-scale fisheries, specifically in Timor-Leste. It is a pseudo-acronym meaning "fisheries" in the Tetum language.
PD	Project Documents
PNTL	*Polícia Nacional Timor-Leste*
PSC	Production Sharing Contract
PSD	Particle Size Distribution
Q1, Q2, Q3, Q4	Fiscal Quarters
RCP	Representative Concentration Pathway
ROV	Remotely Operated Vehicle
RT	Rotary Table
SAQP	Sampling and Analysis Quality Plan
SBM	Synthetic Based Mud
SDP	Strategic Development Plan
SDS	Safety Data Sheet
SE	Southeast
SG	Specific Gravity
SW	Southwest
SundaGas/SGBU	SundaGas Banda Unipessoal Lda
SSS	Sea Surface Salinity
SST	Sea Surface Temperature
TD	Total depth
TG	TIMOR GAP Chuditch Unipessoal Lda
THR	Total Hydrocarbon Recoverable
TL	Timor-Leste
TLEA	Timor-Leste Exclusive Area
TOR	Term of Reference
TSS	Total Suspended Solid
TVD	True Vertical Depth
TWT	Two Way Time
UN	United Nations
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNTL	*Universidade Nasional Timor-Lorosa'e* (Timor-Leste National University)
UPF	*Unidade Polícia Fronteira*
WBM	Water Based Mud
WHO	World Health Organization
ZOCA	Zone of Corporation Area

Measurement Units

Acronym	Definition
BCF	Billion cubic feet
BBL	Barrel
BOPD	Barrel of Oil per Day
dB	Decibel
Degree	Celsius
HP	Horse Power
Hz	Hertz
Km	Kilometre
Km^2	Kilometre square
Km/h	Kilometre per hour
Kn and Kts	Knots
M	Metre
mm	Millimetre
MMSCFD	Million standard cubic feet per day
M/S	metres per second
μPa	Micro Pascal (10^{-6})
NM	Nautical mile
PPM	Parts Per Million
TC	Tropical Cyclone
TCF	Trillion Cubic Feet
%	Percentage

1. Executive Summary

1.1. Introduction

SundaGas Banda Unipessoal, Lda (SGBU) and TIMOR GAP Chuditch Unipessoal, Lda (TIMOR GAP) were awarded a Production Sharing Contract (PSC) by Petroleum National Authority *(Autoridade Nacional do Petróleo-ANP)* in 2019 to conduct petroleum activities in Timor- Leste's offshore. The contract area for PSC-TL-SO-19-16 covers approximately 3,571km^2. This contract area is located in Timor Sea, about 80km south of Greater Sunrise Gas field and 140km East-Northeast of Bayu-Undan production facility.

SGBU is planning to drill an appraisal well, Chuditch-2, based on the interpretation of reprocessed 3D 'Kyranis' seismic data (TGS, 2021 & 2022), using a suitably designed and capable self-elevating jack-up MODU. Following the completion of a site survey for Chuditch-2, the appraisal well is expected to be drilled in approximately 68m water depth and to a target depth of approximately 3,010m True Vertical Depth (TVD) in the Plover Formation.

The drilling campaign is scheduled during Q2 of 2026, and it is expected to last 44 days. The appraisal well aims to evaluate the hydrocarbon resources within the Chuditch field to facilitate future production planning. The study also incorporates previous geophysical and geotechnical surveys, drilling cuttings modelling analysis, mud dispersion modelling, oil spill modelling, and well abandonment design.

The Chuditch-2 Appraisal Well Project Document (PD) submission was approved by the ANP on 15 November 2023 and determined to fall within 'Category A' (having the potential to generate significant environmental impacts). As prescribed by Ministerial Diploma No. 46/2017, an Environmental Impact Assessment (EIA) will be conducted to assess major impacts for the duration of the drilling campaign and to assist in the design of Environmental Impact Statement (EIS), Environmental Management Plan (EMP), and Environmental Monitoring Program.

1.1.1. Objective of the EIS

The main objectives of the EIS are:

- To evaluate, identify, and assess potential environmental risks associated with the offshore drilling campaign.
- Developing mitigation strategies to minimize negative environmental impacts
- Ensuring compliance with Timor-Leste's environmental laws and international best practices; and
- Facilitating transparency and stakeholder engagement through public consultations.

The EIA findings will guide the formulation of an EIS, EMP, and an Environmental Monitoring Program to ensure continuous compliance throughout the appraisal drilling life cycle.

1.2. Summary of EIS Activities

1.2.1. Scope of the EIS

The scope of this EIS is focused on the proposed appraisal drilling project and well testing; and does not extend to the potential future oil and gas activities in the Timor Sea by SGBU as the proponent.

The EIS study will examine the potential impacts of the proposed appraisal drilling and well testing activities on the seawater, marine life, sediment quality, air quality, and associated activities as outlined in the approved Terms of Reference (TOR) to carry out the EIA study to produce the EIS and EMP for the proposed project.

The evaluation and assessment of impact were mainly based on:

- Comparison with laws, regulations, national and international standards with reference to criteria for environmentally sensitive areas, conservation, and protection of endangered and endemic species.
- Consistency with policy and objectives such as socio-economic development; and
- Consultation and acceptability with the relevant authorities.

The EIS also presents measures and recommendations for the mitigation of any potentially adverse impacts identified based on the information gathered. These include primary and secondary data, publications and other available documents pertaining to the environmental status of the site.

1.2.2. Methodology of the EIS

The study methodology of the EIS consists of the following:

- Public Consultation.
- Environmental Baseline studies information as approved by ANP for scope of Chuditch-2 EBS study and in-situ measurements of selected environmental quality parameters.
- Interview and discussions with stakeholders and local community.
- Discussion with relevant authorities.
- Review of historical information and secondary data.

An Environmental Management Plan (EMP), which addresses the resources to perform the mitigating measures has been prepared in a separate document. The EMP will outline the environmental management practices and environmental quality monitoring program along with the roles and responsibilities, timelines, etc.

1.3. Alternatives and justification of the project

A “No Project” scenario is not viable, as drilling is essential to confirm the commercial viability of gas reserves in PSC TL-SO-19-16. Confirmation of commercial resources and their future development would reduce reliance on energy imports and provide future export earnings for the nation of Timor-Leste. There are no alternative technologies to access subsurface hydrocarbons without drilling.

An original Chuditch-2 well site was selected (2.6NM from Chuditch-1) but proved unsuitable following surveying of the proposed drilling area in 2024, due to seafloor ridges and mounds, which could impact benthic habitats and caused issues with safe MODU positioning. A new location, 0.154NM (286m) further east, was selected as it offered a flatter seabed with minimal environmental impact. Further relocation is not feasible due to geological constraints, environmental equivalence, and cost implications.

The selected Chuditch-2 well location is the optimal choice for minimizing environmental impact while ensuring technical and economic efficiency. Please refer to section 8 of the EIS.

1.4. Environmental description

This section provides the description of the environment that will be impacted by this appraisal drilling project.

1.4.1. Physical components

1.4.1.1. Climate and rainfall

The Bonaparte Basin and Timor Sea region experience a tropical climate and distinct summer monsoonal ‘wet’ season from October to March and followed by a typical cooler winter ‘dry’ season from April to September. According to 2024 rainfall data from Point Fawcett (Tiwi Islands NT), the overall maximum in January was recorded at 337mm while the minimum was 0.5mm in July.

Given that the appraisal drilling is scheduled for Q2 of 2026, it will fall within the dry season, when Easterly winds result in drier and warmer conditions with very little rainfall (RPS, 2024) with no threat of cyclonic activity.

1.4.1.2. Oceanography

The Chuditch-2 location is near the Exclusive Economic Zone (EEZ) boundary between Timor-Leste and Australia, experiencing semi-diurnal tides that influence water movement and ecological interactions. The seabed in the vicinity of the proposed well lies between 60 to 80m below mean sea level.

Generally, south-westerly surface waves occur from December to March and easterly surface waves from April to October. Wind-driven currents cause seasonal variations that impact circulation, with speeds highest in September and lowest in April. Tidal variations range from 0.8m (neap) to 7m (spring tides), influencing sediment transport and nutrient cycling.

1.4.1.3. Wind

The wind speed variability in Chuditch-2 location influenced by Australia-Asian Monsoon cycle and El Niño-Southern Oscillation (ENSO). The dry season (April to September) is characterized by steady northeast to southeast winds of 5 to 12m/s driven by the southeast trade winds over the Timor Sea. In the event where IOD and ENSO co-occur the pacific force dominates the interannual variability.

1.4.1.4. Tropical Cyclones

The location of the project is prone to tropical cyclone which occur during wet season. Most tropical lows and cyclonic systems pass through the area in a west or southwest direction before turning southwards. According to Australian Bureau of Meteorology, fully mature tropical cyclones range in size from 100km in diameter to 1,500 km. The most severe cyclones often occur in the months between December and April

1.4.1.5. Seismicity and Tsunamis

Subduction-zone earthquakes in the Timor Trough are shallow at the offshore trench and deepest to the north, with most occurring at depths up to approximately 200km. The contract area south of the Timor Trough on the Australian continental plate, in an area with very limited seismicity and no recorded tsunamis.

1.4.1.6. Geology

The Chuditch-2 well targets the Jurassic Plover Formation, characterized by fluvio-deltaic sandstones and mudstones. The estimated reservoir depth is 2,813m TVD-MSL, with a gas-water contact at 2,920m. The stratigraphy includes the Plover Formation with sandstones and claystones, the Flamingo Formation has marine shales and turbiditic sandstones, and the Bathurst Island Group include claystones and calcareous sediments.

1.4.1.7. Air Quality

The air quality is normally good in an offshore location. including Chuditch-2. During the appraisal drilling, the air emissions are generated from transportation, power generators, refrigeration, air conditioning (HVAC), fire extinguisher, well testing, and any other fugitive emissions. These atmospheric emissions include greenhouse gases such as carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and fluorinated gases or ozone depleted substances (ODS). The total GHG emissions are projected to be approximately 6,993 metric tonnes (MT) of CO_2-equivalent (CO_2-eq) from mentioned generators. With appropriate mitigation such as employ exhaust stacks with suitable heights, utilization of high-efficiency flare burner, flare watch, and gas detectors, the risk consequences will be minor and localized.

Therefore, impacts of gaseous pollutants on the ambient air quality due to drilling operations are insignificant and transient at the remote location, approximately 240km from the shores of both Timor-Leste and Australia. The impact of pollutants discharged in exhaust gases from the diesel driven power generators of drilling in an offshore area would be minimal.

1.4.1.8. Underwater Noise

Prior to drilling activities, the only source of non-natural noise and vibration are transient vessel traffic via propeller cavitation, engine noise and mechanically generated vibration. During appraisal drilling, the noise is generated by MODU engines, power generations, helicopter operation, drilling top drive system, drill string and shakers and support vessel activities.

In the operational area, the marine fauna such as marine mammals are most likely to be at risk from acoustic disturbance, as the auditory bandwidth of large whales overlap with the low frequency broadband noise produced by thrusters during vessel positioning and movement as well as active drilling. However, when the vessel is maintaining its position using bow thrusters and generating substantial thrust from its main engine, noise may be discernible up to a few kilometres. Nevertheless, this range of audibility will be diminished under windier (noisy) conditions. The potential impact of the proposed drilling program on fauna, as outlined above, is regarded as transient and insignificant at best. It is more likely to encourage avoidance behaviours rather than causing direct harm.

1.4.1.9. Marine Water Quality

Marine water quality sampling was conducted for the Chuditch-2 Environmental Baseline Survey (EBS) and test results provided in a technical report dated March 2025 carried out by WA Marine Pty Ltd trading as O2 Marine, Western Australia.

The water quality profiling studies indicated minimal spatial variability in water quality across the project area, temperature, salinity, turbidity, and pH remained stable from surface to seafloor, there was a slight thermocline detected at 22–25m depth. The dissolved oxygen (DO) levels were high (~95%) but decreased slightly below 25m, indicating a stratified water column and showed low turbidity levels which indicate minimal sediment suspension and particulate matter.

The Environmental Baseline Survey confirmed high dissolved oxygen and low pollutant levels, heavy metals, hydrocarbons (oil and grease) were below detection limits in water samples.

1.4.1.10. Sediment

The sediments in the Timor Sea are dominated by fine sand, silt, and clay. The analytical summary of the EBS around the proposed Chuditch-2 location is as follows:

- Particle Size Distribution (PSD) were clay (<4 μm), silt (4-62μm), sand (62-250μm), medium sand (250-500μm), and coarse sand (500-2000μm). Sediment PSD was generally uniform across sampling locations, where coarse grained sand (500μm- 2,000μm) was typically the most dominant fraction, followed by silt (4μm-62μm). Medium grained sand generally comprised the lowest fraction of grains across all sample sites, and while no sites appeared to be significantly different in their PSD composition.
- The dissolved metals results for gold, mercury and manganese results were reported below the LOR in all samples and for the remaining metals (As, Ag, Ba, Cd, Co, Cu, Cr, Fe, Pb, Mn, Hg, Ni, Sb, Se, and Zn) the results were all generally reported at low concentrations below ANZG (2018).
- The moisture content of sediment samples ranged between 33% and 44%. The median moisture content across all sample sites was 39%, while there was a low standard deviation in % moisture content between samples (2%).
- The oil and grease results were generally reported below the LOR (<500 mg/kg) however oil and grease were detected in low concentrations except at two sites were testing revealed levels of 690mg/kg and 630mg/kg.
- The sulphur concentrations ranged between 2,100mg/kg and 6,100mg/kg. Median concentrations of sulphur across all samples were 3,500mg/kg, while the standard deviation was 1,217mg/kg.
- Results for hydrocarbons in sediments of BTEXN (Benzene, Toluene, Ethylbenzene, Xylenes, and Naphthalene), Aliphatic and Aromatic Hydrocarbon, and Polyaromatic Hydrocarbon (PAH) concentrations were reported below the LOR at all sample sites.
- Total recoverable hydrocarbons (TRH) were detected in low concentrations at several sample sites, normalised TRH concentrations were reported below the ANZG (2018) DGV.

1.4.2. Ecological Components

1.4.2.1. Benthic Infauna

Biological sampling conducted during the EBS survey indicated the benthic infauna consist of 192 individuals from 62 identified taxa, with species diversity evenly distributed with no dominant species. The three most abundant species across all sites were the bristle worm Anthuridae, the Litocorsa sp1 and the Apseudidae.

In general, the abundance of benthic infauna around Chuditch-2 appraisal well location is low. Analysis of video transect of the location revealed the area around the Chuditch-2 well has low diversity.

1.4.2.2. Marine Fauna

Even though, the Timor Sea is home to a wide variety of marine organism such as fish, dolphins, whales, and sea turtles, however, no opportunistic megafauna was observed during EBS.

Marine Mammals

Apart from whale, dolphin and porpoise species have broad distribution with some considered endangered or vulnerable, while species like humpback and fin whales might occasionally appear in the contract area. Humpback whale migration, calving and resting areas are over 400km southwest of the contract area.

Turtles

The Timor Sea provides favourable biophysical and oceanographic conditions that support foraging, nesting, and migratory activities for marine species, including sea turtles. The recorder five marine turtles are Hawksbill Turtle, Leatherback Turtle, Green Turtle, Loggerhead Turtle, and Olive Ridley Turtle. The turtle's migration usually occurs in March to August, hence, turtles will be on beaches around appraisal drilling campaign.

Sharks

The great white shark may transit the region and is considered vulnerable. At least 49 species of sharks, including whalers, are identified within the Timor Sea region, with whale sharks occasionally transiting through the contract area although their movements are not well understood.

Birds

Approximately 224 bird species exist with 23 endemic to the Timor Island, two species are critically endangered, three are endangered according to the IUCN Red List. In 2012, there was one sighting of an Eastern Reef Egret during the Marine Fauna Observation. Whilst there were observations of seabirds during G&G however, there were no specific names were mentioned.

1.4.2.3. Corals

The Chuditch-2 proposed drilling site is not in the vicinity of any coral reef habitats, or sub- tidal shoal communities and so are not concerned by any potential impact from drilling activities.

1.4.2.4. Fisheries

The Chuditch-2 well is located in deep offshore waters, with no significant overlap with local or commercial fisheries. Drilling operations will have limited impact.

1.4.2.5. Protected Areas and National Parks

The area comprises marine protected areas (MPAs) and national parks that provide protection to biodiversity and importance for eco-tourism. Since the project is near marine protected areas, proper project planning will be carried out in order not to harm species and their natural habitats. The Chuditch-2 project is proximal to MPAs and national parks and therefore crucial in biodiversity conservation.

The Oceanic Shoals Marine Park is located approximately 15km from the Chuditch field in Australian waters. Within this Marine Park, there is the Oceanic Marine reserve (National Park) which does not permit any fishing activities ('no take' zone). As the drilling location and marine parks are far apart with good industry practices and the EMP in place, there would be minimal impact on the marine parks.

1.4.3. Economic Component

Timor-Leste has a GDP of $3.16 billion (2022), projected to grow at 3.1% (2024) and 3.9% (2025). Key sectors of the economy are oil and gas, agriculture, fisheries, and tourism, with the oil and gas sector having been the most important component of the country's socio-economic landscape since the restoration of independence. The development of the Chuditch project has the potential to significantly and positively impact Timor-Leste and support national development – the Chuditch-2 appraisal well is a 'proof-of-concept for future development.

Royalties and tax revenues go into the Petroleum Fund and contribute to the government's budget including funds for education, health and infrastructure. It also creates jobs in maritime logistics, engineering and maintenance and in supporting industries such as transportation, catering and accommodation. Offshore development also boosts the economy through increased demand for local businesses and services and a multiplier effect that increases household incomes and consumer spending. These are key to diversifying and strengthening Timor-Leste's economy and broader economic resilience.

1.4.3.1. Employment sectors

According to Trading Economics (2023), the overall unemployment rate in Timor-Leste was 1.8% in 2022 and 2023, a relatively low figure compared to global averages. However, this does not account for the high levels of underemployment and informal labour, particularly in rural areas.

The oil and gas industry is an important employer in Timor-Leste both direct and indirectly. To address the challenges in the employment sector, the government has prioritized strategic economic diversification in SDP 2011-2030.

1.4.3.2. Fishing

Fisheries are a major part of the local economy in the coastal area. Fish densities in the region of the contract area are likely to be low, with some pelagic species traversing the area. Despite of the government effort through laws and regulations, there are still illegal, unreported, and unregulated (IUU) fishing threatening marine ecosystems and local livelihood.

1.4.3.3. Tourism

Marine tourism has been identified as a potential economic growth area for Timor-Leste, particularly along the north and east coasts, and could deliver social and economic benefits through employment. Some ecotourism, including cultural tourism in coastal areas, in interaction with marine wildlife (dolphins, whales), fishing competitions and diving operators already exist, although further development of these industries is reliant on improved infrastructure and services. Activities to promote tourism include charter fishing, diving, snorkelling, whale mammal watching and visitations on luxury cruise boats to Timor-Leste. There are no known significant heritage or archaeological sites, shipwrecks or marine heritage sites in the vicinity of the survey/drilling area. There is no regular passenger vessel passing by the Chuditch Field.

1.4.3.4. Seaport and Shipping

The highest density of Timor-Leste's shipping activity occurs in the northern part of the island. However, there are major ports of the northern Australia where Timor Sea is part of their shipping route. The drilling project will operate within a defined safety exclusion zone declared by rig management and publish in Notices to Mariners (NOTAM). Thus, the appraisal drilling in Chuditch-2 will have no impact on vessel traffic.

1.4.3.5. Agriculture and Forestry

Timor-Leste is famous for its coffee, sandalwood and other crops such as cashew nuts, mangoes, spices, vanilla, pineapples, passion fruit, guavas and flowers. The Chuditch-2 location is far offshore and would not have significant impact on the agriculture and forestry.

1.4.3.6. Other Industries

Other essential industries include mineral, oil and gas sectors for both onshore and offshore. There is ongoing mineral exploration onshore Timor-Leste which will boost the economy of the nation.

Additionally, there was Bayu-Undan operation within 150km of Chuditch which ceased in May 2025. Adjacent to Chuditch contract area, its ENI's contract area which will acquire 3D seismic survey. There are also other underdeveloped oil and gas fields such as Greater Sunrise, Kelp-deep, Kuda Tasi, and other fields.

1.4.4. Social Component

Timor-Leste has a population of about ~1.34 million (2023), with 60% under 25 years old. The rural areas account for about 70% of the population, while Dili, the capital city, is the primary urban hub. Whilst Timor-Leste has made progress in improving living standards, significant challenges still remain.

The Clean Water and Sanitation Census 2022 reported that most occupied housing units rely on public taps or public piped water (39.5%) as sources for drinking water. The others depend on rivers, streams, lakes, ponds and irrigation channels to get drinking water. Approximately 75% of households have access to improved drinking water sources, but only 46% have access to basic sanitation facilities.

As of 2024, Timor-Leste, has achieved a national electrification rate of 99%, according to *Eletricidade de Timor-Leste* (EDTL). This milestone reflects substantial government efforts to expand electricity access across the country.

Public health in Timor-Leste has shown areas of progress. Life expectancy has also seen significant improvement.

Cultural Impact Assessment: There are no known significant marine heritage or archaeological sites, historical shipwrecks or marine heritage sites in the vicinity of the drilling activity. However, it is notable that the people of Timor-Leste still commonly carry out traditional rituals prior to conducting activities in the ocean.

1.5. Public Consultation

Stakeholder engagement is a crucial component of the EIA process. Consultations have been conducted through public notices and public consultations.

Two public notices were published for drafts of Term of Reference (TOR) and Environmental Impact Statement (EIS) and Environmental Management Plan (EMP). These notices were published through local newspapers, GMN TV, and social media platform of the proponent (SGBU) and the environmental consultant (Halona Serena).

The public consultations were a one-day townhall meetings that was participated by different government entities, local fishermen community, NGOs and Academic institutions. These public consultations take place on April 22nd and June 23rd in Timor Plaza and Delta Nova, respectively.

The number of participants for the public consultation was significant, and the stakeholders actively participated in question-and-answer section. This is proof that the appraisal drilling campaign for Chuditch-2 is accepted by the public.

1.6. Risk and Impact Assessment

A multi-disciplinary team consisting of SGBU Well Operations Manager, Drilling Superintendent, HSE manager, Environment Adviser and the environmental consultants held an ENVID online workshop on 14 and 15 August 2025 and discussed the environmental impacts of drilling operations, identified the hazards, the sources and classified the environmental risk. The results of the ENVID workshop are in Appendix 7 and detail the risk and impact assessment and mitigation measures.

Table 1 Summary of impacts from planned drilling

Aspect	Activity	Potential Environmental Impact	Risk		
			Consequence	Likelihood	Rank
Physical presence	Grounding MODU spud cans on seabed	Seabed disturbance and smothering / Corals, seabed invertebrates, benthic habitats.	Minor	Highly Unlikely	Low
	Grounding MODU spud cans on seabed – preload testing		Major	Highly Unlikely	Medium
	Drilling	Vessel collision with MODU / Marine fauna (fish, mammals, turtles and seabirds), benthic habitats, fisheries and socio-economic receptors	Massive	Remote	Medium
		Collision, entanglement with subsea infrastructure, interference with emergency response / Fisheries and socio-economic receptors	Minor	Highly Unlikely	Low
	Flaring	Flaring can reduce a vessel operator's ability to accurately perceive navigation cues at night and may cause a visual distraction / Air quality, Marine fauna (behavioural disturbance), Avifauna (sea birds and migratory birds), marine water quality, benthic habitats, thermal radiation, light pollution and socio-economic receptors	Major	Remote	Medium
	Drilling	Dropped object on Benthic Habitats	Minor	Remote	Low

Aspect	Activity	Potential Environmental Impact	Risk		
			Consequence	Likelihood	Rank
	Plug and Abandonment	Loss of well control or hydrocarbon release / Air quality, Marine fauna (fish, turtles' marine mammals), Seabirds and Avifauna, marine water quality, benthic habitats and subsea ecosystems, thermal radiation and socio-economic receptors	Major	Remote	Medium
Drilling discharges	Discharges water-based mud (WBM) cuttings, and cement	Water quality degradation - Smothering of benthic habitats and biota, water quality degradation, Increased local turbidity	Minor	Likely	Medium
	Discharge of Synthetic Based Mud (SBM) on cuttings	Water quality degradation - Smothering of benthic habitats and biota, water quality degradation, Increased local turbidity	Minor	Likely	Medium
	Recycling of Synthetic Based Mud (SBM)	Water quality degradation - Smothering of benthic habitats and biota, water quality degradation, Increased local turbidity	Slight	Remote	Low
Other waste discharges	Chemical and Hydrocarbon discharges	Marine water quality, marine fauna, fisheries and socio-economic receptors	Moderate	Unlikely	Medium
	Chemical and Hydrocarbon discharges	SBM Spill overboard / Marine water column, marine fauna, fisheries and socio-economic receptors	Minor	Highly Unlikely	Low
	Wastewater and sewage disposal	Water quality degradation / Marine water quality, benthic habitats and biota, marine fauna,	Slight	Highly Likely	Low

Aspect	Activity	Potential Environmental Impact	Risk		
			Consequence	Likelihood	Rank
		fisheries and socio-economic receptors			
	Hazardous, laboratory and medical waste	Biohazardous waste comingled with other waste / Marine water quality. Marine Fauna, Terrestrial and Human Receptors, Fisheries and Socio-Economic Receptors	Minor	Remote	Low
	Cooling and brine water	Water quality degradation and potential alteration of marine environment through localised increase in water temperature with engine cooling water / Marine water quality, benthic habitats and biota, marine fauna, fisheries and socio-economic receptors	Minor	Likely	Medium
	Produced formation water (PFW)	Water quality degradation / Marine water quality, benthic habitats and biota, marine fauna, fisheries and socio-economic receptors	Moderate	Highly Unlikely	Medium
	Bilge water discharge	Water quality degradation / Marine water quality, benthic habitats and biota, marine fauna, fisheries and socio-economic receptors	Minor	Highly Unlikely	Low
	Deck Drainage	Water quality degradation / Marine water quality, benthic habitats and biota, marine fauna, fisheries and socio-economic receptors	Minor	Possible	Medium
	Drill floor drainage	Water quality degradation / Marine water quality, benthic habitats and biota,	Minor	Possible	Medium

Aspect	Activity	Potential Environmental Impact	Risk		
			Consequence	Likelihood	Rank
		marine fauna, fisheries and socio-economic receptors			
	Food waste	Water quality degradation / Marine water quality, benthic habitats and biota, marine fauna, fisheries and socio-economic receptors	Slight	Highly Likely	Low
	Solid waste	Water quality degradation / Marine water quality, benthic habitats and biota, marine fauna, fisheries and socio-economic receptors	Minor	Unlikely	Medium
Air emissions	MODU and support vessel operations - fuel combustion	Increase the cumulative impact on air quality and climate change / Atmospheric air quality, global system (global receptors),	Slight	Highly Likely	Low
	Fugitive emission - MODU	Increase the cumulative impact on air quality and climate change / Atmospheric air quality, global system (global receptors)	Slight	Highly Likely	Low
	Fugitive Emission - Well test package	Increase the cumulative impact on air quality and climate change / Atmospheric air quality, global system (global receptors)	Slight	Highly Likely	Low
	Controlled Emission - Well test package	Increase the cumulative impact on air quality and climate change / Atmospheric air quality, global system (global receptors).	Slight	Highly Unlikely	Low
Light Pollution	MODU Operations general	Changes to marine fauna behaviour due to light emissions / Marine	Minor	Highly Unlikely	Low

Aspect	Activity	Potential Environmental Impact	Risk		
			Consequence	Likelihood	Rank
		fauna, Avifauna (including flying and surface feeding birds), Plankton.			
Noise pollution	MODU Operation-Drilling	Changes to marine fauna behaviour due to noise emissions / Marine Mammals, Marine Turtles, Fish, Seabirds, Plankton communities, Benthic Habitats and Biota and Fisheries resources	Slight	Highly Likely	Low
	Helicopter operations – take-off and landing	Changes to marine fauna behaviour due to noise emissions / Marine Mammals, Marine Turtles, Fish, Seabirds, Plankton communities, Benthic Habitats and Biota and Fisheries resources	Slight	Highly Likely	Low
	MODU Operations – Flaring	Short term behavioural / disruption impacts on local wildlife including noise vibration / Marine Mammals, Marine Turtles, Fish, Seabirds, Plankton communities, Benthic Habitats and Biota and Fisheries resources	Minor	Likely	Medium
	Versatile Seismic Imager Tool (SLB)	Changes to marine fauna behaviour due to noise emissions / Marine Mammals, Marine Turtles, Fish, Seabirds, Plankton communities, Benthic Habitats and Biota and Fisheries resources	Minor	Highly Unlikely	Low
Socio-Economic development	Drilling program	Disruption in daily living and movement patterns	Slight	Remote	Low
		Change in occupational opportunities	Minor	Highly Unlikely	Low

Table 2 Summary of risks from unplanned activities

Aspect	Activity	Potential Environmental Impact	Risk		
			Consequence	Likelihood	Rank
Uncontrolled release of Hydrocarbons at surface -Well blow out at 17 1/2-inch mud line	Drilling 17½" Top hole section – surface gas leaks	GHGs to the atmosphere, toxic and physical impacts from hydrocarbons on marine fauna and flora / Global Climate System, Air Quality Receptors, Marine Water Column, Benthic Habitats and Biota, Marine Fauna, Human and Socio-Economic Receptors including fisheries and coastal communities	Major	Highly Unlikely	Medium
Uncontrolled release of Hydrocarbons at surface -Well blowout 12 1/4-inch section	Drilling 12 ¼ section – Oil spill from well blowout	GHGs to the atmosphere, toxic and physical impacts from hydrocarbons on marine fauna and flora / Global Climate System, Air Quality Receptors, Marine Water Column, Benthic Habitats and Biota, Marine Fauna, Human and Socio-Economic Receptors including fisheries and coastal communities	Massive	Remote	Medium
Uncontrolled release of hydrocarbon	Errant Vessel enters 500M exclusion zone - collision with MODU	GHGs to the atmosphere, toxic and physical impacts from hydrocarbons on marine fauna and flora / Global Climate System, Air Quality Receptors, Marine Water Column, Benthic Habitats and Biota, Marine Fauna, Human and Socio-Economic Receptors including fisheries and	Major	Remote	Medium

Aspect	Activity	Potential Environmental Impact	Risk		
			Consequence	Likelihood	Rank
		coastal communities			
Uncontrolled release of hydrocarbon	Vessel to vessel and vessel to MODU collision within 500m exclusion zone	GHGs to the atmosphere, toxic and physical impacts from hydrocarbons on marine fauna and flora / Global Climate System, Air Quality Receptors, Marine Water Column, Benthic Habitats and Biota, Marine Fauna, Human and Socio-Economic Receptors including fisheries and coastal communities	Major	Highly Unlikely	Medium
Uncontrolled release of hydrocarbon	Spillage during refuelling – Vessel to MODU	GHGs to the atmosphere, toxic and physical impacts from hydrocarbons on marine fauna and flora / Global Climate System, Air Quality Receptors, Marine Water Column, Benthic Habitats and Biota, Marine Fauna, Human and Socio-Economic Receptors including fisheries and coastal communities	Moderate	Unlikely	Medium
Uncontrolled release of hydrocarbon	Flare Burner Dropout	GHGs to the atmosphere, toxic and physical impacts from hydrocarbons on marine fauna and flora / Global Climate System, Air Quality Receptors, Marine Water Column, Benthic Habitats and Biota, Marine Fauna, Human and Socio-Economic Receptors including fisheries and	Minor	Unlikely	Medium

Aspect	Activity	Potential Environmental Impact	Risk		
			Consequence	Likelihood	Rank
		coastal communities			
Uncontrolled release of hydrocarbon	Uncontrolled release of SBM	Temporary physical and toxic effects of SBM on marine fauna and flora / Marine water Quality, benthic habitats and biota, marine fauna.	Minor	Unlikely	Medium
Uncontrolled release of hydrocarbon	Contained and localised Oil Spill	Temporary physical and toxic effects of oil on marine fauna and flora / Marine water quality, benthic habitats and biota, marine fauna.	Slight	Possible	Low
Introduction of Invasive Marine Species (IMS) from Ballast Water	Biofouling from Ballast water	Changes in the marine ecology / Benthic Habitat and Biota, Native Fish Populations, fisheries and Socio-Economic Receptors and Protected areas and Biodiversity Values	Massive	Highly Unlikely	High
Introduction of Invasive Marine Species (IMS) on MODU and Vessels Hulls	Biofouling on MODU and Vessel Hulls	Changes in the marine ecology / Benthic Habitat and Biota, Native Fish Populations, fisheries and Socio-Economic Receptors and Protected areas and Biodiversity Values	Massive	Highly Unlikely	High

1.7. Conclusion and Recommendations

This EIA has been conducted to evaluate the potential environmental impacts arising from the proposed appraisal drilling program. Generally, the assessment has been conducted based on the appraisal drilling operational program and internationally acceptable drilling methods.

In conclusion, the mitigation measures proposed for all the impacts identified are aimed at protecting the physical, biological, and socio-economic environments. EMP has been developed to manage the potential impacts of the proposed activities and ensure that they remain at acceptable levels throughout the course of the program. With the nature of the proposed appraisal drilling project, which is of short duration (approximately 44 days) with no permanent structures, the impacts are considered minor/low, temporary and localised.

2. Detail of the Project Proponent

2.1. Detail of the proponent

Operator: **SundaGas Banda Unipessoal, Lda.**

TIN: 2003222

Rua Presidente Nicolau Lobato

Timor Plaza, Level 3, Suite 337

Comoro, Dom Aleixo, Dili

Timor-Leste

Tel: +670 331 0847

Joint Venture Partner: **TIMOR GAP Chuditch Unipessoal, Lda.**

TIN: 2003016

Rua Presidente Nicolau Lobato

Timor Plaza, Level 3, Suite 301-314

Comoro, Dom Aleixo, Dili

Timor-Leste

Tel: +670 331 1422

2.2. Company Organisation Structure

Figure 1 Organisational Structure

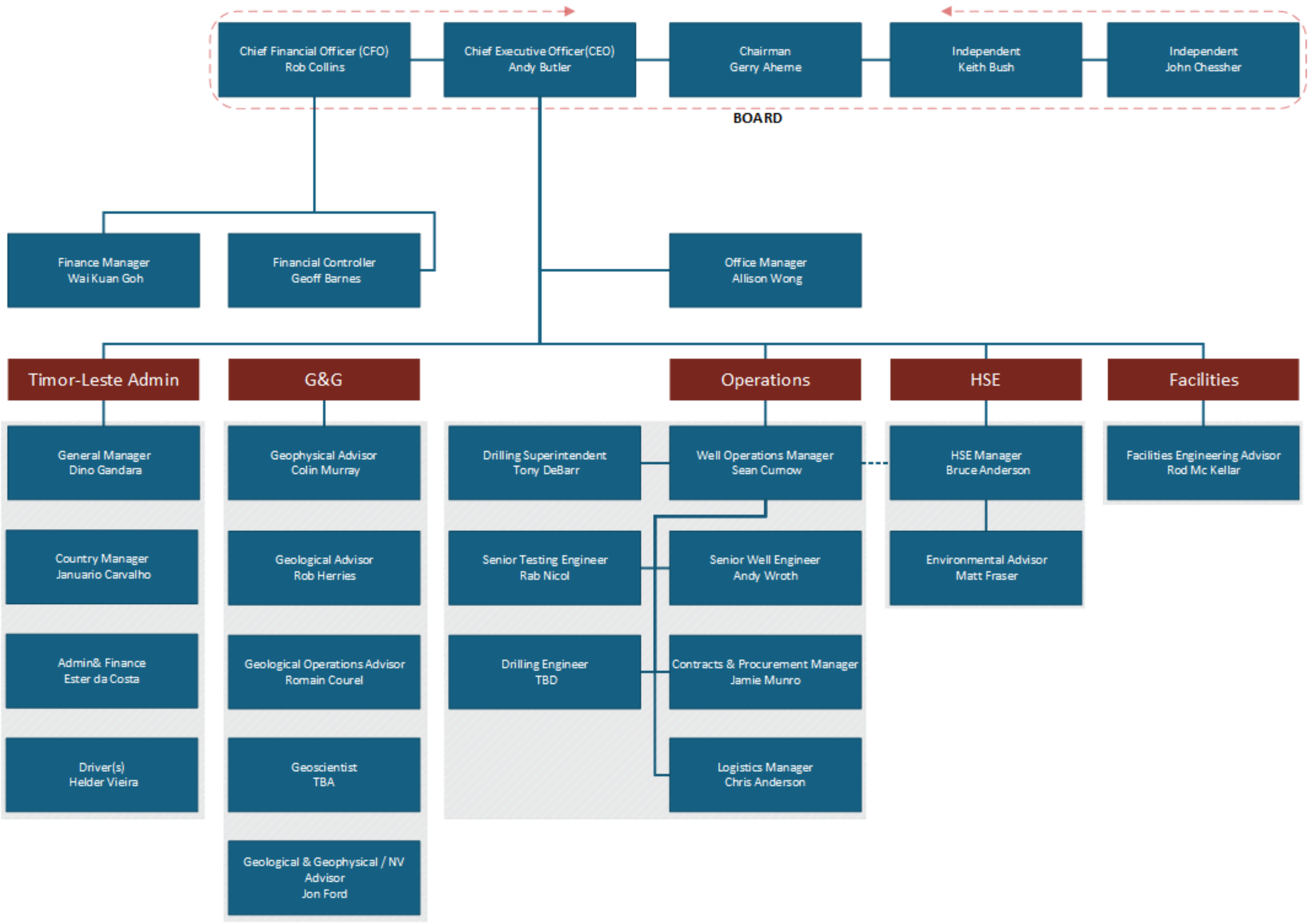


Table 3 Key SGBU Personnel and their Contact Details

Name	Position	Email	Phone
Dr Andy Butler	Managing Director	andy.butler@sundagas.com	+65 93845820
Sean Curnow	Well Operations Manager	sean.curnow@sundagas.com	WhatsApp +44 7384 513 212
Tony DeBarr	Drilling Superintendent	tony.debarr@sundagas.com	WhatsApp +84 129 713 9040
Bruce Anderson	HSE Manager	bruce.anderson@sundagas.com	WhatsApp +61 439 039 066
Dino Gandara	General Manager	dino.gandara@sundagas.com	+670 77626286

3. Detail of the EIA Consultant

SundaGas Banda Unipessoal, Lda (SGBU) engaged Halona Serena Lda (Halona Serena), a Timor-Leste registered national consulting company, to carry out the Environmental Impact Assessment (EIA) study to produce the Environmental Impact Statement (EIS) and Environmental Management Plan (EMP) for the proposed project. Halona Serena has been providing services to domestic projects in Timor-Leste for approximately 3 years prior to commencing the subject EIA study.

Halona Serena is located in:

Rua Presidente Nicolao Lobato, Timor Plaza CBD 2, Room 402
Comoro, Dom Aleixo, Dili, Timor-Leste

Telephone: +670 7711 4459

A number of highly qualified Halona Serena personnel were involved in this project:

Name:	**Maria Do Ceu Rosales**
Role:	Owner and Director Halona Serena
Qualification:	Environmental Science and Business Law
Experience:	As an Environmental Scientist with more than 7 years' experience predominantly in environmental assessment, management, and public procurement. Maria has led environmental studies on a variety of environmental assessments and feasibility studies specifically for water resources management and worked on a variety of projects from small-scale to large projects, including establishing more than five water and sanitation projects to the rural communities and successfully completed marine environmental monitoring project for Tibar Port mega project.

Name:	**Awinash Dulip**
Role:	Senior Consultant
Qualification:	MBA from The International University Baton Rouge, Louisiana; Master of Science in Hydrobiology and Fisheries from University of Port Harcourt, Nigeria; and Bachelor of Science in Zoology from University of Poona, India
Experience:	35 years' experience in EHS and specifically in Environment management around EIA, EIS and EMP development, and environment monitoring in Oil & Gas and the Mining sector. Worked with various governments, private companies, organizations, funding institutions and as a member of the Timor Leste ANP regulatory authority

Name:	**Pascoela Sequeira**
Role:	Senior Consultant
Qualification:	M.Sc. in Natural Gas Engineering and Management; B.Sc. in Chemical Engineering from University of Oklahoma.
Experience:	Process Engineer experience for 8 years in evaluating the LNG process plant design for future Timor-Leste LNG plant and its supporting activities. As part of the Halona Serena team, successfully obtained Environmental Licensing for TGPB for the Pualaca Block Seismic Activity.

Name:	**Bertanizo Guro da Costa**
Role:	Consultant
Qualification:	Associate degree
Experience:	10 years of experience in research in various sectors, including environmental science, conservation, security, defence, legal pluralism, impartiality of formal justice system, education and domestic violence. 5 years of experience in leadership role, as a research coordinator, and general coordinator of association and Expertise in monitoring and evaluation, research methods, statistics, data analysis, media and communications

Name:	**Mario Marques Cabral**
Role:	Consultant
Qualification:	Marine Biologist
Experience:	20 + years of experience as a marine biologist. Worked under Indonesian and Timor - Leste governments for marine departments. Candidate for Blue Planet prize in 2022 (af:011785). The Blue Planet Prize is an award presented to individuals or organizations from around the world in recognition of outstanding achievements in scientific research and its application that have helped provide solutions to global environmental problems.

Name:	**Eurico Ediana da Costa**
Role:	Consultant
Qualification:	MBA from Auckland University of Technology, New Zealand; Bachelor of Public Administration from Timor-Leste National University.
Experience:	An experienced sociologist with a demonstrated history of working around private sector development, research, decentralization, public policy, social-economic, community development, local government development, monitoring and evaluation, and gender mainstreaming. Skills in M&E design, data analysis, research reporting, project management, policy analysis, business analysis, negotiation, problem-solving, capacity building, community consultation.

Name:	**Tiago Gamboa**
Role:	Consultant
Qualification:	Master in Geographer - Urban Planning.
Experience:	25 years' experience as a Geographer and HSE Consultant with experience in environmental management and awareness, EIA, environmental and social management planning, climate change and infrastructure resilience, water resources, urban cleaning and public health, in the Public and Private Sector, including international development cooperation in Timor-Leste.

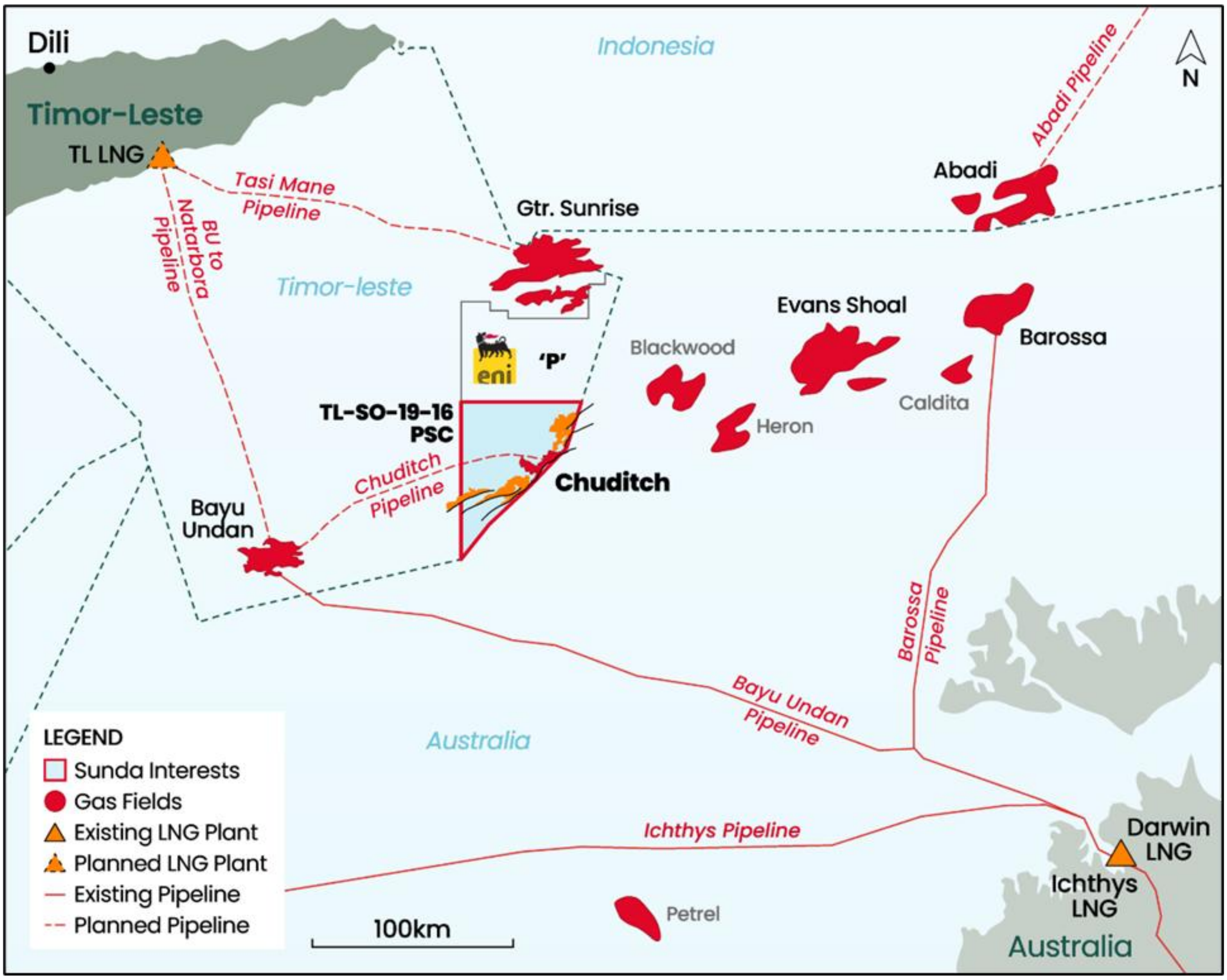
Name:	**Joctan Dos Reis Lopes**
Role:	Consultant
Qualification:	MSc in Marine Biology at Bangor University (School of Ocean Sciences)
Experience:	A marine and coastal fisheries ecologist, actively engaged in small-scale fisheries for over 6 years. Work mainly focuses on developing data innovation and digital transformation to improve fisheries stock assessments, ecosystem interactions and aquatic food systems and enhance coastal resilience and livelihoods in Indo-Pacific Island countries. A published researcher with profound knowledge of ecosystem modelling and local and indigenous knowledge systems. Worked alongside scientists, experts, governments, and fisheries practitioners, to co-develop adaptive tools and context-specific practices that guide inclusive, well-informed, and sustainable marine resource management. One of the pioneers who developed PESKAS, an augmented real-time dashboard that collects catch data and provides fishing trends around Timor-Leste.

4. Project Description

4.1. Project Identification

The appraisal well is known as Chuditch-2 and is located within the Chuditch field located in contract area PSC-TL-SO-19-16. This contract area is located in the Timor Sea, in the northern Bonaparte Basin, Sahul Platform area. The Chuditch field is situated about 145NM south of Timor-Leste's southern coast and well will be located approximately 43NM south-west of Greater Sunrise and approximately 76NM east-northeast of Bayu Undan. The location of Chuditch and the nearby fields are shown in Figure 2.

Figure 2 -Location of Contract Area PSC-TL-SO-19-16/Chuditch and nearby fields.



4.2. Project Category

The project falls within the context of oil and gas appraisal drilling well operations. Chuditch-2 is an appraisal well drilled to evaluate the potential quantities of gas in the Chuditch field in the Timor Sea for future hydrocarbon production. Such a project requires offshore drilling, environmental analysis, and geological data to make future operational and commercial decisions.

In November 2023, ANP approved the Project Document (PD) for drilling of Chuditch-2 on the PSC-TL-SO-19-16 and classified the project as a Category A activity, based on Decree Law No. 39/2022 1st Amendment of Decree Law No. 5/2011 on Environmental Licensing. SGBU subsequently submitted the Terms of Reference (TOR) document which was approved in November 2024 by ANP and is the basis for preparing this Environmental Impact Statement (EIS) and the Environmental Management Plan (EMP).

4.3. Nature, Size and Location of the Project

4.3.1. Project Nature

Appraisal well drilling and well testing operations are conducted to assess the presence and viability of hydrocarbon resources in quantities that may support commercial extraction. These operations typically occur following the drilling of an exploration well, (Chuditch-1) and evaluation of all subsurface data including in this instance reinterpretation of existing seismic data. The purpose of drilling Chuditch-2 appraisal well is to confirm and assess commercial viability of the gas resource while minimizing environmental impact.

The objectives of the Chuditch-2 appraisal well are to confirm the gas anticipated from the seismic mapping, better define gas resources associated with the Chuditch-1 discovery in the Plover sandstones reservoir and to perform a Drill Stem Test (DST) to evaluate the expected future production rates that may be achieved from the Chuditch field.

SGBU's team has designed procedures to cover the proposed drilling and well testing operations on the planned Chuditch-2 well, which is the second of two wells drilled on Block PSC TL-SO-19-16 in the Chuditch field.

The well will be drilled vertically using a jack-up drilling unit and is expected to penetrate the Plover sandstone formations in 12¼" in the interval from 2,880m to 3,010m MDBRT. The well total depth is planned to be 3,010m MDBRT.

The 12¼" hole will be drilled utilizing SBM. Wireline logging will be run in open hole to evaluate formation character and pressure.

If appraisal drilling is deemed successful based on the gas column and reservoirs encountered, a 9⅝" casing will be run and cemented in place, and a DST will be conducted in 9⅝" cased hole to evaluate well productivity.

Prior to any testing operations, the well will be displaced with sea water then circulated to NaCl brine for the DST. The well will be perforated under-balanced with 4.50" HSD TCP guns, with 5" DST tools and a 4½" test string with a multi-rate test planned to evaluate the reservoir productivity. On completion of the DST, the well will be plugged and abandoned. Project details are summarized in Table 4.

Table 4 Summary of Chuditch-2 Project Details

Item	Detail			
Well name	Chuditch 2			
Partnership	SundaGas Banda Unipessoal, Lda 60%, TIMOR GAP Chuditch Unipessoal, Lda 40%			
Project name	Chuditch 2			
Well type	Appraisal			
Well trajectory	Vertical profile			
Country	Timor-Leste			
Anticipated hydrocarbon(s)	Gas / Condensate			
Block	TL-SO-19-16 PSC			
Basin	North Bonaparte Basin			
Surface Location (Chuditch-2)	Latitude:	10° 32' 56.832" S	X:	406,436
	Longitude:	128° 8' 41.402" E	Y:	8,833,746
Bottom hole Target (Chuditch-2)	Latitude:	10° 32' 56.832" S	X:	406,436
	Longitude:	128° 8' 41.402" E	Y:	8,833,746
Geodetic Information	WGS84, UTM Zone 52S, CM 129°E			
Target Objective	Plover Formation			
Drilling Rig	Jack-up MODU			
Depth Reference	Mean Sea Level (MSL)			
Water Depth (MSL)	+/- 70m			
Well TD	+/- 2,971 m TVD-MSL			
Formation Temperature (Max)	~139°C (~282.2 °F) at TD			
Formation Pressure	+/- 4400psi - Formations are predicted to be normally pressured from seabed down to Plover Formation			
Target tolerance	50m at the Plover Formation target area			
Hole Section	• 17½" hole for 13⅜" casing, planned setting at 1,650 m MDBRT. Drilling fluid will be WBM (Seawater and Hi-vis) sweeps with returns to seabed. • 12¼" hole for 9⅝" casing, planned setting depth at 3,010 m MDBRT. Drilling fluid will be SBM. Return to shale shaker before cuttings discharge to seabed.			

4.3.2. Jack Up MODU

The Jack-Up MODU is equipped with comprehensive facilities, including accommodation, kitchen services, heating and power supply, sewage management, storage areas, medical and emergency response units, as well as secondary operations such as welding, painting, and machining.

To support logistics, a minimum of two Anchor Handling Tugs (AHT) will assist the MODU by providing:

- Mobilisation, positioning & marine support
- Drilling & Well-Testing marine support
- Routine cargo & consumables supply
- Backloading / Waste management
- Emergency & regulatory functions (Standby / SAR / Firefighting / Medevac / OSR)
- Personnel Transport (backup)

Two Supply Vessels will then assist the MODU by providing the transportation of equipment and supplies between the shore and the MODU and support overall project activities offshore, including:

- Drilling & Well-Testing Marine Support
- Routine Cargo & Consumables Supply
- Backloading / Waste Management
- Emergency & Regulatory Functions (Standby / SAR / Firefighting / Medevac / OSR)
- Personnel Transport (backup)

Additionally, Rotary Wing services will be deployed for:

- Personnel Transport (primary)
- Emergency Response (LIMSAR / Medevac)
- Critical Cargo

Crew members will operate on a nominal 28-day rotation schedule, with approximately five crew change flights conducted per week to ensure operational efficiency and workforce sustainability. Both the vessels and rotary wing aircraft will be contracted through a tendering process supported by a detailed scope of work that will include minimum acceptable technical specifications to undertake all of the activities listed here.

The MODU will also provide dedicated storage for a variety of process chemicals and secondary materials. These include:

- Fuel Oil.
- Fresh (potable) water.
- Ballast (Seawater).
- Drilling water.
- Bulk mud and cement.
- Liquid mud.
- Dry process materials.
- Pipe rack storage.

A typical jack-up MODU and the main deck view are shown in figure 3 and figure 4, respectively

Figure 3 -Illustration of typical Jack-Up MODU

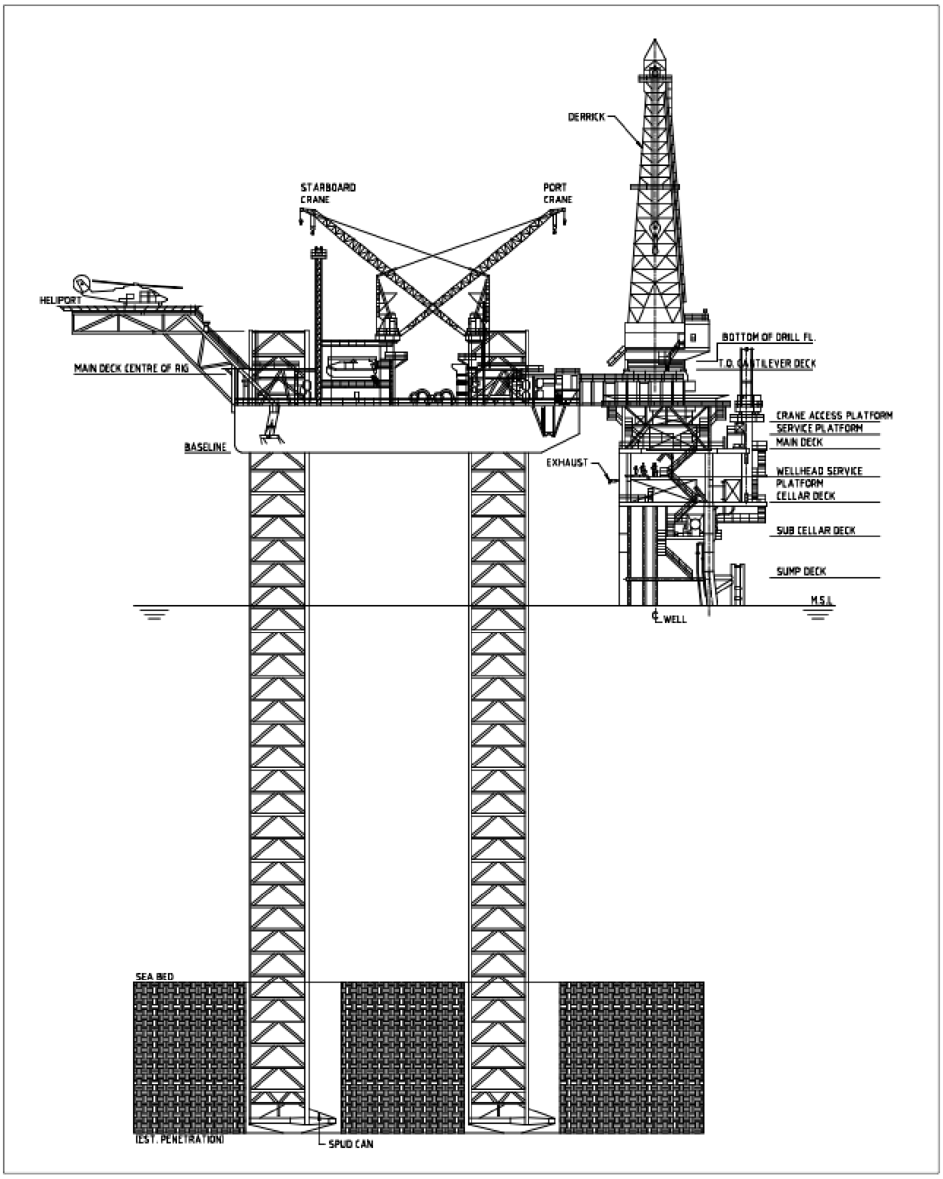
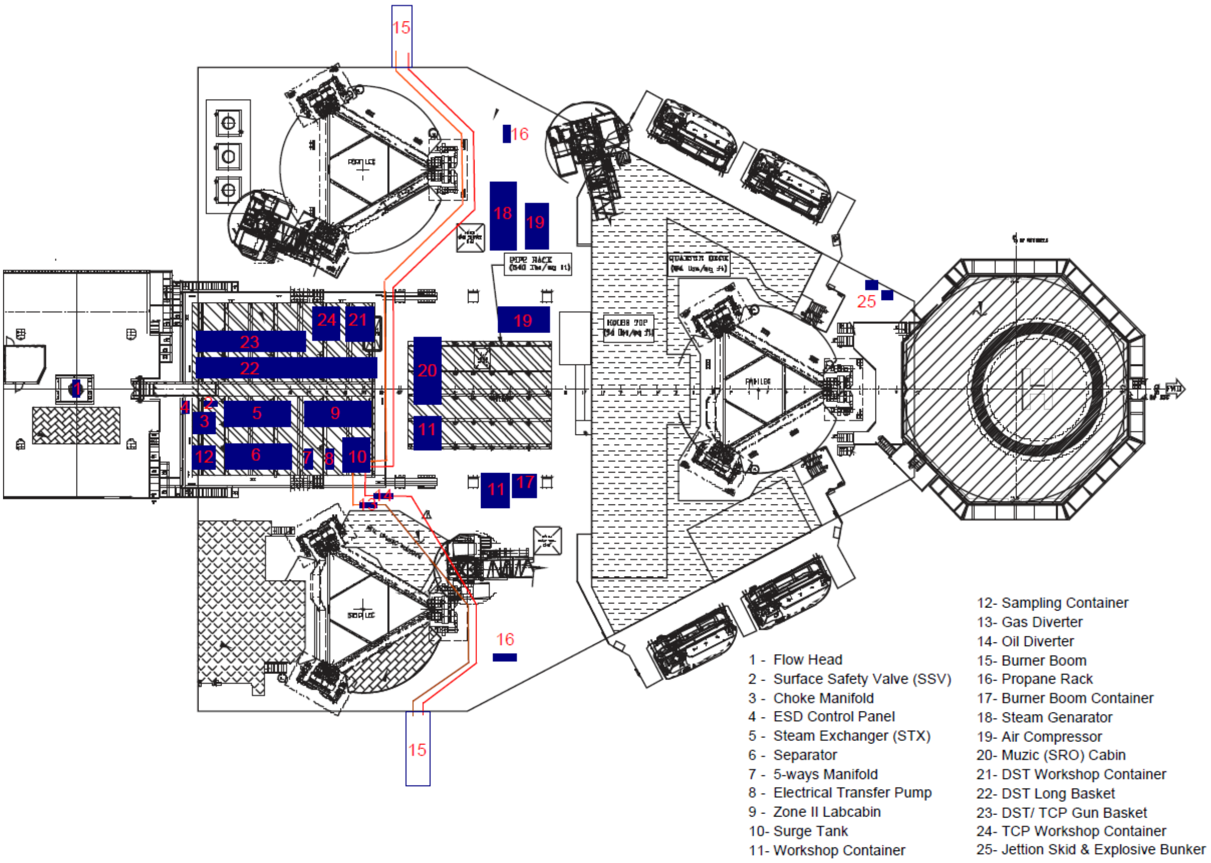


Figure 4 Typical view of Main Deck of a Jack-Up MODU



4.3.3. Project activities and drilling program

The MODU will be towed by one or two AHT's to the drill site. Upon arriving at the required location, the second AHT will be connected to the aft of the MODU (port or starboard depending on metocean conditions at the time). The two AHT's will position the MODU over the planned location, and the legs will then be lowered to the seabed. Pre-loading of each leg will be performed to verify stability, and the MODU will then be elevated to the desired height above the MSL.

Jack-up MODU legs are typically 43m apart in the transverse direction and 40m apart in the longitudinal direction. The spud cans, on the bottom of the legs, are approximately 14m in diameter. The spud cans will be the only part of the MODU that makes contact with the seabed.

Geotechnical and Geophysical (G&G) site surveys were completed in Q1 2024. The G&G site surveys confirmed a suitable primary well location and selected two additional locations should construction of a relief well be required. A temporary safety exclusion zone of 500m radius will be established around the MODU location during the drilling operations.

Offshore supply vessels will be sourced through competitive tender, one of the vessels will always be at location to act as a 'standby' vessel. Helicopters required for personnel transfer and medivac will be sourced from aviation contractors capable of providing a safe and cost-effective service.

SGBU are planning to commence project activities and rig move in Q2 of 2026, the MODU will be towed to location and positioned over the programmed well centre. Following soft pinning and ballasting operations, the MODU will jack up to the approved air gap of approximately 15-

18m above mean sea level and begin to rig up, take on extra personnel, equipment, fluids and chemicals in preparation for spudding the well.

Drilling activity of the Chuditch-2 well will target the Plover Formation to appraise the gas discovery encountered by Shell on the Chuditch-1 well. Its primary goals include confirming thicker gas pay in an upward direction from the original well toward its bounding fault and conducting a Drill Stem Test (DST) to assess the field's production potential.

The drilling process uses bits of different sizes to drill a series of concentric holes from the seabed to the planned well total depth. During drilling operations, a fluid known as drilling fluid or mud is circulated through the inside of the drill string to the bit and returns to the surface once the surface casing string has been installed. Drilling fluid performs several important functions including:

- Removal of drilled cuttings from the bottom of the well and transports cuttings back to the surface, where they are then separated from the mud and discarded.
- Providing a hydrostatic column to control formation pressures, preventing the uncontrolled flow of formation fluids into the borehole.
- Sealing permeable formations.
- Maintaining well stability.
- Cooling, lubricating and supporting the drill bit and assembly.
- Transmitting hydraulic energy to tools and drill bit.

The Water Based Mud (WBM) drilling fluid is prepared by mixing mud additives and chemicals on site to the desired concentrations in seawater whilst the majority of the Synthetic Based Mud (SBM) drilling fluid will be prepared at the drilling fluid contractors base in Darwin. During the drilling of the 12¼” section, SBM will circulate in a closed system being pumped down hole and recovered over shale shakers on the MODU to separate SBM from cuttings prior to the SBM being returned to the active circulation system. The WBM and SBM systems to be used for the drilling campaign do not pose a risk of contamination to subsurface formations.

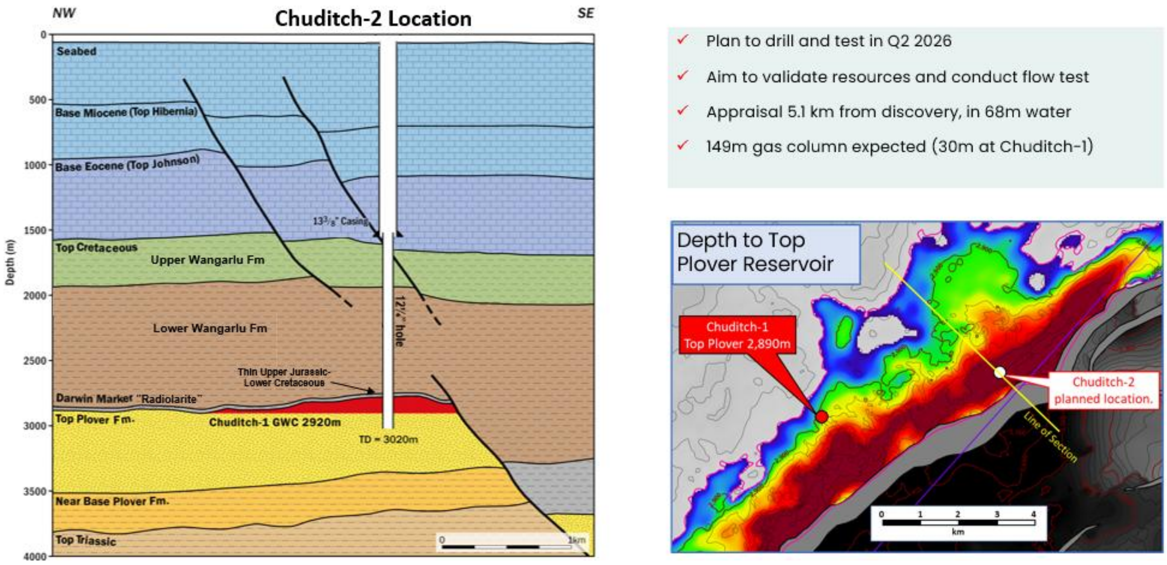
4.3.3.1. Well Design

The objectives of an appraisal well in Chuditch contract area will be to confirm the gas anticipated from the seismic mapping, better define gas resources associated with the Chuditch-1 discovery and to perform a DST to evaluate the expected future production rates that may be achieved at Chuditch, and thus likely commercial viability. The program will include detailed engineering plans for the drilling of the well, including casing and cementing strategies, drilling fluid selection, and well control measures. Figure 5 shows the well design for Chuditch-2.

The well will commence drilling 17½” hole, with fluid and cuttings returns taken to the seabed, once this hole section is drilled a casing string will be lowered into the hole and cemented. This provides a conduit for the return fluid during the drilling of the next section when SBM will be used.

After each section of the well is completed, the drill string is lifted and protective steel pipe or casing lowered into the well and cemented into place. The casing assists in maintaining well stability and helps to reduce fluid loss from the well bore into the surrounding rock formations.

Figure 5 Well design of Chuditch 2 appraisal well



4.3.3.2. Safety and risk management procedures

The chosen MODU will have a comprehensive safety management system and hold a validated, current Safety Case in accordance with Degree Law 32, Article 120. Further, SGBU and the MODU Contractor will work to develop a Safety Case Revision and bridging documents as required, to incorporate and systematically manage additional risks bought to the MODU by SGBU operation. The incorporation of SGBU risks will go through HAZOP and HAZID studies in strict accordance with the in-force MODU's Safety Case and with Decree Law 32.

Specific references to emergency planning, well control procedures, tropical rotating storm planning, personnel training and equipment maintenance schedules and strategies to mitigate risk and ensure the safety and success of the operation in an environmentally responsible manner are specifically detailed in the MODU safety and operational management system, or in SGBU operational plans and procedures. All of these requirements and systems are clearly laid out in Decree Law 32, to which both the MODU Contractor and SGBU are legally obliged and committed to fulfilling.

4.3.3.3. Logistics and supply chain management

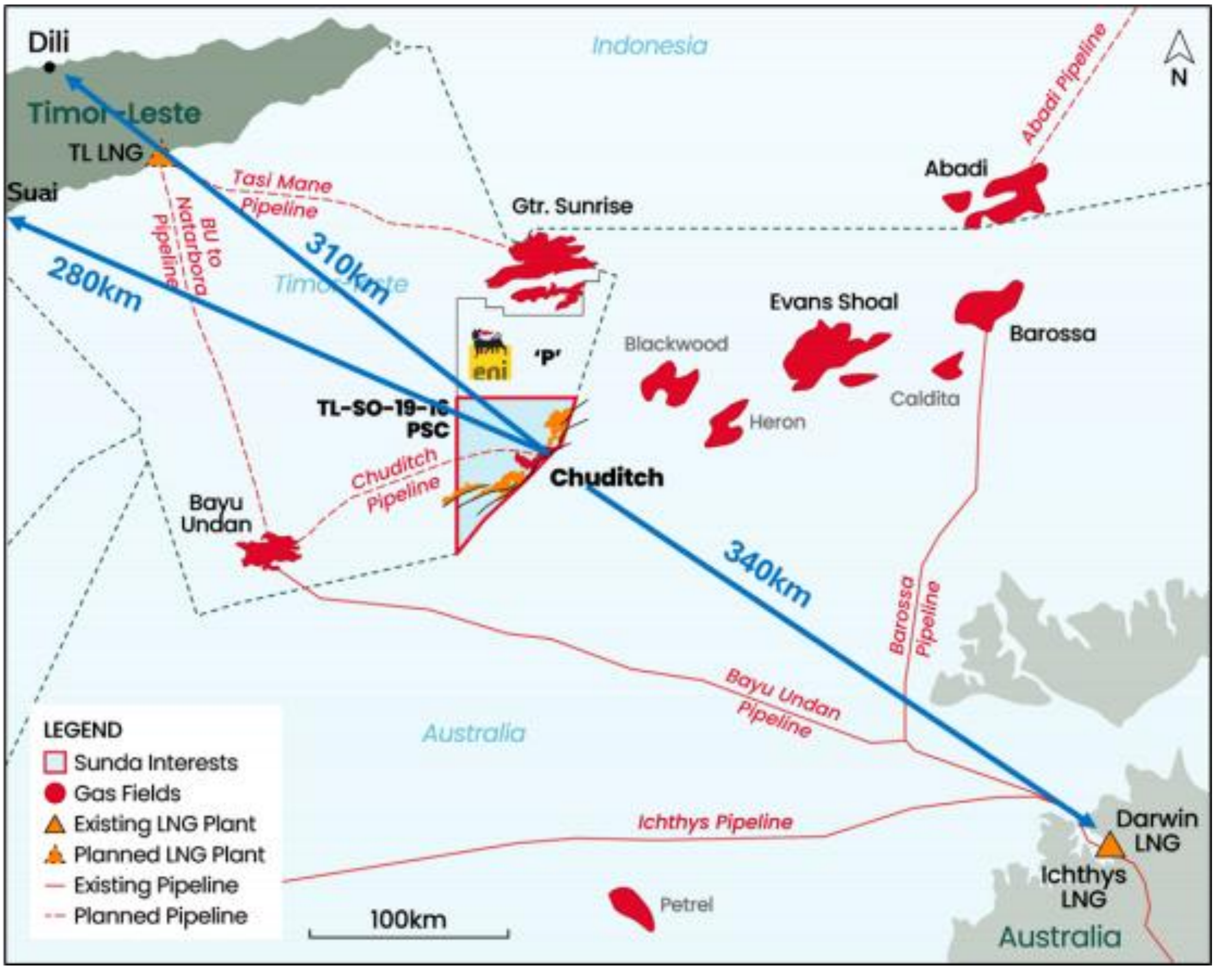
Plans for the procurement and transportation of equipment, materials, and personnel to and from the offshore drilling site are in planning and are not finalized. SGBU will plan to ensure efficient operations. The Chuditch-2 well is located 167NM SE of Dili and 184NM NW from Darwin, with travel times of 1.5 hours for helicopters and 24 hours for supply vessels.

In addition to the mobilisation, drilling and testing operations, normal operations will include loading and offloading of cargo vessels as well as mud and chemical transfers. It is anticipated that equipment and chemicals required during the drilling program will be supplied to the MODU by vessel from Darwin, these will be transferred to the MODU by the MODU crane. Figure 6 shows potential support supply base locations and relevant distances.

4.3.3.4. Drilling resource requirements

The majority of the resources required to drill the offshore appraisal well will be sourced from Australia. The MODU will come self-contained with a highly trained and specialized workforce. Accommodation is supplied on the MODU, which will cater for two drilling shifts working on a 12-hour basis as well as daily operational and maintenance staff requirements. All other supporting drilling technical services will also be accommodated on-board.

Figure 6 Support Supply Base Location and Routes



4.3.3.5. Weather monitoring and contingency plans

Monitoring systems will be employed to track weather conditions and contingency plans will be developed for adverse weather events, such as cyclones or tropical lows to ensure the safety of personnel and equipment. SGBU will contract with an appropriate weather forecasting company to provide metocean data for the project. Contingency planning for weather events will be in accordance with MODU procedures.

4.3.3.6. Community engagement

SGBU has engaged with local communities and stakeholders through the Public Consultation process, addressing concerns, and providing information about the location, intended drilling activities, duration and their potential impacts. The company will continue to reach out to all stakeholders through the period of preparation and operations.

4.3.3.7. Regulatory compliance

Adherence to regulatory frameworks and obtaining necessary permits and approvals for offshore drilling activities in liaison with ANP, ensuring compliance with legal and environmental standards from the Government Of Timor-Leste (GOTL), is a critical ongoing consideration in operations planning.

4.3.3.8. Drilling schedule and milestones

A timeline outlining the sequence of drilling operations, including key milestones and targets for completion of each stage of the drilling program is presented in table 5.

4.3.3.9. Quality Assurance and Quality Control

Procedures will be in place to maintain the quality and integrity of drilling operations, including regular inspections, testing, and monitoring of equipment and processes in accordance with SGBU-GEN-OPS-0026 Quality Assurance and Quality Control Standard.

4.3.3.10. Environmental and baseline survey

An Environmental Baseline Survey (EBS) study was conducted in February 2025 which included water quality, sediment quality, and marine fauna. The EIA data obtained will inform the EIS, EMP and the monitoring program. The Scope of Environmental Baseline Study was approved by ANP in September 2024.

The primary objective of the EBS was to gather comprehensive baseline environmental data to enable effective post-drilling monitoring and impact assessment. The EBS identifies and documents baseline conditions for water quality, benthic habitats, and sediment characteristics near the well site to assess potential impacts from drilling activities.

Environmental quality monitoring is planned to be carried out during drilling to understand if any changes are seen in environmental parameters of water quality, benthic habitats, and sediment characteristics near the well site. The anticipated monitoring program during the drilling phase will include representative sampling of the EBS locations and associated testing.

4.3.4. Drilling Plan Summary

The planned sequence of operations is presented in the estimated project execution timeline detailed operation breakdown for appraisal well drilling in table 5.

The planned sequence of operations is:

- Mobilize the jack up MODU to the Chuditch-2 well location. Position, pre-load and jack up to the planned air gap height above MSL. Skid out cantilever and prepare for well spud.
- Drill 17½" hole combined with Measurement While Drilling (MWD / Logging While Drilling (LWD)) to planned section Total Depth (TD) using Sea Water, pumping 50bbls Hi-vis sweeps every half stand. At section TD, the hole will be circulated clean and displaced with 9.5ppg Potassium Chloride (KCL) / Polymer mud prior to running casing. The Remotely Operated Vehicle (ROV) will be launched to monitor for gas bubbles and returns to seabed.
- Run 13⅜" casing with the compact housing off). Install casing clamp, activate the tensioning unit and land the casing string on the tensioning unit. Cement 13⅜" casing with full bore cement head. Disconnect compact housing running tool. Retrieve and layout the casing landing string. Install Blow Out Preventer (BOP) adaptor/BOP and pressure test connection between BOP and compact housing (The full BOP test will have been conducted offline). Run wear bushing.

- Make up and Run In Hole (RIH) 12¼" Bottom Hole Assembly (BHA) to tag cement. Drill out the 13⅜" shoe track and 3m into new formation and conduct Formation Integrity Test (FIT).
- Drill 12¼" hole c/w MWD/LWD to well TD using SBM with mud weight in the range of 9.5-9.8ppg (TBC). At the TD of well, circulate hole clean and Pull Out Of Hole (POOH) for logging.
- Wireline logging will be performed over the 12¼" open hole section as per program.
- A 9⅝" casing string will be run and cemented in place; top of cement will be placed at 100m above 13⅜" shoe. Disconnect 9⅝" casing hanger running tool and layout landing string. Run and install 9⅝" pack-off assembly inside the compact housing and pressure test.
- Run wellbore clean out tools. Clean and circulate well until clean including BOP ram cavities. Displace well to NaCl packer fluid. POOH.
- Rig up wireline. Run Cement Bond Log (CBL) tools and POOH. Rig down wireline.
- Run guns and DST string. Set DST packer and pressure test. Fire the guns and perform well testing as per program.
- Kill the well and pull DST string.
- Set cement plugs, cut casing and recover wellhead/BOP for the well abandonment as per the program.
- Prepare for the MODU move off location.
- Demobilize the MODU.

Table 5 Estimated project execution timeline and operational breakdown for drilling

Operation	Type	Number of Days
Mobilization	Move	2.5
Pre-Loading / Rigging Up	Move	5.6
17½" Hole section	Drill	3.6
13⅜" Casing	Casing	1.9
18¾" BOP	BOP	1.0
12¼" Hole section	Drill	6.3
12¼" OH Logging	Log	3.8
9⅝" Casing	Casing	2.3
9⅝" CH Logging	Log	0.4
Well Clean-up	Clean-Up	1.4
Well Perforating / Testing	Test	6.6
Abandon Well	Plug	3.4
Rigging Down / Jack Down	Move	2.6
Demobilization	Move	2.6
Duration in Total	Approximation	**44.0**

Figure 7 Number of days per activity and cumulative days

4.3.4.1. <u>Well testing</u>

The DST is intended to assess the commercial viability and potential of the hydrocarbon reservoir and specifically to determine the productive capacity, pressure, permeability, and extent of the reservoir. It is usual that in the event of the presence of sufficient quantities of hydrocarbons a temporary drill stem test string may be run and the well fluids flowed to the surface and processed using a surface well testing package that involves the hydrocarbons being flared to the atmosphere.

SGBU plans to perform a DST on the expected gas-charged Plover reservoir interval in the Chuditch-2 appraisal well. The DST is currently being designed and will be integrated into the overall well design by the SGBU well test engineer. The DST package consists of two horizontal burner booms, one each to port and starboard of the jack-up MODU, with dedicated gas lines complete with an ignition system to avoid 'dropout' during ignition for flaring gas and separate burner heads complete with ignition system for burning oil/condensate on each boom.

A standard three phase separator rated at 1,440psi, complete with oil, gas and water outlets capable of handling 75mmscf/d of gas and 6000bopd will be used. A full suite of 2.25" ID, 10K DST of downhole test tools including the following:

- retrievable packer.
- tubing test valve.
- safety valve.
- sample carrier.
- downhole shut-in tester valve.
- single and multi-cycle circulating valves.
- gauge carriers.

These together provide isolation, tubing testing, downhole safety closure, downhole shut-ins for pressure build up, circulation, sampling and memory gauge conveyance.

The two DST gauge carriers will be run in the DST string with 2/4 x electronic pressure / temperature memory gauges in each carrier. All gauges will be linked to surface through the acoustic SRO system which gives real time bottom hole data read out throughout the DST. A full-bore DST sample carrier will also be deployed complete with bottom hole samplers. These samplers will be activated by applying a predetermined annulus pressure.

A subsurface, hydraulically controlled safety valve will be located in the MODU BOP, where the BOP is close around a slick joint on the tool, allowing annulus pressure to be controlled via the MODU pumps through the MODU choke and kill lines, giving the required pressure for the downhole tool operations.

A thermal flow monitoring system will also be run along the length of the perforated interval, attached to the perforating guns and linked to the surface read out system, allowing real time monitoring of the flowing temperature profile of the perforations during DST operations.

Sufficient methanol will be brought onto the jack-up MODU to mitigate the potential for hydrates formation.

In general, drill string testing entails taking measurements while flowing hydrocarbons to the surface and flaring and is a primary source of critical data for the reservoir model and the principal means by how reservoir engineers adjust reservoir model parameters, understand the reservoir and employ the knowledge gained to optimize future completion and development strategies.

During testing, operators measure formation pressure, characterize the formation fluids and reservoir and determine permeability and skin (damage to the formation incurred during drilling or other well operations). Data that indicate how the formation reacts to pressure increases and decreases during a test can also reveal critical information about the reservoir.

Once TD has been reached, the well logged (noting in particular the gas water contact) and casing run and cemented, well testers will rig up the well test package. A test string complete with tubing conveyed perforating guns and test packer will be run to a pre-determined depth and the packer set to isolate the zone to be tested, ensuring that the perforation location avoids formation water production, as is reasonably practicable. Guns are then fired and the formation perforated. The well is flowed at different rates through a choke valve and surface equipment which can be adjusted to control the flow rate precisely and provide positive well control.

Reservoir fluids produced to the surface are sent directly to a separator/surge tank, designed to function as storage/separation for produced liquids and gases until contaminants such as drilling fluids are eliminated, or at least minimized, from the flow stream.

On the Chuditch-2 well, three clean-ups flow are programmed and produced gases and fluids including produced water will be redirected to the test separator where bulk fluids are separated into oil (if present), condensate, gas and water. The separator also facilitates the separation of any debris, such as sand and other material from the flow. The liquid wastes and liquid fraction of the PFW will then be processed through the MODU oily water separator prior to discharge overboard. The bulk solids and slops from liquid and PFW streams in both the separator and oily water separator will be retained onboard and shipped back to shore for disposal in accordance with the waste management plan. Failure of the rig's oily water separator would result in the cessation of discharge of PFW and the retainment of oily water until the oily water separator is functioning in accordance with the MODU Procedures and manufactures specifications.

During the DST, reservoir fluids are produced to the separator at varying rates according to a predetermined schedule. Apart from clean-up flows, well testing will include build up, drawdown and Absolute Open Flow (AOF). The AOF refers to the theoretical rate at the limit at which the well would flow if backpressure on the sand-face, or the borehole wall, were zero.

Note the maximum capacity of the well test choke and system is 50mmscf/d, which will limit the AOF to the maximum flow rate of the test package. The minimised flaring plan anticipates a total flare time of approximately 31 hours. Table 6 provides estimated flow periods and produced volumes.

Table 6 Estimated flow periods and estimated produced volumes

Period	Duration Hours	Gas Rate MMSCF/D	CGR BBL/MMSCF	Estimated Gas Volume MMSCF	Estimated Condensate Volume BBL	Notes
Initial flow	1	0	0	0	0	Shut it when gas to surface
Clean-Up Flow	8	40	4	13.33	53.33	
Multi Rate Flow #1	6	10	4	2.5	10	
Multi Rate Flow #2	6	25	4	6.25	25	
Multi Rate Flow #3	6	40	4	10	40	
Sampling Flow	2	10	4	0.83	3.33	
Maximum Flow	2	45	4	3.75	15	
Total Cumulative Volumes				36.67	146.67	

4.3.4.2. Cement Program

Cementing is an important aspect of drilling hydrocarbon wells as the cement is used for a variety of purposes including to secure and support casing strings, isolate zones for production purposes and solve various hole problems. In the cementing process, cement is used with a variety of additives that act as accelerators/ retarders/ density adjusters and fluid loss additives, etc. An outline of the proposed cementing program is detailed in table 7.

Table 7 Proposed cementing program

Hole Size (in)	Casing Size (in)	Shoe depth (MD RT)	Slurry	Density (PPG)	TOC	Cement Type *	Excess (%)	Comment
17½	13⅜	1,650	Lead and Tail	12.0/15.8	250m Tail. Lead: Seabed	Class G	200	
12¼	9⅝	3,010	Lead and Tail	12.5/15.8	350m Tail. Lead: 100m above previous shoe	Class G blended	20	Including additives for gas tight and CO2 anti corrosion for Tail slurry
8½ Contingent	7	3,010	Single	15.8	Top of Liner hanger	Class G Blended	15	Same as tail slurry of 9⅝" casing.

* Class G cement is a specialised, API Specification 10A compliant Portland Cement designed for oil and gas well cementing and is primarily used from the surface to depths of 2400 meters.

This illustrated cementing program is for technical guidance only. The final slurry designs for each casing size will be based on tests utilizing MODU cement and water samples, recorded temperatures or other means of determining accurate bore hole pressures, temperatures, final shoe depths, callipered hole volumes, etc. The final cementing program will be issued to the MODU prior to each individual cement job. Any excess cement on the rig and boats will be returned to shore in Darwin.

The planned cementing programs are:

- 13⅜" casing will be cemented by full bore cement head c/w 12.0 ppg Lead and 15.8ppg Tail slurry with Top Of Cement (TOC) at seabed.
- Spacer for WBM shall be pumped prior to releasing bottom plug to improve cement quality.
- 9⅝" casing will be cemented by full bore cement head c/w 12.5ppg Lead and 15.8ppg Tail slurry with TOC at 100m above 13⅜" shoe.
- As the static bottom hole temperature is more than 110°C, Class G cement blended with silica will be used. Also, as the isolation of reservoir interval is required, the tail slurry will include gas block additives and CO2 anti-corrosion additives.
- Spacer for SBM shall be pumped prior to releasing bottom plug to improve cement quality.

4.3.4.3. Cement plug program

Cement plugs are to be set for isolation of perforation zones in 9⅝" cased hole. A slurry at 15.8ppg shall be utilized for all plugs.

In general, the blended cement will be used for the deep plugs. However, this type of cement can be used for the shallow plugs to avoid loading new cement.

The maximum length of cement plugs to be set is 200m which will minimize the risk of cementing-in the stinger due to the extra time taken to pull slowly out of the plug.

After plug is in place POOH slowly (30-50ft/min) and break connections carefully to avoid stripping plug. Any delays shall be avoided as usually the slurry is designed with a short pump time to improve strength development.

Prior to testing a plug (tagging or pressure testing), time should be allowed for it to develop sufficient compressive strength of at least 500psi.

4.3.4.4. Chemical Usage

Various drilling chemicals are added to the mud as it is mixed on the MODU in order to provide specific properties for drilling at different depths, through various rock types and reactive clays. The density of the mud will be monitored and adjusted to match the downhole conditions and maintain a 150psi overbalance. The drilling mud is stored in dedicated tanks within the drilling unit.

A summary of the types and quantities of current estimate based upon use of WBM in 17½" hole section and SBM in 12¼" hole section the mud chemicals for consumption is provided in table 8. The basic formulation for mud is lime, montmorillonite / bentonite, caustic soda, and barite, none of which are considered toxic. Additives including a bactericide and hydrocarbon based defoamer are used in small amounts to prevent environmental impacts. Chemical use will be dependent on downhole conditions.

Table 8 Mud Chemical consumption summary

Water Based Mud: 13646 bbls	**25Kg Sack**	**Maximum Volume**
Bentonite		161 (MT)
Soda Ash	46	
Caustic Soda	46	
Xan-plex D	110	
Potassium Chloride		2 (MT)
Mil-Pac LV	6	
Barite		2 (MT)
Synthetic Based Mud: 4017 bbls	**25Kg Sack**	**Maximum Volume**
Saraline 185V		1434 (bbls)
Carbo-Mul HT		3300 (gallons)
Carbo-Gel	505	
Lime	467	
Delta FL ST	267	
Calcium Chloride		27 (MT)
OMYA-Carb 10	377	
OMYA-Carb 20	377	
Barite		61 (MT)
Brine: 4000 bbls	**25Kg Sack**	**Maximum Volume**
Sodium Chloride		96 (MT)
Brine-Pac XTS		150 (gallons)
Mil-Bio Sea 98		150 (gallons)
N'Oxygen XT	4	
NX Clean-up A+		5000 (litres)
Xan-plex D	17	

4.3.4.5. Plug and abandonment

Once the DST is completed, the well test equipment is rigged down and back loaded. Upon completion of drilling activities, the well will be plugged and abandoned where a bridge plug, or a high viscosity pill, will be installed to ensure that higher density cement does not fall in the wellbore. The bridge plug or pill would be set and cement pumped on top through the drill pipe and then the drill pipe withdrawn before the slurry thickens.

The well will be abandoned as per an approved abandonment program which will detail depth and length of cement plugs and requirement for pressure or weight testing of same. Finally, the casing is cut below the mudline and pulled to surface

Once the well is secured for abandonment and all equipment retrieved, the MODU will be prepared for moving to the next location.

4.3.4.6. Post well survey

The ROV will be deployed and conduct a post well survey in the vicinity of the well to ensure no dropped equipment or other object is left on the seabed. Video transects are downloaded to a separate storage device and made available for use in post project environmental monitoring if required and/or used in environmental monitoring reporting.

4.3.4.7. Rig Down and MODU Move

The jack-up then down rigs equipment, jacks down to the water and retracts the legs in a pre-planned sequence. The tow vessel takes tension on the bridle and moves the jack-up MODU off location.

4.3.4.8. Well control event

The Plover is a normally pressured formation. In the event of encountering shallow gas whilst drilling top hole, drilling into an unknown over pressured zone or equipment failure the jack-up MODU may encounter a well kick or loss of control resulting in either partial loss of down hole fluids or in a worst-case scenario total evacuation of the hydrostatic mud column and well bore fluids migrating to the surface. Risks are considered in jack-up MODU and equipment selection, and all scenarios are considered in well design and drill pipe, casing selection and BOP specification.

The well is prognosed to be an almost dry gas well with a small fraction of condensates (<4%) and approximately 18% CO_2. Modelling indicates a condensate release will remain offshore and disappear rapidly through a combination of evaporation, bioremediation and entrainment in the water column. The weathered residues of the condensate will comprise mostly straight chain normal alkane (n-alkane) commonly called “paraffin wax”. The paraffin wax residues in the condensate will always remain afloat as the product spreads out and thins while it weathers at sea. As the residual condensate increases in viscosity until the pour point is higher than the surrounding seawater, it will begin to form thin clear sheets and white crystalline pancakes. These waxy sheets will then break up into small white waxy flakes due to the action of the waves and wind over time.

Condensate hydrocarbons which cause most of the aquatic toxicity are usually smaller aromatic and soluble components (one and two ring aromatics) or poly aromatic hydrocarbons. The condensate is prognosed to be 82% by mass of volatile and semi volatile compounds, which are the compounds considered toxic. However, these compounds will evaporate rapidly on the sea-surface. Hence, the weathered residues of the condensate are considered to not have these components present at levels that would pose a significant aquatic toxicity risk.

The dry gas including CO_2 will rise to the surface and combine with atmospheric gases in the event of a subsea release and will not remain entrained in the water column.

4.3.4.9. Side track

Should the drill string become stuck in hole and efforts to free it are unsuccessful, it may be necessary to use either a shaped explosive charge or a specialised mechanical cutter to separate drill pipe above the stuck pipe.

After recovering remaining drill pipe above the stuck pipe, a contingency, which will be considered in the event of loss of the drill string, will be to run back in hole to a planned depth and kick off a side track and use directional drilling techniques to continue drilling to target. There is no additional impact to the environment in a side track other than operational duration being increased.

4.3.4.10. Unplanned anchoring

Should a supply vessel experience a loss of power or propulsion and be close to the MODU on the upwind side, it may be necessary to drop an anchor to halt drift. Vessels of the size to be employed for the project will have enough anchor chain and rode to allow a 3 to 1 scope. In water depths of ~68m the majority of the chain will remain off the seabed ensuring a minimized drag zone and impact to the seabed. Where safe and practicable to do so, any anchoring will occur in waters deeper than 70m, which are mostly devoid of live benthic habitats, so as to minimize potential impacts to the benthic habitats.

4.3.4.11. Diesel, Non-Aqueous Drilling Fluid, Synthetic Based Mud Spill

Spill modelling for realistic unplanned discharges to the environment show that in all modelled scenarios, diesel and Non-Aqueous Drilling Fluid (NADF) spills remain well offshore with a diesel spill remaining at surface level and weathering/evaporating within 5 days to a level where it is no longer visible to the naked eye. Modelled NADF similarly lost approximately 45% of total volume within a 5-day period. NADF at ~0.8 Specific Gravity (SG) is significantly lighter than sea water and thus remains at surface level where wind/wave/current and sun combined with high levels of biodegradation of the Saraline 185V cause the spill to rapidly disperse within a 5-day period (MuTek, 2024).

4.3.5. MODU Specification

SGBU will contract a jack-up MODU for the Chuditch-2 appraisal well program. The jack-up MODU is supported by three vertical legs, with spud cans designed to contact and penetrate the seabed and provide stability and support for the MODU. Impact to receptors from spud can interaction with the seabed will be transient and minimal.

Typical Drilling equipment is described in table 9 and expanded on in this section.

4.3.5.1. Mud Pumps

There will be three or four National Oilwell model 14-P-220 Triplex each with a continuous 2,200HP rating capable of operating at a maximum working pressure of 7,500Psi or of similar specification depending upon the MODU contracted.

Table 9 Typical high pressure mud system

Item	Output / Size	Detail
System working pressure	Psi	7500
System test pressure	Psi	7500
Mud pump quantity		4
Mud pump make		National Oilwell
Model		14-P-220
Type (Triplex/Duplex)		Triplex
Mud Pump drive motors/pump		2
Motor type		General Electric 752 Hi Torque Shunt Wound Motors
Continuous Power Rating	Hp	2200
Fluid End Type		Plungers
Maximum Working Pressure	Psi	7500
Test Pressure	Psi	7500
Max. Pump Speed	SPM	90
Working flowrate per pump		1155gpm @ 2660 psi – 514gpm @ 6000 psi
Liner sizes		5-9''

4.3.5.2. Mud Tanks

A typical MODU will have between 8 and 10 mud storage tanks, with a total capacity of 5000 bbls. Approximately half of this capacity will be for the active system with the remainder being reserve mud.

4.3.5.3. Shale Shakers

The rig will be equipped with four or five, high efficiency, liner motion shale shakers. The screen size will be selected at the minimum screen mesh size practical to minimize OOC (Oil-on Cuttings). OOC will be monitored closely whilst drilling / circulating operations are ongoing. Samples from all the solids control discharges will be taken, analysed and reported daily when drilling the 12¼" section.

4.3.5.4. Blow Out Preventer (BOP)

The rig will be equipped with a minimum 10,000psi rated, 18¾ inch high-pressure BOP. All appropriate components will be H_2S rated with sealing elements suitable for use in an SBM environment.

4.3.5.5. Engine and Generator Units

The MODU power generation system will typically consist of 5 Diesel fuelled internal combustion engines coupled to hi output alternators. The generation plant will be situated within the internal levels of the MODU structure where noise is negated by several compartments of varying size between the noise source and the exterior. The exhaust stacks emerge from the upper level of the MODU structure and hot exhaust gases are exhausted via tubular exhaust stacks high above workspaces in open air.

4.3.5.6. Solids Treatment Equipment

In addition to the MODU supplied shale shakers SGBU will install a centrifuge to further reduce drilled solids in the drilling fluid minimizing the amount of dilution required. As a function of the approval to employ the NADF Saraline 185 V, SGBU has committed to the discharge of 9.2% NADF by wet weight of cuttings or less for SBM contaminated drill cuttings averaged over the usage of SBM during drilling. Cuttings generated during operations are presented in table 10.

Table 10 Cuttings generated during Operations

Hole Diameter (Inches)	Casing Diameter (Inches)	Interval (mBRT)		Mud Type	Discharge Depth (mBMSL)	Cuttings Volume (m3)
		From	To			
17.5	13.375	109	1950	WBM	70	365
12.25	9.625	1650	3010	SBM	5	142

4.3.5.7. Drilling Fluid

This project will use both Water Based Mud (WBM) in the 17½" section and Synthetic Based Mud (SBM) when drilling the 12¼" section through technically challenging formations. The chemical selection and assessment process used for the appraisal drilling and well testing is in accordance with good oilfield practice. SGBU have a process for selection and evaluation and use of chemical substances including drilling fluid and cement additives to ensure the well integrity, formation compatibility, operational efficiency, and environmental safety throughout Chuditch-2 drilling operations.

Chemicals are chosen on the basis of efficiency in performance and environmental acceptance criteria. Wherever possible chemicals are chosen which are Centre for Environment, Fisheries and Aquaculture Science (CEFAS) Chemical Hazard Assessment and Risk Management (CHARM) Gold standard or CEFAS Offshore Chemical Notification Scheme (OCNS) E rated as least harmful to the environment and considered to be As Low As Reasonably Practicable (ALARP).

Should a specified chemical not meet ALARP acceptability criteria, SGBU may conduct a chemical-specific hazard assessment of the candidate chemical to determine its suitability for use. The Hazard assessment process will be documented and conducted in accordance with the Hazard Assessment process.

If a chemical is rated as equivalent to D through E, or colour banded as Silver or Gold the chemical shall be acceptable for use.

If a chemical is rated A, B, or C or colour banded purple, orange, blue or white, use of the chemical must be justified. When a candidate chemical is proposed for use in a drilling program and it is rated A, B or C or has colour banding of Purple, Orange, Blue or white in accordance with CEFAS CHARM or OCNS rating methodology, alternatives will be considered to eliminate or substitute the chemical.

If the chemical cannot be suitably eliminated or substituted and SGBU has determined the candidate chemical poses the lowest environmental hazard and is necessary to safe and efficient operation, SGBU will develop a written submission and justification which demonstrates to the ANP on the use and discharge of the candidate chemical will meet regulatory obligations and/or propose controls/mitigations must be in place in order to do so. The submission will include a chemical assessment that uses the ecotoxicity and environmental fate data to estimate the Hazard Quotient (HQ) of the chemical, which is the basis of the CHARM/OCNS ranking. This assessment will then be used to rank the chemical and choose the least harmful chemical that also meets technical specifications.

If the justification is acceptable to the regulator, the chemical is accepted for use. Should the justification not be sufficient for approval by the regulator, the chemical shall be rejected.

Once a chemical has been chosen, the quantity used, and its ultimate fate will be tracked. Its 'ultimate fate' could include such aspects as storage, discharge overboard, waste brought to shore, injection downhole or being left in the well, or it could be consumed in a chemical reaction. This 'material balance' will be calculated, where reasonably practical, using conservative assumptions if precise information is not readily available. (i.e., assuming any material otherwise not accounted for is discharged).

Water-Based Mud

Water-based mud (WBM) will be used to drill the 17½" hole from seabed to the 13⅜" casing setting depth (1,650m MDBRT) using seawater and hi-viscosity sweeps. The water-based mud volume to be discharged to the environment is approximately 2,170m^3.

The WBM will be seawater and high viscosity sweeps which contains bentonite, caustic soda, soda ash, drill water and Xan-plex D. The mix has a specific gravity of 1 to 1.14 and will be discharged at seabed.

Synthetic Based Mud (SBM)

The NADF to be used in the construction of the 12¼" section of the Chuditch-2 well will be Saraline 185V, an OCNS "E" rated substance. Saraline 185V was the subject of an application for use by SGBU granted by ANP on 19 July 2024. ANP reference ANP/HSE/S/24/106 - Approved for Offshore Discharge. The SBM volume to be discharged to the environment as oil retained on cuttings is approximately 99m^3 (20% over gauge hole).

Saraline 185 V is an 'E' rated (Lowest Environmental Hazard) product under the OCNS (Offshore Chemical Notification Scheme) and approved for offshore discharge in more than 40 countries due to its extremely favourable environmental profile. Table 11 details Saraline 185V Properties.

Table 11 Saraline 185V Properties

Property	Test Protocol	Result
Biodegradation		
Aerobic (Freshwater)	OECD 301F	75% after 28d (Readily biodegradable
Aerobic (Marine Water)	OECD 306	64% after 28d (Readily biodegradable)
Aerobic (Soil)	OECD 307	Half-life (DT50) = 21d (Based on 1000mg/kg initial dose)

Property	Test Protocol	Result
Water Column Toxicity		
Acartia Tonsa	PARCOM, ISO 14669	48h EL50:>1,000mg/L (non-toxic)
Skeletonema costatum	OSPAR/PARCOM	72h EL50:>1,000mg/L (non-toxic)
Mysidopsia Bahia	US-EPA 2001 40 CFR 435	96h IC50:>1,000,000ppm of 10% SPP (non-toxic)
Pagrus Auratus	US-EPA 2003	7d IC50:>100,000mg/L (non-toxic)
Daphina Magna	OECD 202	48h EL50:>1,000mg/L (non-toxic)
Brachydania Reria	OECD 203	96h LL50:>1,000mg/L (non-toxic)
Sediment Organism Toxicity		
Caraphium Valutator	PARCOM Protocol 1995 (A)	10d IC50>20,000mg/kg (wet basis)
Bioaccumulation Potential		
Octanol-water partition coefficient	OECD 117	Log Kaw>6.5 (not bio accumulative due to poor bioavailability)

Low Toxicity

Its linear structures result in low toxicity to fish, invertebrates and algae in the water column and sedimentary toxicity testing. Notably, Saraline 185 V does not bioaccumulate in marine organisms.

High Biodegradability

Saraline 185V is readily biodegradable in both marine water (OECD 306 test) and fresh water (OECD 301F test). Saraline demonstrated excellent bioremediation properties even considering onshore land farming methods as proven in studies in Bangladesh, China and New Zealand (Sanzone et al., 2016).

SBM consisting of Saraline 185V drill water, Carbomul HT, Deltaver, Carbogel, Deltalift, Carbotrol 375, lime, calcium chloride and barite will be used from the depth of 1,650m, in the 12¼" hole until TD is reached at approximately 3,010m MDBRT. Whilst in use The SBM will be circulated in a closed system and returned over the shale shakers.

The cuttings will be treated to a maximum of 9.2% wet weight, oil on cuttings before discharge overboard to the seabed from a discharge depth of 5m below MSL. Note: Only cuttings will be discharged. SBM will be separated from cuttings as the cuttings and mud move across the shaker screens, or through the centrifuge, and mud will be returned to the active system for re-use.

At the conclusion of the drilling project the total remaining volume of SBM will be returned to the service provider's onshore storage facility prior to MODU release. The SBM will then be recycled, reused, or resold. Table 12 provides physical properties of Saraline 185V and table 13 provides a comparison of Saraline 185V to Diesel and LTMO.

Table 12 Saraline 185V Physical Properties

Typical Properties	Saraline 185V	Remarks
Product Type	Synthetic Paraffin	Higher purity, consistent quality
Density @ 15°C, kg/m3	778	Under/ near balanced drilling
Flash Point, °C	85 - 93	Improved worker and assets safety
Viscosity @ 40°C, cSt	2.6 – 2.8	Higher drilling efficiency
Pour Point, °C	-30	Better cold flow properties

Typical Properties	Saraline 185V	Remarks
Aniline Point, °C	95	Enhanced elastomer compatibility, less non-productive time.

Table 13 Comparison of Saraline 185V to Diesel and LTMO

Property	Diesel	LTMO	Saraline 185V	GTL Advantages
Flashpoint °C	56-75th	70-115	85	Improved Safety
Aromatics PPM wt total PAHs PPM (Grimmer series)	$3x10^5$ - $6x10^5$ – 3000 (NA)	50-1000 (NA)	200 ~ 0.002 (<0.2 PPB	Lower toxicity, improved worker safety
BTEX, PPM	400 – 2500	Non detected	Not detected	Lower toxicity, improved worker safety
Density at 15°C, Kg/M^3	800 – 865	804 – 814	790	Lower mud density
Viscosity, eSt, 40°C	1.9 – 4.1	1.68 – 3.6	<2.8	Fast consistent drilling
Pour Point °C	-12	-27 to -20	-24	Good performance in harsh environments
Aniline point °C	61	72 – 91	94	Improved elastomer compatibility

4.3.6. Drilling Waste Management

The various waste streams that are likely to be generated from the MODU will include:

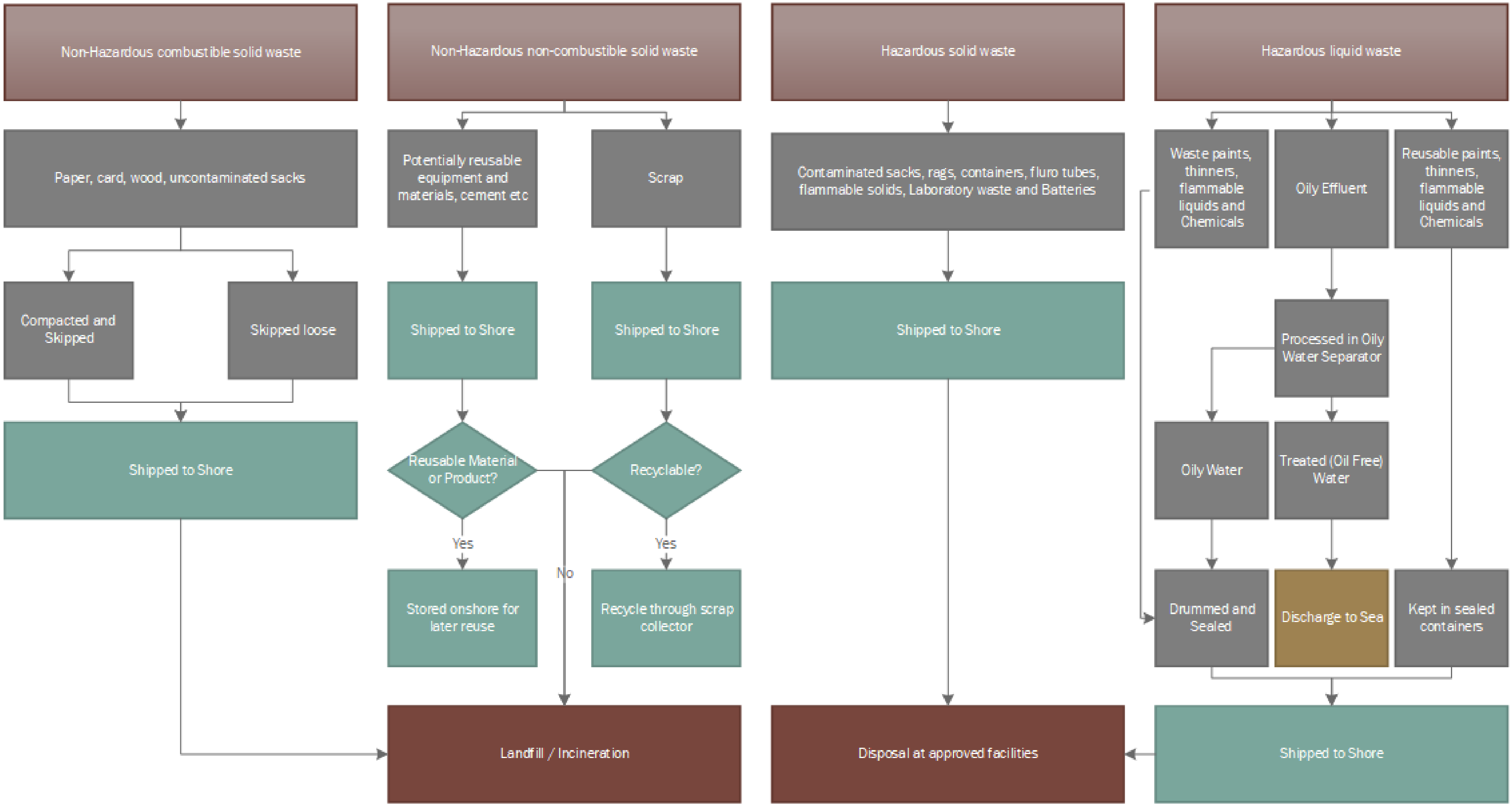
- Drill cuttings mainly comprised of shale, limestone, sand and clay.
- Waste WBM and SBM from drilling activity.
- Drilling wastewater as a result of washing the drilling cuttings. Silt and sand will contain chemical ingredients from the drilling fluid and needs treatment before discharge.
- Chemical and slops generated from the wastewater treatment and oily water separator.
- Hydrocarbons such as waste oil from oil changes and leakages from equipment. Used oil is designated as hazardous.
- Non-hazardous solid waste such as paper wood and plastics.
- Hazardous waste including hazardous ingredients such as fluid or testing chemicals and containers previously holding hazardous material.
- Biodegradable waste such as food scraps.
- Wastewater will be treated by the MODU waste disposal system and discharged into the sea after treatment. Excess water-based drilling mud will be pumped straight into the sea as the chemicals used are biodegradable, non-toxic and environmentally acceptable. In the case of hazardous drilling wastes, these will be collected, stored and transported ashore for disposal in accordance with the waste management plan.
- Used fuels and chemicals will be stored in containers in areas lined with impervious floors and surrounded by containment bunds on the MODU. Recyclable material will intermittently be transported to the supply vessel and materials include used filters, paper, cardboard, and plastic.
- Oily water will be treated by oily water separators and any overboard discharge from the oily water separators will be monitored by an oil-in-water monitor. By design, the overboard pump will automatically shut down if the concentration of oil in discharged water exceeds 15 parts per million (ppm) oil in water.

- Sewage treatment unit with vacuum collection system is installed on the MODU.

Waste management arrangements for Chuditch 2 are detailed in the SGBU Waste Management Plan (SGBU-GEN-HSSE-0012)

The MODU contractor will conform to MARPOL and other international standards for waste segregation and management. Figure 8 provides a flow diagram for a typical waste management process which is typical and representative of a MODU waste management process. The project EMP and the Waste Management Plan will provide details of the waste management process to be implemented for the Chuditch 2 well.

Figure 8 Representative Jack Up Waste Management Plan



4.3.6.1. Drainage System

The drainage system on the MODU provides controlled contaminated water collection and treatment system with dedicated discharge points as a means of reducing the likelihood of uncontrolled discharge of contaminants into the environment to a level that is ALARP.

At the helideck, an effective drainage system is important to prevent water and aviation fuel ponding on the landing surface. Therefore, the helideck on the jack up MODU is designed to always remain free from standing water and fuel accumulations. It is facilitated with gutter and drip trays to prevent spilled or leaked materials from entering the water. The drains will be penetrated by a valve and will be discharged overboard directly. The contaminated water will be collected in a catch tank and transferred to the portable container.

At the main deck, deck drain will capture various fluids and other materials that are spilled or washed onto the deck. In order to prevent the uncontrolled discharge of the deck drain, a perimeter drain system and separate drainage systems for each process area are in place to funnel fluids etc. to the deck drainage system. Fluids collected by deck drains will be filtered prior to discharge and the contaminated water will be stored in a ‘slops’ holding tank and pumped to a supply vessel for discharge and processing at an authorised and appropriately certified waste management station.

The heavy machinery and equipment area is equipped with pollution drip pans i.e. rotary table drip pan, draw-works drip pan, etc. The drainage from this area is collected via drip pans under the MODU floor and directed to the slops tank before being treated by a separator tank. In term of the mud process area, the drain is directed to a drain sump for treatment. All of the contaminated water and pollutants from these two areas will be finally transferred into a mud contaminated drainage tank, fluids treated to MARPOL standard will be discharged overboard.

4.3.6.2. Jack Up Effluent Management

During operation, measures aimed at minimizing harmful effects to the receiving environment will be put in place in regard to controlled discharge of liquids such as drilling fluids and cooling water from the vessel and MODU. Discharge limits/guidelines as stipulated in MARPOL have been adopted for screening criteria for the Chuditch-2 Appraisal well project.

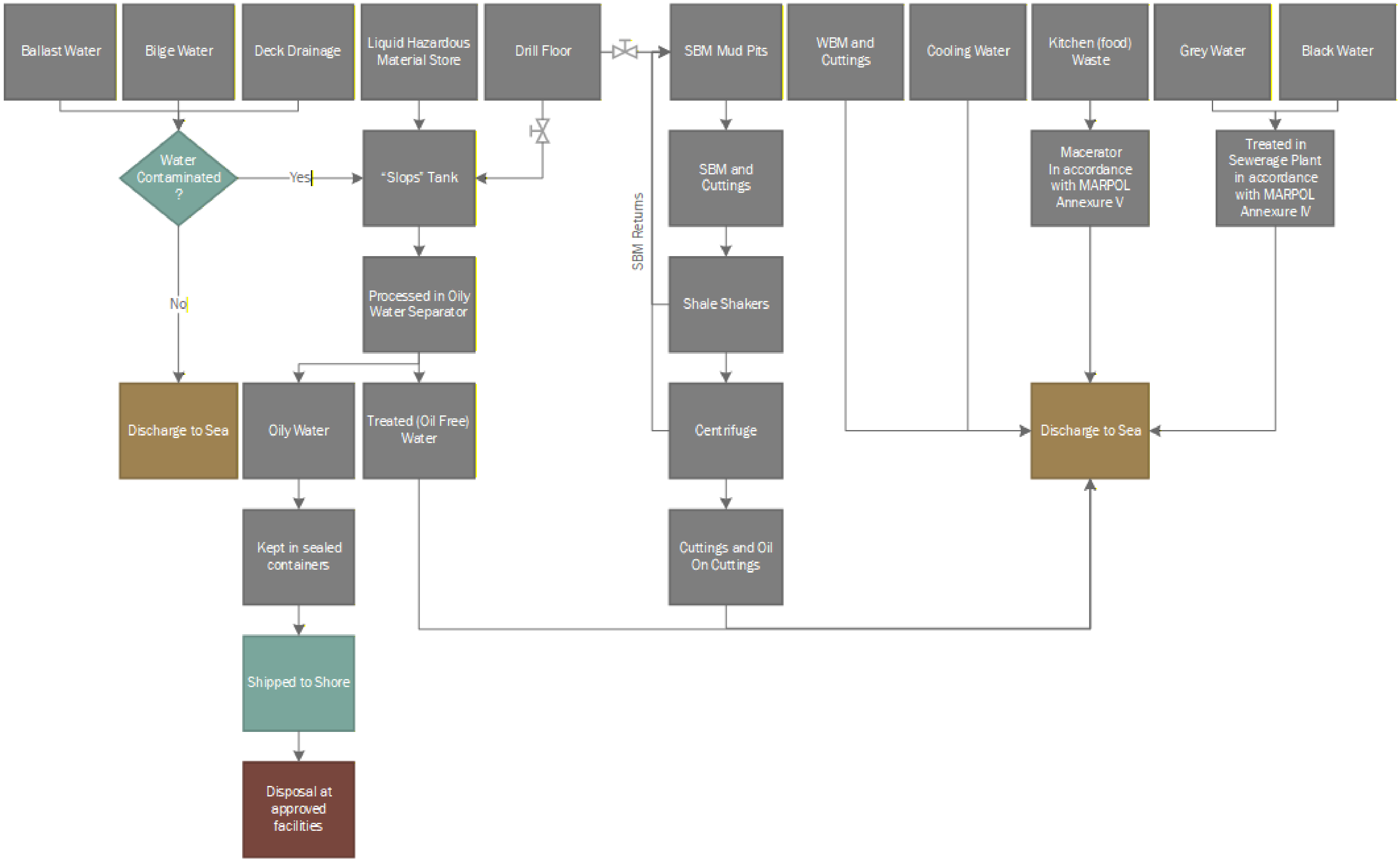
All liquid discharges will be in accordance with the applicable MARPOL requirement or other applicable standard such as World Bank EHS Guideline for Offshore Oil and Gas Development. Hazardous materials such as chemicals and used oil will be segregated and transferred back to shore for treatment, recycling and disposal.

Oily/contaminated water will be routed to the oil/water separator and treated to separate the oil which will be transferred to the waste oil tank for transfer to shore for recycling/disposal. Contaminated water will then move to the greywater treatment unit for further treatment before discharge. Grey and black water will be treated and discharged in accordance with MARPOL. MODU effluent management plan is given in figure 9.

Cleaners and detergents may have an effect on the environment. SGBU will ensure that all chemicals, cleaners and surfactants to be used offshore are approved by the ANP.

MODU wash, a widely used, non-hazardous liquid cleaner, is routinely employed on jack-up MODU’s and offshore vessels in the maintenance of apparatus and machinery as well as deck areas subject to contamination from crew boots, oil and other products. Wastewater from cleanup on the jack-up MODU will be captured by deck drainage and channelled to the oil/water separator where oily substances can be captured, treated, and managed to avoid marine environment contamination. Any chemicals or cleaning agents to be used in this regard will not violate environmental standards on safety or environmental harm and hence will not cause ecological effects.

Figure 9 Typical Jack Up MODU Effluent Management Plan



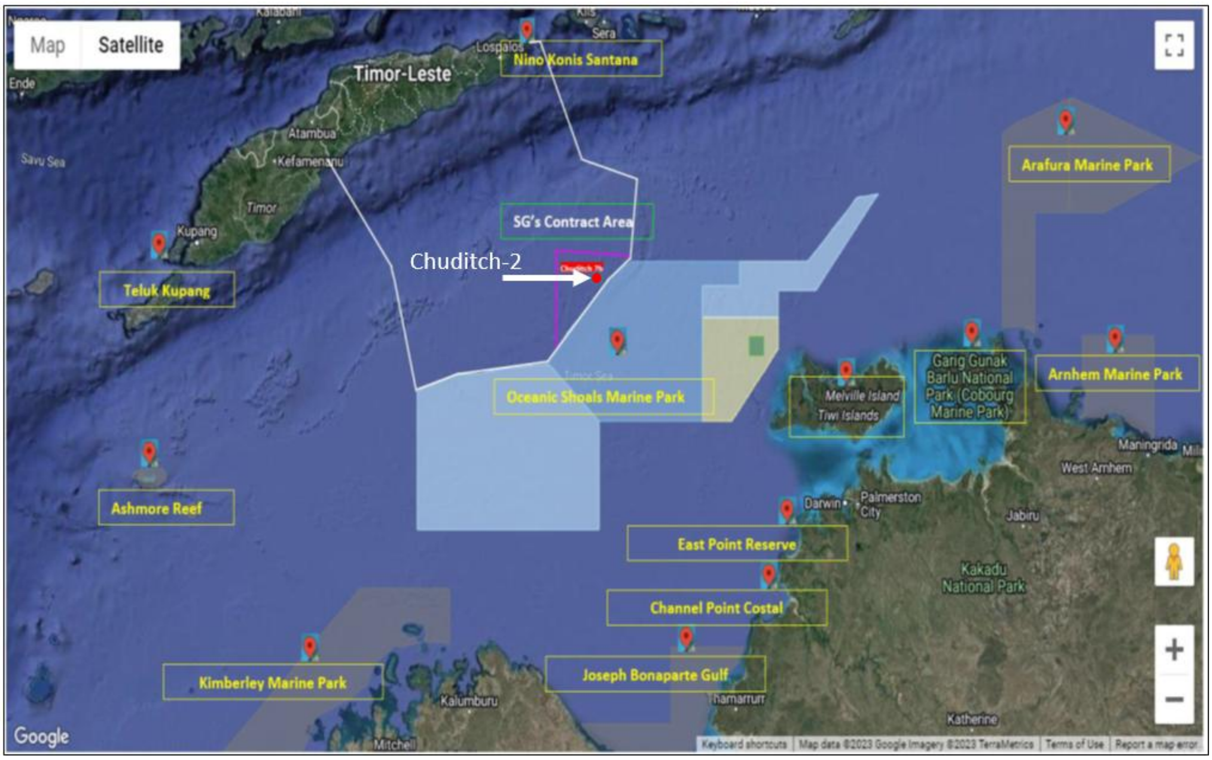
4.3.7. Project Size

The appraisal drilling of Chuditch-2 is located within the contract area PSC TL-SO-19-16 which is approximately 3,571km^2 in total size. The appraisal well is expected to be drilled to target depth of approximately 3,010m in the Plover Formation.

4.3.8. Project Location

The proposed surface location for Chuditch-2 well is 5.1 km east of the Chuditch-1 well in approximately 68m of water depth. The well is in Timor-Leste waters approximately 700m from the delineator between Timor-Leste and Australian Exclusive Economic Zones (EEZ). The Chuditch prospect is located approximately 145NM off the south coast Timor-Leste and part of the PSC-TL-SO-19-16 Production Sharing Contract area in the northern Bonaparte Basin. The Chuditch-2 field is located on the Sahul Platform in the Timor Sea, 80km southwest of Greater Sunrise and 140km east-northeast of Bayu-Undan. Figure 10 shows the location of the Chuditch-2 appraisal well in relation to the EEZ boundary and the Oceanic Shoals marine park.

Figure 10 Proposed Chuditch-2 Well Location in reference to EEZ and Oceanic Shoals Marine Park



4.4. Justification and need for the Project

The Petroleum industry has been identified as a key component in the Timor-Leste Strategic Development Plan (SDP) 2011-2030 for economic development to move the country from low-income to a middle-income nation. The revenue from the petroleum sector can contribute greatly to health care, education, and security of Timor-Leste's people. Additionally, the petroleum sector will be able to create opportunities for the people in Timor-Leste to improve their living standards through high-level employment as well highly skilled professional careers.

Human resources improvement and opportunities through training in geology, petroleum and chemical engineering, petroleum finance, and business and project management, as well as for operational staff will occur with development of the hydrocarbons sector.

Timorese with appropriate training and skills will be valuable in the petroleum industry, not only in Timor-Leste but in the Asia Pacific region and around the world.

This project will directly assist Timor-Leste in reaching the stated target in the SDP: The private sector will be the primary source of growth in incomes and employment for Timorese. Moreover, SGBU have signed with Government of Timor-Leste through MPRM the Memorandum of Understanding (MoU) of production for SundaGas to supply raw material/gas to the future LNG plant in Natarbora, Manatuto.

4.5. Proponents Endorsement of the EIS

The signed endorsement of the EIS is provided on page (ii) of this document, under the title 'Proponents Authorisation and Endorsement of the EIS' with the complimentary language:

"SGBU is committed to good Industry practice and has rigorously undertaken the Environmental permitting and approval process including the EIS and EMP documents. An EIS is one of the methods by which SundaGas demonstrates transparency and accountability in the planning and execution of an offshore project. Hence, SGBU endorses the contents of this report and will abide by all recommendations contained herein".

4.6. Structure of the EIS

This EIS document is in principle, a proposal for protecting the environment, preventing, minimizing and remedying the effects of pollution, and other environmental harms to receptors and stakeholders from the petroleum operations as stipulated in the relevant Environmental Legislation in section 5 of this EIS. The EIS is prepared in accordance with the template provided in Annex 4 of the Diploma Ministerial No.46/2017. Accordingly, the contents of the EIS will be structured as follows:

1 Executive Summary
2 Details of the Project Proponent
3 Details of the EIA consultants
4 Project Description
5 Policy, legal and institutional framework
6 Description of the environment
7 Climate change
8 Alternatives
9 Impact assessment and mitigation measures
10 Social impact assessment
11 Economic assessment
12 Summary of environmental management plan
13 Public consultation and information disclosure
14 Difficulties encountered
15 Conclusions and recommendations
16 Non-technical summary

5. Policy, Legal and Institutional Framework

This chapter identifies key environmental legislation relevant to this Project and is not intended to provide an extensive legal review of the Project Proponent's obligations.

According to the scope of work, the EIA for this Project should be conducted in accordance with relevant environmental legislation, which includes:

- Regulatory approval of oil and gas development projects is undertaken by ANP under Decree Law No. 39/2022 1st Amendment of Decree Law No.5/2011 on Environmental Licensing which defines the environmental licensing system for public and private projects which are likely to produce environmental and social impacts.
- Government licensing (or approval) of the drilling campaign is required under Timor-Leste Decree-Law No. 39/2022 1st amendment of Decree-Law No. 5/2011 Environmental Licensing prior to the commencement of project operations on location.

As of November 15th, 2023, ANP approved the Project Document (PD) for the proposed Chuditch-2 Appraisal Well Project. Per the approved PD and aforementioned Decree-Law, the planned drilling campaign by SGBU on PSC TL-SO-19-16 is classified as a Category A development as it has "the potential to cause significant adverse impacts", and as prescribed in Ministerial Diploma 46/2017, requires a detailed EIA.

The EIA required under Timor-Leste national law is similar to an Environmental and Social Impact Assessment (ESIA) required for International Finance Corporation (IFC) Category A Projects. The required TOR was prepared to meet the Government of Timor-Leste requirements and IFC Performance Standards, to guide the preparation of the EIA in accordance with the project approval conditions. During the EIA process, data obtained from the baseline data survey and secondary data is used to prepare the EIS, EMP and environmental monitoring program for the project including mobilization, drilling, and demobilization.

SGBU will identify and assess the environmental and social risks and impacts of the drilling campaign, design and incorporate appropriate impact avoidance and mitigation measures into the project design, well construction and associated operations. This shall be done in accordance with:

- National legislation and regulations
- International Standards and Guidelines as applicable.
- International Conventions and Agreements as applicable.

The details of these laws, regulations, guidelines, action plans, agreements and conventions including their brief description and relevance to the project are shown in table 14.

Table 14 Applicable Timor-Leste Laws, Regulations, and International Standards and Guidelines.

Title	Description	Relevance to the Project	Compliance with the Provision
Timor-Leste Legislation and Regulations			
Constitutions of the Republic Democratic of Timor-Leste Article 61 (Environment).	The article specifies provisions for state including the proponent shall undertake to defend, and safeguard the environment recognizes the rights of all citizens to a humane, health and ecologically balances environment while also specifying the duty of everyone to preserve and protect the environment for the benefit of future generations.	Provides the basis for environmental protection and safeguarding in the Country.	SGBU shall comply with all relevant laws for environmental protection.

Title	Description	Relevance to the Project	Compliance with the Provision
Decree Law No. 39/2022 - the first alteration of the Decree Law no. 5/2011 about the Environmental Licensing.	The procedure for directing the environmental assessment, the review of application for environmental license, issuance and renewal of license. • Categorization of the project according to severity of the environmental impacts. • Procedures and information requirement for Category A project • Organization and composition of the review committee and its duties and responsibilities. • Specific provisions for public consultation and the protection of the traditional customs and cultural practices. The issuance of the decision by the Environment Authority on the review of the application and the rights of the project owner to appeal the decision.	Categorization of the project according to severity of the environmental impacts. Procedures and information requirement for Category A project Provides the Environmental Licensing procedure	Undertake all necessary steps, conduct studies and follow the procedures set in this Law especially obtaining the Environmental Licence for the proposed appraisal drilling project.
Decree Law No. 5/2016 – National System of Protected Areas (Appendix 1 – List of Timor-Leste Protected Areas).	The Decree Law defines the norms and principles for the creation of the national system of terrestrial and marine protected areas, for the classification of protected areas and for the approval of the applicable management instruments, according to the international best practices, in the matter, duly adapted the national reality, without forgetting the important role of community authorities and existing customs.	Defines for the protection of the terrestrial and marine protected areas	SGBU shall acknowledge in the EIS, those protected areas.
Decree Law No. 26/2012 on Basic Environmental Law	The Decree Law identifies the protection of the environmental life and wildlife protection, including the basic principles for the conservation, preservation, and sustainable use of natural resources in order to improve the quality of life of the local populations.	Defines sustainable use of natural resources, conservation and preservation of natural resources	SGBU shall prepare an EIS and EMP for the proposed activity.
Decree Law No. 6/2020 Legal Regime for protection and the conservation of biodiversity	The decree law sets a legal regime for the conservation of biodiversity, and the sustainable use of its component.	To protect and conserve the biodiversity, including marine species and their habitat around the drilling project.	SGBU shall conduct risk and impact assessment and design an EMP.
Diploma Ministerial No.45/2017 – Rules and Procedures of the Evaluation Committee for Project with Category A	The article specifies the importance of establishing rules and procedures for the evaluation committee for the management of the environmental evaluation process for projects in category A	Establishment of a committee in order to review the project that categorize into category A.	SGBU shall comply with this rule and procedure.
Diploma Ministerial No. 46/2017 -	The article specifies details requirement for Screening, Baseline Study, Term of Reference, EIA, EIS, and EMP including	Mandates requirements and obtaining approval for TOR, EIS, and EMP	SGBU shall carry out the detailed requirements in accordance with this

Title	Description	Relevance to the Project	Compliance with the Provision
Regulation on the Detailed Requirements for Screening, Scoping and TOR, EIS and EMP.	language to be used in the aforementioned documents and their minimum content requirement.		Ministerial Diploma No 46/2017
Diploma Ministerial No.47/2017 – Public Consultation Procedure and Requirement during Environmental Baseline Process	The Diploma Ministerial specifies the procedures and requirement of involvement of public and communities into different stages of the environmental assessment process through public consultation.	Specifies the procedures and requirement of involvement of public and communities into different stages of the environmental assessment process through public consultation.	SGBU shall follow the procedure and requirements to ensure the involvement of the public and communities at all stages.
Decree Law No. 59/2023 – Organic structure of the Ministry of Petroleum and Mineral Resources	Constitutional Article 33 (c) (Minister of Petroleum and Minerals) responsibilities item (o) Considering the complexity and technical expertise of the oil and mineral resources sector, conduct the respective environmental licensing procedures and approve the corresponding environmental licenses in that sector.	Provides a description of legal framework that empower Ministry of Petroleum and Minerals to issue environmental license.	SGBU shall apply for an Environmental Licence.
Decree-Law No.32/2016 Offshore Petroleum Operations	The decree law applies to all offshore petroleum operations, which is carried out in accordance with the law on petroleum activities, including the transport and storage of crude oil and natural gas, with a direct impact on any deposits. This decree law also sets the requirements, including the EIS, EMP, Environmental monitoring, and OSCP.	Sets the requirements, including the EIS, EMP, Environmental monitoring, and OSCP.	SGBU shall follow the requirements of carrying out an EIS, EMP, Monitoring plan and OSCP.
Labour Legislation Law No. 4/2012 – Timor-Leste Labour Code	The law describes the rights between employers and workers regarding the working hours, leaves, remunerations, compensations and health and safety welfare	Provides basis for the project proponent to set up a working condition and contracts between employer and employee and used during the project activities.	SGBU shall comply with the Labour Legislation Law No. 4/2012 – Timor-Leste Labour Code.
Government Resolution No. 27/2023 about the Ocean National Policy of Timor-Leste	The national policy intends to address the national marine issues, including pollution and climate change.	The drilling activity will take place in the Timorese water, and to find integrated approach based on the national policy to mitigate the drilling impact to the ocean.	SGBU shall ensure an integrated approach to mitigate any impact to the Ocean.
Decree-Law No. 39/2020 in Timor-Leste establishes the Maritime Authority System (SAM).	This law aims to create a coordinated institutional framework for maritime affairs, bringing together various entities with competencies related to maritime areas under Timor-Leste's sovereignty or jurisdiction.	Article 21 on COMAR operational level and coordination with relevant entities to respond to oil spills in Timor-Leste waters.	SGBU shall prepare an OSCP.

Title	Description	Relevance to the Project	Compliance with the Provision
International Guidelines, Conventions and Agreements			
IFC EHS General Guidelines 2007	The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice.	Provides general guidance on the application of good environmental practice.	SGBU shall follow these guidelines
IFC EHS (June 2015) guidelines for offshore oil and gas development.	The guidelines are industry specific for offshore oil and gas development and are designed to be used together with the General EHS Guidelines document, which provides guidance to users on common EHS issues potentially applicable to all industry sectors.	Provides guidance on the application of good environmental practice for offshore oil and gas development.	SGBU shall follow these guidelines
United Nations Convention on Biological Diversity (UNCBD)	The Convention on Biological Diversity (CBD) entered into force on 29 December 1993. It has 3 main objectives: 1. The conservation of biological diversity 2. The sustainable use of the components of biological diversity 3. The fair and equitable sharing of the benefits arising out of the utilization of genetic resources	Timor-Leste is a biodiverse and significant ecosystem with many endemic species. The country signed the convention in 2001. As the project could have impacts on the flora and fauna or risk to the loss of the biodiversity, it is fundamental principle for the project proponent to prevent or minimize the risk of biodiversity loss during the project implementation.	SGBU shall comply with these guidelines
United Nations Framework for Climate Change Convention (UNFCCC)	The United Nations Framework Convention on Climate Change (UNFCCC) provides a framework for intergovernmental efforts to reduce greenhouse gas emissions and adapt to the expected impacts of climate change. It also provides guidance to member states on developing and implementing national climate change strategies, incorporating both adaptation and mitigation actions. Timor-Leste became a signatory to the UNFCC in October 2006.	The project activities release GHG emissions which could be one of the contributing factors to the country's climate change issue. Minimization climate change risks by reducing the GHG emissions are an essential part of the project environmental objective and target. This convention is the principal guidance for the project proponent to prevent the air pollution and reduce the GHG emissions as much as possible	SGBU shall conduct an EIS and consider the ecology, flora and fauna
IPIECA Guideline	Social responsibility, application of good environmental practice. IPIECA is a not-for-profit association that provides a forum for encouraging continuous improvement in industry performance. IPIECA is the only global association involving both the upstream and	Provides oil and gas industry specific guidance on the application of good environmental practice.	SGBU shall follow Good Industry practice.

Title	Description	Relevance to the Project	Compliance with the Provision
	downstream oil and gas industry. It is also the industry's principal channel of communication with the United Nations. IPIECA develops, shares and promotes good practice and knowledge to help the industry and improve its environmental and social performance. This is done with the understanding that the issues that dominate the sustainable development agenda – climate and energy, environmental and social issues – are too big for individual companies to tackle alone. The industry must work together to achieve improvements that have real impact. IPIECA helps to achieve this goal.		
International Union for Convention of Nature (IUCN)	The international convention is an international organization focus on the nature conservation and sustainable of utilizing the natural resources. The IUCN works in the field to promote ecological conservation in order to ensure the sustainable development concepts.	Timor-Leste is a signatory member of the IUCN convention which has responsibility to protect its ecological components to ensure the economic sustainable development. Therefore, this project will identify all species categories listed under the IUCN red list which can be impacted by the project activities	SGBU shall follow these guidelines.
International Finance Corporation performance standards 1.	Performance Standard 1 – Assessment & Management of Environmental and Social Risks and impacts establish the importance of (i) integrated assessment to identify the environmental and social impacts, risks, and opportunities of projects including effective community engagement and consultation with local communities on matters that directly affect them, management of environmental and social performance throughout the life of the project.	Provides internationally recognized guidance on the conduct of EIA process	SGBU shall consider the IUCN convention
International Finance Corporation performance standard 3.	Performance Standard 3 - Resource Efficiency & Pollution Prevention- To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. To promote more sustainable use of resources, including energy and water. To reduce project-related GHG emissions.	Provides internationally recognized guidance on best practice to avoid / minimize environmental and social impacts, promoting reduction of GHG emissions	SGBU shall conduct EIS and EMP
International Finance Corporation	Performance Standard 6- Biodiversity Conservation and Sustainable Management of Living Natural Resources. Habitat is defined as a	Provides internationally recognized guidance on best practice to marine habitat protection and	SGBU shall follow these guidelines.

Title	Description	Relevance to the Project	Compliance with the Provision
performance standard 6.	terrestrial, freshwater, or marine geographical unit or airway that supports assemblages of living organisms and their interactions with the non-living environment. For the purposes of implementation of this Performance Standard, habitats are divided into modified, natural, and critical. Critical habitats are a subset of modified or natural habitats. To protect and conserve biodiversity. To maintain the benefits from ecosystem services. To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.	conservation of biodiversity in the planning of offshore projects	
WHO Air Quality Guidelines (AQG)	WHO Air Quality Guidelines (AQG) offer guidance on threshold limits for key air pollutants that pose health risks and provide a reference for setting air pollution targets at regional and national levels to improve air quality. Air quality guidelines have been published by WHO in 1987 and they were revised in 1997. The 2005 update represents the most current assessment of air pollution health effects, based on an expert evaluation of the scientific evidence. The guidelines offer recommended exposure levels for particulate matter (PM_{10} and $PM_{2.5}$), ozone, nitrogen dioxide and sulphur dioxide, as well as a set of interim targets to encourage a progressive improvement in air quality.	The air quality benchmark used as reference by the project proponent is the WHO air quality guidelines.	SGBU shall consider these guidelines in the management of air emissions.
Climate Change Kyoto Protocols. Government Resolution of National Action Plan for Climate Change	Kyoto Protocol is an international treaty which extends the UNFCCC parties commitment to reduce the greenhouse gas according to the scientific consensus. The protocol implements the objective of reducing the global warming potential gas in the atmospheres. The government resolution of national action plan for climate change (NAPA) is the first national document that identifies urgent and immediate climate change adaptation needs of the most vulnerable groups. It provides a starting point from which climate change adaptation can be mainstreamed into development plans as a key strategy for attaining sustainable development and poverty reduction (MDG, 2010)	Timor-Leste is the signatory party of the Kyoto Protocol which shall ensure the implementation of the protocol in order to reduce the GHG emissions.	SGBU will record the greenhouse gas emissions generated during the drilling of Chuditch-2.

Title	Description	Relevance to the Project	Compliance with the Provision
ANZECC & ARMCANZ (2000) – Australian and New Zealand Guidelines for Fresh and Marine Water Quality	These guidelines provide a summary of water and sediment quality parameters and their 'trigger values' to protect and manage environment of the fresh and marine water. Additionally, it provides advice on designing and implementing water quality monitoring and assessment programs.	The water and sediment quality parameters are adopted for the purpose of this project. The 'trigger values' are used as a benchmark for all the parameters used for environmental baseline survey as well as monitoring program.	SGBU shall note the requirements of this protocol.
United Nations Convention on the Law of the Sea, 1982 (UNCLOS)	The convention on the Law of the Sea lays down a comprehensive regime of law and order in the world's oceans and seas establishing rules governing all uses of the oceans and their resources. It enshrines the notion that all problems of ocean space are closely interrelated and need to be addressed as a whole. Coastal States have sovereign rights over the continental shelf (the national area of the seabed) for exploring and exploiting it; the shelf can extend at least 200 nautical miles from the shore, and more under specified circumstances	Relates to EEZ Governance and sovereign rights /National area of the seabed.	This law was considered in the development if the EIS.
London Convention on the Prevention of Marine Pollution by dumping of wastes and other matter, 1972 (London Convention).	The convention is an agreement to control pollution of the sea by intentional disposal at sea of potentially harmful materials	Any chemical inventories onboard the survey vessel will be adequately transported and stored in suitable containers to prevent accidental discharge to the sea.	SGBU shall comply with the convention.
MARPOL 73/78 – The international Convention for the Prevention of Pollution from Ships.	The international convention is the main convention covering prevention of pollution of the marine environment by ships/vessels from operation or accidental causes. The objective of this convention is to reduce the volumes of the harmful material entering marine environment. • Annex I – Regulations for the Prevention of Pollution from Oil • Annex IV – Regulations for the Prevention of Pollution by Sewage from Ships • Annex V – Regulations for the Prevention of Pollution by Garbage from Ships Annex VI – Regulations for the Prevention of Air Pollution from Ships	The survey vessel is required to comply with the provisions of MARPOL.	SGBU shall comply with MARPOL 73/78 convention for the MODU operations.

6. Description of the Environment.

This chapter is prepared using secondary, published information and according to the approved Terms of Reference (TOR) - Drilling Activities PSC TL-SO-19-16 dated November 2024, along with data and information from the Chuditch-2 Environmental Baseline Survey (EBS) Technical Report dated March/April 2025.

The Timor Sea and its tropical marine environment support significant and growing economic activity including oil and gas exploration. To reduce uncertainty in decision making regarding the sustainable use and ongoing protection of these marine resources, environmental baseline studies and data are important to describe the existing environment.

Timor Sea region is tropical with two distinct seasons having a dry season and monsoon season. These govern the climate, ecological and biological components. This section has used both secondary and primary environmental baseline data.

The approved EBS was conducted in February 2025 and the information gathered is considered while writing this section. The baseline conditions of the existing environment have thus formed the basis of valuable insight into the natural, ecological, economic, social, and cultural features of the project area. The description of environment is used while writing the possible impacts that may arise from the Chuditch-2 project which are considered crucial in writing the environmental management statement.

6.1. Physical Component

These elements focus on those aspects of the physical environment and considering how natural processes can relate to or be affected by the appraisal drilling project.

6.1.1. Climate

The Bonaparte Basin and Timor Sea region experience a tropical climate and distinct summer monsoonal 'wet' season from October to March and followed by a typical cooled winter 'dry' season from April to September. The two seasons go through a rapid transitioning, usually in April and September-October due to two major atmospheric pressure system affecting the region. These atmospheric pressures are the subtropical ridge of high-pressure cells and a broad tropical low pressure or Monsoon Trough.

The subtropical highs move from west to east across the Southern Indian Ocean in winter, and further South in summer, usually separated by low pressure troughs or cold fronts. The highs provide the driving force behind the Southeast trade winds which dominate the Timor Sea in winter months.

The Monsoon trough or Inter-Tropical Convergence Zone (ITCZ) is a broad area of low atmospheric pressure running East-West through the tropics in the summer months.

During the wet season the South-Westerly winds can generate thunderstorm activity, high rainfall and cyclones. While in the dry season the Easterly winds result in dry and warm conditions with very little rainfall (RPS, 2024)

There have been no major catastrophic climate incidents in the past years in the area of the Chuditch-2 appraisal drilling campaign nor is there any data to suggest the negligible and transient impacts to the receiving environment generated by the Chuditch-2 well activities will contribute to a measurable impact to climate change.

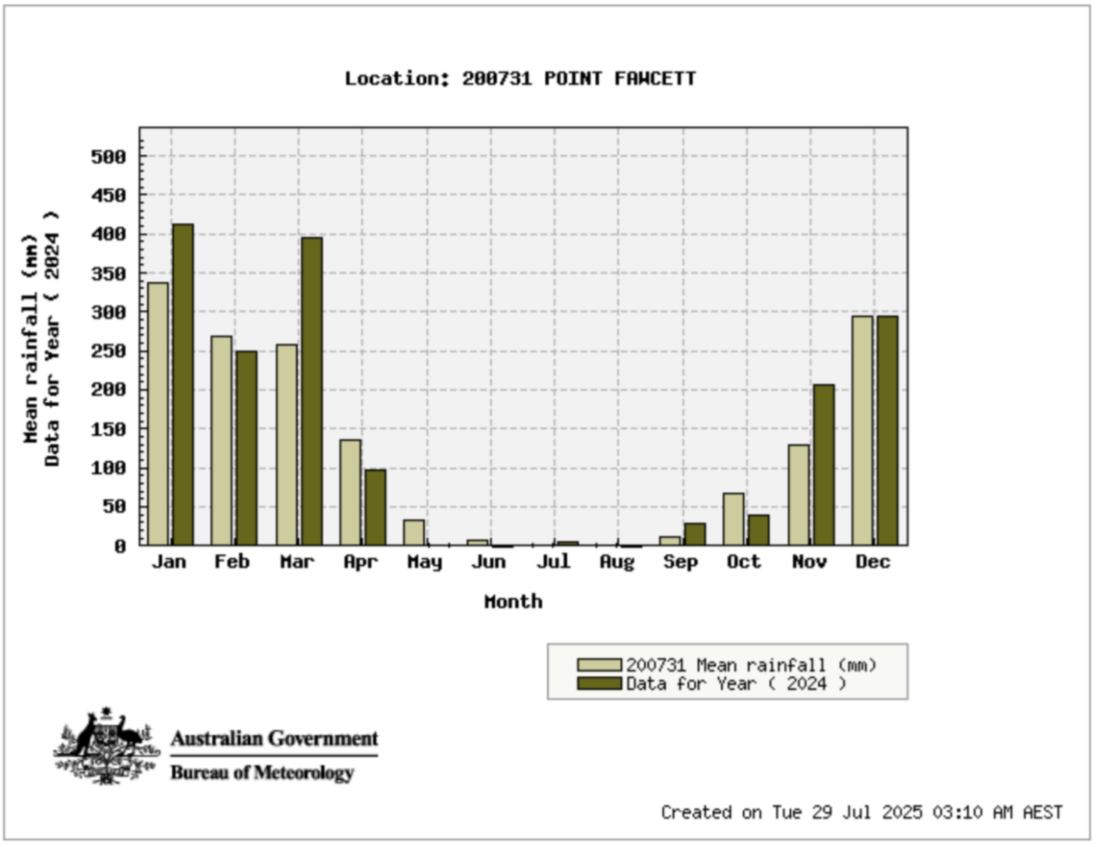
6.1.2. Rainfall

During ‘dry’ season (April to September), rainfall in the north is low to non-existent in most areas, although light showers are common closer to the coast in the southern waters of the Timor Sea.

During the wet season, the weather on the south coast of Timor-Leste is largely determined by the position of the monsoon trough, which can be in either an active or inactive phase. The active phase is usually associated with broad areas of cloud and rain, with sustained moderate to fresh north-westerly winds on the north side of the trough. Widespread heavy rainfall can result if the trough is close to or over land. An active phase occurs when the monsoon trough is temporarily weakened or retreats northwards. It is characterised by light winds, isolated showers, and thunderstorm (ADB, 2021)activity, sometimes with gusty squall lines.

Historical mean rainfall data for 1995 to 2025 and rainfall data for 2024 in Point Fawcett, Melville Island are shown in figure 11. The figure shows maximum annual rainfall of 337mm occurred in January and minimum annual rainfall of 0.5mm in July. High rainfall is associated with the Northwest Monsoon and low rainfall with the Southeast Monsoon. Heavy rainfalls are also associated with tropical cyclones and thunderstorm activity.

Figure 11 Mean Rainfall Data (1995-2025) and data for the year of 2024 in Point Fawcett (Source: BoM, 2025)



6.1.3. Oceanography

The main forces contributing to surface water movement in the vicinity of Chuditch Area are:

- General oceanic circulation.
- Astronomical tides.
- Wind stress.

Tides and Currents

The Pacific–Indian through-flow flows south through the Indonesian Archipelago and into the Eastern Indian Ocean bathing it in warm, relatively low salinity seawater. Figure 12 shows the regional synoptic-scale currents of northern Australia and the Timor Sea.

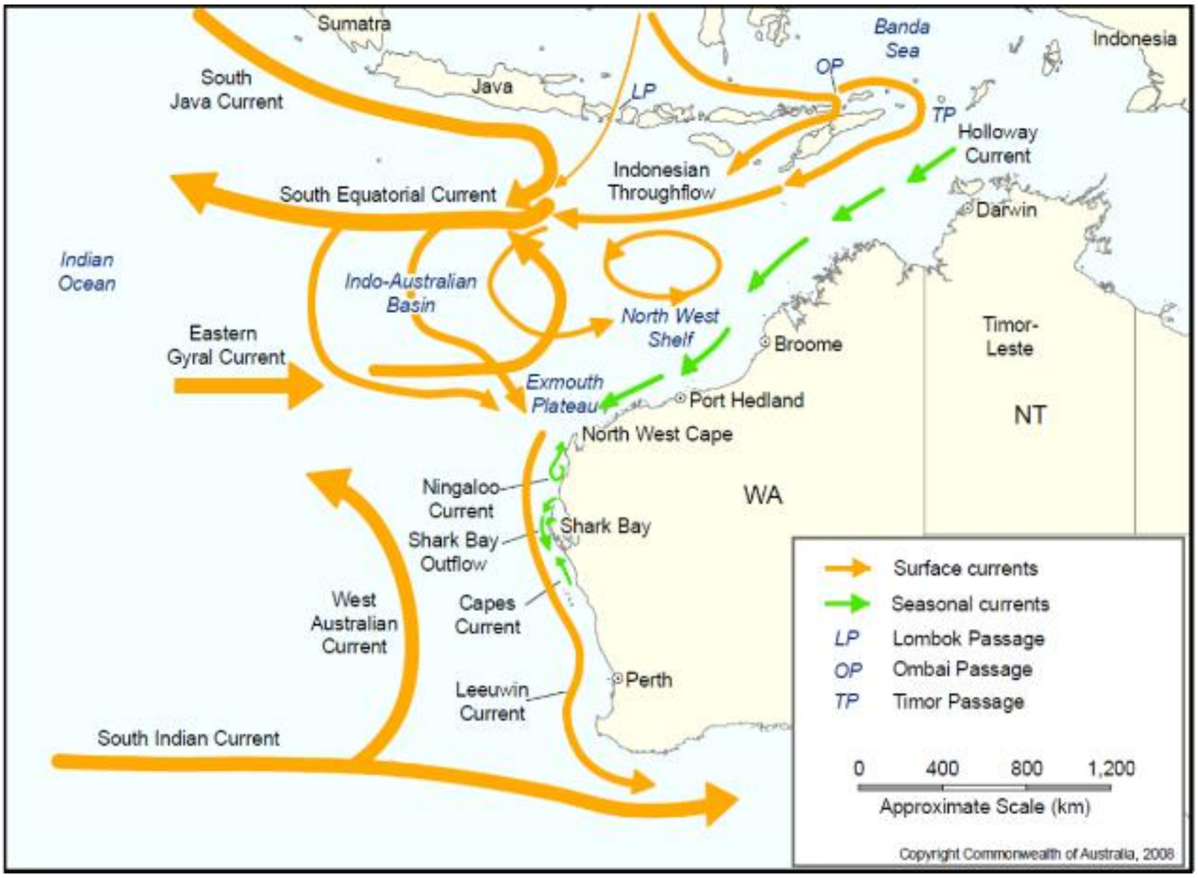
Within the project area, this may add a westerly component to the current regime. Current speeds vary depending on the season. Lowest speeds would occur in April at the end of the northwest monsoon when winds blow towards the Pacific whilst highest speeds would occur in September associated with the southeast monsoon (Wijffels et al., 1996).

The majority of water movement off northern Australia and the Timor Sea is poleward, with the water being relatively warm and low in nutrients (DEWHA, 2008). A strong seasonal wind regime is closely associated with seasonality in surface currents in the region, including the seasonal strength of trade winds in the equatorial Pacific Ocean which drive the Indonesian through-flow (ITF).

The Chuditch location is situated near the EEZ delineation between Timor-Leste and Australian territorial waters and experiences semi diurnal tides. Tidal ranges are large – 0.8m neap and up to 7m spring tides (RPS, 2018) and thus strongly influence currents in the region, notably, tidal amplitudes appear to be retained at long distances offshore and travel initially in a north easterly direction in the deeper waters of the region (RPS, 2018).

The tidal current component is imposed over the synoptic scale flow. In addition to the synoptic-scale and tidal currents, locally generated wind-driven currents also influence water movement within the area. These appear to be more variable and are superimposed over large-scale flows.

Figure 12 Regional synoptic-scale currents of northern Australia and the Timor Sea (Source: DEWHA, 2008).



Waves

The wave conditions in Chuditch-2 are influenced by the regional wind and ocean current system. The area typically experiences moderate wave heights of 1.5 to 3 meters. However, during the wet season, the waves increase due to the strengthening of monsoonal winds. Tropical cyclone swell will generate waves which propagate radially (roughly) out from the storm centre. Depending on the size, intensity, relative location, and forward speed of the storm, a tropical cyclone in the Timor Sea region can generate swell with a period of 6 to 16 seconds, in any direction, with heights reaching up to 10 meters or more.

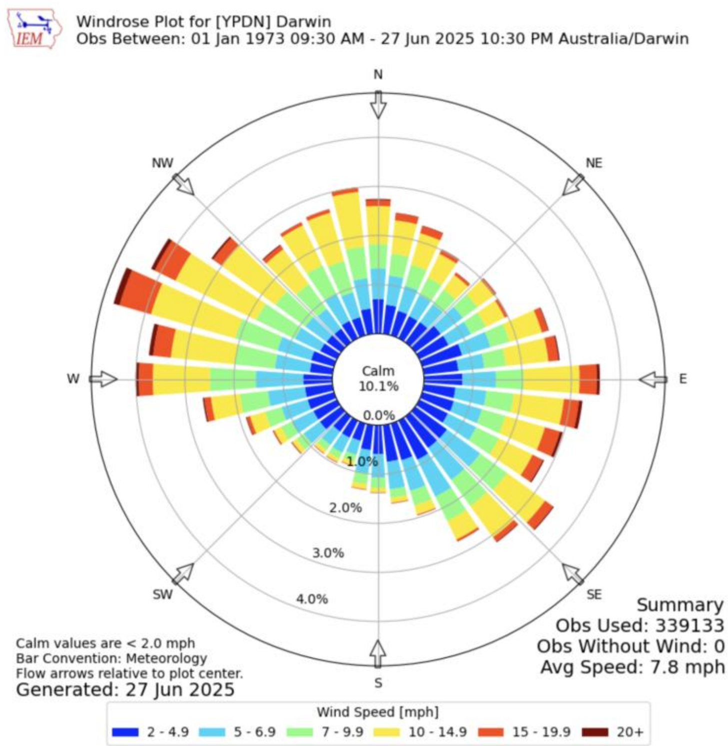
6.1.4. Winds

Based on the long-term climatology, the Timor sea is strongly influenced by the Australia-Asian monsoon cycle. In dry season (April to September) is characterized by steady northeast to southeast winds of 5 to 12m/s driven by the southeast trade winds over the Timor Sea. The 'wet' season (October to March) is characterized by northwest to southwest winds of 5m/s for periods of 5 to 10 days with surges in mean wind speeds of 8 to 12m/s for periods of 1 to 3 days.

During the transition season (September to October), with seasonal low-pressure systems sweeping across the Australian mainland West to East, the surface wind in the Timor Sea possesses a westerly component with a light wind of less than 5m/s. While during the transition season in April, the wind is charactered by southeasterlies for a period and then returns to northwest airflow (RPS, 2024).

The interannual variability of winds is closely linked to the El Niño-Southern Oscillation (ENSO), which exhibits a weak state during El Niño events and a strong state during La Niña events. (Wang et al, 2022). The IOD and ENSO are important anomalous climatic events in the Indian Ocean and Pacific Ocean. In the event where IOD and ENSO are cooccur the pacific force dominates the interannual variability. The wind speed and wind direction data were gathered from Darwin station as shown in Figure 13.

Figure 13 Summary of wind speed and direction from 1973 to 2025 at Darwin Station. Accessed on 27 June 2025 (Source: IEM, 2025)



6.1.5. Cyclonic Weather Systems

The Bonaparte Basin is prone to tropical cyclones during the wet season. Under extreme cyclonic conditions, 10-minute sustained wind speeds can exceed 205km/h with gusts reaching as high as 408km/h (Cyclone Olivia – Aus BOM, 1996).

Tropical cyclones develop in the Timor Sea in the northern wet season, usually forming within an active monsoon trough. Tropical Lows and Cyclones may also develop in the Coral Sea and move through the Torres Strait, usually as a tropical low or low range cyclone and may strengthen through the Gulf of Carpentaria region or in the Timor Sea (ABOM, 2024).

Heavy rain and strong winds, sometimes of destructive strength can be experienced along coastlines within several hundred kilometres of the centre of large cyclonic systems.

Most tropical lows and cyclonic systems pass through the area in a west or southwest direction before turning southwards.

Fully mature tropical cyclones range in size from 100km in diameter to 1,500km (Cyclone Justin 3/03/1997, Aus BOM). Tropical cyclones typically have a distinct life cycle of about 4 to 7 days although some category 1 systems briefly reach gale force while other systems can be sustained for weeks at various levels of intensity or degrade to tropical low status before reforming.

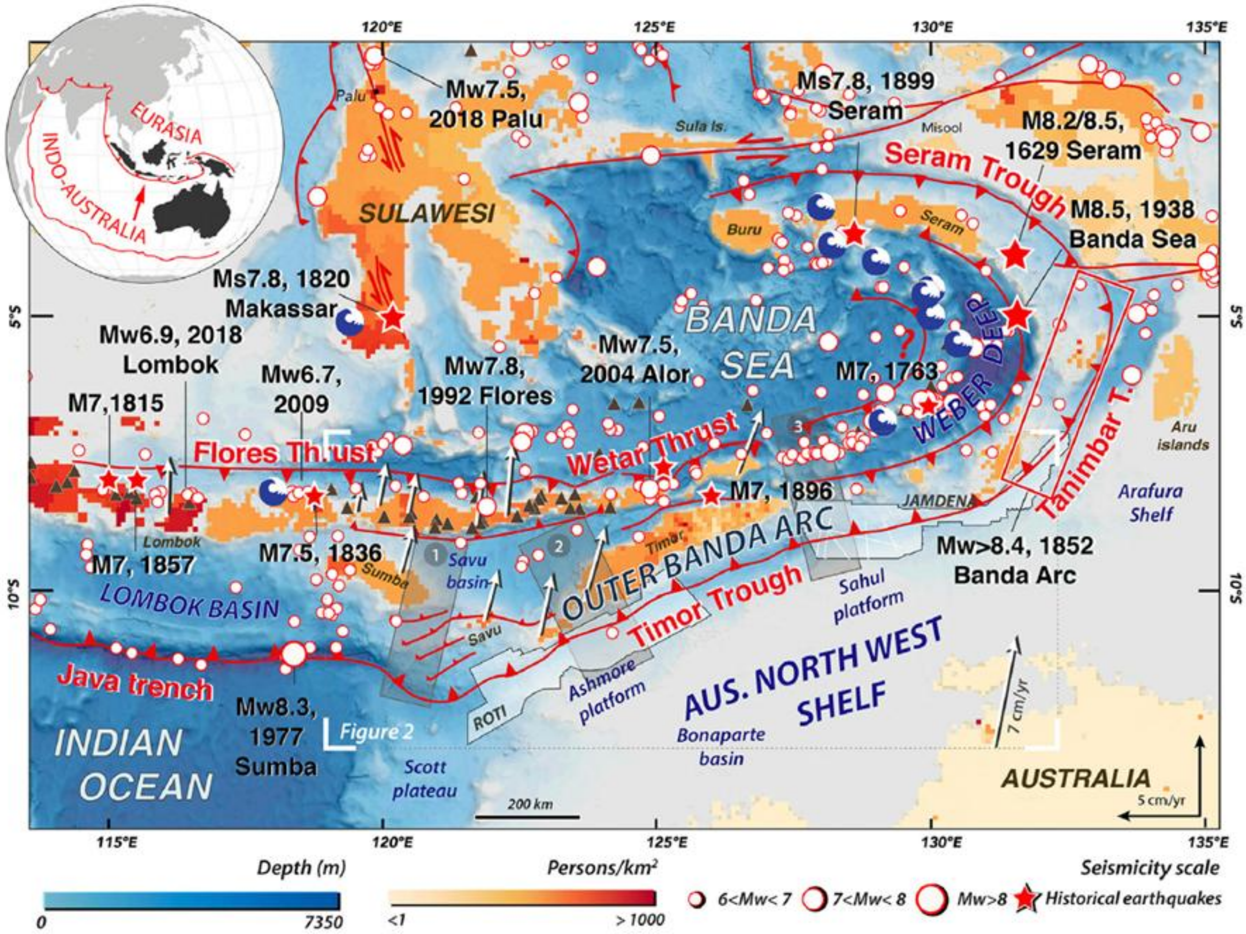
The most active months for tropical cyclones in the Timor Sea/Bonaparte Basin region are December to April, when the surface temperatures are at their highest and the water column is at or above 26.7°C (SKM, 2001).

Most (75%) of these cyclones are not fully mature, with estimated wind speeds of less than ~80km/h. Severe cyclones, with wind speeds exceeding 100km/h occur, on average, once every 2.6 years (Heyward et al., 1997).

6.1.6. Seismicity and Tsunamis

The Timor Sea has experienced tectonic activity for at least six million years due to the convergence of the Australian and Eurasian continental plates. The dominant earthquakes in this area are subduction and strike-slip related earthquakes, caused by one crustal plate being forced below another. Earthquake activity tends to be focused to the north of the island of Timor, along the Flores-Wetar trend and further west in the Lombok Basin. The contract area south of the Timor Trough on the Australian continental plate, in an area with very limited seismicity and no recorded tsunamis. Figure 14 shows the locations of seismicity and tsunamis in the Banda and Timor Seas region.

Figure 14 Seismo-tectonic setting of the Banda Arc region, based on seismicity from USGS catalogue (1976–2020) are represented by red and white dots. Blue wave symbols are past tsunamis. Major faults (in red). (Source: Coudurier-Curveur et al, 2023)



6.1.7. Geology

The primary hydrocarbon reservoir in the Bonaparte Basin is sandstone of the Plover Formation, ranging from Early Jurassic to Callovian age. The Chuditch-2 well, based on offset data is prognosed to encounter 'near-dry' gas in the Plover Formation.

The regional stratigraphy in the area includes various formations spanning different geological periods:

1. Plover Formation (Pliensbachian to Callovian): Primary reservoir target, comprising fluvio-deltaic sandstone, mudstone, coals, and marginal marine sandstone. At Chuditch-1, it underlies shales of the Jurassic Flamingo Formation.
2. Flamingo Formation: Deep marine shales and turbiditic sandstone sourced from the south, displaying different depositional facies on the Sahul Platform, including marginal marine sandstone equivalent to the Sandpiper Sandstone south of the Malita Graben.
3. Bathurst Island Group: Comprising several sequences:
   - Echuca Shoals Formation: Glauconitic claystone and siltstone overlying the Intra-Valanginian Disconformity.
   - Darwin Formation (Aptian to Early Albian): Condensed radiolarian claystone/calcilutite unit deposited during the Cretaceous transgression.
   - Wangarlu and Vee Formation: Claystone, marls, and calcilutites deposited in a marine shelf to slope environment.

4. Johnson Formation (Palaeocene) and Hibernia Formation (Eocene): Mainly calcilutites with dolomites, cherts, and claystone streaks.
5. Cartier Formation (Oligocene): Calcareous claystone and marls.
6. Oliver Formation (Miocene): Continuous carbonate deposition with an unconformity at the top due to the collision of the Australian and southeast Asian plates.
7. Barracouta Formation (Pliocene to Recent): Active margin carbonates overlying the Miocene unconformably.

The estimated target formation tops are 2,813m TVD-MSL (Chuditch-2) and the geology of the Chuditch-2 well is shown in table 15.

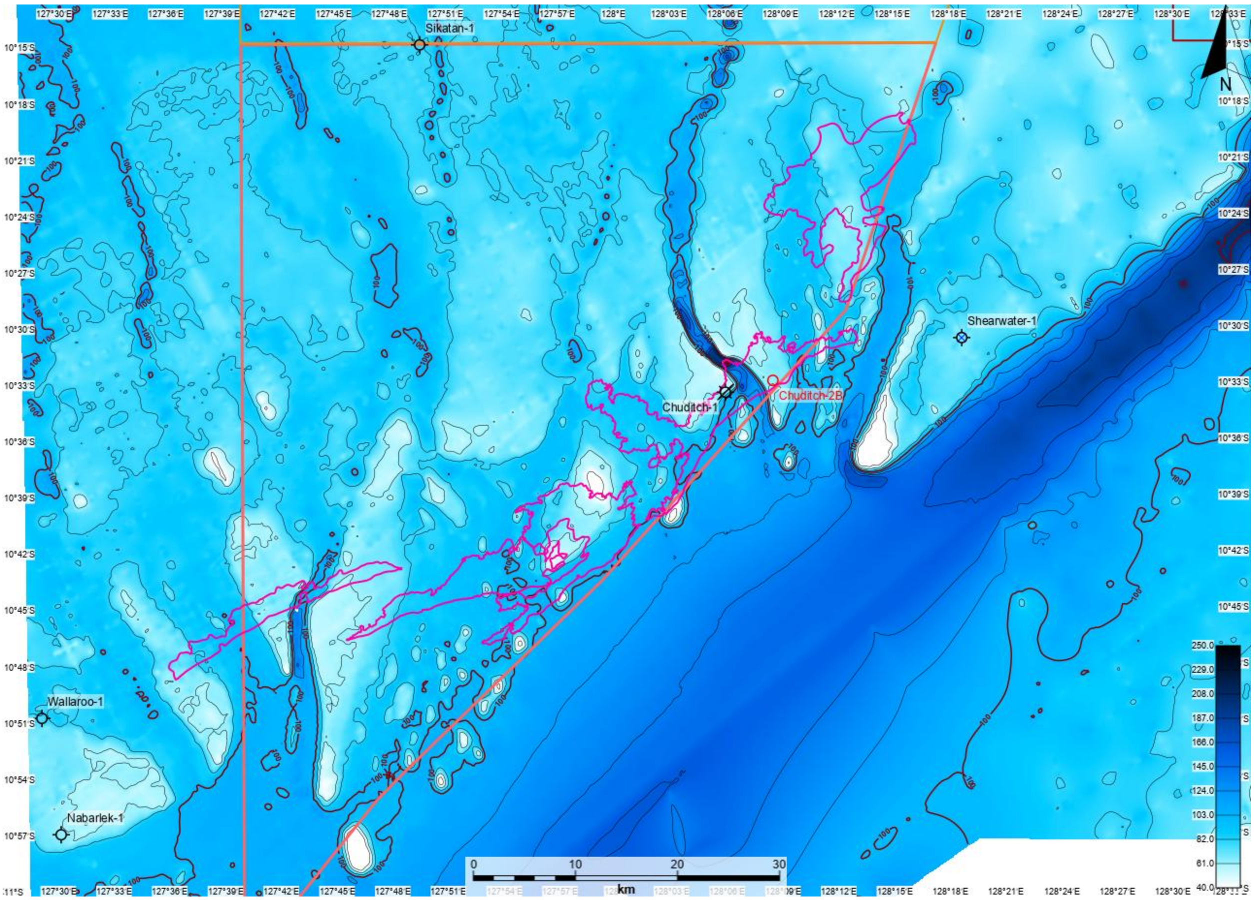
Table 15 Geology Structure of Chuditch-2 Appraisal Well

Formation	Chuditch-2 Depth TVD-MSL (m)	Uncertainty (m)
Sea Bed Carbonates	70	+/- 5
Hibernia Fm (Green horizon) Calcarenites & calcilutites grading to calcareous clay stones	726	+/- 20
Johnson Fm (Pink horizon) Argillaceous calcilutites to calcareous clay stones	1225	+/- 20
Wangarlu Fm (Purple horizon) Claystone with minor calcareous claystone	1604	+/- 20
Darwin Fm (Pink horizon) “radiolarite” Claystone & marl	2750	+/- 30
Plover Fm – reservoir target Sandstones & clay stones	2776	+/- 30
Gas-water-contact	2920	+/- 2
Total Depth	**2970**	**+/- 30**

6.1.7.1. Bathymetry

Geotechnical and Geophysical study for Chuditch-2 Appraisal drilling was completed in Q1 2024. This study indicated that the benthic topography is approximately 68 meters within a semi-arid plateau with mounds and ridges which might harbour a more diverse infaunal and benthic community (figure 15). However live coral reefs, which typically thrive in shallower, sunlit waters, are absent. The ROV survey conducted during the EBS indicates substrate composition of soft sediments (sand/mud and hard substrates (rock, pebbles/ gravel-rubble)) in some localized areas around the well, creating complex topography features. The Chuditch-2 well, based on offset data is prognosed to encounter ‘near-dry’ gas in the Plover Formation.

Figure 15 Bathymetry of PSC TL-SO-19-16 Chuditch Contract Area



6.1.8. Air

The air quality is normally good in offshore location, although emissions from shipping, drilling and other offshore activities will contribute to localized air pollution. The appraisal drilling program is of a short duration of about 44 days. The diesel driven power generators generate some pollutants, namely SO_2, NO_x, and CO which will be discharged into the atmosphere through exhaust stacks of suitable heights to ensure noxious gases are directed away from crew accommodation. Therefore, impacts of gaseous pollutants on the ambient air quality due to drilling operations are insignificant.

Moreover, the drilling location is located at a distance beyond territorial waters from the shores of Timor-Leste and Australia. The impact of pollutants discharged in exhaust gases from the diesel driven power generators in the offshore area will be minimal. The generators are maintained as per manufacturers criteria.

The air sampling is not included in EBS prior to drilling activities as the operational area is approximately 130Nm from the Timor-Leste coastline, which itself is a remote and non-industrialized area.

Secondary data shows that the air temperature variations are small. The mean maximum summer and winter air temperature recorded at Point Fawcett on Melville Island as the closest metrological station to the project area range between 33-34˚C in November/December. The annual minimum temperature is 27˚C in June (RPS, 2024). The average tropical cyclone frequency for the Timor and Arafura seas region is one cyclone per year with cyclones most commonly occurring between December and April (RPS, 2024).

6.1.9. Noise

Noise pollution in the Timor Sea, like in other marine environments, is primarily caused by human activities such as shipping, oil and gas exploration, and fishing. Cargo ships, tankers, and fishing vessels generate significant underwater noise, the large heavy vessels produce low-frequency sounds that can travel long distances underwater.

With a significant present of oil and gas reserves in Timor Sea, there are several offshore drilling platforms, pipelines, and seismic surveys conducted in the region. The Eni block next to the Chuditch contract area is shortly planning on conducting a seismic survey and hence, it will generate underwater noise.

Overtime, Timor-Leste has entered several bilaterial agreements allowing commercial fishing fleets to access deep-sea fishing, however, these were cancelled due to noncompliance issues (FAO, 2019). In the absence of licensed and active offshore fishing vessels in the proposed drilling project area, there is no known noise generated by fishing vessels.

The closest secondary data for noise was the survey conducted by INPEX in the Browse Basin for the Ichthys field development. Based on this survey, the average ambient noise level under low sea states was found to be 90 dB re 1 µPa, with inputs of low-frequency energy from the Indian Ocean (INPEX – Ichthys Phase 2 Development Drilling, 2025)

6.1.10. Marine Waters

Information in this section is taken from the Chuditch-2 EBS Technical Report dated March/April 2025, conducted by WA Marine Pty Ltd trading as O2 Marine, Western Australia. The data, figures and tables and information is reproduced from that report as primary information around the planned Chuditch-2 Appraisal Well Program.

Generally, the marine waters in the Timor Sea are pristine, with high values of dissolved oxygen and low levels of pollutants. Baseline water quality parameters such as salinity, temperature, and nutrient levels are critical to any assessment of potential impacts due to drilling activities.

Environmental Baseline water quality data allows for an assessment of potential impacts caused by drilling operations, such as the discharge of drilling mud, drilling fluids, and other pollutants. The EBS measured relevant water quality for physical, chemical and biological parameters, including heavy metals, hydrocarbons and other pollutants related to the discharges.

The criteria of selection the locations and criteria parameters are based on OSPAR Commission Assessment of the impacts of the offshore oil and gas industry on the marine environment and the results as per NATA (National Association of Testing Authorities) accredited laboratory-Analytical Reference Laboratory (ARL), ANZG (2018) and IMCRA (2018) guidelines. ANZECC and ARMCANZ (2000) guidelines are used to evaluate the marine water quality, sediment quality, and toxicants from the proposed project

EBS Sampling Summary

The EBS was conducted in February 2025 with laboratory analysis occurring immediately afterwards encompassing the extent of potential impacts to water quality, sediment quality and benthic habitats based on the mud and cuttings dispersion modelling for the drilling program (MuTek, 2024) to design the sampling plan for impacts on potential receptors.

The sampling design and rationale for the scope of works has been presented by RPS in the Scope of Chuditch-2 Environmental Baseline Study [AU213017880.001] document (RPS, 2024).

The sampling design is grouped as follows:

- At the well location and in the immediate vicinity (direct impact, benthic impact zone);
- 300m from the well location (potential for benthic impact);
- 600m from the well location (furthest potential extent for benthic impact);
- Relief well location; and
- 1000m from the well location (potential low water quality impact).

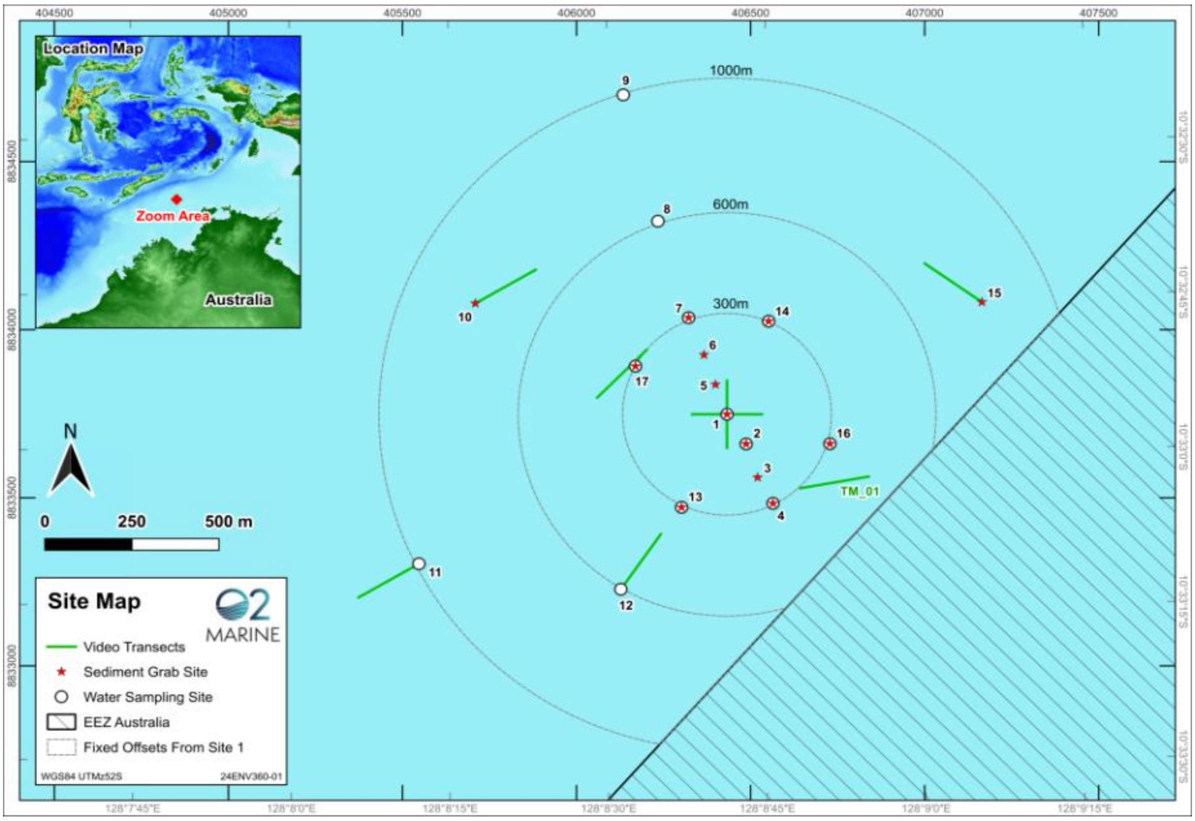
Sampling Location

Sampling locations for the Chuditch-2 Environmental Baseline Survey were selected to ensure relevance to cuttings dispersion modelling. The number of sites required for sampling is outlined in table 16. The EBS sampling locations around Chuditch-2 Appraisal Well are presented in figure 16.

Table 16 Sampling locations and numbers of sites completed

Task	Sample	Required number of sites	Number of sites completed
Water quality sampling	Water samples	12	12
	Water column profiles	12	12
Sediment sampling	Sediment samples	13	13
	Infauna	13	13
Benthic habitat assessment	Towed camera	8	8
Marine fauna sightings	Opportunistic sightings	N/A	N/A

Figure 16 EBS Sampling locations around Chuditch-2 Appraisal Well



Water quality samples were collected using Niskin bottles (figure 17) which was then analysed in a NATA certified laboratory for suspended solids, heavy metals, and hydrocarbons.

Figure 17 Niskin bottle water sampler used for water quality sample collection

Water samples were collected at the sea surface (1-5m depth), mid-column (~30m depth) and near bottom (seabed+ 1-5m) using 10 litre Niskin bottles.

Water samples were then stored and transported to laboratories for analyses which comply with industry standards (e.g. SW-PACK-012 for Environmental Monitoring at Environmental Analysis Laboratory).

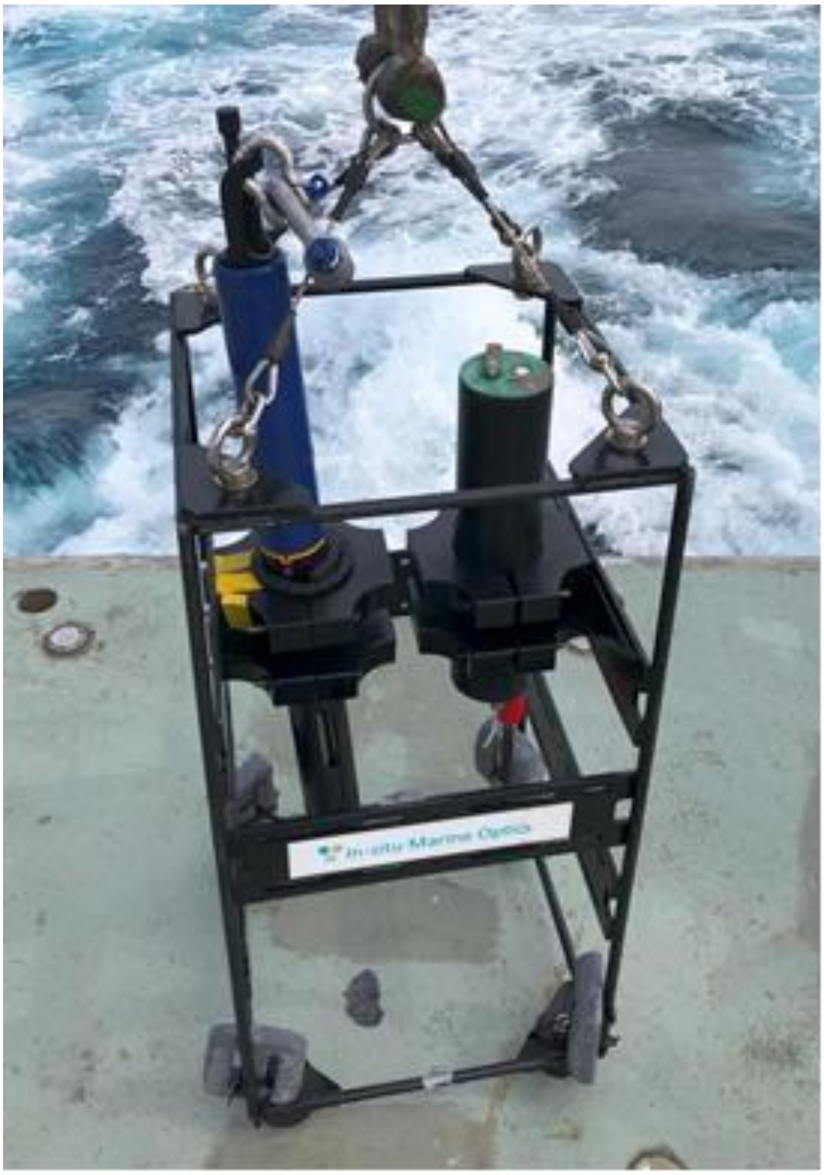
Water Column Quality Profiling

A Conductivity, Temperature and Depth (CTD) profiler (figure 18) was used to measure water temperature and salinity in the water column and inform the water sampling analyses and provided useful environmental baselines for the area.

Water column profiles were collected in accordance with the SAQP. The CTD profiler recorded the following parameters:

- Time
- Depth
- Temperature
- Specific conductivity (SpC)
- Salinity (ppt)
- pH
- PAR (9 wavelength multispectral sensor);
- Turbidity (FNU) and
- Dissolved Oxygen (DO) (%).

Figure 18 YSI Exo1 Sonde and IMO Ms9 light



The summary of physiochemical water column profiles from the EBS are:

Table 17 Parameters and ANZECC Guidelines

Parameters	ANZECC 2000	EBS Data
Temperature (°C)		28.77 – 30.29
pH	8.2	8.21 – 8.26
Dissolved Oxygen (% Saturation)	90 – 110	~95
Salinity (ppt)		34.05 – 34.19
Conductivity (µs/cm)		51990.00 – 52147.10
Turbidity (FNU)	0.5 – 10	0.06 – 0.26
Oil and Grease (mg/L)		<5 - 9
Sulphur (mg/L)		980 - 1300
Chlorophyll a, Chl a (µg/L)	0.5 – 0.9	<LOR
Dissolved Metals:		
95% SPL		<LOR
99% SPL		<LOR
Hydrocarbons		<LOR

Physiochemical Profiles

The summary of physiochemical water column profiles from the EBS, in summary are:

- pH results ranged from between 8.21 and 8.26
- Salinity results ranged between 34.05 and 34.19 ppt
- Temperature values ranged between 28.77 and 30.29°C
- Conductivity results ranged between 51990.00 and 52147.10 µs/cm
- Turbidity values ranged between 0.06 and 0.26 FNU.
- Minimal spatial variability in water quality across the project area.
- Temperature, salinity, turbidity, and pH remained stable from surface to seafloor.
- Slight thermocline detected at 22–25m depth.
- Dissolved oxygen (DO) levels were high (~95%) but decreased slightly below 25m, indicating a stratified water column.
- Low turbidity levels indicate minimal sediment resuspension and particulate matter.

PAR Profiles

The light penetration results from the light Photosynthetically Active Radiation (PAR) tests from the water column profiles are summarized in table 18 across all locations measured under the EBS survey in February 2025.

Table 18 PAR values from EBS Survey across all locations.

Location	Mean	Minimum	Maximum
Surface	467.2	92.79	1115.8
Bottom	1.42	0.57	2.98

Water Samples EBS Analysis Results

The water samples were analysed for the following parameters.

- Total Recoverable Hydrocarbons (TRH)
- Total aromatic hydrocarbons
- BTEX (benzene, toluene, ethylbenzene and xylene)
- Polycyclic aromatic hydrocarbons
- Oil and grease
- Sulphur
- Heavy metals (As, Ba, Cd, Cr, Co, Cu, Hg, Ni, Pb, Zn, Mg, Fe, Se)
- Chlorophyll-a; and
- Total organic carbon.

The samples were analysed at NATA-accredited laboratories in Australia. The analytical results are summarized below.

Dissolved Metals

The dissolved metals results across all EBS locations sampled are in summary:

- Gold, mercury and manganese results were reported below the LOR in all samples.
- Generally, for the metals (As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, Sb, Se) analysis data all reported at low concentrations below ANZG (2018) 95% and 99% Special Protective levels (SPLs).

Hydrocarbons

Hydrocarbon results from water samples for BTEXN, TPH, TRH, and VOCs were all reported below the Limit of Reporting (LOR).

Chlorophyll-ɑ

Chlorophyll-ɑ was reported below the LOR in all water quality samples.

Oil and Grease

Oil and Grease values ranged between <5mg/L and 9mg/L and the Median oil and grease results across all sampling sites was <5mg/L.

Sulphur

Sulphur results ranged between 980mg/L and 1300mg/L. The Sulphur results were generally consistent between sites and across depths.

The details results and analysis of the marine water quality are placed Appendix 1. The Chuditch-2 Environmental Baseline Survey (EBS) Technical Report dated March/April 2025 conducted by WA Marine Pty Ltd trading as O2 Marine, Western Australia. The data, figures, tables and information are reproduced from that report as primary information around the Chuditch-2 Appraisal Well Program.

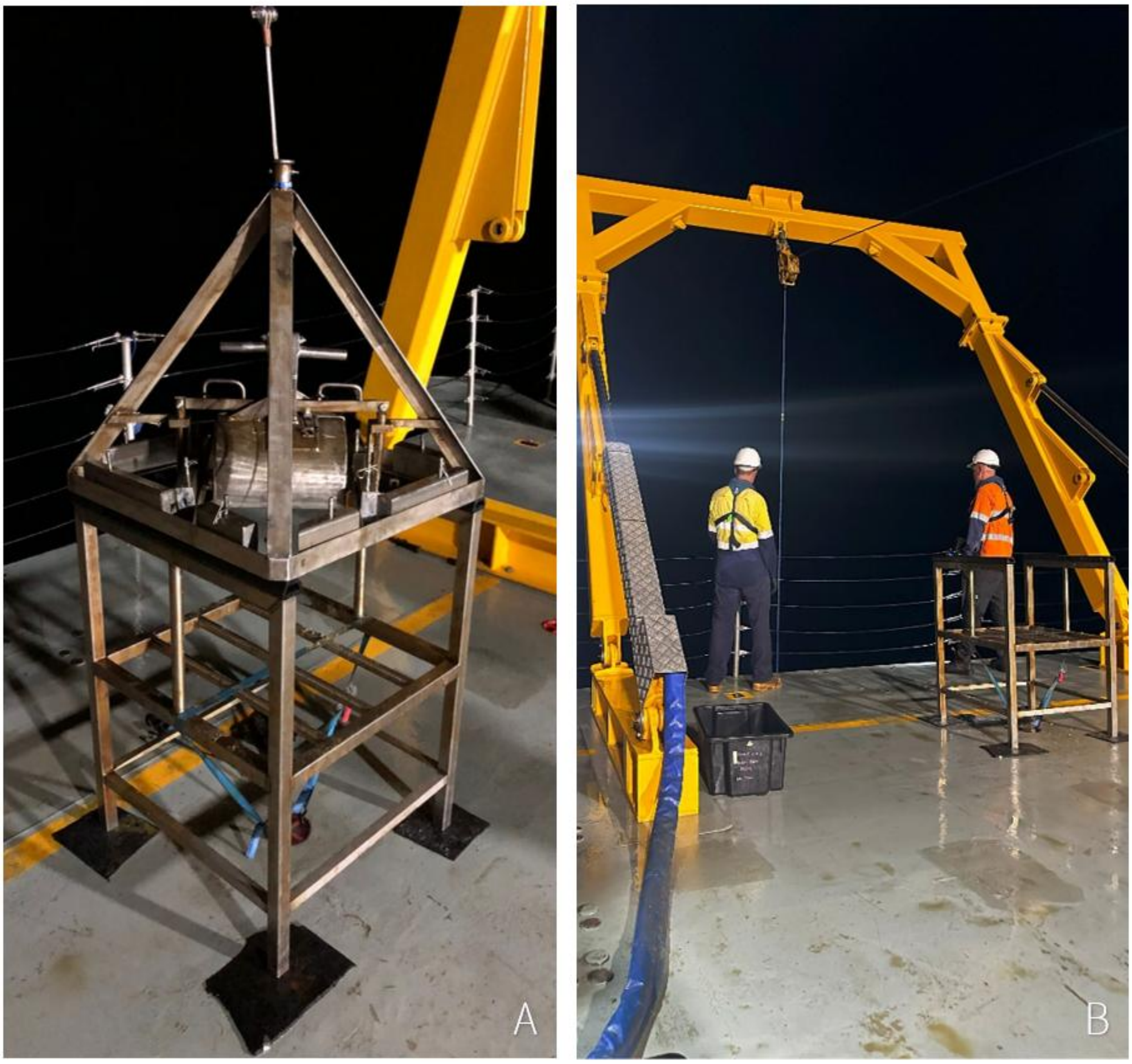
6.1.11. Sediment

The sediments in the Timor Sea are dominated by fine sand, silt, and clay. Sediment quality is of prime importance as an aid to understanding the possible impact of drilling activities, such as sediment resuspension or contamination from drilling waste.

Sediment quality monitoring helps identify any potential impacts caused by drilling operations, particularly the release or creation of contaminated sediments which can affect marine ecosystems (Trefry et al., 2013, Reuscher et al., 2020).

Sediment was collected and processed onboard using methods adapted from the Australian national standard for grab and box corer sampling (Przeslawski et al., 2024). At each designated grab site two sediment samples were collected using a large Van Veen grab / day grab sediment sampler, (figure 19) with a volume of at least 7 litres (Álvarez et al., 2020) for physical, chemical and biological analysis.

Figure 19 Day Grab sediment sampler positioned on retrieval point, B) Day Grab deployed overboard from vessel stern via A-Frame



From each grab, sediment was sampled for sediment quality analysis. Sediment samples was stored and transported to laboratories for the following analyses which included as industry standards (e.g. SS-PACK-080 for Drilling Mud Exemption at Environmental Analysis Laboratory).

Sediment samples were analysed for the following parameters:

- Total Recoverable Hydrocarbons (TRH).
- Benzene, Toluene, Ethylbenzene, Xylenes and Naphthalene (BTEXN).
- Total Petroleum Hydrocarbons (TPH).
- Polycyclic Aromatic Hydrocarbons (PAH).
- Metals (Al, As, Ba, Cd, Cr, Co, Cu, Fe, Hg, Ni, Pb, & Zn).
- Oil and grease.
- Sulphur.
- Total Organic Carbon (TOC); and
- Particle Size Distribution (PSD).

The samples were analysed at a NATA-accredited laboratory in Australia.

The summary of the EBS results are:

Particle Size Distribution

Particle Size Distribution (PSD) were clay (<4 µm), silt (4-62µm), sand (62-250µm), medium sand (250-500µm), and coarse sand (500-2000µm).

Sediment PSD was generally uniform across sampling locations, where coarse grained sand (500µm-2000µm) was typically the most dominant fraction, followed by silt (4µm-62µm). Medium grained sand generally comprised the lowest fraction of grains across all sample sites, and while no sites appeared to be significantly different in their PSD composition.

Dissolved Metals

Dissolved metals results are presented summarised below.

- Gold, mercury and manganese results were reported below the LOR in all samples.
- Remaining metals (As, Ag, Ba, Cd, Co, Cu, Cr, Fe, Pb, Mn, Hg, Ni, Sb, Se, and Zn) were all generally reported at low concentrations below ANZG (2018).

Moisture

Moisture content of sediment samples ranged between 33% and 44%. The median moisture content across all sample sites was 39%, while there was a low standard deviation in % moisture content between samples (2%).

Oil and Grease

Oil and grease results was generally reported below the LOR (<500-mg/kg) however was detected in low concentrations except two sites which recorder 690mg/kg and 630mg/kg.

Sulphur

Sulphur concentrations ranged between 2100-mg/kg and 6100-mg/kg. Median concentrations of sulphur across all samples were 3500-mg/kg, while the standard deviation was 1217-mg/kg.

Hydrocarbons

Results for hydrocarbons in sediments of BTEXN, Aliphatic and Aromatic Hydrocarbon, and Polyaromatic Hydrocarbon (PAH) concentrations were reported below the LOR at all sample sites.

Total recoverable hydrocarbons (TRH) were detected in low concentrations at several sample sites, normalised TRH concentrations were reported below the ANZG (2018) DGV.

The details results and analysis of the marine sediment quality are located in Appendix 2. The Chuditch-2 Environmental Baseline Survey (EBS) Technical Report dated March/April 2025 conducted by WA Marine Pty Ltd trading as O2 Marine, Western Australia. The data, figures, tables and information are reproduced from that report as primary information around the Chuditch-2 Appraisal Well Program.

6.2. Ecological Components

These components include living organisms and ecosystems which may be affected by the project. From secondary data the following description on ecological components are inferred.

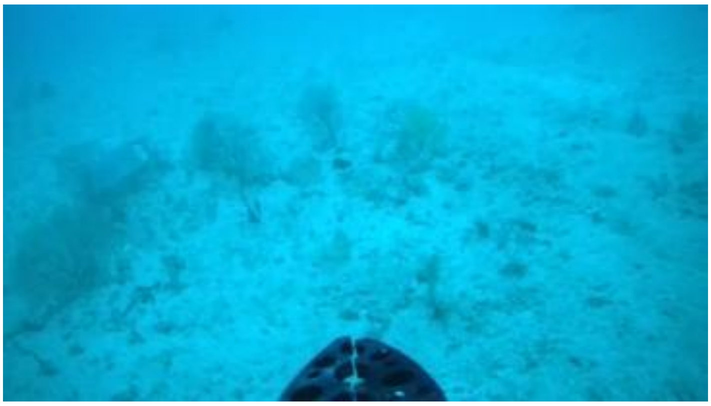
Benthic communities consist of hundreds of species, yet many are sparsely distributed. As such, indicator groups are often used where the abundance or richness of one taxonomic group is used as a proxy for others (Mellin et al., 2011). Previous studies have yielded species inventories of sponges, octocorals, and polychaetes in the region and identified these groups as appropriate biological surrogates for benthic biodiversity (Wilson, 2010, Przeslawski et al., 2015, Przeslawski et al., 2019). As such, environmental baselines and monitoring around the Chuditch-2 site should focus on sponges, octocorals and polychaetes to assess conditions and detect changes in benthic communities in the Chuditch-2 region.

The grab samples from the G&G site survey were consistently similar across the area, and no live bivalves or bryozoans were recovered. Only one live sponge and one brittle star were retrieved from the samples. The high degree of easily suspended sediment and the lack of light suggest that sponge growth is low. Additionally, the drop camera work over the area showed a high similarity with single sponges present in 3 of 10 images and covering less than 5% of the field of view which were reconfirmed by the observations made during the EBS survey February 2025 and figure 20 shows towed video footage collected by ROV in the same study.

At the regional scale, the Timor Sea is characterised by raised geomorphic features with shoals and banks which foster biodiversity levels observed due to light penetration at shallower depths and increased nutrients from ocean currents. This highlights the fact that the carbonate banks and terrace formations serve as key ecological features that promote regional biodiversity hotspots. Benthic communities can vary within these environmental attributes based on bathymetry, exposure, geochemistry, and substrate coupled with currents shaping the structure, distribution and abundance over time (Przeslawski et al., 2011, Nichol et al., 2013, Radke et al., 2015).

The Chuditch-2 site closely resembles that shown by environmental data collected by Geoscience Australia and the Australian Institute of Marine Science in Oceanic Shoals Marine Park, sampled within 45-90 meters of depth (Nichol et al., 2013). The sediments found in these terraces were typically medium to coarse-grained sand. In contrast, finer sediments were more common in deeper subdued geomorphic features (plains, valleys), and coarser sediments were more common on banks (Anderson et al., 2011). These terraces offer a significant correlation to the high biodiversity of benthic faunal groups where dense patches of sponges and octocorals (e.g. lithistids, halichondrids, and Xestospongia testudinaria) and both hard and soft substrates are profoundly intricated (Heap et al., 2010, Przeslawski et al., 2014).

Figure 20 Description and example images of each of the five (5) benthic habitat classes. (Source: O2 Marine, 2025)

Class	Description	Image
Bare Sediment	Largely featureless (flat), unconsolidated substrate with minimal (<1%) or no biota cover	
Bare Sediment (bioturbated)	Unconsolidated substrate with minimal (<1%) or no biota cover, although with consistent bioturbation	
Sediment with Sparse Filter Feeders	Largely unconsolidated substrate with sparse (<10%) biota cover, where various filter feeder types are present	
Filter Feeders (mixed habitat)	Combination of habitat types (e.g. sediment, rubble, reef, etc.) with no dominant substrate. Filter feeders (e.g. sponges, sea whips, gorgonians, ascidians, soft corals, hydroids, etc.) dominant across substrate, typically in moderate to high cover.	

Class	Description	Image
Reef with Mixed Assemblage	Varying relief (from flat to >3 m) of consolidated rock which typically forms part of a large, structurally complex reef feature. Reef substrate dominated by various forms of filter feeders and fish. Typically, high (25-75%) to dense (>75%) in biota cover	

6.2.1. Benthic Infauna

Infauna can also provide an important environmental baseline for soft sediment communities, as they are important to ecosystem function and often an integral component of environmental monitoring in soft sediment habitats (Nygård et al., 2020, Schenone et al., 2023).

During the EBS, after sediment was removed for sediment quality analysis, the remainder of the sediment sample was then processed for infauna analysis. Sediment was washed through a 1mm sieve, and the retained fraction was preserved in ethanol. The sieved fraction was then sorted and analysed by a taxonomist to operational taxonomic unit. Taxonomic analysis occurred onshore.

The result of the benthic infauna analysis is described in table 19.

Table 19 Benthic Infauna classification & result from EBS Report by O2 Marine

Parameters	EBS Data
Substrate Type	Of the 4,542 classified points, 3,772 were assigned substrate information, which were largely comprised of Sand / Mud (59.4%), while similar proportions were assigned as Rock (20.9%) and Pebble / Gravel – Rubble (49.1%), with Cobbles (0.6%) the only other substrate classification recorded.
Major category	Mixed Filter Feeders comprised 96.4% of all points assigned with dominant biota information, with Black & Octocorals (2.3%), Sponges (cup) (0.7%), Black & Octocorals - Fan (2D) (0.4%), and Sponges (mixed) (0.1%) collectively comprising the remaining 3.4%.
Total Biota Cover (%)	3,692 points, with 53.5% classified as Sparse/Low in cover. Relatively similar proportions of benthic biota cover were classified as Moderate (15.5%), Bare (14.1%), and High (12.2%), while 4.2% was classified as Dense, and 0.4% of classified points had None Recorded assigned to percent cover.
Summary of Classification	3,752 points which were largely allocated to the Sediment with Sparse Filter Feeders (48.6%) and Filter Feeders (mixed habitat) (21.1%) classifications, followed by Reef with Mixed Assemblage (14.9%), Bare Sediment (bioturbated) (12.9%), and Bare Sediment (2.6%).

The three most abundant species across all sites were the bristle worm Anthuridae, the Litocorsa sp1, and the Apseudidae.

Detailed information on marine fauna including habitat and characteristics of benthic habitats and detailed information on the characteristics and abundances of the filter feeders encountered during the EBS are placed at Appendix 3.

6.2.1.1. Diversity Indices

Diversity indices are mathematical measures of species diversity and richness that provide more information about community composition than simply using raw abundance. Four indices were selected to provide information relevant to diversity, richness, and evenness. These are:

- Margalef's index (d) was selected to assess the species richness; Across the EBS survey area, the species richness index (Margalef) had the lowest value of (0.0) and the highest value of (6.636).
- Shannon's index (H) was selected to assess the species diversity; The species diversity index (Shannon-H) had the lowest value of (0.0) and the highest value of (3.086)

In general, the abundance of benthic infauna in the area of the Chuditch-2 appraisal well is low and with a sparse population of observed infaunal and epi faunal species. The area around the Chuditch-2 well is generally poor in diversity.

6.2.2. Marine Fauna

The Timor Sea is a biodiversity hotspot in terms of fish, marine mammals - such as dolphins, whales, sea turtles and sharks. Baseline studies recorded key species and habitats with an emphasis on the possibility of disruptions due to underwater noise/vibration, pollution, or habitat disturbance.

During the EBS study, no opportunistic marine megafauna were observed by O2 Marine field staff or Offshore Unlimited vessel crew during survey operations.

Biodiversity Hotspot: The Timor Sea is home to a wide variety of marine organisms such as fish, marine mammals like dolphins and whales, and sea turtles. These species are of ecological importance and therefore create a need for protection.

6.2.2.1. Marine Mammals

A wide array of whale, dolphin, and porpoise species have broad distributions, including in the Timor Sea, with some considered endangered or vulnerable due to their migratory habits. While species like humpback, and fin whales may occasionally appear in the contract area, it does not offer a unique or suitable habitat for them and therefore their movements in the area are transitory. Humpback whales' migration, calving, and resting areas are over 400 km southwest of the contract area, only occasional individuals might travel toward the Joseph Bonaparte Gulf and NT offshore waters.

Blue whales, particularly the pygmy blue whale sub-species, are unlikely to be found in the contract area as the well location is far from their known migration routes and known distribution (Edyvane et al., 2024). Omura's whale may occur in the contract area based on limited data of sightings across north-western Australia and off north-east Queensland. The coastal waters of the Joseph Bonaparte Gulf and Darwin Harbour are significant areas for coastal dolphin species, such as Indo-Pacific humpback, Australian snubfin, and spotted bottlenose dolphin. However, they are less likely to be found in the deep offshore waters of the contract area. Species may occasionally venture into the Bonaparte Basin waters.

The Indo-Pacific humpback dolphin, found along the northern coast of Australia, prefers warm waters shallower than 25m and feeds on coastal-estuarine fish. Breeding occurs yearly, with births usually in spring and summer. While not known for large-scale migrations, seasonal shifts in abundance have been observed. Spotted bottlenose dolphins inhabit tropical and subtropical coastal waters, typically near shores or in shallow waters less than 30 m deep. Their presence in the contract area, located offshore at greater depths, is likely limited due to their preference for shallower waters.

Omura's whales, a recently described species, are distributed in tropical and warm-temperate regions globally. They have been detected year-round in the Timor Sea, with more common sightings between April and September (Stacey et al., 2015). While some populations may be non-migratory, their movements across north-western Australia are still not fully understood. Given their year-round detection in the Joseph Bonaparte Gulf and across north-western Australia, Omura's whales may be encountered within the contract area and Bonaparte Basin (Pomilla et al., 2005).

In 2012, during the Marine Fauna Observation conducted by Minza, (Minza, 2007), there were 11 cetacean sightings in block JPDA 06-101A. The G & G survey conducted in 2024 did not record any sightings of marine mammals. This could suggest that the cetaceans sighted in 2012 were migratory species, and their usual habitat was far from the contract area as the cetacean sightings between September and December were within a known migration period. In contrast, the proposed appraisal drilling in Q2 2026 is understood to be outside of the known migration period.

Table 20 Marine Mammals - Common & scientific name, cetacean type, & IUCN Red list status.

Common Name	Scientific Name	Cetacean Type	IUCN Red list status
Humpback	*Megaptera Novaeangliae*	Whale	Endangered (EN)
Bryde's whale	*Balaenoptera edeni*	Whale	Least Concerned
Blue Whale	*Balaenoptera musculus*	Whale	Endangered
Killer whale, Orca	*Orcinus Orca*	Whale	Data Deficient
Sperm Whale	*Physeter Macrocephalus*	Whale	Vulnerable
Omura's Whale	*Balaenoptera Omurai*	Whale	Data Deficient
Spotted bottlenose	*Tursions aduncus*	Dolphin	Near threatened (NT)
Snubfin	*Orcaella heinsohni*	Dolphin	Vulnerable
Dugong	*Dugong Dugon*	Dolphin	Vulnerable
Australia Humpback	*Sousa Sahulensis*	Dolphin	Vulnerable

6.2.2.2. Turtles

As part of the Arafura and Timor Sea (ATS) region, the Timor Sea provides favourable biophysical and oceanographic conditions that support foraging, nesting, and migratory activities for marine species, including sea turtles. Timor-Leste, located within this region, is home to five recorded species of marine turtles: Hawksbill Turtle, Leatherback Turtle, Green Turtle, Loggerhead Turtle, and Olive Ridley Turtle. Additionally, six of the world's seven species of sea turtles can be found in the ATS region, highlighting its significance as a habitat for these endangered marine creatures (Fajariyanto et al., 2020).

Sea turtles, including Leatherback and Olive Ridley Turtles, rely on a cohesive network connected by migratory pathways influenced by oceanographic currents. While some species, like Green and Leatherback Turtles, travel globally across multiple oceans, complete tracking data for all species is lacking. Sea turtles exhibit fidelity to their breeding sites, returning annually, which ensures the continuity of genetic stock and evolutionary lineage. Marine Protected Areas (MPAs) within the ATS region are crucial for sea turtle conservation. Jaco Island and Tutuala Beach are known nesting sites, and other potential breeding sites may exist along the South coast of Timor-Leste or in the Northern Territories of Australia.

Australia leads conservation efforts with its Recovery Plan for Marine Turtles. However, sea turtle preservation requires connectivity among multiple locations through migratory pathways and nesting beaches with more than 30 % reported (Fajariyanto et al., 2020).

Table 21 Turtles common and scientific names and IUCN Red List Status

Common Name	Scientific Name	IUCN Red list status
Green Turtle	*Chelonia mydas*	Endangered
Hawksbill Turtle	*Eretmochelys imbricata*	Critically Endangered
Loggerhead Turtle	*Caretta caretta*	Vulnerable
Leatherback Turtle	*Dermochelys coriacea*	Vulnerable
Olive Ridely Turtle	*Lepidochelys olivacea*	Vulnerable

Table 22 Sharks common and scientific name and IUCN Red list status

Common Name	Scientific Name	IUCN Red list status
Whale Shark	*Rhincodon typus*	Endangered
White shark	*Carcharodon carcharias*	Vulnerable
Grey nurse shark	*Carcharias taurus*	Critically Endangered
Northern River shark	*Glyphis garricki*	Vulnerable
Oceanic Whitetip shark	*Carcharias longimanus*	Critically Endangered
Scalloped Hammerhead	*Sphyrna lewini*	Critically Endangered
Speartooth	*Glyphis glyphis*	Vulnerable

6.2.2.3. Birds

Birds, while primarily land animals, rely on the ocean for their life cycles, particularly during migration. Coastal areas are crucial for roosting, nesting, and foraging, with mangrove trees providing safe roosting spots and easy access to food sources. Birdlife International has identified several Important Bird Areas (IBAs) in the ATS region, including small islands and mangrove habitats that serve as sanctuaries for seabird species.

In Timor-Leste, approximately 224 bird species exist, with 23 endemic to the Timor Island group. Among these, two are critically endangered, and three are endangered, according to the IUCN Red List. The Christmas Island Frigatebird is the only seabird among them. Seabirds that may occur in the general area include various tern species, the silver gull, the lesser frigatebird, the common noddy, and the streaked shearwater.

During the Minza 2D seismic survey in the contract area in 2009, the MMO reported a total of 10 seabirds in 6 sightings. The species recorded were Shearwaters sp., Petrel Sp. (*Pterodroma Sp.*), Crested Tern (*Sterna Bergii*), Frigatebird sp, and one sighting of an unidentified seabird. In 2012, during the Marine Fauna Observation, there was one sighting of an Eastern Reef Egret (*Egretta sacra*). The G & G Survey does not provide specific names of bird species that might transit the area of the Chuditch-2 drilling project. With the short timeframe of drilling activities, the impact on migratory birds is considered to be insignificant.

Table 23 Birds common and scientific name and IUCN Red list status

Common Name	Scientific Name	IUCN Red list status
Christmas Island Frigatebird	*Fregata Andrewsi*	Vulnerable
Silver gull	*Larus novaehollandiae*	Least Concern
Lesser frigatebird	*Fregata areil*	Least concern
Common noddy	*Anous stoildus*	Least concern
Streaked shearwater	*Calonectris leucomelas*	Near threatened

Common Name	Scientific Name	IUCN Red list status
Crested tern	*Sterna bergii*	Least concern
Sooty tern	*Sterna fuscata*	Least concern
Roseate tern	*Sterna dougalli*	Least concern
Brown booby	*Sula leucogaster*	Least concern
Masked booby	*Sula dactylatra*	Least concern
Bulwer's petrel	*Bulweria bulweril*	Least concern
Matsudaira's Storm-Petrel	*Oceanodroma matsudairae*	Vulnerable
Leach's Storm-Petrel	*Oceanodroma leucorhoa*	Vulnerable

6.2.3. Corals

The EBS study did not find any significant Corals in the vicinity of the Chuditch-2 well location.

However, several coral reefs exist in the Timor Sea, all of which perform critical functions as habitats for marine species. No soft reef systems were observed during the EBS survey in the vicinity of the Chuditch well location due to water depth, lack of light and unconsolidated sediments on the seabed. However, as reef systems might lie within the area of influence of a spill or well control event, potential impacts related to increased turbidity, sedimentation, and pollution were considered to preserve these sensitive ecosystems.

Coral Reefs at Risk in Southeast Asia Report indicate the percentage of coral reefs in good or excellent condition (live coral cover of more than 50%) in the eastern side were 45% compared to only 23% in the western side. (Burke et al., 2002) also identified a number of coral reefs along the Timor-Leste coast, including five distinct communities along the south coast of Timor-Leste, that were considered to be at medium to high risk of impact from the combined effects of coastal development, marine based pollution, sedimentation, overfishing and destructive fishing.

Fringing reefs are one of the most visible types of corals in Timor-Leste. These reefs are exposed to strong coastal currents and are even found in river mouths. They contribute to high fragment levels deposited at the upper reef slope. The shallow coral reefs on the northern coast occupy an estimated area of 3,000 hectares, with potential coral habitat of over 60,000 hectares in deeper waters (Kim et al., 2022). Whilst coral species occur in shallow coastal waters to open ocean depths of 6,000m, reef-building corals occur in less than 46m depth waters.

Corals on the northern coast of Timor-Leste include Acropora, Porites, Heliopora, Millepora, Xenia, and Briarium species. In contrast, the southern coast reefs have higher sponge, hydroid, algal, ascidian, and Montipora coral cover. Montipora colonies with black line disease and some damaged by Drupella grazing are recorded on the southern coast.

The southern coast's climatic variation, including high rainfall and lower water salinity, may affect coral distribution, however, there is limited knowledge about coral reefs in this area. Shallow waters support coral filter-feeders, while deep-water continental shelf communities lack habitat diversity but may host filter-feeding heterotrophs where hard substrate is available.

The eastern side of Timor-Leste exhibits a higher percentage of coral reefs in good or excellent condition, with 45%, compared to only 23 % on the western side, as indicated by the Timor-Leste coral reefs risk assessment (Burke et al., 2002). This study also identified several coral reefs along the Timor-Leste coast, including five distinct communities along the south coast, considered to be at medium to high risk of impact from coastal development, marine-based pollution, sedimentation, overfishing, and destructive fishing practices. These reefs include coral filter-feeders in shallow waters and continental shelf communities in deep waters.

In areas with minimal seafloor topography and hard substrate, habitat diversity is limited, predominantly hosting detritus-feeding crustaceans, holothurians, and echinoderms. However, filter-feeding heterotrophs such as sponges, soft corals, and gorgonians may occur when hard substrate is available (Kim, 2021).

The G&G site survey in early 2024 indicated that at the well location's depth of approximately 68 meters, live coral reefs, which typically thrive in shallower, sunlit waters, are absent. Thus, drilling operations have minimal risk of directly impacting these sensitive marine ecosystems.

6.2.4. Fisheries

The Chuditch Field is located approximately 183Nm from the nearest coastline of Timor-Leste. The Chuditch-2 Appraisal well activities are restricted to a 500-meter declared safety zone and will not be of significance to commercial or artisanal fisheries for local communities.

Coastal communities along the 600km of Timor-Leste's coastline rely on a wide range of fish, including the large tuna species, flying fish, coral reef fish and deep-water snappers for their livelihoods. Fishing is of great economic importance because it provides a source of livelihood and ensures food security. Artisanal fishing characterizes catches in the region, together with a little commercial fishing targeting tuna and mackerel among other species.

The DNFA estimates that for over half the 20,000 fishermen of Timor-Leste, fishing is the main source of food and income many individual, small-scale operators with small boats catch a range of fish mostly sardines.

There are 739 species (234 genera, 61 families) of reef fish and expected to predict 921 species of coral fish record in Timor-Leste. The site diversity ranged from 64 to 293 species/site with an average of 210 species/site.

The coral Fish Diversity Index predicts 921 species. Sites with the highest fish diversity included Atauro Island with barrier reefs (293), *Loikere* (271), *Ete Asa Lepek* (259), West Jaco Island (249), and Tenu in Lautem (243). Several new fish species were also collected including *Chrysiptera caesifrons* and *Eviota santani*.

Fish densities in the contract area are likely to be low with some pelagic species that are utilized in traditional and commercial fisheries in the deeper offshore areas. Timor-Leste government has implemented several regulatory measures for illegal, unreported, and unregulated (IUU) fishing. These regulatory measures include establishment of minimum sizes and weights for taking species, list of protected aquatic species in order to preserve biodiversity, and commercial fishing licenses.

Despite these efforts, challenges persist, hence, Timor-Leste has taken steps to strengthen its commitment to combating IUU fishing by approving accession to the Agreement on Port State Measures, as outlined in Government Resolution No. 8/2023. SGBU will contact relevant entities in Timor-Leste including the Department of Fisheries, Ministry of Transport, and National Maritime Authority if and when SGBU obtains any data on illegal fishing activities and the presence of Fish Aggregating Devices (FADs).

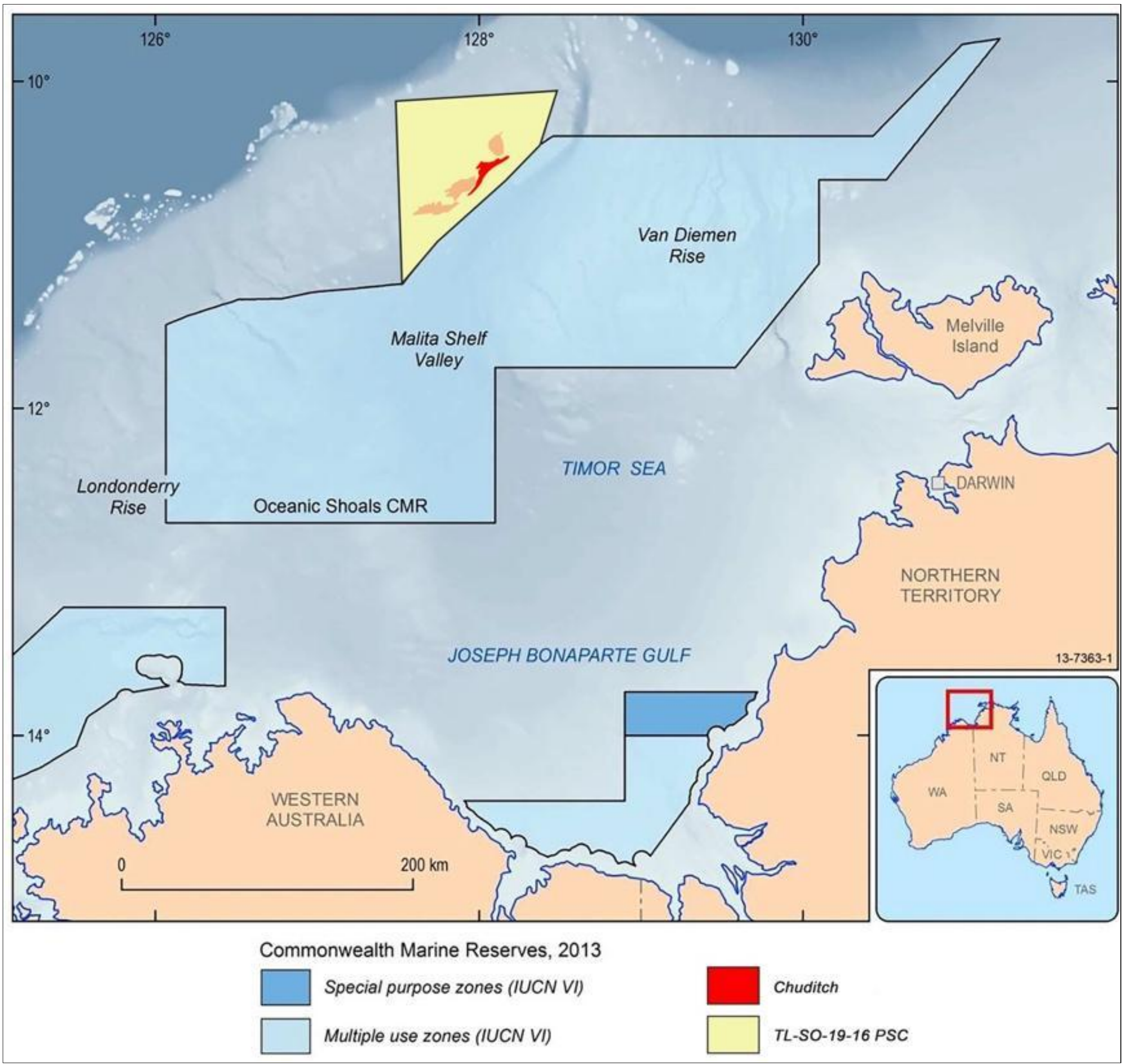
6.2.5. Protected Areas & National Parks

This area comprises Marine Protected Areas (MPA) and National Parks that provide protection to biodiversity and importance for geo-tourism. Since the project is situated close to certain MPAs, proper project planning will be carried out in order not to harm species and their natural habitats.

- The MPAs, National Parks: The project area is proximal to MPAs and National Parks crucial in biodiversity conservation for eco-tourism, especially geo-tourism.
- Biodiversity Importance: These protected areas safeguard various ecosystems, hence protecting different species and their habitats, most of which are very sensitive to environmental changes.

The Coral Triangle (figure 21), in general, is a highly biodiverse region globally, renowned as the central hub of tropical marine biodiversity. The origins of this remarkable biodiversity are attributed to the complex tectonics, evolution, and geological history of the region, along with climate fluctuations and changing sea levels. Within the Ocean Shoals Marine National Park (located approximately 8NM from the Chuditch well location (figure 10), there is the Oceanic Marine reserve which does not permit any fishing activities ('no take' zone).

Figure 21 Proposed Chuditch contract area and marine protected areas i.e. Oceanic Shoals Marine Park



6.3. Economic Components

These components address the human economic activities and industries that could be impacted by the project.

Traditionally, the majority of Timorese still practice subsistence agriculture growing corn, rice, cassava, millet and sweet potatoes. Other products such as palm and betel nut play important role for traditional rituals. Coffee plantations are the main source of income for the Timor-Leste economy. Forest products such as sandalwood have had significant value also, but due to the near extinction of relevant species it is protected and controlled in trade by the government.

In farming activities, buffalo, cattle, pig and chicken are important for the economy of rural communities. Due to the agricultural traditions in Timor-Leste, industry is limited. The Timor-Leste government is also promoting tourism and with recent development of international involvement in the country, it opens potential to grow the tourism industry. In terms of fisheries, Timor-Leste has enormous resources, but relatively little has been explored of the country's potential economic contribution.

For mineral and energy industry, offshore oil and natural gas deposits found in Timor Sea, there is potential for this to support the future of Timor-Leste's economy. The development of oil and gas resources in offshore waters and recently onshore has begun to supplement government revenue.

Timor-Leste's economy has experienced fluctuations in recent years. In 2022 according to World Meters, the country's nominal Gross Domestic Product (GDP) was approximately $3.16 billion, with a real GDP of about $2.25 billion after adjusting for inflation. This represented a significant decline from the previous year, with a real GDP growth rate of -17.49% in 2022.

Looking ahead, the Asian Development Bank (ADB) forecasts a GDP growth of 3.1% in 2024 and 3.9% in 2025, indicating a potential economic recovery. Whilst, based on World Bank data, Timor-Leste's GDP per capita was estimated at $1,502.50 as of 2023.

The economy is heavily reliant on oil and gas revenues, which poses challenges due to the finite nature of these resources. Efforts to diversify the economy are ongoing, with a focus on sectors such as agriculture, tourism, and manufacturing.

In terms of trade, Timor-Leste's imports were valued at $850 million in 2020, with refined petroleum, cars, cement, delivery trucks, and motorcycles being the main import goods. The primary import partners were Indonesia (27.1%), China (23.2%), and Singapore (8.97%).

The country faces socio-economic challenges, including poverty and unemployment. Efforts to address these issues are critical for sustainable development.

For a comprehensive analysis of Timor-Leste's socio-economic components, it is essential to consider these economic indicators alongside factors such as education, healthcare, infrastructure, and governance.

The Oil and gas sector is a critical component of its socio-economic landscape. The operation of the Chuditch-2 project significantly impacts the country and supports national development. The royalties, taxes and production sharing agreements go into the government's budget to fund education, health and infrastructure. It also creates jobs in maritime logistics, engineering and maintenance and in supporting industries such as transportation, catering and accommodation. Offshore drilling also boosts the economy through increased demand for local businesses and services and a multiplier effect that increases household incomes and consumer spending. These are key to diversifying and strengthening Timor-Leste's economy and broader economic resilience.

6.3.1. Employment sectors

The employment sector in Timor-Leste reflects a developing economy characterized by high informality, sectoral imbalances, and ongoing challenges in job creation. According to Trading Economics (2023), the overall unemployment rate in Timor-Leste was 1.8% in 2022 and 2023, a relatively low figure compared to global averages. However, this does not account for the high levels of underemployment and informal labour, particularly in rural areas. Youth unemployment remains a major issue, with a rate of 12.31% among individuals aged 15–24 as of 2019. Many young people struggle to transition into formal employment due to limited opportunities and inadequate skills training.

Additionally, the International Labour Organization (ILO, 2021) reported that Timor-Leste's labour force participation rate (LFPR) is 30.5%, which is low for a developing nation. This figure reflects significant gender disparities, with men participating at a rate of 36.9% compared to 24.2% for women. Many women are engaged in unpaid domestic work or informal agricultural activities, which limits their participation in the formal economy.

Employment in Timor-Leste is primarily concentrated in sectors such as services, agriculture, and industry. According to the ILO (2021), the services sector is the largest employer, accounting for 59.1% of the workforce and including areas such as education, healthcare, public administration, and retail. The agriculture sector employs 26.9%, focusing on subsistence farming of crops like coffee, maize, and cassava. The industrial sector accounts for 13.5% of employment and is driven by construction, manufacturing, and extractive industries. Despite its relatively small workforce share, the industrial sector is vital for infrastructure development and economic diversification.

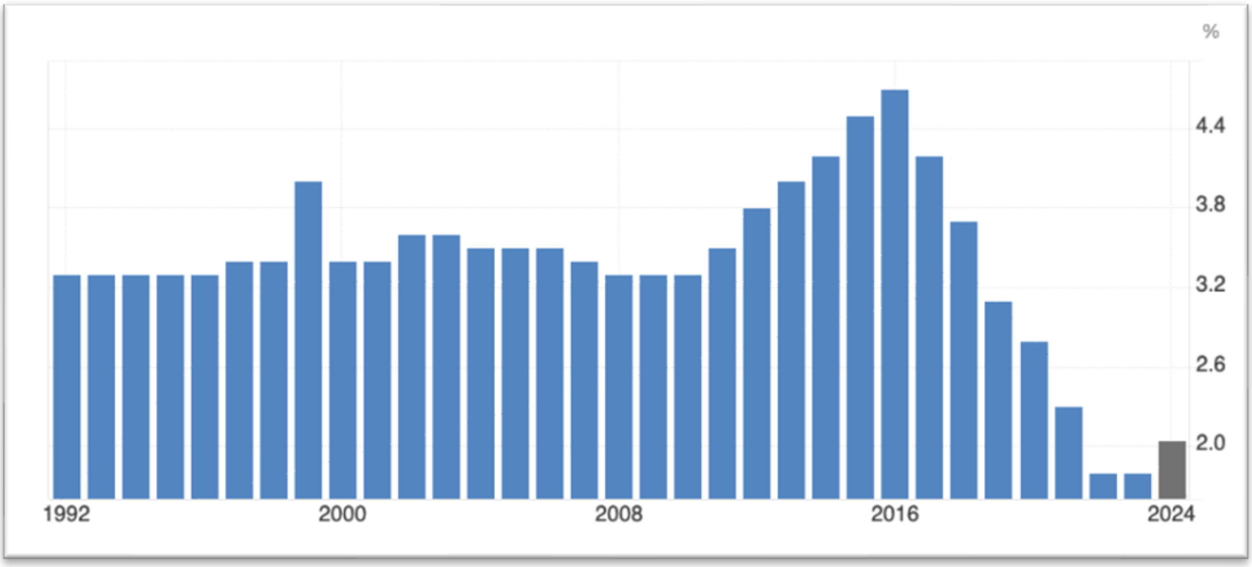
The industry of oil and gas in the country is among the biggest employment in Timor-Leste. Employment opportunities will be both directly created and through support industries such as transport and logistics for skilled and unskilled labour.

In terms of economic contributions, the AMAN Alliance (2023) reported that private-sector employment in non-oil-producing companies contributed $590.2 million to the GDP in 2023. The retail/wholesale trade and construction sectors were key contributors to this growth. Private sector employment grew by 3%, with approximately 62,500 people employed in 2023, reflecting a modest improvement in job creation.

To address the challenges in the employment sector, the government has prioritized strategic economic diversification as outlined in the Strategic Development Plan (2011–2030). This includes reducing reliance on oil revenues by promoting agriculture, tourism, and manufacturing, which are expected to generate sustainable employment opportunities. Investments in infrastructure projects, such as road networks and construction, are also being prioritized to stimulate economic activity. Human capital development is another key focus, with vocational training and education initiatives being implemented in collaboration with organizations like the ILO to improve workforce skills and align them with market demands.

Despite these efforts, challenges such as high levels of informal employment, limited opportunities for youth, and gender inequality persist. Addressing these systemic issues remains critical to achieving sustainable economic growth and improving livelihoods in Timor-Leste. The government's focus on education, infrastructure, and economic diversification offers a pathway toward fostering a more inclusive and resilient labour market.

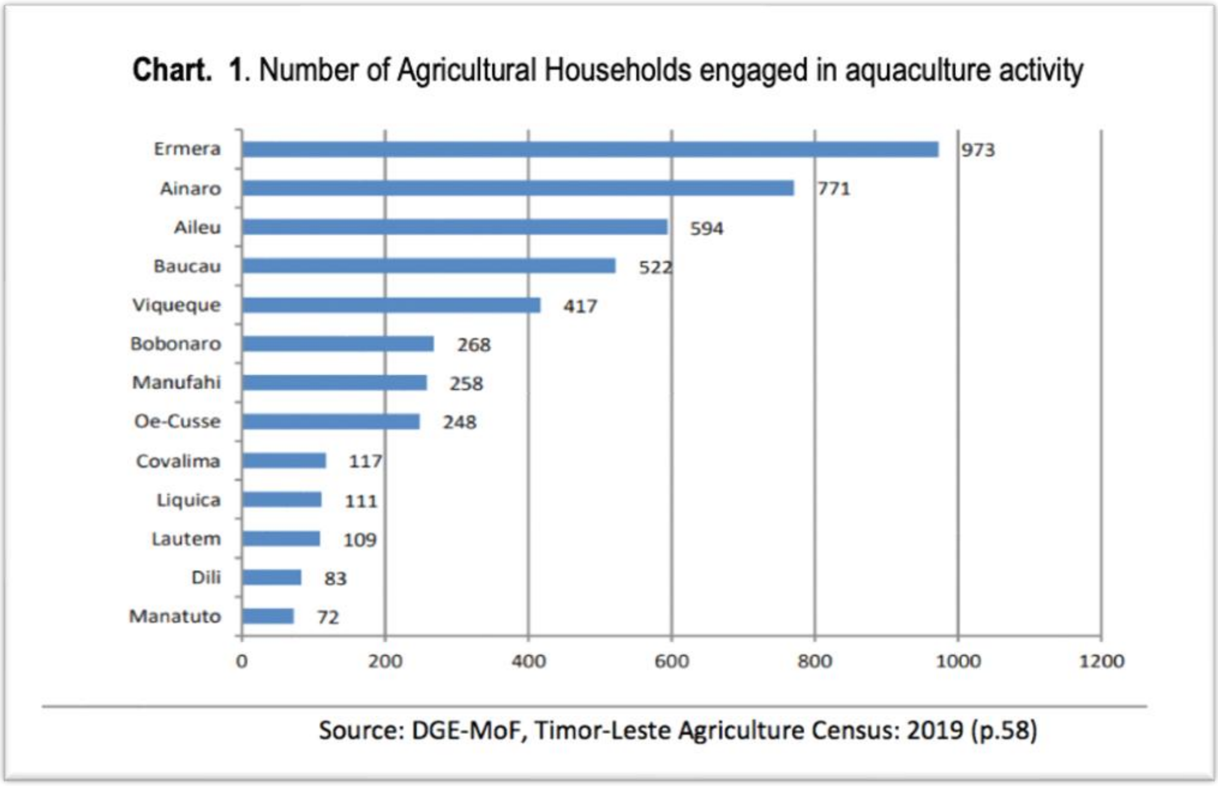
Figure 22 Unemployment rate (Source: World Bank, 2024)



Fishing

Fishing is a cornerstone of Timor-Leste's economy and sustenance, with approximately 40,000 individuals directly engaged in the sector. The nation's waters, part of the Coral Triangle, are rich in marine biodiversity, supporting both artisanal and small-scale fisheries. Number of Households engaged in aquaculture / fisheries activities (figure 23)

Figure 23 Number of Agriculture Households engages in aquaculture activity. (Source DGE-MOF, 2019)



Fisheries are a major part of the local economy in the coastal areas. It is of great economic importance since fishing provides a source of livelihood and ensures food security, besides aiding in artisanal fisheries and commercial fisheries, which assist the coastal economy. Artisanal fishing, in a traditional manner, characterizes catches in the region, together with a little commercial fishing targeting tuna and mackerel among other species. Their economic importance, be it at local incomes or market contributions, is immense, and as such, they are vital in securing the livelihood of the communities. However, it may destroy fishing grounds, cause habitat contamination, and add another player that competes for resources. This also includes mitigation through compensation programmes, continued monitoring, and liaison with local fishermen for resolution of issues that will help minimize conflict.

Artisanal fishers primarily use handlines, gillnets, and traditional traps to target species such as reef fish, tuna, and mackerel. These activities are vital for food security, as fish constitute a primary protein source for the population.

Coastal communities along the 600km of Timor-Leste's coastline rely on a wide range of fish, including the large tunas, flying fish, coral reef fish and deep-water snappers for their livelihoods. The DNFA estimates that for over half the 20,000 fishermen of Timor-Leste, fishing is the main source of food and income many individual, small-scale operators with small boats catch a range of fish mostly sardines. According to fish production data from the National Directorate of Fisheries and Aquaculture in ATSEA Program Socio Economic Impact Assessment report (2011), there were an estimated 2,889 tonnes of fish (with equivalent value of around US$ 5.8 million) landed in Timor-Leste in 2005. Dili was the most active fishing district, dominating the country's fish production and seaweed export, with limited fishing from the south coast towards the Contract Area.

There are 739 species (234 genera, 61 families) of reef fish and expected to predict 921 species of coral fish record in Timor-Leste. The site diversity ranged from 64 to 293 species/site with an average of 210 species/site.

The coral Fish Diversity Index predicts 921 species. Sites with the highest fish diversity included Atauro Island with *barrier reefs* (293), *Loikere* (271), *Ete Asa Lepek* (259), West Jaco Island (249), and Tenu in Lautem (243). Several new fish species were also collected including Chrysiptera caesifrons and Eviota santani.

Many of the species listed for Timor-Leste are found throughout the tropics and are important commercial species, such as the tunas (The Big Tuna, Thunnus obesus) listed as threatened species, mackerels and snappers. Fish densities in the region of the contract area are likely to be low, with some pelagic species traversing the area. However, waters with greater fish abundance are likely to occur in the shallow, coastal fringe and around reefs and shoals on the edge of the continental shelf (CSIRO 1999a). The broader area of the Timor Sea region supports pelagic fish species that are utilized in traditional and commercial fisheries that occur in the deeper offshore areas.

Some figures that give the efforts of Fishery in Timor-Leste:

Figure 24 Volume of fish catch

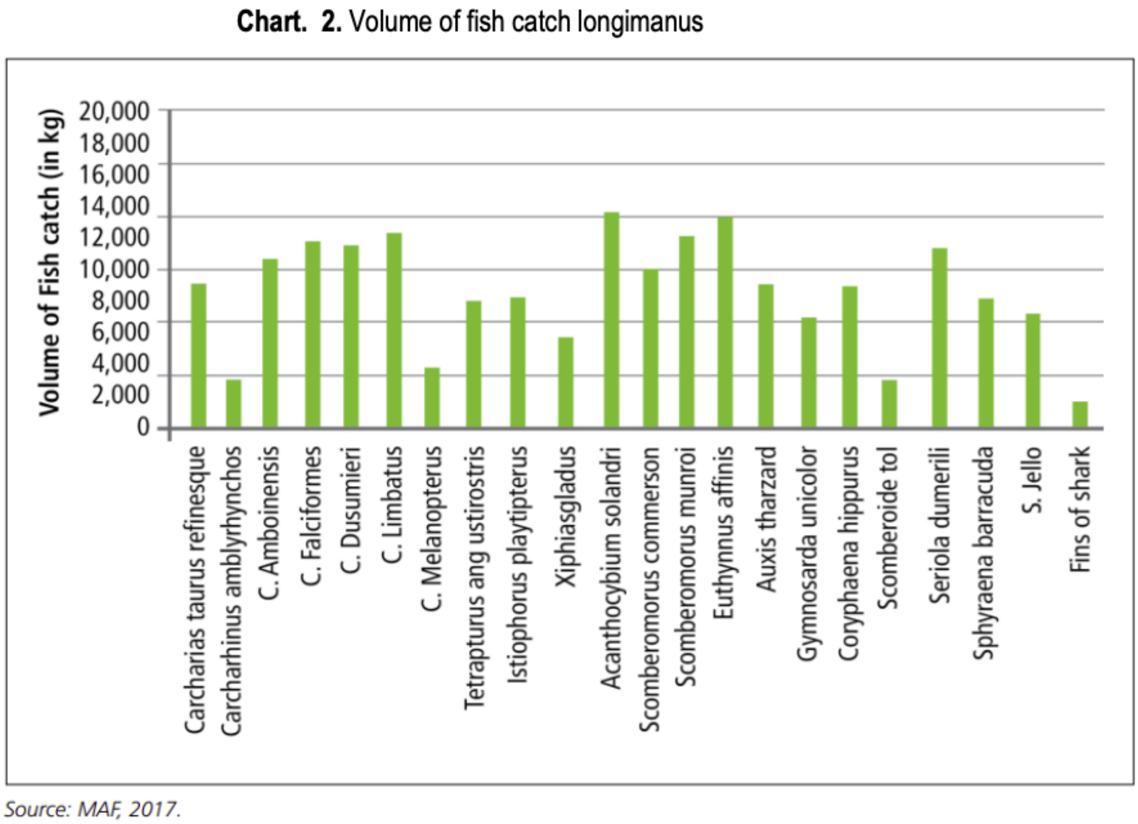


Figure 25 Small scale fishing area in Timor-Leste

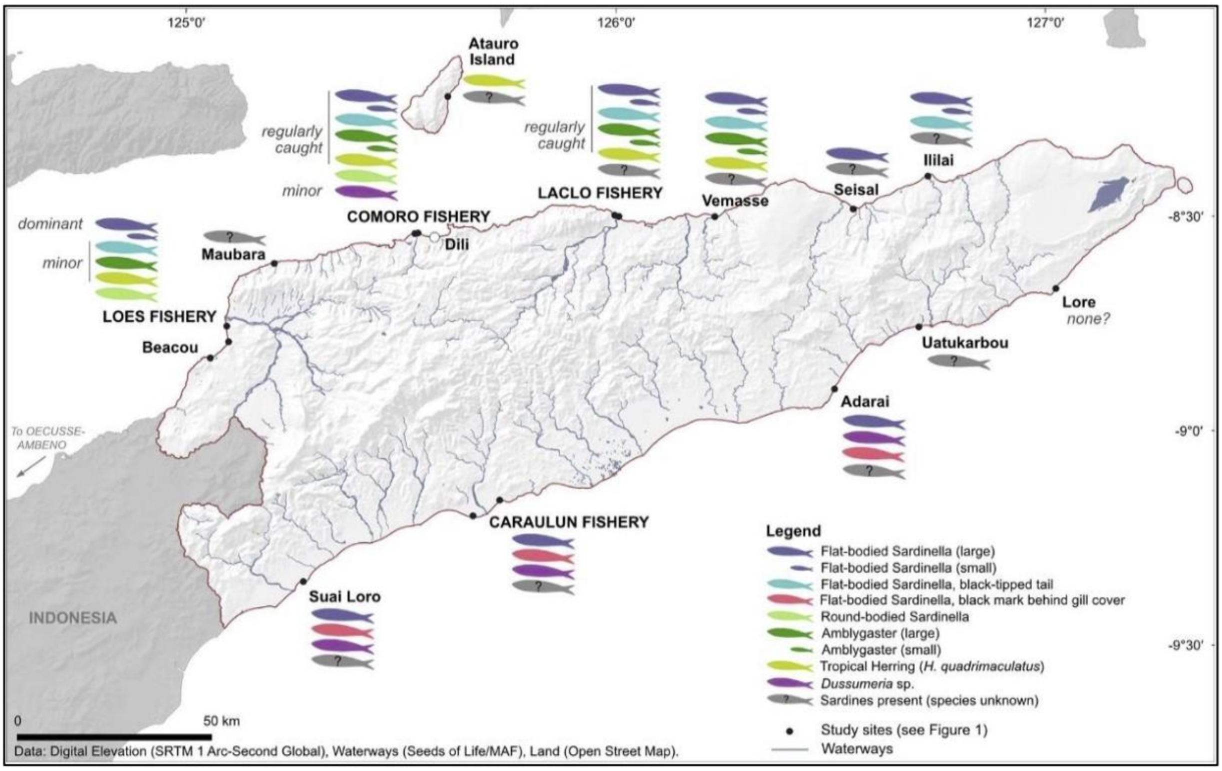
In the Timor-Leste Sea, at that time more than 239,460 tons of fish or equivalent to $1.2 Billion were stolen from Timor Sea.

To ensure sustainable fishing practices, the government has implemented several regulatory measures. Joint Ministerial Order No. 11/GM/2015 establishes minimum sizes and weights for taking of species, aiming to prevent overfishing of juvenile stocks. Additionally, Joint Ministerial Order No. 18/MAP/MCIA/II/2017 lists protected aquatic species, prohibiting their capture to preserve biodiversity. The implementation of a Satellite System for Monitoring Fishing Vessels (VMS) under Decree-Law No. 21/2008 further enhances the management of fish stocks by enabling effective monitoring, control, and surveillance of fishing activities.

Despite these efforts, challenges persist, including illegal, unreported, and unregulated (IUU) fishing, which threatens marine ecosystems and local livelihoods. In response, Timor-Leste has taken steps to strengthen its commitment to combating IUU fishing by approving accession to the Agreement on Port State Measures, as outlined in Government Resolution No. 8/2023.

The Peskas platform, an open-source web portal, provides data and insights on fisheries in Timor-Leste. Initiated in 2016 in partnership with the Ministry of Agriculture and Fisheries, Peskas uses catch data collected by local enumerators and vessel tracking data to show fishing trends over time and space. This near-real-time monitoring system focuses on small-scale fisheries and supports sustainable management practices.

Figure 26 Fish catch composition per area (Source Hunnam et. al. 2021)



6.3.3. Tourism

Though the Chuditch Appraisal Well project is an offshore project, its impacts on the tourism industry, mainly on marine-based tourism activities of diving, snorkelling, and eco-tourism are considered.

There are no known impacts to tourism associated with the Chuditch location which is 184 Nm offshore and in a minimum of 65m of open seas. Aquatic and Eco-tourism is predominantly a coastal or near coastal waters activity. The only credible impact considered is that of environmental pollution resulting from an unplanned spill or well control event.

Tourism is one of the Government of Timor-Leste's tools for ensuring economic and socially sustainable development. The Government of Timor-Leste has officially published a website providing information related to tourism in Timor-Leste. This has been a stepping-stone for the country to introduce Timor-Leste worldwide through the website.

Marine tourism has been identified as a potential economic growth area for Timor-Leste, particularly along the north and east coasts, and could deliver social and economic benefits through employment. Some eco-tourism, including cultural tourism in coastal areas, in interaction with marine wildlife (dolphins, whales) fishing competitions and diving outfits already exist however further development of these industries is reliant on improved infrastructure and services (Bateman & Bergin, 2011).

In northern Australia, commercial marine tourism is an important industry although a small component of the overall tourism sector. Activities include charter fishing, diving, snorkelling, whale mammal watching and visitations on luxury cruise boats around the Kimberley archipelago and NT coast to view sparsely inhabited pristine marine and coastal region. This industry is expected to grow over coming years (DEWHA, 2008b).

In the northern region, the marine tourism industries are largely associated with recreational fishing ventures which are projected to increase to increase both in terms of effort, numbers and potentially movement from coastal to offshore areas (Fernander and Grainer 2010 - ATSEA Program Socio Economic Impact Assessment report 2011). The cruise shipping sector has seen significant growth in northern Australia, particularly through Darwin.

There are no known significant heritage or archaeological sites, shipwrecks or marine heritage sites in the vicinity of the survey/drilling area. There is no regular passenger vessel passing by the Chuditch Field.

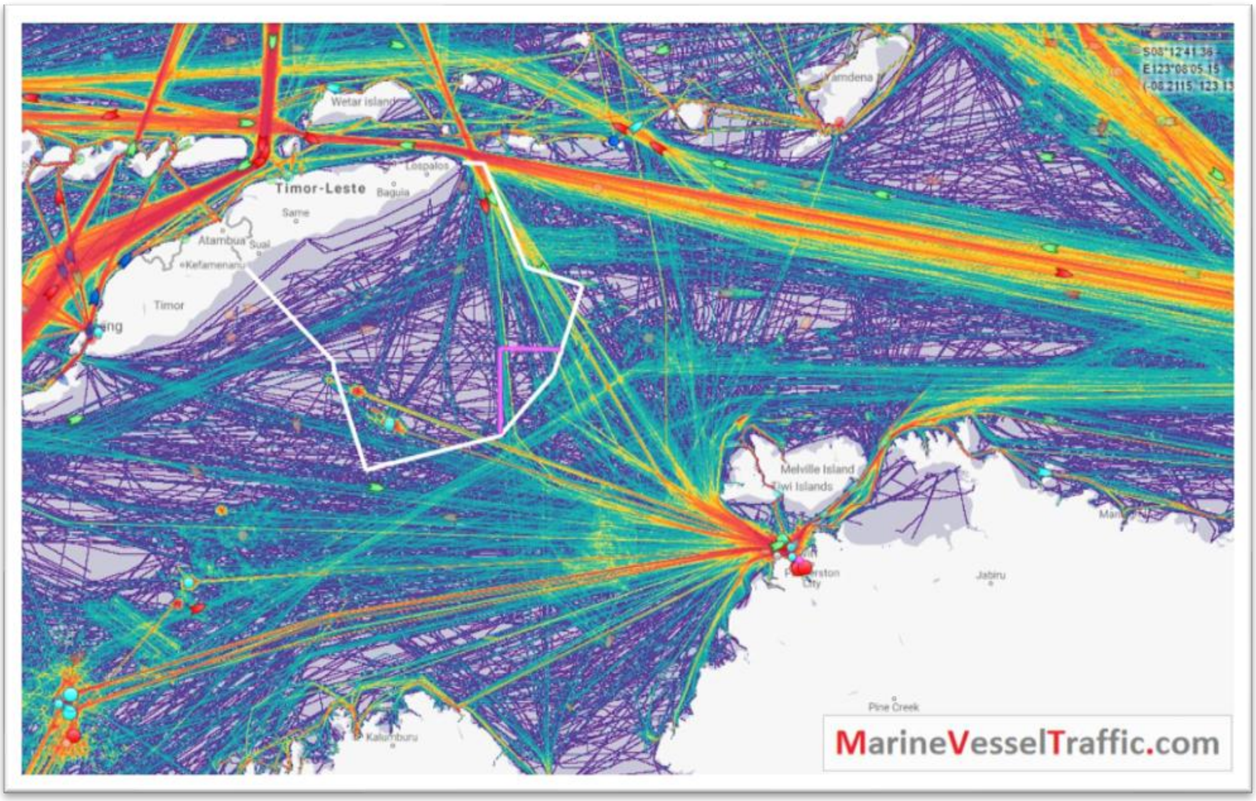
6.3.4. Seaport and Shipping

Shipping into and out of Timor-Leste is through the port of Dili, with a relatively limited but growing number of vessels. However, administration of shipping is underdeveloped. A new port has recently been completed in Tibar, Liquiça municipality, 2 km to the west of Dili and has been operating since November 2022. It is estimated that this new facility will lead to an increase in shipping traffic to Timor-Leste. Additionally, there are passengers ferry services between Dili and regions like Oecusse and Atauro, providing essential connectivity for passengers and vehicles. These operation ports their operation is in the opposite site of the project; hence, there is no intervention with the project activity.

On the other hand, in northern Australia, the major ports (Darwin, Dampier, Broome, Weipa, Karumba, Nhulunbuy) are experiencing increased activity due to expansion in the resources sector and exports of major commodities (Iron-ore, natural gas and other petroleum products, lead, zinc, manganese and copper) (DEWHA 2008A & 2008B). The number of non-government port authority ports in Australia are associated with private resources sector (e.g., in areas adjacent to Gove, Groote Eylandt and McArthur River in the Northern Territories) with major expansion in ports having been undertaken for gas developments).

There is almost a certain amount of traffic associated with offshore support vessels associated with oil and gas industry production and exploration. An increase in shipping and port expansion associated with the growth of the resources sector in the region has potential implications for the marine environment (DEWHA 2008b). Details record of fishing and shipping activity in Timor Sea shown in figure 27.

Figure 27 Details recording fishing and shipping activity in Timor-Leste (Source: Marine Vessel Traffic



The drilling project will operate within a defined safety exclusion zone declared by Rig management and published in Notices to Mariners (NOTAM). The project will maintain a standby vessel within close proximity to the Rig at all times tasked with contacting and shepherding away any errant vessel. The proposed project activities will have no impact on vessel traffic.

6.3.5. Agriculture and Forestry

Timor-Leste is famous with its coffee variety named Timor Hybrid and also known as the country origin of sandalwood. The following crops are considered economically productive for Timor-Leste: cashew nuts, mangos, spices, vanilla, pineapples, passion fruit, guavas, as

well as flowers. The proposed drilling location is far offshore and would not have any significant impact on the agriculture and forestry aspects. The development of Oil and Gas subsequently would have significant positive impact in supply chain of fresh fruits and vegetable to Oil and Gas Industry.

6.3.6. Other Industries

6.3.6.1. Mineral Exploration

Timor-Leste is considered as a highly promising country for mineral and natural gas and oil both onshore and offshore. Based on the study carried out by UNESCAP, Timor-Leste has reserves of metallic minerals: copper-gold, chromite, gold, manganese; and non-metallic minerals: bentonite clay, phosphorite, gypsum and salt, wollastonite, graphite and talc, silica sands, sulphur, and ochre. In the northern edge of Timor-Leste, there are indications of the existence of copper, chromite, gold, silver, and manganese.

The north edge of Oecusse is claimed as the richest copper zones in Timor-Leste as well as Baucau and north central Viqueque Municipality. Atauro and Ossu area of the Viqueque Municipality have number of gold and silver occurrences. In the eastern and western coastal areas of Timor-Leste possesses limestone and marl. Phosphate and bentonite are found in central Baucau Municipality. Good quality marble is also found in Manatuto. The belt from east Dili to the east coast possibly contains clay and kaolin. Mineral that has not been explored yet but are predicted to exist in Timor-Leste are laterite nickel, platinum, and diamonds. This is onshore and development of mining resources would boost the economic development of Timor-Leste.

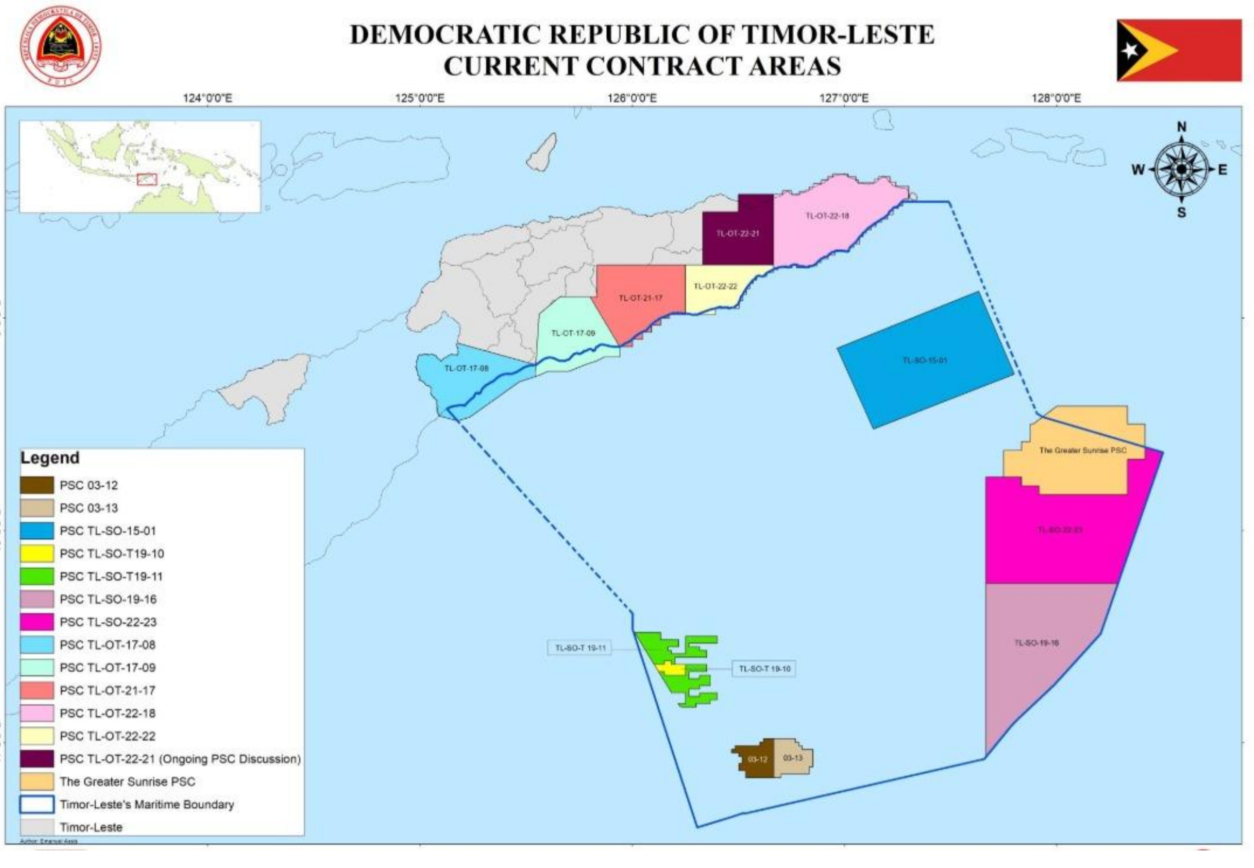
6.3.7. Oil and Gas Industry

Until recently, there was only one operational asset within 150km radius of the Chuditch contact area which was Bayu-Undan field. The Bayu Undan production is ceased in May 2025 and is planning to be repurposed to a Carbon sequestration project.

Adjacent to Chuditch contract area, there is the ENI contract area that will acquire 3D Seismic survey. Additionally, there are other oil and gas fields that are underdeveloped including Greater Sunrise, Kelp-deep, Kuda Tasi, and other fields beyond Timor-Leste's jurisdiction.

Whilst, in the onshore of Timor-Leste there are a number of product sharing contact (PSC) blocks that are either in the exploration or under contract. Both onshore and offshore assigned PSC blocks are presented in figure 28.

Figure 28 Map of PSC block for onshore and offshore of Timor-Leste (Source: ANP Website)



6.4. Social Components

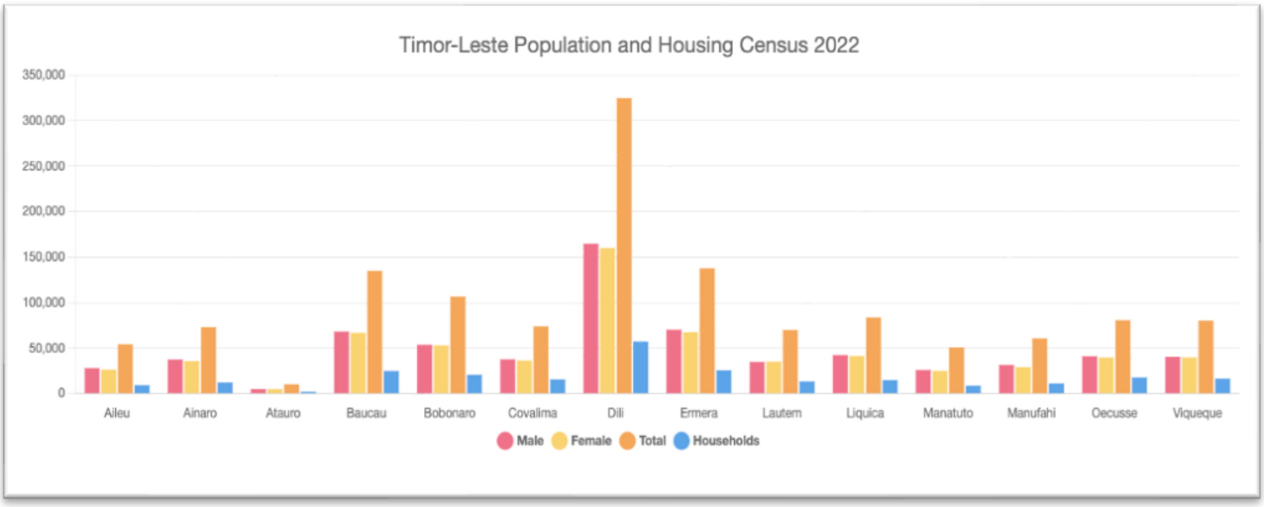
The baseline information regarding social components are derived from secondary, publicly available and published sources. The sources are Government websites, public, Institutional publications, Government of Timor-Leste National Strategic Development Plan, World Bank 2023, basic sanitation facilities, WHO, UNDP, UNFPA, ILO, MAF.

Timor-Leste has made significant strides in rebuilding its social and economic components since achieving independence in 2002.

6.4.1. Demographics and Population Composition

As of 2023, Timor-Leste's population is estimated at approximately 1.34 million people (World Bank, 2023), with a youthful demographic profile. Over 60% of the population is under the age of 25, reflecting high fertility rates averaging 4.2 births per woman (UNFPA, 2022). Figure 29 shows Timor-Leste Population Census 2022. This demographic trend has implications for the country's labour force, education system, and social services. Rural areas account for about 70% of the population, while Dili, the capital city, is the primary urban hub. Ethnically, the population is diverse, with Austronesian and Melanesian influences, and there are over 30 local languages spoken, in addition to the official languages of Tetum and Portuguese.

Figure 29 Timor-Leste Population Census 2022. (Source: INE, IP., 2022)



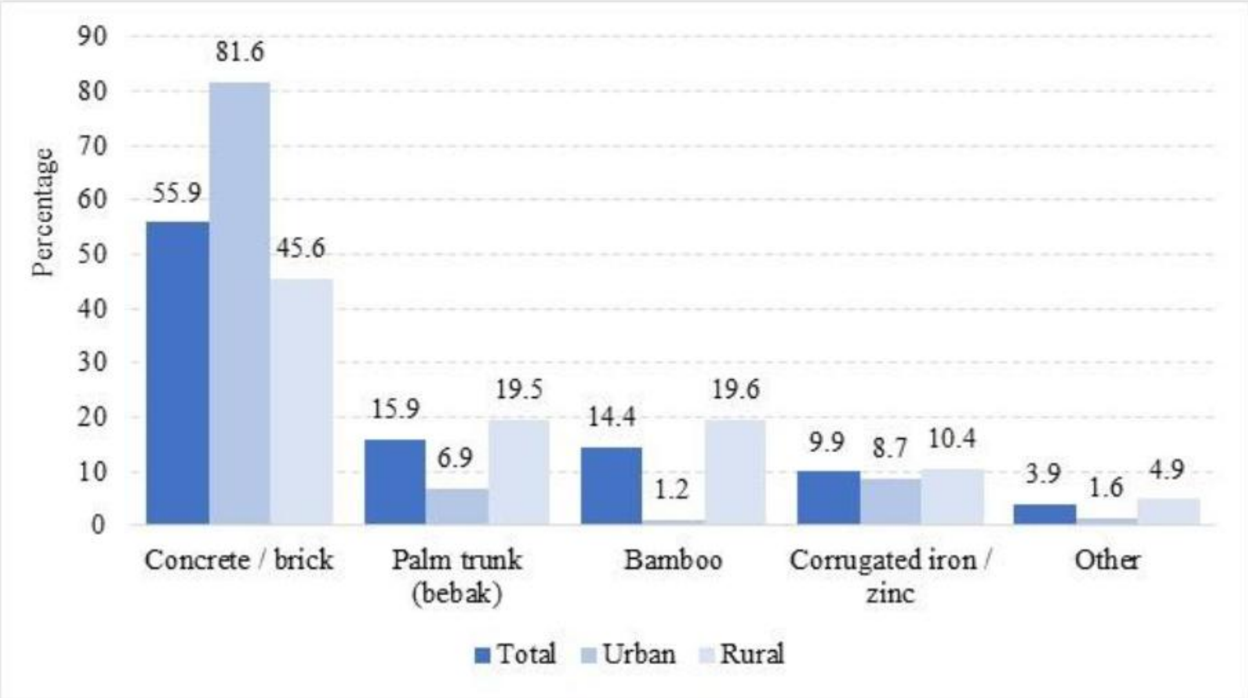
6.4.2. Living Standards

The Timor-Leste housing 2022 Census reported that 55.9% of household lived in accommodation units with concrete or brick walls while 19.5% of all housing units have palm trunks (*bebak*). About one in seven houses use bamboo walls.

6.4.2.1. <u>Housing</u>

The Timor-Leste Housing 2022 Census (figure 30) reported that 55.9% of households lived in accommodation units with concrete or brick walls. Palm trunk (*bebak)* is the second-most common wall material used. In rural areas, 19.5 percent of all housing units have palm trunks as wall material. In urban areas, this is much less (6.9 percent). About one in seven Timor-Leste housing units have bamboo walls (14.4 percent). While this is 19.6 percent in rural areas, just a few houses in urban areas use bamboo as construction material for walls (1.2 percent).

Figure 30 Timor-Leste Housing Census 2022 (Source: INE.IP, 2022)



6.4.2.2. Clean Water and Sanitation

The criteria to classify drinking water services are 'improved' or 'unimproved' type of drinking water sources, accessibility of drinking water on the premises, the time required to collect drinking water, including queuing, the availability of water if needed and absence of contamination.

An improved drinking water source can deliver safe water through its design or construction. The following types of water supplies are considered a source of improved drinking water: piped supplies and non-piped supplies (such as boreholes, protected wells and springs, rainwater, and packaged or delivered water, e.g. by tanker trucks). Unimproved water sources do not protect against bacterial and chemical contamination. These sources include rivers, streams, irrigation channels and lakes.

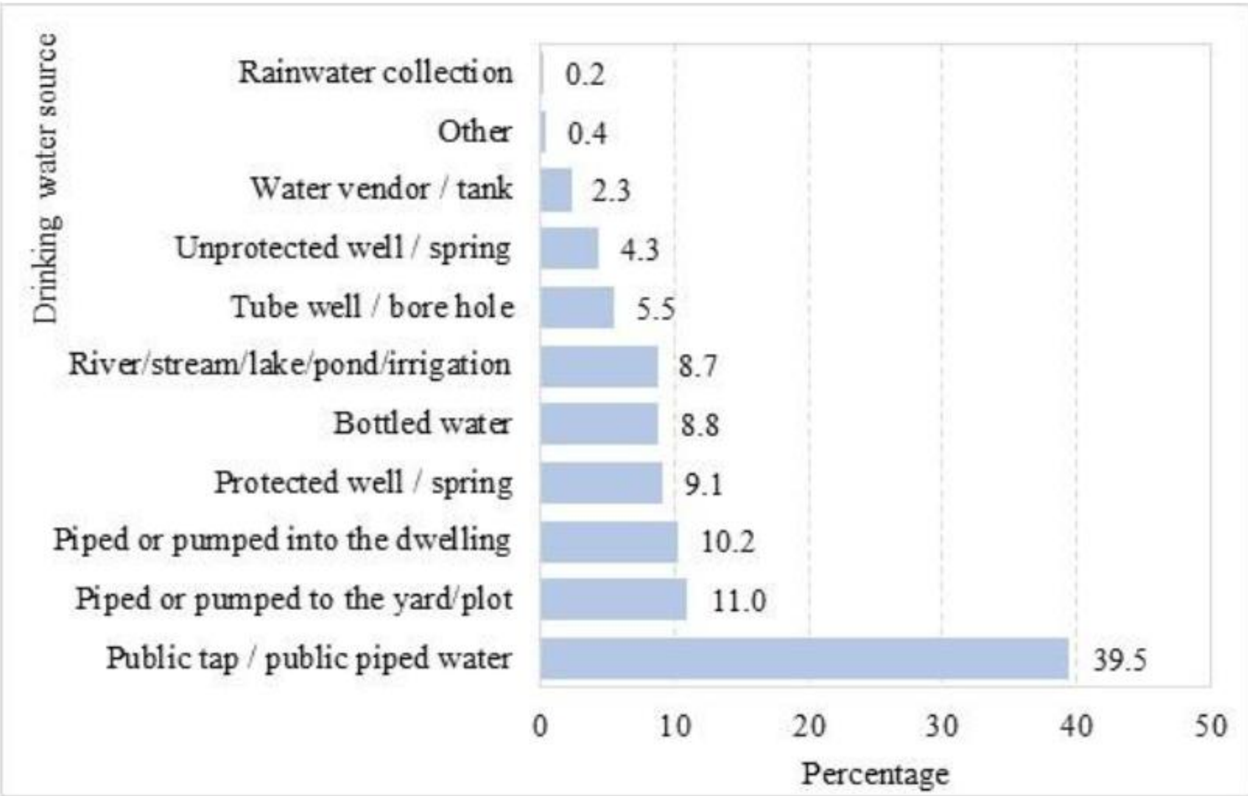
The Clean Water and Sanitation Census 2022 (figure 31) reported for drinking water source that the most occupied housing units rely on public taps or public piped water (39.5percent). Only a minority of 10.2 percent of all housing units have piped or pumped water in the house, and 11.0 percent have a private water source in the yard. Bottled water and water delivered by a water vendor account for 8.8 and 2.3 percent of all housing units, respectively. Figure 32 shows that people in 8.7 percent of all housing units depend on rivers, streams, lakes, ponds and irrigation channels to get drinking water, and 4.3 percent obtain their drinking water from unprotected wells and unprotected springs. This means that unimproved drinking water sources are used in 13.0 percent of all housing units.

Approximately 75% of households have access to improved drinking water sources, but only 46% have access to basic sanitation facilities (WHO/UNICEF Joint Monitoring Programme, 2022).

Lack of proper sanitation is a major contributor to waterborne diseases, particularly in rural communities.

Figure 31 Clean water and sanitation census 2022. (Source: WHO/UNICEF, 2022)

Figure 32 Drinking water source (Source: INE.IP, 2022)



6.4.2.3. Electricity Access

As of 2024, Timor-Leste has achieved a national electrification rate of 99%, according to Eletricidade de Timor-Leste (EDTL). This milestone reflects substantial government efforts to expand electricity access across the country. Currently, only one suku, Betulau, in the post-administrative area of Lequidoe, Aileu Municipality, remains under construction. Furthermore, 96% of aldeias nationwide are now connected to the electrical grid, marking significant progress in enhancing electricity access for both urban and rural communities.

This achievement aligns with the National Strategic Development Plan (2011–2030), which prioritizes universal access to reliable, 24-hour electricity by 2030. The plan emphasizes rural electrification as a cornerstone of sustainable development, aiming to reduce inequalities and foster economic growth across Timor-Leste. (Timor-Leste National Strategic Development Plan).

Despite these advancements, challenges persist, particularly in rural areas, where intermittent power supply hampers productivity and quality of life. To address these challenges, the government and international organizations have launched targeted initiatives. For instance, the UNDP's Accelerating Clean Energy Access to Reduce Inequality (ACCESS) project, funded by the Korea International Cooperation Agency, has been pivotal in improving energy access for vulnerable communities. Between 2020 and 2023, the project focused on enhancing sustainable electricity access in 25 villages across Dili (Atauro), Bobonaro, and Manatuto municipalities, aiming to improve livelihoods and reduce energy inequality (UNDP ACCESS Project).

Additionally, the UNSDG's Solar-Powered UN House project highlights Timor-Leste’s commitment to greener and more sustainable energy solutions. This initiative showcases the potential of renewable energy sources, such as solar power, to address chronic energy challenges and reduce dependency on expensive and environmentally harmful diesel generators (UNSDG Solar-Powered UN House).

The government is further promoting renewable energy technologies, including micro-hydro, solar panels, and biofuel generators, particularly in remote areas. Communities are encouraged to adopt these solutions, with opportunities to produce surplus energy for sale to the national grid.

While Timor-Leste has made commendable progress toward electrification, continued efforts are necessary to ensure the reliability, affordability, and sustainability of electricity, particularly in rural areas. Strengthening infrastructure and advancing renewable energy initiatives will be critical to achieving the country's long-term development goals.

6.4.3. Living Standards

Public health indicators in Timor-Leste highlight areas of progress and ongoing challenges.

6.4.3.1. Life Expectancy

Life expectancy in Timor-Leste has seen significant improvement, increasing to approximately 70 years as of 2023. This progress reflects advancements in healthcare, education, and living conditions within the country. Despite these gains, life expectancy in Timor-Leste remains lower than the global average, which was 73.4 years in 2019 according to the World Health Organization (WHO).

The improvement is attributed to investments in public health infrastructure, vaccination programs, and reductions in infant and maternal mortality rates. However, challenges persist, including access to healthcare in remote areas, nutritional deficiencies, and the burden of communicable and non-communicable diseases. Continued efforts in addressing these issues are essential to closing the gap with the global average.

6.4.3.2. Life Expectancy

Health facilities in Timor-Leste often operate with limited resources, including insufficient medical equipment, essential medicines, and infrastructure such as clean water, electricity, and transportation services. Rural health posts, which are typically the first point of care for many communities, are especially affected by these shortages. Moreover, the country faces a critical shortage of skilled healthcare professionals, including doctors, nurses, and midwives. This shortage is compounded by challenges in recruiting and retaining qualified staff in rural areas. Many healthcare workers prefer urban settings due to better living conditions, professional opportunities, and access to education for their families.

6.4.3.3. Maternal and Child Health

Maternal and child health indicators highlight the need for targeted interventions. Although progress has been made since independence in 2002, maternal mortality remains high, with 142 maternal deaths per 100,000 live births in 2020 (World Bank). Neonatal and under-five mortality rates are also higher in rural regions (41 per 1,000 live births) due to limited access to antenatal care, skilled delivery services, and postnatal care (World Bank, 2023).

While Timor-Leste has made notable progress in rebuilding its healthcare system post-independence, significant disparities remain. Achieving universal healthcare access requires sustained investments in health infrastructure, human resources, and community outreach programs. Addressing these challenges is critical to improving health outcomes, particularly for women and children in rural areas.

6.4.4. Education

Timor-Leste's education system comprises six years of primary education, followed by three years each of lower and upper secondary education, totalling 12 years of formal schooling. As of 2015, the country had 106 secondary schools, with 61 public and 45 private institutions. The net attendance ratio for secondary education stood at 32.8%, with a higher participation among females (35.9%) compared to males (29.9%).

In tertiary education, the net attendance ratio was 16.3%, indicating that a modest proportion of the population pursued higher education. A significant concentration of tertiary students resided in Dili municipality, accounting for 66.7% of the total higher education student body.

Additionally, the Timor-Leste government has committed to supporting students through initiatives through the Human Capital Development Fund, which allocated at least $150,000 in 2023 to assist up to three Timorese students in pursuing studies in the United States. Furthermore, the collaboration with development partner’s support students to study in Europe, Australia, New Zealand, China, Japan, etc.

These collaborative efforts between the government and international partners aim to develop a skilled workforce capable of contributing to Timor-Leste's ongoing development, aligning with the educational objectives outlined in the SDP 2011–2030.

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These collaborative efforts between the government and international partners aim to develop a skilled workforce capable of contributing to Timor-Leste's ongoing development, aligning with the educational objectives outlined in the SDP 2011–2030.

6.4.5. Transportation

Infrastructure plays an important role to support economic and social development. The Government of Timor-Leste along with Funding agencies have improved the transportation infrastructure in general. However, there are many challenges due to climate changes, low maintenance, not enough human resources to support the system.

The Timor-Leste Strategic Development Plan 2011–2030 outlines a comprehensive vision for enhancing the nation's transport infrastructure across land, air, and maritime sectors. The plan emphasizes the critical role of a robust transportation network in facilitating economic growth, social development, and national integration Timor-Leste's transportation infrastructure encompasses land, air, and maritime sectors, each presenting unique challenges and ongoing development efforts.

6.4.5.1. Land Transportation

The nation's road network spans approximately 6,041km, with about 2,600km paved and the remainder unpaved. The general condition of these roads is inadequate, often hindering efficient transportation. Public transport primarily consists of privately operated minibuses, known locally as *microlets*, which serve various routes without formal schedules. Recent initiatives, such as the Timor-Leste Branch Roads Project, aim to improve road connectivity by linking key towns and enhancing access to popular destinations like Mount Ramelau.

6.4.5.2. Air Transportation

The country operates several airports, with Presidente Nicolau Lobato International Airport in Dili being the primary hub for international flights. This airport accommodates flights to destinations including Darwin, Denpasar, and Singapore. However, limitations such as a short runway and lack of night-time landing capabilities restrict operations to daylight hours. Other airports, such as those in Oecusse, Baucau and Suai, primarily handle domestic flights and are less equipped for international traffic.

6.4.5.3. Marine Transportation

Maritimes transport is vital for both domestic and international trade. The Port of Dili has historically been the main international cargo reception port, but its capacity has been insufficient to meet import needs. To alleviate this, the Tibar Bay Port was developed and began on November 2022, aiming to handle all cargo shipping and improve trade efficiency. Additionally, ferry services operate between Dili and regions like Oecusse and Atauro, providing essential connectivity for passengers and vehicles.

6.4.6. Religion

Timor-Leste has no official state religion and the government values different religious views. Catholicism has dominated the religion of Timor-Leste especially due to the Portuguese's occupation for a very long time. Protestant, Animist and Islamic have also been practiced by Timorese. Most Timorese also practice animistic beliefs, where traditions and old animistic cultures are still attached in some rural areas. However, animistic is more cultural rather than religion belief.

6.4.7. Social Structure and Local Governance

Timor-Leste's community structures are deeply rooted in traditional systems, with customary practices ("*adat*") playing a pivotal role in social cohesion and dispute resolution. Local governance operates through village-level councils ("*sucos*"), which are essential for implementing development programs and resolving conflicts. These councils work alongside formal administrative systems established by the national government, ensuring localized decision-making and community engagement.

6.4.8. Language

Timor-Leste consists of diversity of ethnic groups that speaks more than 30 languages as well as Bahasa Indonesia and Portuguese have been used across the territory with some of the larger language groups being, Timorese largely speak Tetum, *Mambae*, Portuguese, Bahasa Indonesia, *Tokodede*, *Makasae, Kemak,* and *Bunak*. Among those languages, Tetum and Portuguese are claimed as the official languages in Timor-Leste for those living around Dili and the neighbouring northern coast.

6.5. Cultural Components

6.5.1. Traditions

Timor-Leste traditions are strongly related to mythology and verbally spread from generation to generation. The tradition is dominated by animist spiritualism that believes the spirits of the dead people should be worshiped. The spirits, named as *Lulik*, are on shapes and objects such wells, streams, stones, and animals.

A significant tradition of Timor-Leste is *Tais* weaving. It is the textile of the country that expresses the beauty and ancient traditions of Timor-Leste, which is mostly crafted by women. *Tais* has been widely worn for dances, religious gatherings and special rituals in Timor-Leste.

Music and dance in Timor-Leste have been strongly influenced by Portuguese and Indonesian cultures, with the most popular dance namely Likurai. Performed by women, this is a welcoming dance for men back to their homes after the war.

6.5.2. Cultural Heritage

The form of cultural heritage may thus relate to valuable sites, whether these are related to maritime heritage, traditional fishing practices, or indigenous systems of knowledge. The analysis of the cultural impact by identifying all places featuring cultural significance and analyse the potential influence of a project on such an area. The Cultural Heritage: Sites might include maritime heritage: sites related to the sailing tradition, Traditional fishing practices form part of the culture and employment of local communities, and Indigenous knowledge systems manifest themselves in the unique practices tied to land and sea. However, in the vicinity of the drilling activity, there are no known significant heritage or archaeological sites, shipwrecks or marine heritage sites. Furthermore, the Timorese people still carry out traditional rituals prior to conducting activities in the ocean.

7. Climate Change.

This chapter describes the relevant climate change aspects to the drilling of appraisal well operations and the decommissioning of drilling in Chuditch-2. All relevant data and information on climate in this chapter are based on the data available from the Bureau of Meteorology at Point Fawcett at Melville Island, Australia (approximately 124Nm from the Chuditch field) and the Arafura Timor Sea-2 project undertaken in 2021-2023. An additional source of information is from the Metocean desktop study report (March 2024) by RPS, who were employed by Sunda for the Chuditch Appraisal well project. More climate change data and trends are taken from Timor-Leste's climate risk country profile from the Asian Development Bank (ADB, 2021) and the Timor-Leste National Adaptation Plan – Addressing Climate Risk and Building Climate Resilience (2020).

Being located in the Arafura Timor Sea (ATS), this region is characterized by complex ocean-atmosphere interactions, with the Indonesian Through Flow - a vital component of the global thermohaline circulation - significantly influencing the heat and freshwater budgets of the Pacific and Indian Oceans (Hendrizan et al., 2021). The intensity and variability of the Indonesian Through Flow have far-reaching impacts on regional and global climate patterns. Intraseasonal and interannual climatic variability in the Western Indian Ocean, which includes the Arafura and Timor Seas, is driven by a complex interplay between air-sea interactions, atmosphere-ocean dynamics, and changes in climatology and oceanographic boundary conditions at various timescales (Spencer et al., 2005).

7.1. Historic Weather Observations & Trends

The Chuditch-2 appraisal well is part of the Bonaparte basin and Timor Sea region. This area experiences a tropical climate similar to mainland Timor-Leste, with distinct summer monsoonal 'wet' and 'dry' seasons. The wet season is from October to March, while the dry season is from April to September.

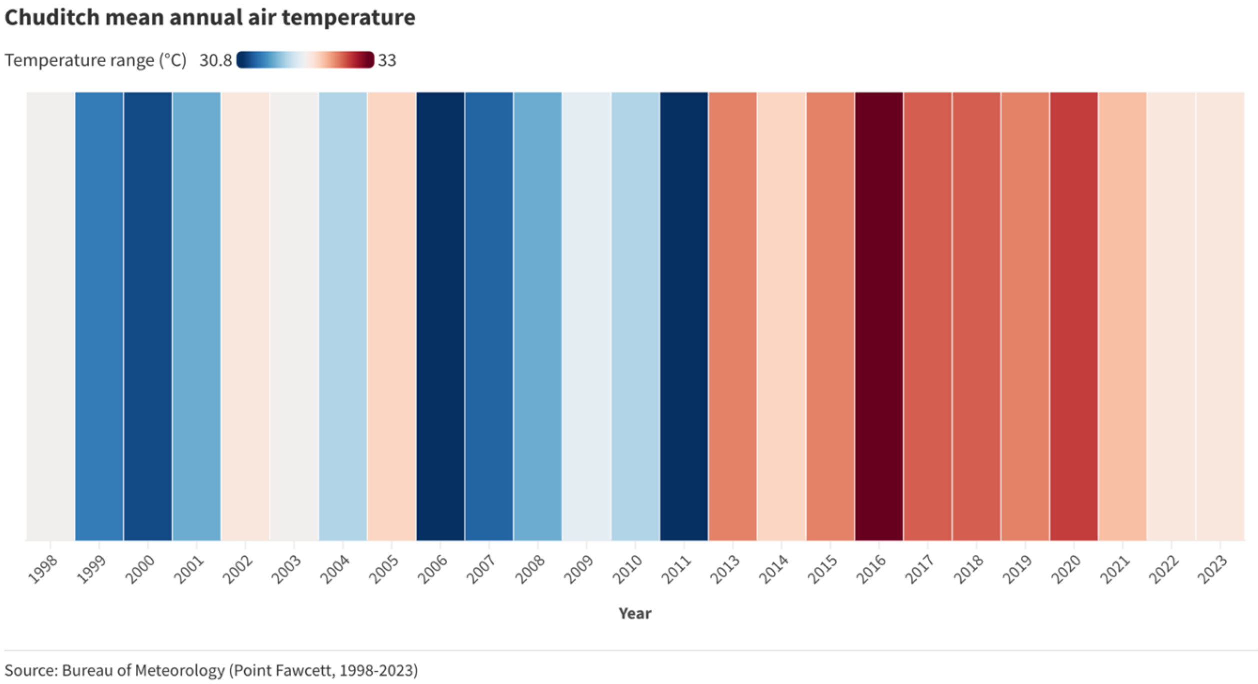
Meteorology and oceanography data at the fine scale of Chuditch-2 are currently deficient. Yet numerous updated and accurate data obtained at a regional scale can provide insights into the complexity of ocean-atmosphere interactions. Hence, these factors have significant implications for the regional climate, including precipitation patterns, air temperature, and the overall ecosystem health of the ATS region, where this proposed drilling site is situated.

7.1.1. Air Temperature

The air temperature data for Chuditch was obtained from the nearby meteorological station at Point Fawcett as shown in figure 33. The recorded data shows that the air temperature varies from 27˚C to 34˚C in June and December, respectively.

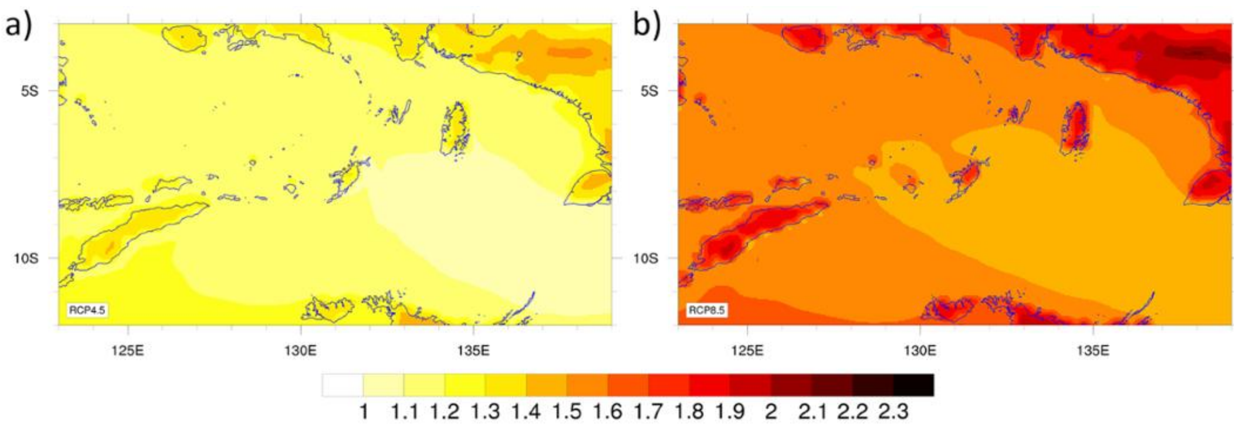
The records show that the temperature, adjusted for seasonal variation, has risen slowly over the years by an average of 2 degrees since 1998. Moreover, data from USAID estimates a rise in temperature of 0.16˚C per decade since 1950, and warming appears to have accelerated since the 1980s (ADB, 2021). In addition, the Arafura and Timor Seas region exhibits a uniform increase in air temperature at moderate Representative Concentration Pathway (RCP) 4.5 and high emission RCP 8.5 scenarios based on the mid-century projection for 2041-2070.

Figure 33 Trend of annual mean temperature data 1998 - 2023 for the Chuditch field. Adapted from the Australian Bureau of Meteorology.



Specifically, Timor-Leste shows an increase in air temperature of 3.6–3.8°C by 2070 (figure 34 a and b). Yet, air temperature in the open oceans, notably in Chuditch-2, is projected to be less significant than in coastal areas in the ATS region, including Timor-Leste, Gulf of Carpentaria and Northern Australia (Johnson et al., 2023). This may conclude that less terrestrial runoff from the south coast of Timor-Leste will not have any significant impact on onshore ecosystems such seagrass meadows, coral reefs, as well as sea turtle populations.

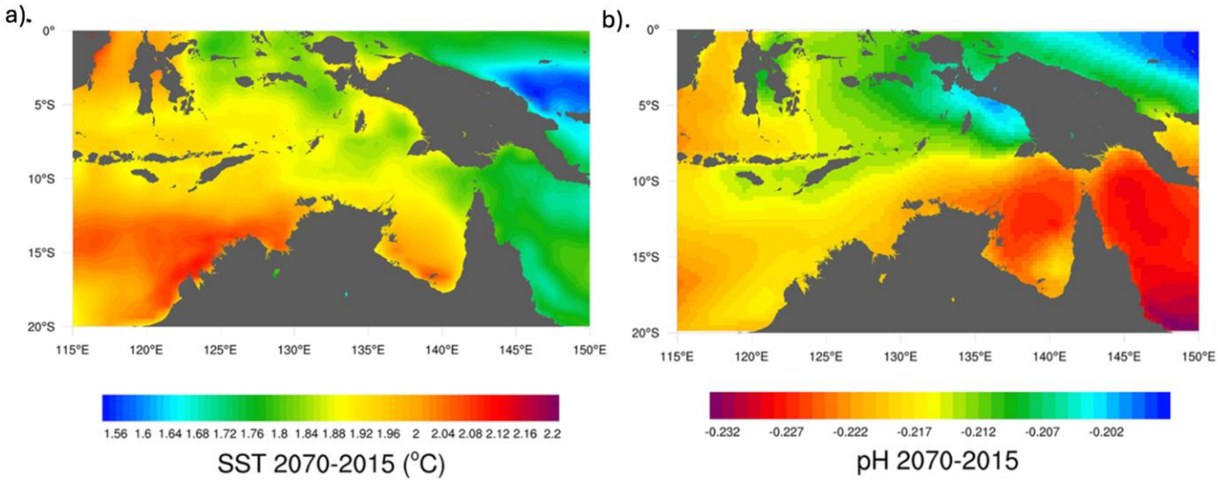
Figure 34 a) and b) The projected change in mean air temperature by the 2041-2070 scenario, which ranges from 1 ˚C to 2.3 ˚C (Source: Johnson et al., 2023).



7.1.2. Sea Surface Temperature (SST) and pH

Based on the SSP5-8.5 (high emission) scenario, the sea surface temperature is expected to increase across the Timor Sea, extending into northern Australian coastal waters, the Gulf of Carpentaria, and the Indian Ocean. Under all the emission scenarios, the ocean pH (acidification) by 2070 would exhibit a net decrease across the ATS region with 0.227–0.212 units relative to 2015 (figure 35 a and b), including the proposed Chuditch-2 drilling site (ATSEA, 2023). Thus, the impacts of both sea surface temperature and acidification combined with other non-climate drivers on the critical habitats and marine organisms are spatially variable at the regional scale yet relatively specific in terms of vulnerability drivers.

Figure 35 a) and b) The sea surface temperature and pH across ATS region shows a mixed spatial pattern from 2015 to 2070 under SSP5-8.5 (high emission). (Source: ATSEA, 2023)



7.1.3. Rainfall

During ‘dry’ season (April to September), rainfall in the North is low to non-existent in most areas, although light showers are common closer to the coast in the southern waters of the Timor Sea.

During the wet season, the weather on the south coast of Timor-Leste is largely determined by the position of the monsoon trough, which can be in either an active or inactive phase. The active phase is usually associated with broad areas of cloud and rain, with sustained moderate to fresh north-westerly winds on the north side of the trough. Widespread heavy rainfall can result if the trough is close to or over land. An active phase occurs when the monsoon trough is temporarily weakened or retreats Northwards. It is characterised by light winds, isolated showers, and thunderstorm activity, sometimes with gusty squall lines.

Rainfall data collected at Point Fawcett from Bureau of Meteorology (RPS, 2024) shows the mean monthly rainfall is ranging from 0.1mm (dry/winter season) to 460mm (wet/summer season). Heaviest rainfall is typically associated with tropical cyclones. These cyclones generally form south of the equator in the eastern Indian Ocean and in the Arafura and Timor Sea during wet season. In Timor Sea, most of the storms are tropical lows or tropical cyclones at an early stage of development.

7.1.4. Wave

Wave conditions around the Chuditch-2 field are determined by regional wind and ocean current systems. It normally experiences moderate wave heights of between 1.5 to 3 meters, although waves increase during the wet season from December to March, where the strengthening of monsoonal winds contributes to higher wave activity. Swells from the Indian Ocean can also influence wave conditions in the Timor Sea. Generally, the weather in this region is calm during the dry season, from April through October, with lower wave heights.

The sea state of Timor Sea comprises contributions from:

1. Indian Ocean Swell – A perennial feature of exposed Timor Sea waters. Typically, this swell arrives at the outer edge of the continental shelf from the west-southwest before refracting during propagation across the shelf, to become more north-westerly and even northerly near shore.
2. Winter easterly swell – where sufficient fetch is available (at least 108NM), the synoptic winter easterlies which prevail over all of the Timor Sea, may generate an easterly or north-easterly short period swell of 6 to 10 seconds. this swell will oppose the perennial west-south-westerly swell and can result in directional 'bimodal' sea states, which can contribute to operational difficulties for floating facilities and vessels.
3. Westerly monsoonal swell – where sufficient fetch is available (at least 108NM), the prevailing summer westerly monsoon will generate a westerly or north-westerly short period swell of 6 to 10 seconds. This swell will act to enhance the prevailing Indian ocean swell.
4. Tropical cyclone swell – will generate waves which propagate radially (roughly) out from the storm centre. Depending upon parameters such as storm size, intensity, relative location and forward speed, tropical cyclones in the Timor Sea region may generate swell of 6 to 16 seconds period from any direction, with heights ranging up to 10 m or more. Tropical cyclone swell can be expected to be more severe in the western region of the Timor Sea.
5. Local wind generated sea – typically ranges in period from 2 to 7 seconds but may attain 8 seconds under very persistent forcing. Heights are extremely variable from 0 to 4 m under non-tropical cyclone forcing and possibly exceeding 6 m (significant wave height) under severe tropical cyclone forcing. The location of local seas would be the same as the generating wind, unless local bathymetry effects (refraction, diffraction, shielding) act to influence wave direction and significant wave height.

7.1.5. Currents & Tides

Currents in the Timor Sea, including around the Chuditch field, are driven by the Indonesian Through Flow (ITF) and local wind-driven circulations. ITF carries warm water from the Pacific to the Indian Ocean. This provokes a strong east-to-west current. The tidal movements around a facility are semi-diurnal with two high and two low tides each day. The tidal range around a facility is relatively small, the average spring tide approximately 1.5 meters.

Currents:

- Barotropic Tide: Minimal attenuation on shelf slopes; tidal speed around 0.5m/second.
- Baroclinic Tide: Occurs in areas with temperature stratification, where warmer surface water overlays cooler bottom water. Strong at continental slopes and shelf breaks (~200m depth contour).
- Local Wind-Induced Currents: Generated by wind, particularly during severe tropical cyclones. Currents can exceed speeds of 1.0m/second and occasionally approach 2.0m/second.
- Regional Circulation: Influenced by oceanic circulation, prevailing winds, the ITF, and contributions from continental shelf waves.
- High Frequency Currents: Caused by internal motion, related to the stratification of the water column and steep shelf slope bathymetry. These currents move up the continental slope and towards the shore (~100m depth).

The combination of barotropic and baroclinic tides reflects the interaction between tidal forces and temperature stratification, particularly near the shelf break. Wind-induced currents become more prominent during cyclones, with significant speeds affecting offshore operations. Regional circulation, including the ITF, plays a major role in transporting warm water and nutrients. High-frequency currents impact the movement of water towards the shore, influencing marine ecosystems near the continental shelf.

Tides:

- Type: Semi-diurnal (~12-hour period) and diurnal (~24-hour period), with substantial tidal amplitude.

The semi-diurnal and diurnal tides create regular variations in sea levels with significant amplitude, which are important for understanding water movement and sediment transport in the area.

7.1.6. Sea Level

In the Timor Sea, there is a secular trend of sea-level rise in the context of global trends due to climate change. Data from the last few decades shows a steady rise in sea levels at an average rate of 3mm/yr. This rise will be expected to continue, with potential implications for coastal erosion and saltwater intrusion in low-lying areas of Timor-Leste. However, the Chuditch-2 field offshore is not directly affected by projected rising sea levels.

7.2. Future Projections Under Projected Climate Change

7.2.1. Temperature

Climate change models predict a significant rise in air and sea surface temperatures in the Timor Sea. Mid-century temperatures between 2041 and 2070 could increase by 1.5 to 3°C under the moderate RCP 4.5 scenarios, while temperatures under the high-emission RCP 8.5 could go up as high as 4°C. Such temperatures could cause changes in marine life and habitats concerning coral bleaching and the movement of species distribution.

7.2.2. Rainfall

Projections indicate that rainfall in the Timor Sea region is likely to be heavier, more variable and with a greater likelihood of extreme events. Wet season rainfall is likely to increase, and dry season rainfall decrease, with the latter being associated with greater variability. This may impact on offshore operations and terrestrial runoff is likely to have an impact on adjacent coastal ecosystems as well.

7.2.3. Wave

Climate change may increase wave heights and storm surge frequency in the future, especially during the wet season as the monsoons are stronger. Higher waves can be harmful to offshore infrastructure like MODUs and platforms. There is a fair probability that periods of calm during the dry season will persist, although the overall energy due to wave action can be expected to increase with increased storm frequency.

7.2.4. Currents & Tides

Changes in projected global ocean circulation patterns, including the ITF, are likely to alter the speed and/or direction of the currents at present experienced in the Timor Sea. Such changes would influence sediment transport, nutrient distribution and the migration of marine species. The tidal patterns are likely to remain about the same, although local effects of sea level rise may alter tidal ranges in specific areas.

7.2.5. Sea Level

Sea level rise is likely to continue to accelerate, with a gain as high as 0.5 meters towards the end of the century under the high-emission variant scenario. This would likely result in the increased flooding and erosion of coasts along Timor-Leste but is not very likely to directly affect the operations of the Chuditch-2 and similar wells. However, higher sea levels and storm surges might raise the vulnerability of coastal infrastructures and marine ecosystems.

7.3. Climate Implications of the Proposed Project or Environment

Table 24 summarizes the potential climate implications for the project and/or the marine and coastal environments within the drilling site.

Table 24 Summary of Climate Implications.

Climate Impact Sources	Impact Projection Analysis	Potential Factor Impacted	Implication on Project or Environment
Temperature	• Changes in ambient temperature • Increase in sea-surface temperature • Increase evaporation • Increase humidity • Heatwaves	• Viability of ecosystem • Human Health • Agriculture • Ground and surface water • Marine Flora and Fauna	• Potential impacts on human health due to heatwaves, i.e. dehydration, fatigue • Potential increase in energy consumption due to cooling system • Acceleration of coral bleach, ocean acidification, and stress on coral reefs. • Drought effects on water storage and soil fertility
Rainfall	• Changes in rainfall patterns e.g. flooding and drought • Increase in rainfall events e.g. cyclones	• Forest Ecosystem • Coastal zone • Freshwater resource • Damage to infrastructure	• Effects on productivity due to extreme weather delays, e.g. mobilization, drilling activity
Sea-Level	• Cyclone and surges • Physical changes to coastal zones	• Coastal zone • Marine ecosystem • Marine Flora and Fauna • Seawater • Damage to offshore infrastructure	• Impacts to the physical coastal zones – inaccessible or unsafe • Increases impacts caused by cyclone-induced storm surge. • Decrease in frequency of tropical cyclone but increase in intensity. • Impacts on mangroves • Increased in saltwater intrusion.

7.4. Measures and Mitigations

The Chuditch-2 drilling activity is not expected to materially influence climate change and the trends in temperatures, sea levels and weather patterns. Therefore, no mitigations for climate change impacts are proposed.

8. Alternatives.

8.1. No Project Alternatives

In order to test for the presence of hydrocarbon in a subsurface accumulation, a well must be drilled to intersect the formation. In the case of the PSC TL-SO-19-16 contract area, exploration commenced in 1991 and eventually leading to Shell, as operator of an earlier concession, drilling the Chuditch-1 well in 1998.

After the block was surrendered by a number of prior operators, in November 2019, SGBU signed a new PSC, TL-SO-19-16, including the Chuditch area. Under the terms of the PSC, SGBU committed to undertake petroleum exploration activities including reprocessing 3D seismic data (TGS, 2021 & 2022) and drilling of an appraisal well (Chuditch-2) within a specified time frame. Reprocessing of the seismic data was successfully completed and indicated a significant structure associated with the natural gas resources discovered with the Chuditch-1 well. Drilling of an appraisal well is required to determine the commercial viability of the discovery field. Timor-Leste, as a developing nation desires to develop its natural resources generate future export revenues and to limit the requirement to import energy resources. Accordingly, the Chuditch project is a key component of national development and there is no realistic alternative to the planned appraisal drilling campaign.

Given that there is no alternative to the project, the only viable alternatives are technical requirements for the drilling program such as well location, types of equipment (i.e. MODU specification), materials (i.e. drilling fluids), and techniques of waste treatment to limit impacts to the receiving environment.

No current, technically feasible alternative methodology to access and exploit the discovery field exists. Therefore, the ‘No Project,’ alternative is discounted on the above basis.

8.2. MODU Type

A jack-up MODU is a technically superior and safer facility to drill and conduct a DST on Chuditch 2 based primarily on the well locations water depth. A number of the different aspects of a Jack Up and Semi-Submersible MODU’s is shown in table 25.

Table 25 MODU Comparison Table

Aspect	Jack Up	Semi-Submersible
Water Depth Suitability	• Best in **shallow water** (up to ~400 ft / 120 m)	• Requires **deeper water** (200 ft+), unsuitable in very shallow areas
Platform suitability	• Fixed to seabed → *no heave, roll, or pitch*	• Floats → *continuous motion* from waves, currents, wind
Draft – Hull depth below waterline	• Shallow draft, safe in coastal or shelf areas	• Deep draft may exceed water depth in shallow areas
Station keeping	• Legs anchored to seabed, no anchors or DP needed	• Requires anchors or dynamic positioning, impractical in shallow water and potentially greater environmental damage from anchor spread
Drilling riser and BOP Stress	• Stable platform → less mechanical stress on riser & wellhead	• Motion increases stress, higher risk of riser/BOP failure in shallow water
Wave and weather impact	• Elevated above sea → safe from green water on deck	• Hull sits low → waves can hit deck in rough shallow seas

Aspect	Jack Up	Semi-Submersible
Mooring hazard	• None (no mooring lines)	• Anchors/lines may interfere with seabed structures, vessels, or subsea systems
Safety of personnel	• Safer work environment due to stability, minimal motion	• Higher accident risk from rig movement, mooring hazards, and wave impact

Jack-up drilling rigs are superior to semi-submersibles in shallow water because they stand firmly on the seabed, creating a stable, motion-free platform that avoids the heave and roll experienced by floating rigs. Their shallow draft allows safe operation close to shore, while their simple station-keeping eliminates the need for complex mooring or dynamic positioning. This stability reduces stress on drilling equipment, improves safety by keeping operations above wave impact, and makes jack-ups more cost-effective and technically reliable than semi-submersibles in shallow environments.

Jack Up MODU's also offer superior riser integrity, improved BOP safety margins, and a more secure work environment in shallow water compared to semi-submersibles, which are technically optimized for deep-water operations.

8.3. Well Location

Scans conducted during the geophysical study conducted in February 2024 revealed ridges and mounds in the area of an initially proposed well location. Whilst sited within a semi-arid plateau, it was considered that mounds and ridges might harbour a more diverse infaunal and benthic community than anticipated. Additionally, due to the location of the mounds and ridges that could create issues for the proper support and stability of the MODU and potential damage to spud cans.

Initially, the planned location for Chuditch-2 was 4.8km from the original Chuditch-1 well. However, the geophysical site survey described above revealed that the proposed location was not suitable for a jack-up MODU and led to the selection of a final location some 286m further east and about 5.1km from Chuditch-1.

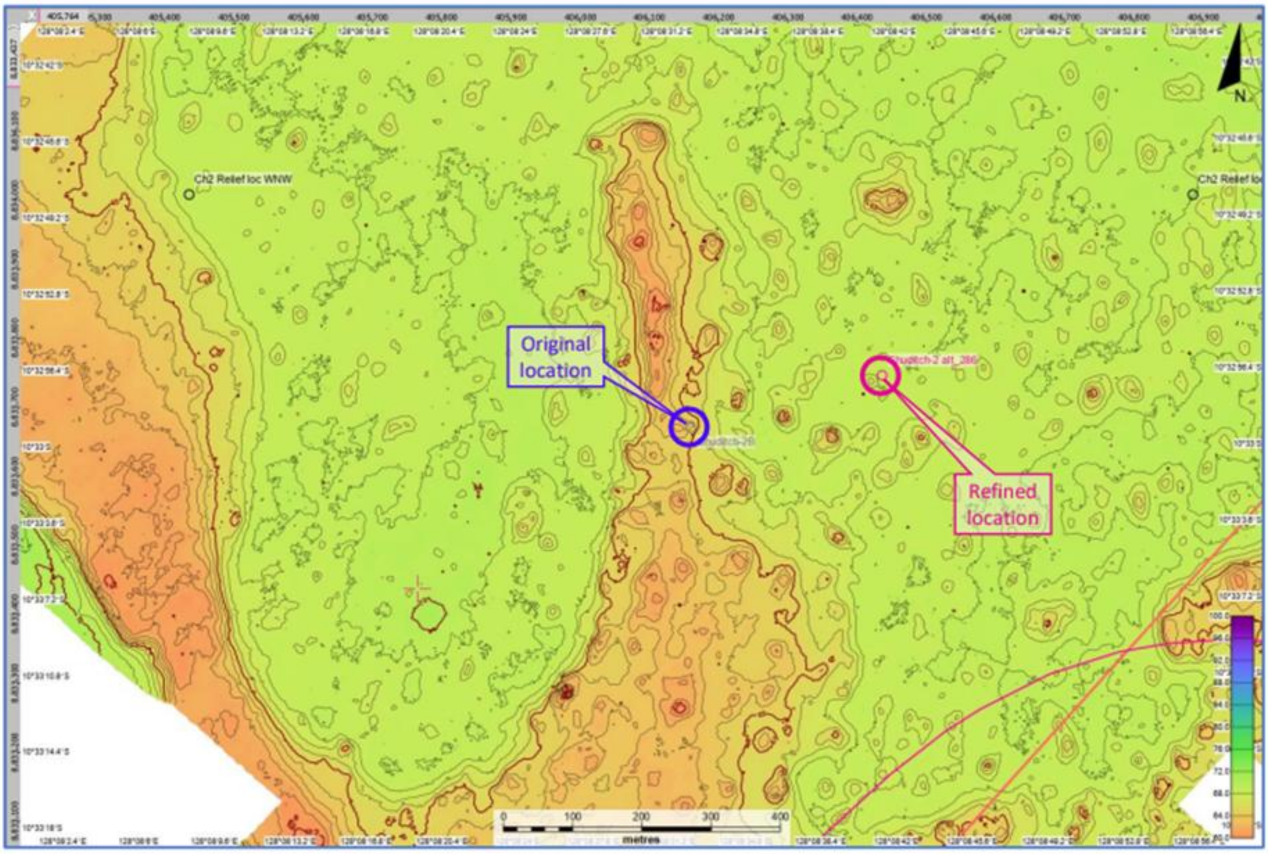
The new location allows optimal location of the MODU and has less probability of impact to mounds and ridges in the vicinity. The new Chuditch-2 location has a flatter seabed than the original proposed location as shown the bathymetry map in figure 36.

Other viable locations did not meet the technical requirement for the drilling program to locate the well at or near a target area of the gas reservoir. Options for the wellsite are constrained to within a short distance depending on the subsurface target. Another change in location is as likely to cause a similar impact to the receiving environment as is the current chosen location and there is no environmentally persuasive reason for a further change in location.

In addition, any change to location might lead to a requirement for an inclined trajectory of the well to reach the prognosed target, materially impact the cost of the well and introducing some operational risk.

As the well is expected to confirm the available reserves as commercially viable, under terms of the PSC, all costs incurred are cost recoverable. Accordingly, SGBU seek to limit the economic burden associated in well design and execution to Timor-Leste.

Figure 36 Bathymetry of original location and refined location for Chuditch-2 from Geophysical Site Survey. (Source: RPS, 2024).



8.4. Vertical Drilling versus Directional Drilling

Vertical drilling is the chosen drilling method for Chuditch 2 for many reasons. These include

- Vertical wells are quicker, more efficient and cheaper to design, drill and are commonly used in early exploration/appraisal phases of a project to gather geological and reservoir data
- Vertical wells require less specialised equipment, fewer downhole tools, and simpler casing and cementing programs.

In contrast, directional drilling is typically employed when there is a specific need to reach a subsurface target that cannot be accessed vertically, such as avoiding surface obstacles or sensitive habitats. While directional wells can sometimes be drilled faster and may reduce the environmental footprint if required to avoid sensitive seabed areas, in cases where the seabed environment is not particularly sensitive—as with the Chuditch-2 location. The environmental baseline survey shows that benthic habitats in the drilling location are relatively sparse and that significant coral outcrops or large consolidated benthic habitats are not present in the drilling location. The seabed is characterised by sparse and isolated sea-fans, isolated coral heads and gorgonians dominated by sandy any silty seabed. Therefore, using directional drilling to relocate the seabed interception location is unlikely to have any environmental benefit.

8.5. Produced Formation Water Management and Alternative Measures

The likelihood of Produced Formation Water (PFW) being generated during well testing is very low.

Due to the anticipated length of the hydrocarbon column and plans to perforate away from any hydrocarbon water contact, it is not anticipated that formation water will be produced during the DST phase of operations. Data from an MDT on the Chuditch 1 well indicates that formation water consists of 28,000 mg/lt NaCl. Capture of a formation water sample will be attempted during the wireline logging operations at TD and this will allow for chemical analysis of the formation water at an onshore lab for future development planning.

Should formation water be produced during the DST this will be analysed and any hydrocarbon content reduced to acceptable levels prior to discharge.

8.6. Alternatives to a Drill Stem Test

A Drill Stem Test (DST) is proposed to evaluate the well should sufficient hydrocarbons be encountered.

The DST will provide the most accurate data on reservoir characteristics such as flow capacity and permeability, dynamic flow properties, possible boundary effects, and well productivity over an extended test period. An MDT (Modular Dynamic Tester) will also be run as part of the wireline logging suite at TD and this will provide high-quality, high-resolution pressure and sample data at selected points in the wellbore. The MDT will allow fluid analysis and near wellbore characteristics to be investigated but this testing / sampling tool does not provide the deep reservoir investigation and dynamic flow characteristics that will be required to move the project towards development.

Hence the selection of a full DST to evaluate the well is the most practical, efficient, cost-effective method that will give the most detailed productivity and reservoir performance data.

9. Impact Assessment & Mitigation Measures

9.1. Introduction

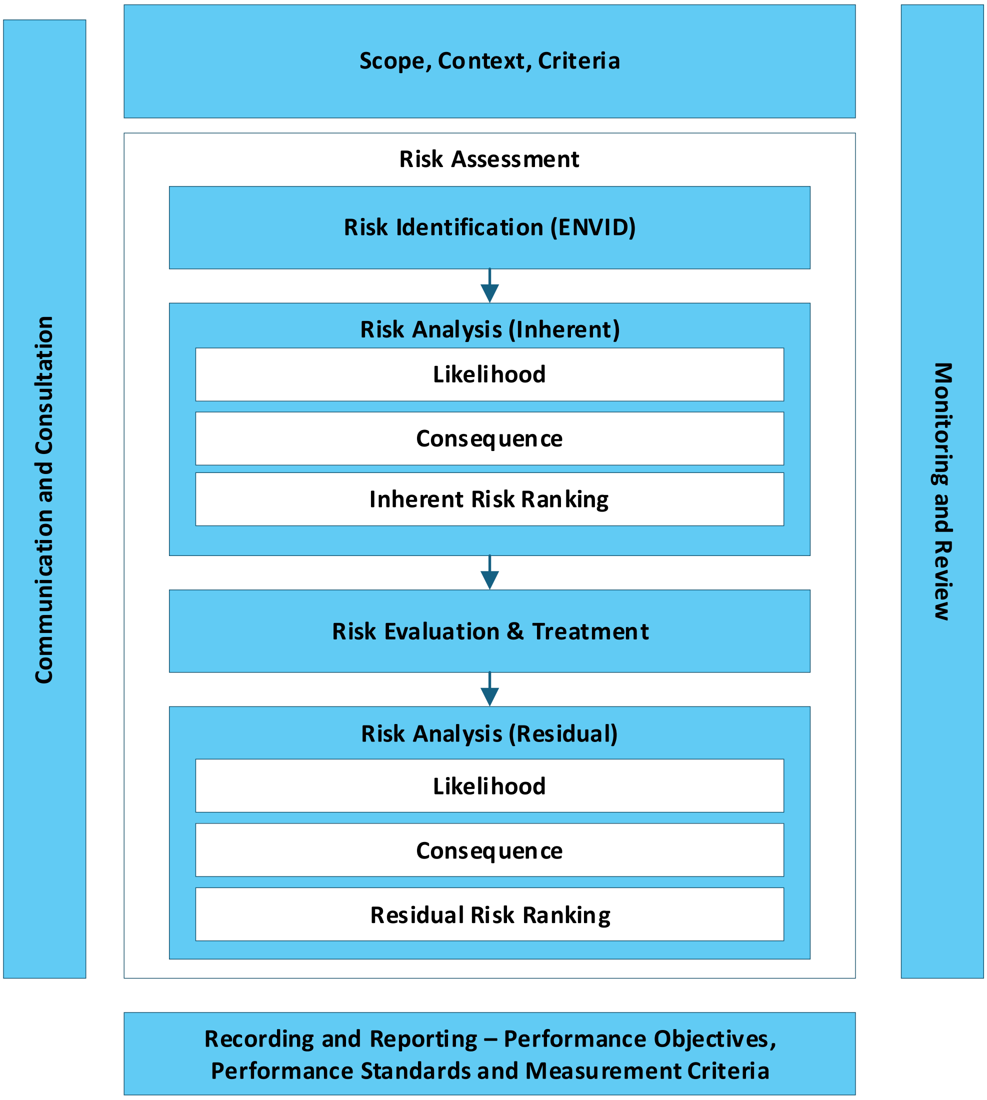
SGBU maintains a comprehensive, integrated system which includes standards and procedures necessary for the management of Health Safety and Environment (HSE) risks. The SGBU HSE Policy sets the direction and minimum expectations for environmental performance and is implemented through the standards and procedures of the SGBU Safety Management System.

The potential environmental impacts associated with the proposed appraisal drilling activities and the corresponding mitigation measures are discussed below. The assessment is limited to the current drilling project and does not extend to future petroleum development.

9.2. Methodology and Approach

An Environmental Risk Assessment (ENVID) was conducted, and which followed the general principles of ISO 31000: 2018 Risk Management Guidelines. The Company's Environmental risk assessment process is presented in figure 37.

Figure 37 Company Environmental Risk Assessment Process, based on ISO 31000:2018



9.2.1. Establishment of Scope, Context and Criteria

The first stage of the ENVID process was to establish scope, context, and criteria based on the company Environmental objectives, regulations, government decree laws and international standards and guidelines as presented in section 5 of this EIS document.

When establishing the scope and the context of the process, it is important that consideration is given to:

- Objectives and decisions that need to be made.
- Outcomes expected from the steps taken in the process.
- Time, location, specific inclusions and exclusions.
- Appropriate risk assessment tools and techniques.
- Resources required, responsibilities, and records to be kept.
- Relationship with other projects, processes, and activities.

The criteria must be clearly defined, taking into account the obligations of SGBU and the perspectives of stakeholders. The following has been considered when setting the risk criteria:

- The nature and type of uncertainties that can affect outcomes and objectives.
- How consequences and likelihood are measured.
- Time related factors.
- Consistency in the use of measurement.
- How the level of risk is to be determined
- How combinations and sequences of multiple risks will be taken into account; and
- SGBU's capacity.

9.2.2. Risk and Impact Assessment Overview and Approach

9.2.2.1. Risk Identification

The primary objective of the ENVID process was to ascertain, recognize, and delineate potential environmental risks that could impede SGBU's drilling operations in Chuditch-2. The ENVID process is based on activities (planned and unplanned) that will be implemented during the appraisal drilling and those activities impact on the defined receptors.

In the case of the appraisal drilling, the receptors are:

- Biological and Ecological processes include protected species, marine primary producers, and ecological diversity.
- Environmental quality included water quality, marine water quality, and air quality.
- Societal included protected areas or marine protected areas, cultural, and compliance.

9.2.2.2. Risk Analysis

The risk analysis process followed a structured, step-by-step approach consistent with ISO 31000. Initially, risk sources were identified by examining the sources of impact, the environmental aspects and the potential environmental receptors, including social, economic and cultural impacts that could reasonably arise from those activities.

9.2.2.3. Risk Evaluation

Risks were assessed on an inherent basis by evaluating the consequence and likelihood of identified impacts in line with the SGBU Environmental Risk Matrix (SGBU-GEN-HSSE-0047) and prior to the application of mitigation measures.

Where relevant:

- Accepted criteria and standards, including regulatory limits for pollutants and guidelines for acceptable noise levels, were referenced.
- IFC Guidance (IFC, 2007a) together with ANZECC and ARMCANZ (2000) guidelines for marine water quality, sediment quality and toxicants were applied as appropriate.

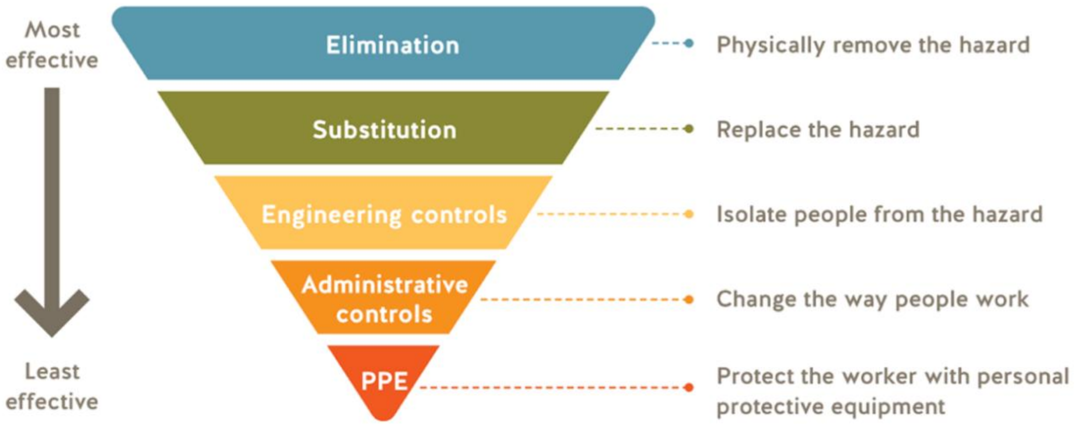
Appropriate planned and existing mitigation measures and controls were identified and documented. The inherent risks were then re-analysed with the planned and existing mitigation measures and controls in place, and reassessed to determine their residual risk, through reassessment of likelihood and consequence with the planned and existing mitigation measures and controls in place.

For social, economic and cultural impacts, the SGBU Environmental Risk Matrix was used as an objective benchmark to balance professional judgement against prevailing contextual factors.

9.2.2.4. Risk Treatment

Environmental performance objectives and standards were developed to define the environmental outcomes and the measurable requirements for managing and monitoring environmental impacts, to ensure that risks are controlled to acceptable levels. Based on the outcomes of the environmental objectives and standard, qualitative measurement criteria were defined and the hierarchy of control was used where reasonable and practicable as the basis for selecting the most effective and appropriate control mechanism, as represented in figure 38

Figure 38 Hierarchy of Control



The following were considered when establishing the acceptable levels of impacts and risks:

- The principles of Ecologically Sustainable Development (ESD)
- Other requirements applicable to the Chuditch-2 project (e.g., laws, policies, standards, conventions etc)
- Significant impacts to the Marine Environment
- Internal context.

Principles of Ecologically Sustainable Development (ESD)

SGBU has considered the principles of ESD in defining acceptable levels of impacts and risks.

The principles of ESD are summarised as:

- Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social, and equitable considerations.
- Precautionary principle – if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- The principles of inter-generational equity – that the present generation should ensure that the health, diversity, and productivity of the environment is maintained or enhanced for the benefit of future generations.
- The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.

Other Relevant Requirements

SGBU considered other relevant requirements that apply to the environmental management of petroleum activities, including legislation, policies, standards, and guidelines in establishing acceptable levels of impacts and risks.

The TOR forms the basis for the assessment of the Chuditch-2 project, the scope of work and potential impacts, SGBU has given specific attention to the acceptability of impacts and risks to the marine environment.

Significant impacts to the Marine Environment

Potential impacts and risks to the environment from aspects of petroleum activities were deemed inherently acceptable if:

- The significant impact criteria in relation to the environment are not anticipated to be exceeded.
- The management of the aspect is aligned with published guidance material, including the Australian Department of Agriculture, Fisheries and Forestry (DAFF) (as the leading best practice standard), including threat abatement plans, recovery plans and conservation advice.

Internal Context

The following outlines SGBU internal impact and risk assessment defined acceptable levels:

- Residual planned impacts that are ranked as minor or low (i.e., minor, negligible, no effect or positive effect) and residual risks for unplanned events ranked yellow green, are inherently 'acceptable', if they meet legislative and SGBU requirements and the established acceptable levels of impacts and risks.
- Moderate or medium risk ranked yellow, are ‘acceptable’ with appropriate controls in place and if good industry practice can be demonstrated.
- Major and massive residual impacts from planned activities, and orange residual risks from unplanned activities, are ‘acceptable only if the risks are assessed and manage to ALARP’.
- Catastrophic, critical and red residual risks from unplanned activities, are “unacceptable.” The activity (or element thereof) should not be undertaken as the impact or risk is serious and does not meet the principles of ESD, legal requirements, SGBU requirements or regulator and stakeholder expectations. The activity requires further assessment to reduce the risk to an acceptable level.

The impact significance or risk ranking can be calculated by multiplying the consequences on the environmental to likelihood of the impact (Impact Significance or risk ranking = consequence x Likelihood).

The Total Environmental Impact will then be multiplied by the likelihood to obtain the Impact Significance as shown in table below.

The impact significance (risk ranking)can be calculated by multiplying the consequence on the environment to the likelihood of the impact (Impact Significance = Likelihood x consequence).

The total environmental impact can be obtained by accumulating or adding all four impact categories (i.e., Extension, duration, Intensity Environment and the Intensity Socioeconomic) according to their rankings. The Total Environmental Impact will then be multiplied by the likelihood to obtain the Impact Significance as shown in the figure 39.

Figure 39 Environmental Risk Matrix

Likelihood						
Historical:	"Unheard of in the industry"	"Has occurred once or twice in the industry"	"Has occurred many times in the industry, but not in the Company"	"Has occurred once or twice in the Company"	"Has occurred frequently in the Company"	"Has occurred frequently at the location"
Frequency: (Continuous Operation)	Once every 10,000-100,000* years at location	Once every 1,000-10,000 years at location	Once every 100-1,000 years at location	Once every 10-100 years at location	Once every 1-10 years at location	More than once a year at location or continuously
Probability: (Single Activity)	1 in 100,000-1,000,000*	1 in 10,000-100,000	1 in 1,000-10,000	1 in 100-1,000	1 in 10-100	>1 in 10

Consequence

Biodiversity and Ecological Processes			Environmental Quality				Societal					1	2	3	4	5	6
Protected Species	**Marine Primary Producers**	**Ecological Diversity**	**Water Quality**	**Marine Sediment Quality**	**Air Quality**	**Soil and Ground Water Contamination**	**Protected Areas**	**Cultural**	**Compliance**			**Remote**	**Highly Unlikely**	**Unlikely**	**Possible**	**Likely**	**Highly Likely**
Eradication of local population Loss of critical habitats or activities	Permanent eradication of primary producers on a regional scale	Permanent effects on ecosystem diversity on a regional scale	Continuous or regular contamination to water quality above national/international standards &/or known biological effects concentrations on a regional scale (>100km2)	Permanent contamination above background &/or national/ international quality standards &/or biological effect concentrations on large – regional scale	Continuous exceedances over national/ international air quality standards Damage to the environment or human health	Permanent off site contamination of ground water &/or soil Cost of effective treatment not possible Damage to the environment or human health	Significant permanent effect on one or more of protected area values	Significant permanent impact on aesthetic, economic or recreational values Overall societal benefits do not outweigh impacts	Continuous license/ regulatory exceedances Fines or prosecutions incurred / expected	**A**	**Catastrophic**						
Extensive impact on population (s) Significant impact on critical habitats or activities	Large scale and long term effects Recovery >10 years or permanent	Large scale long term effects on ecosystem diversity Recovery >10 years or permanent	Continuous or regular discharge with contamination above background &/or national/ international quality standards &/or know biological effect concentrations on large scale (10 – 100km2)	Long term contamination above background &/or national/ international quality standards &/or known biological effect concentration on large scale	Sustained, exceedance over national/ international air quality standard Potential harm to the environmental or human health	Extensive off site contamination of ground water &/or soil. Treatment difficult/ expensive Potential threat to the environment or human health	Significant long term effect on one or more of protected areas values	Significant long term impact on aesthetic, economic or recreational values Overall societal benefits do not outweigh impacts	Regular or ongoing license / regulatory exceedances Fines or prosecutions	**B**	**Massive**					Critical	
Minor disruptions to a significant portion of the population Minor impacts on critical habitats or activities No threat to overall population viability	Moderate or large scale effect recovering within 10 years	Localized but long term effect on ecosystem diversity Community/habitat maintains ecological integrity through an unacceptable change in species composition may occur	Continuous or regular discharge with contamination above background &/or national/ international quality standards &/or known biological effect concentrations on medium scale (1-10km2)	Short to medium term contamination above background &/or national/ international quality standards &/ or known biological effect concentrations on large scales	Temporary exceedances over national/ international air quality standards Potential harm to the environment or human health	Extensive contamination of ground water &/ or soil, offsite contamination probable, treatment difficult/ expensive Limited threat to the environment or human health	Minor but long term or permanent effect on one of more of protected area values	Moderate impact on aesthetic, economic or recreational values Overall societal benefits do not outweigh impacts	Repeated license/regulatory exceedances Fines or prosecutions likely	**C**	**Major**			High			
Minor disruptions or impact on a small portion of the population Minor and temporary impact on critical habitat or activity No threat to overall population visibility	Localized and medium term effect Recovery 5-10 years Localized effect recovery in either medium or long term	Localized medium long term effect on ecological diversity Community/ habitat maintains ecological integrity though an acceptable change in species composition may occur	Continuous or regular discharge with contamination above background &/or national/ international quality standards &/or known biological effect concentrations on local-medium scale (<10km2)	Temporary exceedance over national/ international air quality standards No harm to the environment or human health expected	Minor contamination of ground water or soil, contained within the site boundary, treatment difficult/ expensive. No threat to the environment or human health	Minor and short term contamination to ground water or soil, contained within site boundary, readily treated No threat to the environment or human health	Minor and short term effect on one or more of protected areas values Full recovery expected	Minor and temporary impact on aesthetic, economic or recreational values	Occasional license/ regulatory/ target exceedance No fines or prosecutions	**D**	**Moderate**		Medium				
Minor and temporary disruption to small portion of the population. No impact on critical habitat or activity	Localized and short term effect on key primary producers Recovery<5 years	Localized and short – medium term effect on ecological diversity Full recovery expected	Temporary discharge with contamination above background levels & or known biological effect concentrations on local – medium scale (<10km2)	Temporary contamination above background &/or national/ international quality standards &/or known biological effect concentrations on local – medium scale	Minor and temporary exceedance over national/international air quality standards No harm to the environment or human health expected	Minor contamination of ground water or soil, contained within site boundary, readily treated No threat to the environment or human health	Minor and short term effect on one or more of protected areas values Full recovery expected	Minor and temporary impact on aesthetic, economic or recreational values	Occasional license/ regulatory/ target exceedance No fines or prosecution	**E**	**Minor**						
Negligible effect	Negligible effect	Negligible effect	Negligible effect	Negligible effect	Negligible effect	Negligible effect	Negligible effect	Negligible effect	Negligible effect	**F**	**Slight**	Low					

9.3. Risk and Impact Assessment

A multi-disciplinary team consisting of SGBU Well Operations Manager, Drilling Superintendent, HSE Manager, Geophysics Manager, Environment Adviser and the EIS consultants held an ENVID online workshop on 11 and 12th August 2025 and discussed the environmental impacts of drilling operations, identified the hazards, the sources and deliberated as Chuditch-2 well is a gas well and classified the environmental risk. The list of participants for the ENVID is in Appendix 6 and detailed ENVID worksheet is in Appendix 7. Aspects of the Environment evaluated during the ENVID were:

- Physical presence
- Drilling discharges
- Other waste discharges
- Air emission
- Light pollution
- Noise pollution
- Socio-economic development

9.3.1. Planned Activities

The Environmental risk assessment for inherent and residual risk, for the planned and unplanned activities, was evaluated based on the consequence and likelihood of potential environmental impacts, before and after the application of control and mitigation measures.

9.3.1.1. <u>Physical Presence</u>

Physical presence in this context relates to a Jack Up Mobile Offshore Drilling Unit on location at Chuditch 2 for the duration of the planned operation. The MODU chosen for Chuditch 2 is a Jack-Up, chosen for its design to work in relatively shallow water of some 68m, like those at the Chuditch 2 site. More information is available on the MODU by referencing section 4.3.2 and figures 3 and 4.

9.3.1.1.1 Impact Assessment

The physical presence of jack-up rig in Chuditch-2 location will have an impact on the environment and surrounding area. Jack-up MODU's, create distinct footprints when their legs are lowered to the seabed, where their legs 'spud cans' apply physical downward pressure, displacing sediment and destroying local benthic organisms directly under the spud cans which are approximately 14 metres in diameter.

Damage to the seabed from positioning and orientating the MODU is considered to be minor due to the depth of the water column under the MODU and its relatively small footprint, whilst the impact to fishing and shipping operations caused by the mobilisation of the rig was also assessed to be minor. The aesthetic/ visual impacts of the MODU are also considered to be minor due to the remote location of the drilling activity.

The direct effect will be the exclusion of fisheries and vessel traffic around the drilling area, with indirect impacts, including economic costs and the potential risk of a collision risk. The use of a support vessels to 'shadow' the MODU will assist in mitigating the risk of other vessels encroaching too close to the drilling operation, and within its declared 500m safety exclusion zone. Impacts to fisheries and vessels will also be minimised due to the short duration of the campaign.

9.3.1.1.2 Mitigation Measures and Measurement Criteria

Table 26 Risk assessment summary, mitigation measures, measurement criteria and ALARP assessment, for physical presence of jack-up rig in Chuditch-2

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Seabed disturbance and smothering	A detailed multi beam bathymetry analysis baseline seabed survey has been undertaken to select least sensitive location for MODU positioning and orientation (e.g. avoidance of coral outcrops)	• The multibeam bathymetry survey interpretation confirms that sensitive seabed features (including coral outcrops and hard substrates) within the potential spud can footprint and surrounding buffer have been identified and assessed • Final positioning survey records confirm that the MODU was positioned and oriented in accordance with the approved location and orientation derived from the baseline seabed survey	Minor	Highly Unlikely	Low	• Use or drill ship or semi-submersible - not practical given water depth • Don't drill well - financial and economic impact	The use of a drillship or semi-submersible MODU was rejected as not reasonably practicable because these units are unsuitable for the shallow water depth at the proposed location. The option of not drilling the well, while considered, is also not reasonably practicable due to the disproportionate financial and economic impact on the Company and the inability to provide Timor-Leste with a reliable hydrocarbon resource assessment. All feasible controls have been implemented; therefore, the residual risk for this aspect is ALARP.
	Drilling contractors Rig Move procedure is followed by drilling contractor and surveyor	• Records and direct observations confirm that the drilling contractor's approved Rig Move Procedure was implemented in full during MODU positioning and spud can grounding, with no unauthorised deviations. • The presence and active involvement of a suitably competent surveyor and the Senior Day Supervisor are documented, confirming that rig move and spud can grounding activities were conducted in accordance with	Minor	Highly Unlikely	Low		

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		the approved procedure and environmental controls • Any deviation from the approved Rig Move Procedure was identified, documented, environmentally assessed, and approved through the management of change or deviation process prior to continuation of operations.					
	Conducted seabed sediment and geotechnical sampling as part of EIS program	• Sampling records and interpretation demonstrate that seabed sediment and geotechnical data are sufficient to characterise baseline seabed conditions and identify relevant environmental sensitivities within the project area. • Results of seabed sediment and geotechnical sampling are documented within the EIS and demonstrably used to inform impact assessment, risk evaluation, and selection of environmental controls and mitigation measures.	Minor	Remote	Low		
	Pre load testing conducted in accordance with the MODU Procedures to mitigate punch through risk when MODU "Jacks Up" to determine seabed stability	• Records and observations confirm that pre-load testing was planned and executed in accordance with the MODU's approved jack-up and pre-load procedures, including sequencing, hold periods, and monitoring requirements.	Major	Highly Unlikely	Medium		

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		• Pre-load test outcomes demonstrate that seabed bearing capacity and stability were assessed and confirmed prior to full jack-up, with no indications of uncontrolled leg penetration or instability.					
Vessel Collision with MODU	The Company will prepare and submit the necessary notifications and operational details to the ANP to enable the facilitation and onward distribution of a Notice to Mariners to relevant authorities and stakeholders. The Company will also maintain ongoing, direct and local communication with mariners regarding the presence and progress of drilling activities to minimise interference with marine traffic.	• Records demonstrate that required notifications and operational information relating to MODU location, support vessel activities and operational status were prepared and submitted to the ANP in a timely manner, and that marine users were informed through facilitated Notices to Mariners and ongoing marine user communications. • Records demonstrate that any navigational concerns, complaints or near-miss interactions involving marine users were recorded, assessed and managed in a timely manner, with appropriate corrective actions implemented where required.	Massive	Remote	Medium	• Don't drill well - financial and economic impact • Company advises all regulatory offices	The option of not drilling the well was rejected as not reasonably practicable due to disproportionate financial and economic impacts and the inability to meet regulatory and resource-assessment obligations. The option for the Company to advise all regulatory offices was also rejected, as all inter-agency communication must be coordinated through the ANP under established regulatory protocols. No further practicable controls were identified; therefore, the residual risk is ALARP
	Maintenance of a 500m exclusion zone by shadow support vessel	• Records and observations confirm that the shadow support vessel actively monitored, communicated, and enforced the 500 m exclusion zone throughout MODU operations.	Massive	Remote	Medium		

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		• Any attempted or actual breaches of the 500 m exclusion zone were identified, recorded, investigated, and managed in accordance with approved marine procedures, with corrective actions implemented where required.					
	The Company will prepare and submit notifications and relevant operational details to the ANP, including MODU and support vessel shipping routes, schedules and drilling location, to enable onward distribution to relevant ministries and authorities regarding the entry of the MODU and support vessels into the PSC contract area and the maritime territory of Timor-Leste. The Company will also formally notify the ANP in writing of the entry of the MODU and support vessels into the PSC contract area and the maritime territory of Timor-Leste, providing sufficient information to facilitate marine user notification.	• Records demonstrate that written notifications containing complete and accurate information on MODU and support vessel routes, schedules and drilling location were prepared and submitted to the ANP in a timely manner, sufficient to enable onward distribution and facilitate marine user notification. • Evidence confirms that notifications were submitted to the ANP prior to the entry of the MODU and support vessels into the PSC contract area and the maritime territory of Timor-Leste, and that any changes to routes, schedules or drilling location were promptly communicated to the ANP. • Records demonstrate that any deviations from notified routes, schedules or operational areas were documented, assessed and	Massive	Remote	Medium		

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		formally notified to the ANP in accordance with approved change management arrangements.					
	The Company will prepare and submit notifications and relevant operational details relating to the entry of the MODU and support vessels into the PSC contract area and the maritime territory of Timor-Leste to the ANP, to enable onward distribution to the maritime regulator and other relevant regulatory agencies	• Records demonstrate that timely and accurate notifications, including MODU and support vessel routes, schedules and drilling location details, were prepared and submitted to the ANP and were sufficient to enable onward distribution to maritime authorities and other relevant regulatory agencies. • Evidence confirms that notifications were submitted to the ANP prior to the entry of the MODU and support vessels into the PSC contract area and the maritime territory of Timor-Leste, and that coordination with the ANP was maintained for the duration of the activity					
	MODU bridge manned at all times to maintain ongoing communication with other mariners	• Records and observations confirm that the MODU bridge maintained continuous watch and effective two-way communication with other marine users throughout drilling and marine operations. • Evidence demonstrates that the shadow support vessel actively monitored approaching traffic and	Massive	Remote	Medium		

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		implemented timely warning, communication, and shepherding actions to prevent unauthorised entry into the exclusion zone. • Any navigational interactions, attempted exclusion-zone breaches, or communication issues were identified, recorded, and managed in accordance with approved marine procedures, with escalation where required.					
Collision, entanglement with subsea infrastructure, interference with emergency response	The Company will submit notifications and relevant operational details to the ANP to facilitate consultation with and notification of the Fisheries Department regarding commencement and completion of the appraisal drilling.	• Records demonstrate that notifications and relevant operational information relating to the commencement and completion of the appraisal drilling programme were prepared and submitted to the ANP in a timely manner and were sufficient to enable onward consultation with and notification of the Fisheries Department, supporting awareness of MODU activities among local and artisanal fishing communities. • Evidence confirms that notifications were submitted to the ANP in advance of drilling commencement and updated at completion, with coordination maintained as required during the programme to support	Minor	Highly Unlikely	Low	• Company advises Fisheries department	The option for the Company to directly advise the Fisheries Department was rejected as not reasonably practicable because all external regulatory communication must be coordinated through the ANP under established protocols.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		effective information sharing and minimise interaction with local and artisanal fishing vessels.					
	The Company will submit exclusion zone notifications and operational details to the ANP to facilitate onward publication through appropriate national and local communication channels.	• Records demonstrate that exclusion zone notifications and relevant operational details were prepared and submitted to the ANP in a timely manner and were sufficient to enable onward publication through appropriate national and local communication channels, supporting awareness of the timing, duration and location of MODU activities among fisheries stakeholders. • Evidence confirms that exclusion zone notifications were submitted to the ANP in advance of appraisal drilling commencement and updated, where required, at completion, with coordination maintained for the duration of the appraisal programme. • Records demonstrate that any fisheries-related concerns, complaints or incidents associated with MODU activities were documented, reviewed and managed in coordination with the ANP, with outcomes recorded and corrective actions implemented where required..	Minor	Highly Unlikely	Low	• Company conducts "town hall" style information campaigns	Town-hall information campaigns were not adopted, as stakeholder outreach must be coordinated through the ANP and would not provide additional risk reduction. Residual risk is ALARP

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	The Company will prepare and submit notifications and relevant operational details to the ANP to enable onward distribution of Notices to Mariners, including formats and channels suitable for artisanal fishing communities who may not have access to television or print media.	• Records demonstrate that information, notifications and relevant operational details supporting Notices to Mariners were prepared and submitted to the ANP in a timely manner and were suitable for onward distribution through formats and channels accessible to local and artisanal fishing communities with limited access to television, print or electronic media. • Evidence confirms that Notices to Mariners and associated communications clearly and consistently conveyed the location, timing and nature of MODU activities in a manner understandable to local and artisanal fishers, supporting awareness and minimising interaction with fishing vessels.	Minor	Highly Unlikely	Low	• Company advises artisanal fishermen	Directly advising artisanal fishers was not adopted, as all stakeholder communication must be coordinated through the ANP and the measure would not provide additional risk reduction. Residual risk is ALARP.
Flaring can reduce a vessel operator's ability to accurately perceive navigation cues at night and may	The Company will prepare and submit timely notifications and relevant operational details relating to flaring activities to the ANP to enable onward distribution and facilitate the issuance of Notices to Mariners. The Company will maintain ongoing local marine user communications regarding	• Records demonstrate that timely notifications and relevant operational details relating to flaring activities were prepared and submitted to the ANP and were sufficient to enable onward distribution and facilitate the issuance of Notices to Mariners, alerting marine users to potential flaring-	Major	Remote	Medium	• MDT + DFA for quality samples • Downhole PVT sampling • Pressure transient test (build-up/falloff) • Numerical simulation to estimate stabilized flow	Alternatives to a DST (those rejected mitigation measures) were considered but are not reasonably practicable substitutes because they cannot provide sustained surface flow, stabilized gas and condensate rates, or fully representative fluid behaviour under

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
cause a visual distraction	the presence and progress of drilling activities to minimise navigational risk.	related visual hazards during night-time operations. • Evidence confirms that local marine user communications clearly described the presence, timing and status of flaring activities and were maintained for the duration of relevant drilling operations to minimise navigational risk • Records demonstrate that any navigational concerns, complaints or reported visibility issues associated with flaring were documented, reviewed and managed in a timely manner, with appropriate corrective actions implemented where required				• Closed-chamber testing	production conditions. These methods offer only partial reservoir characterisation and cannot deliver the integrated data set required for commerciality assessment, facility design, and resource evaluation. As these alternatives would not achieve the same level of risk reduction or data quality as a DST, they were not adopted, and the residual risk with the DST and all feasible controls in place is ALARP.
Drilling - Dropped Objects	Tool tethering, adherence to lifting procedures, use of certified equipment, secondary retention where practicable, DNV 2.7-1 containers with secured loads in open top baskets	• Records demonstrate tool tethering, secondary retention (where practicable), and approved lifting procedures were implemented for all lifting and work-at-height activities over open water. • Evidence confirms lifting equipment was certified, inspected, and fit for purpose, and that materials were transferred using DNV 2.7-1 certified containers or approved baskets with loads adequately secured. • DROPS inspections, lifting audits, and housekeeping	Minor	Remote	Low	• Nil	The risk of dropped objects impacting benthic habitats has been reduced to As Low As Reasonably Practicable (ALARP) through the implementation of tool tethering, strict adherence to approved lifting procedures, use of certified and inspected lifting equipment, secondary retention where practicable, and the use of DNV 2.7-1 certified containers with secured loads in open-

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		checks confirm ongoing compliance with dropped-object prevention requirements.					top baskets. These measures are recognised as good oilfield practice, are widely applied within the offshore industry, and are proportionate to the low residual likelihood and localised consequence of seabed disturbance. Further controls would not provide a materially greater environmental benefit and would be grossly disproportionate to the residual risk reduction achievable.
Loss of well control or hydrocarbon release	Establish and follow industry best practice plug and abandonment practices for well abandonment and incorporate and operate the same in accordance with the Drilling Program	• Records demonstrate that plug and abandonment activities were conducted in accordance with recognised industry best practice and the approved Drilling Program, including barrier philosophy and verification requirements. • Evidence confirms that primary and secondary well barriers were installed, tested, and verified to be effective prior to proceeding with cutting, retrieval, or final abandonment activities. • Any deviations from the approved plug and abandonment programme or best-practice requirements were documented, technically	Major	Remote	Medium	• Do not plug and abandon the well	Plugging and abandoning the well is required to ensure long-term well integrity and prevent future loss-of-containment risks. Leaving the well un-plugged was considered but rejected as not reasonably practicable, as it would create an ongoing environmental hazard, contravene regulatory obligations, and offer no risk-reduction benefit. P&A is the only option that reduces residual risk to ALARP.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		assessed, and approved through the management of change process prior to implementation.					
	ANP to review and approve the abandonment program in accordance with DL32 Article 39 (2). The abandonment of the well will be based on actual construction and submitted to ANP DL32 / Article 39 and approved in accordance with the same	• Records demonstrate that the abandonment programme, reflecting the as-constructed well configuration, was submitted to, reviewed, and formally approved by the ANP in accordance with DL 32/2016, Article 39(2) prior to execution. • The approved abandonment programme demonstrates appropriate well-barrier philosophy and containment measures consistent with the as-constructed well design and drilling history. • Any changes to the abandonment programme arising from operational findings were documented, technically assessed, and approved by the ANP prior to implementation.	Major	Remote	Medium		

9.3.1.2. Drilling Discharges

The major discharges associated with offshore drilling are drill cuttings and drilling muds. Drilling muds are used to cool and lubricate the drill bit and remove drill cuttings from the well. The drilling mud column is also the primary well control barrier Its role is to maintain both the safety and integrity of the wellbore by slightly exceeding the formation pore pressure, preventing influxes of formation fluids (kicks) into the wellbore.

Additional detailed information on the mud systems used on the Chuditch 2 well are located in section 4.3.3, 4.3.3.1, 4.3.4, 4.3.5.7 and table 9 of this EIS.

The water-based mud volume to be discharged to the environment is approximately 2,170m^3. Drilling with WBM will be riser-less and therefore cuttings will be discharged at the seabed. Whilst the SBM volume to be discharged to the environment as oil retained on cuttings is approximately 99m^3 (20% over gauge hole). Drilling with SBM will use a riser to retrieve the cuttings to the rig where they will be separated from the SBM before discharge.

Drill cuttings are generated when the drill bit penetrates the geological formation below the seafloor. The composition of the cuttings is determined by the nature of the geological formation being drilled. The retrieved cuttings will be of a diverse range of particle sizes, spanning from exceptionally fine to exceptionally coarse, with a median size not exceeding one centimetre.

9.3.1.2.1 Mud and Cuttings Modelling

SGBU contracted PT. MuTeknologi Komputasi Hidraulika to perform drill cuttings and mud dispersion modelling at the proposed Chuditch-2 well site, using MuTeknologi Software to assess the potential impacts of the discharge of drill cuttings on the environment. The outputs of this modelling form the basis of the predicted impacts from drill mud and cuttings.

This study also ensures compliance with regulatory standards and best environmental practice. The findings inform mitigation strategies to protect marine ecosystems while enabling safe and sustainable offshore drilling operations.

Scenario Simulations and Findings:

The study conducted hydrodynamic and dispersion modelling under two seasonal conditions—West Season (February) and East Season (June) - to predict the spread and deposition of drill cuttings.

Two drilling stages were evaluated and analysed:

The modelling simulation Near Seabed Discharge and four scenarios were evaluated and at Mid-Water Discharge at 5m, 15m and 25m depths were evaluated.

Key Results

- Sediment Dispersion: Near-seabed discharge resulted in localized cuttings deposition (<200m radius, 100% coverage), while mid-water discharge dispersed sediment over larger areas (~250m radius, 7% coverage).
- Total Suspended Solids (TSS) Concentration: Maximum TSS levels varied by scenario but remained below regulatory limits (25ppm) beyond 100m from the discharge point.

Seasonal Differences:

- February (West Season): Dispersal patterns favoured a Northerly and Southeasterly transport.
- June (East Season): Drilling cuttings were transported northwest and southward.
- Deposition Thickness: Near-seabed discharge resulted in 200mm thickness at the dumping site, whereas mid-water discharge led to <0.5mm thickness over wider areas.

In conclusion and environmental relevance, this study demonstrates that controlled discharge and strategic well placement significantly reduce sediment accumulation and water quality impacts.

Key takeaways include:

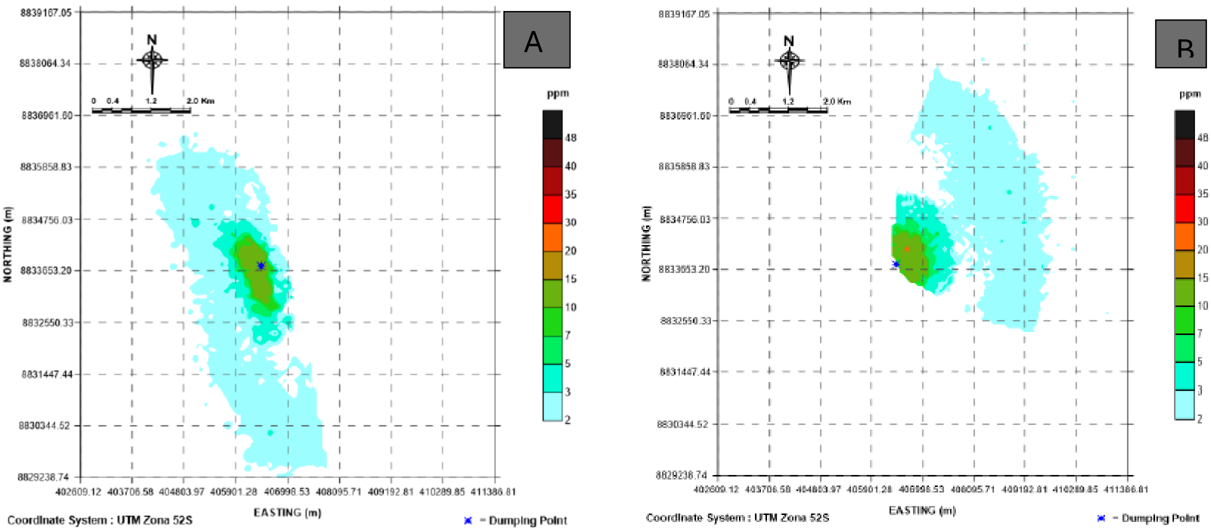
- Localized Impact: Most drilling waste settles within a 200m radius without exceeding 25 ppm.
- Effective Waste Management: The use of high-efficiency shale shakers and cuttings reinjection can further minimize discharge.
- Regulatory Compliance: Findings support adherence to MARPOL 73/78, Timor-Leste's environmental laws, and best offshore drilling practices.
- The modelling results guide spill prevention, waste handling, and environmental monitoring measures, ensuring that the Chuditch-2 drilling operations align with sustainable offshore resource extraction and ecosystem protection.

This study is summarized in the following figures:

The mud and cuttings modelling showed that drilling activities could increase the sediment deposition and total suspended solids (TSS) concentrations near the seabed and at very low levels up to 1 Nautical Mile from the Chuditch-2 well, depending on dumping scenarios and season (MuTek 2024).

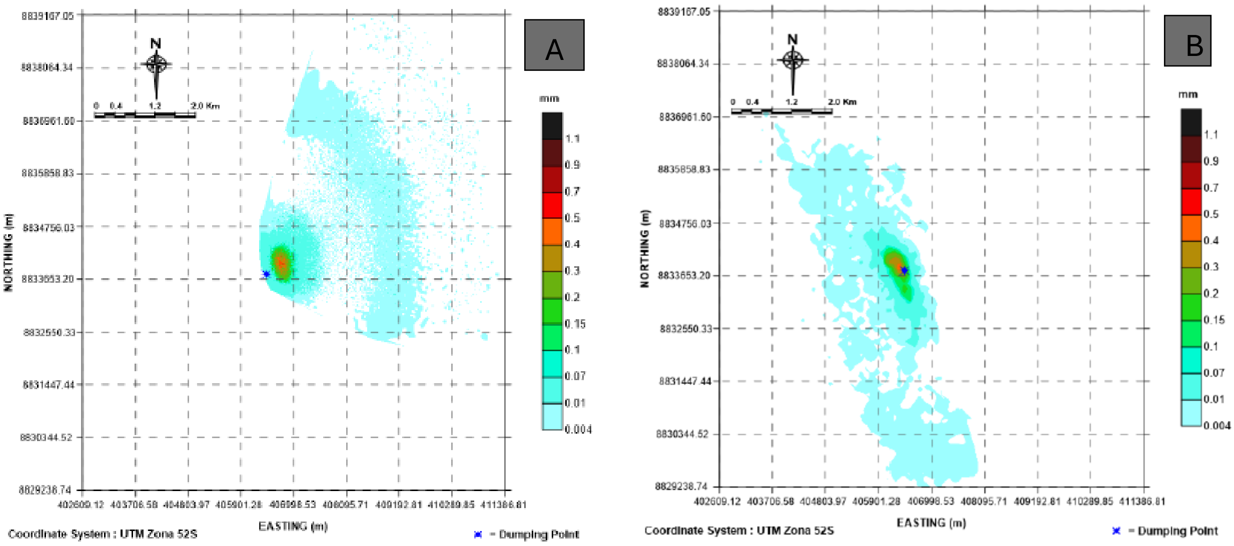
- Results of mud dispersion modelling showing plume extent for maximum total suspended solids discharged at 5 m below mean sea level in figure 40 (A) in February and figure 40(B) in June as adapted from MuTek, 2024.
- The dispersion modelling indicates a north and east dispersion trajectory for drilling activities in February, compared to a north-west-south-east dispersion trajectory in June.

Figure 40 Results of mud dispersion modelling showing plume extent for maximum total suspended solids discharged at 5 m below mean sea level



However, in both seasons the adverse effects of sediment deposition and TSS plumes would be limited to the immediate vicinity of the well site and discharge location, with a maximum sediment deposition thickness of 0.7 – 1.2 mm and coverage of less than 10% (MuTek, 2024). Also of note is the potential movement into Australian waters of the modelled plume for drilling activities in June.

Figure 41 Drilling cuttings modelling showing cutting deposition (mm) limits for a discharge at 5 m below mean sea level in (A) February and (B) June. Adapted from MuTek, 2024



The Chuditch-2 location is approximately 700m from the Australia EEZ. Modelling indicates there is no realistic probability of cuttings deposition crossing into Australian waters (figure 42). Under certain conditions, a plume of turbid water may progress into Australian territorial waters but at a level of between 5-25ppm, which is analogous to TSS/turbidity levels produced naturally in the region influenced by passing weather systems (Woodside, 2004, Pineda et al, 2016, Pineda et al, 2017).

The dispersion modelling indicates a northwest-southeast dispersion trajectory for drilling in June. However, the adverse effects of sediment deposition and TSS/turbid plumes will be limited to the immediate vicinity of the well site and discharge location, with a maximum sediment deposition thickness of 0.7-1.2mm and coverage of less than 10% (MuTek, 2024). Also of note is the potential movement of the modelled plume of TSS/turbid water from drilling activities in June into Australian waters (figure 42).

Modelling predicts that cuttings will settle to the seabed within 1 km or less of well centre at decreasing concentrations to 0.3mm/m^2. Cuttings deposition outside that radius will be highly dispersed and concentration below the expected threshold for environmental impact. Figure 44 shows the spatial extent of cuttings deposition when discharged 5 metres BMSL noting the average density of the deposition at the seabed drops below 0.5mm/m^2 approximately 200 metres from well centre.

Figure 42 Stylised impact zones based on modelled cutting deposition for June. The dotted line indicates area of operations centred around the Chuditch-2 well (asterisk) and the solid oblique line indicates the boundary to the Australian EEZ. Adopted: MuTek, 2024

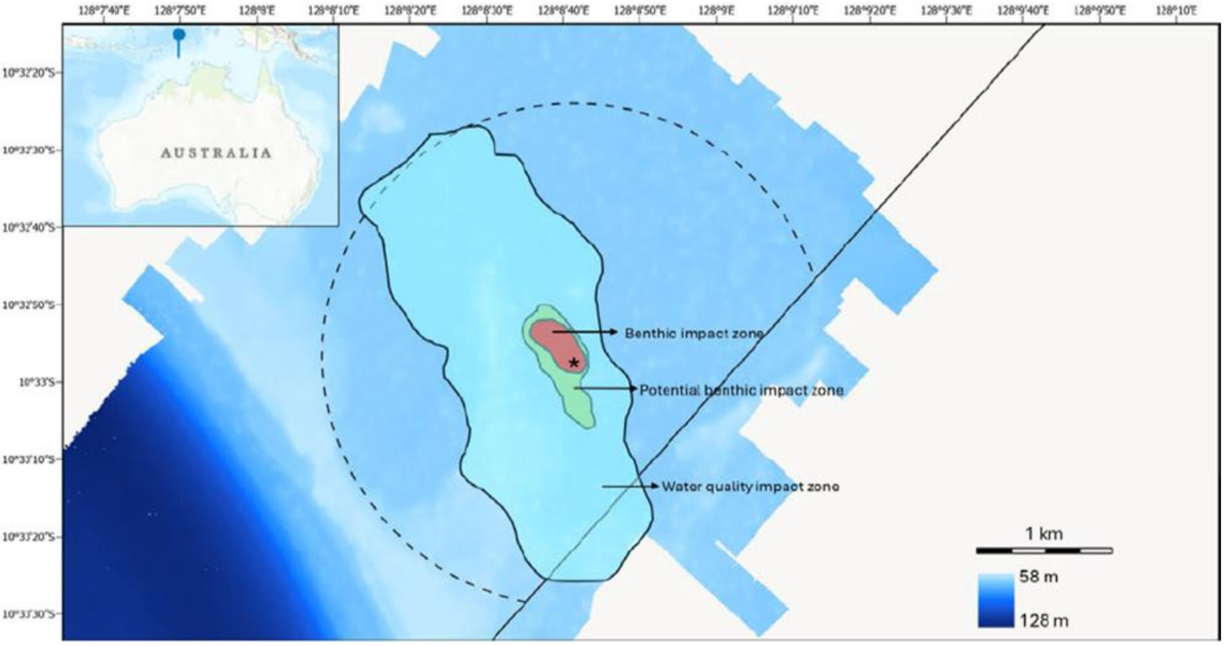
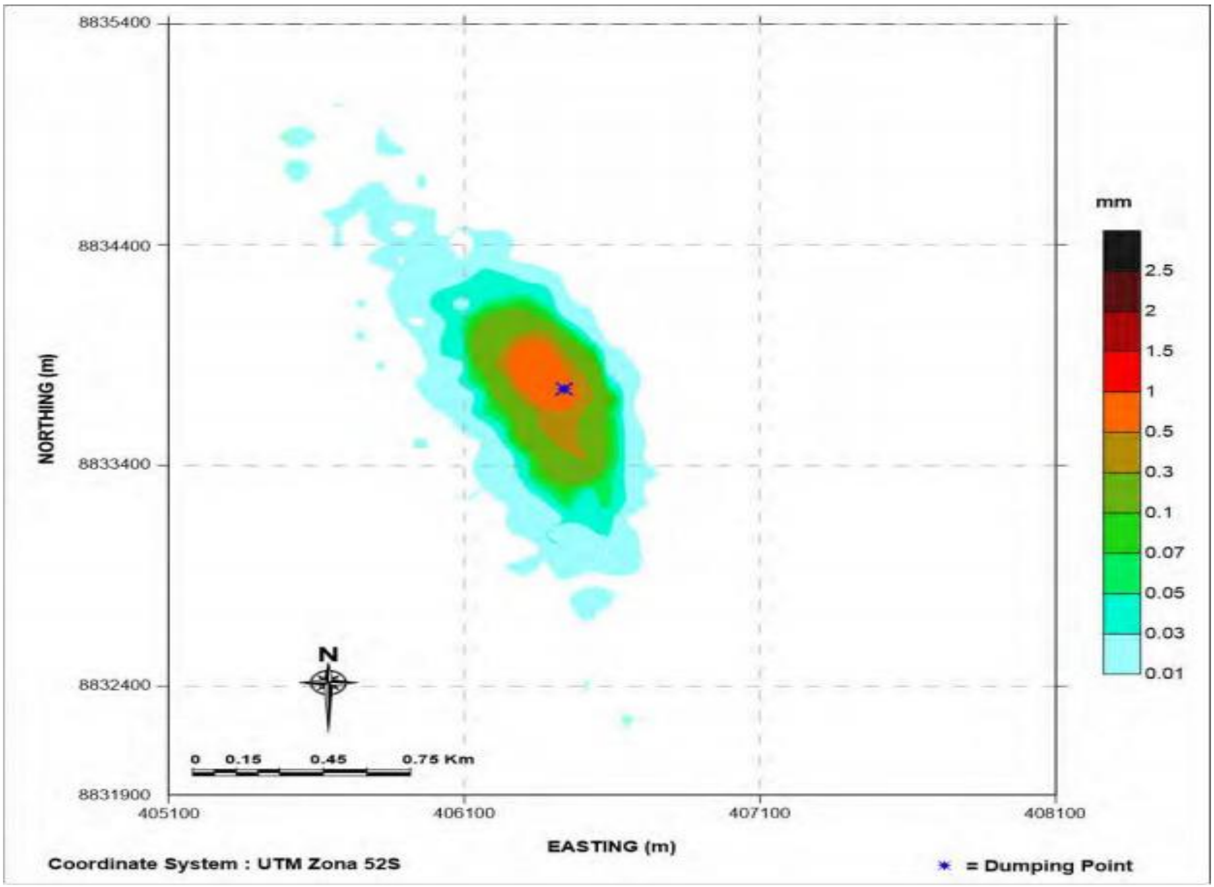


Figure 43 Spatial extent of Cutting Deposition (mm)-discharge at 5m bmsl in June. Adopted: MuTek, 2024



9.3.1.2.2 Impact Assessment

The potential environmental effects associated with the discharge of drill cuttings, drilling fluids and cement relate primarily to:

- The toxicity and biodegradability of drilling fluid and cement additives
- Increases in water column total suspended solids (TSS) and turbidity
- Smothering and alteration of sediment characteristics
- Temporary seabed oxygen depletion if sediments are smothered
- Leaching of naturally occurring or additive-derived materials from cuttings and cement solids
- Short-term exposure of marine fauna to elevated turbidity, suspended solids and localised changes in water quality

Drill Cuttings and Drilling Fluids

Immediate potential impacts from drill cuttings discharge include localised smothering of benthic infauna and epifauna, and short-term exposure of marine organisms to drilling fluids adhered to cuttings. Drill cuttings may contain residual Water Based Mud (WBM), WBM sweeps, spacer fluids and small quantities of Synthetic Based Mud (SBM), including Saraline 185V, as well as commonly used drilling additives such as barite, bentonite, polymers, viscosifiers, lubricants, shale inhibitors and corrosion inhibitors. These additives are selected in accordance with the chemical selection processes and approved by ANP. These chemicals are characterised by low toxicity, limited persistence and high biodegradability.

Cuttings modelling (MuTek, 2024; refer Figure 43, Spatial extent of Cutting Deposition (mm) discharge at 5 m below mean sea level in June) predicts that cuttings will settle to the seabed within approximately 0.5 nautical miles or less of the well centre, with deposition thickness decreasing to approximately 0.3 mm/m² at the outer extent of deposition. Cuttings deposition beyond this radius is predicted to be highly dispersed and below thresholds associated with measurable environmental impact. Storm events and energetic offshore conditions are expected to further disperse deposited material, reducing cuttings thickness to undetectable levels over time.

Accordingly, the environmental effects of discharged drill cuttings are expected to be confined to localised and temporary physical disturbance of seabed habitats in the immediate vicinity of the well location.

Effects of Total Suspended Solids (TSS) in the Water Column

Modelling of total suspended solids in the water column for June 2025 predicts TSS concentrations of up to approximately 200 ppm immediately surrounding the cuttings discharge point at 5 m below mean sea level. TSS concentrations decrease rapidly with distance, reducing to approximately 25 ppm or less within ±50 m of the discharge point (MuTek, 2024). These levels are comparable to naturally occurring turbidity and suspended sediment concentrations experienced seasonally in the region as a result of weather systems and storm events (Woodside, 2004; Pineda et al., 2016; Pineda et al., 2017).

Baseline data collected for the project indicate generally low ambient turbidity (maximum 0.26 NTU; Appendix 1); however, these values do not capture the full range of natural variability associated with cyclones and other high-energy events. The magnitude, duration and spatial extent of TSS generated by drilling activities are analogous to short-term natural disturbance events. Beyond approximately 100 m from the drill site, TSS levels are predicted to be comparable to those experienced during extreme weather events.

Marine fauna, including whales, turtles and fish, are expected to transiently encounter elevated TSS only within a small mixing zone. Cetaceans and marine turtles are highly mobile and are not expected to remain within the immediate vicinity of the discharge. Demersal fish may experience short-term exposure to increased turbidity but are generally tolerant of episodic sediment resuspension in offshore environments. As such, any effects on marine fauna are expected to be temporary and not result in injury, long-term behavioural disruption or population-level impacts.

Smothering and Alteration of Sediment Characteristics

Localised smothering of benthic invertebrate communities is likely to occur in the immediate vicinity of the well, particularly during top-hole drilling where cuttings will be discharged on the seabed around the discharge point. Smothering is expected to be most pronounced close to the discharge point and along the axis of prevailing currents. Some temporary alteration of sediment characteristics may occur due to differences in particle size, density and abrasiveness relative to background sediments.

Baseline survey results indicate that approximately 65% of the surveyed area comprises bare sand, bare sand with bioturbation, or sediment with sparse filter feeders. Of the remaining 35% containing benthic biota, approximately 65% was classified as having less than 25% biological cover. Consequently, the area of seabed potentially affected by smothering is generally characterised by low habitat complexity and low biological sensitivity.

The severity of smothering impacts is expected to be slight due to the low toxicity of the drilling fluids and additives, the limited spatial extent of deposition, the short duration of discharge and the dispersive nature of offshore currents. Recovery is expected to occur through natural reworking of sediments and recolonisation by benthic fauna over relatively short timeframes.

Leaching of Materials from Cuttings

Baseline sediment and water quality data indicate that metal concentrations at the drill location are generally below ANZECC guideline values and limits of reporting (Appendix 1). Formation-derived components of cuttings may release naturally occurring substances such as trace metals, hydrocarbons and salts when exposed to seawater. Leaching rates are influenced by mineralogy, grain size, redox conditions and burial or resuspension processes.

Studies of drill cuttings from comparable offshore developments (ESSO, 1993; Swan et al., 1994) indicate that metal concentrations are typically within the range of natural marine sediments and that significant leaching of contaminants is unlikely. Metals associated with residual drilling mud on cuttings may be transported to the seabed; however, extensive testing of Saraline 185V has demonstrated very low aquatic and sediment toxicity (OCNS ranking E) and high biodegradability (72% degradation in 28 days), indicating that residual drilling fluids do not pose a material risk of contamination or bioaccumulation.

Hydrocarbons may be present in trace quantities on cuttings; however, the volumes potentially transported to the seabed are minor and not expected to result in measurable environmental effects. Post-drilling monitoring is proposed to confirm these predictions.

Overall, leaching of materials from cuttings is expected to be localised, temporary and of low environmental consequence.

Cement Discharges

Cement discharges may occur during cementing operations, equipment clean-up or as a result of small volumes of excess cement returns. Cement slurries and wash waters are characterised by elevated alkalinity (high pH), suspended solids and fine particulates, which may result in short-term changes to local water quality within a small mixing zone.

Potential water-column impacts include temporary increases in turbidity and localised elevation in pH. Marine fauna within the immediate vicinity of the discharge may experience short-term exposure; however, due to the low volumes involved, intermittent nature of discharges and rapid dilution in the offshore environment, pH and turbidity are expected to return to ambient levels over short distances and timescales. Cetaceans, turtles and fish are not expected to experience injury or behavioural disturbance as a result of cement discharges.

Upon settling, cement particulates may deposit on the seabed directly beneath the MODU, resulting in localised smothering and temporary alteration of surface sediments, including increased hardness or consolidation. Once set, cement is chemically stable and not expected to release toxic constituents. Physical effects may include burial of infauna or obstruction of epifauna within a very limited footprint. Benthic communities in offshore environments are generally adapted to episodic sedimentation events, and recovery is expected to occur through natural processes.

Overall Impact Assessment

The discharge of drill cuttings, drilling fluids and cement is expected to result in localised, short-term and reversible impacts primarily associated with physical disturbance and temporary changes in water quality. Impacts to benthic habitats and marine fauna, including whales, turtles and demersal fish, are expected to be minor, spatially limited and not persistent. Larger marine fauna such as whales, turtles and demersal fish are generally mobile species that have home ranges and movement patterns much larger than the spatial extent of cuttings and cement discharges. Therefore, the potential for direct impacts on these receptors is extremely limited. Furthermore, the potential for toxicity or bioaccumulation is also extremely limited due to the lack of spatial overlap with these fauna groups.

With the implementation of chemical selection controls, discharge minimisation measures, modelling, monitoring and standard drilling practices, the environmental risk associated with drill cuttings and cement discharges is considered low and ALARP.

9.3.1.2.3 Mitigation Measures and Measurement Criteria

Table 27 Risk assessment summary, mitigation measures, measurement criteria and ALARP assessment, for drilling fluid discharges.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Water Quality Degradation	Approved Water-Based Mud (WBM), drill cuttings and cement will be discharged at the mudline in accordance with the drilling program.	• Records demonstrate that WBM, cuttings, and cement discharges occurred in accordance with the approved Drilling Program. • ROV observations confirm that discharged materials returned to and remained at the mudline as intended, with no evidence of unintended plume behaviour or off-target dispersion. • Water-quality monitoring results were reviewed against agreed criteria, and any anomalies were investigated and managed in accordance with the monitoring plan and corrective action procedures.	Minor	Likely	Medium	Bringing cuttings and water-based mud to surface and: • treating over the shakers. • Using a cuttings dryer • Skip and Shipping cuttings and mud to shore	Recovering cuttings and water-based mud to surface for treatment, cuttings drying or skip-and-ship was considered but rejected as not reasonably practicable because it is disproportionate in cost, vessel time, equipment footprint and operational risk relative to the minimal environmental benefit achieved. Water-based mud and drilled cuttings disperse naturally and rapidly around the wellhead with low, localised and short-term impact, and this is consistent with accepted industry practice for shallow exploratory wells. As the incremental risk reduction from surface recovery is negligible and the effort grossly disproportionate, the residual risk from seabed dispersion is ALARP.
	Detailed ecotoxicity study conducted on the Synthetic Based Mud (SBM) or Non-	• Records demonstrate that the SBM selected for use was	Minor	Likely	Medium	• Non-Aqueous Drilling Fluids	Saraline 185V was selected because it meets both the

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	Aqueous Drilling Fluid (NADF) proposed to be used in the program to understand the environmental fate; limits on NADF on cuttings discharges.	subject to a detailed ecotoxicity and environmental fate assessment and determined to be suitable for use and discharge under the approved programme. • Evidence confirms that Saraline 185V, or equivalent SBM, with an OCNS "E" rating, was used as specified in the Drilling Program and associated approvals. Approval granted by ANP to use Saraline 185V • Oil-on-cuttings shall not exceed 9.2% NADF by wet weight of cuttings, averaged over 24 hours. Oil on cuttings levels will be verified through retort testing every 24 hours.				(NADF) that did not meet the ALARP acceptability criteria. • NADF that did not meet the well based technical criteria	environmental ALARP acceptability criteria and the well-specific technical requirements for drilling. Other NADF systems were rejected as they either failed to meet the required environmental performance or did not satisfy the technical criteria necessary for safe and effective well construction. As Saraline 185V provides the lowest-risk, technically suitable option, the residual risk is ALARP.
	High efficiency triple deck shale shakers and centrifuge used to separate cuttings from SBM prior to overboard discharge of cuttings	• Records and observations confirm shale shakers and centrifuges were configured, operated, and monitored to optimise SBM recovery from cuttings prior to discharge. • Evidence demonstrates solids control equipment was fit for purpose, appropriately maintained, and operated by competent personnel throughout drilling operations.	Minor	Likely	Medium	• Using a cuttings dryer • Skip and Shipping cuttings and mud to shore	Bringing SBM and cuttings to surface and processing them through triple-deck shakers followed by a centrifuge was selected as the ALARP option because it provides effective fluid recovery and minimises discharge while avoiding the disproportionate cost, deck space, logistics burden and safety risks associated with deploying a cuttings dryer or implementing skip-and-ship operations. The

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
							incremental environmental benefit of these additional measures is minimal relative to their operational impact, making them not reasonably practicable. With shakers and centrifuge in place, residual risk is reduced to ALARP.
	Discharge of cutting via a cutting caisson.	• Records and verification confirm the cuttings caisson is correctly positioned below the hull/spud-can interface and splash zone, and oriented to avoid structural interference and turbulence. • Evidence demonstrates solids control equipment was fit for purpose, appropriately maintained, and operated by competent personnel throughout drilling operations.	Minor	Likely	Medium	• Discharge without a caisson	Using a cuttings caisson is the ALARP option because it directs cuttings and mud below the hull, improving dilution, dispersion and reducing localised seabed accumulation, hull fouling and visual impact. Not using a caisson provides no additional safety or operational benefit and would increase potential for localised environmental effects. As the caisson delivers a clear risk reduction for minimal cost or complexity, it is the reasonably practicable option, and the residual risk is ALARP.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	Reuse of SBM - Returned to shore base at end of campaign for treatment and reuse	• Records demonstrate that SBM was recovered and segregated during drilling and prepared for return to shore without uncontrolled discharge or loss. • Evidence confirms that SBM return, storage, transport, and treatment complied with OEM specifications and shore base procedures and approvals. • Documentation demonstrates full traceability of SBM volumes from offshore recovery through transport, shore-based treatment, and reuse or final disposition.	Slight	Remote	Low	• Discharge SBM overboard at the end of the campaign	Reusing SBM at the end of the campaign was selected as the ALARP option because it avoids offshore discharge, reduces marine contamination risk, & maximises fluid recovery for future operations. Discharging SBM overboard was rejected as it is inconsistent with good industry practice, and would contravene the intent of Ministerial Diploma No. 46/2017, Article 10, which requires petroleum operators to minimise waste generation and prevent harmful discharges to the marine environment. Reuse delivers superior risk reduction at negligible additional cost and therefore represents the reasonably practicable option; residual risk is ALARP.

9.3.1.3. Other Waste Discharges

During the offshore drilling activity, a wide variety of liquid, solid and gasses wastes are expected to produce on the rig and from the drilling activity, some of which are discharged directly or indirectly into the marine environment. These discharges include chemical and hydrocarbon discharges, wastewater and sewage disposal, cooling and brine water, produced formation water, bilge water discharges, deck drainage, drill floor, food and solid waste.

9.3.1.3.1 Impact Assessment

Chemical and hydrocarbon discharges

Hazardous wastes are defined as being waste materials that are harmful to health or the environment. Hazardous wastes generated include recovered solvents, excess or spent chemicals, oil contaminated materials (e.g., absorbents, filters, and rags) and batteries. All hazardous waste materials generated will be documented and tracked, segregated from other waste streams and stored in suitable containers. Recyclable hazardous wastes, such batteries, will be stored separately from non-recyclable materials. All hazardous waste materials will be transported to shore for disposal or recycled at an approved and licensed facility.

Maintenance wastes include used chemicals, lubricating oils, paint, solvents, rags and other cleaning items. Maintenance wastes will not be discharged to the marine environment but will be stored in an appropriate container until the materials are transported onshore for recycling or disposal at approved and licensed facilities.

Wastewater and sewage disposal

The discharge of sewage, drainage water, runoff, and wash water during the appraisal drilling has been assessed as having a low environmental impact. The direct effects of these discharges include minor pollution from trace amounts of oils and chemicals, a slight increase in water temperature, and a marginal rise in nutrient levels within the water column. These changes may lead to localized population increases of certain marine organisms and potential disturbances to the marine environment.

Based on data compiled for cruise ships (EPA, 2008), the following estimates for greywater and blackwater production (table 28) have been calculated.

Table 28 Cruise Ship greywater and blackwater production

Discharge Type	Per Capita Production	Total Production (1)
Greywater	0.14-0.450m^3/day (Average 0.250m^3/day)	25m^3/day
Blackwater	0.0042-0.0102m^3/day (Average 0.032m^3/day)	3.2m^3/day

(1) Assuming a total of 140 persons on board platform and vessels and average per capita production

Using the upper Biological Oxygen Demand (BOD) estimates for both greywater and blackwater, along with the calculated total production rates, the total daily BOD load from these wastewater streams is estimated at 30kg/day. This estimate does not account for any treatment processes that may occur prior to discharge. Given the rapid dispersion of waste in the marine environment and the temporary nature of these discharges, the overall environmental impact is considered negligible.

Hazardous, laboratory and medical waste

Any Biohazardous waste will be stored so it is isolated, contained, identifiable, and incapable of comingling or accidental release to the environment. Biohazardous waste generated during drilling operations shall be segregated, labelled, secured, and stored in designated contained areas on the MODU, to prevent commingling with other waste streams and protect water quality and the marine environment.

Ballast Water

The discharge of ballast water from the offshore drilling rig and associated support vessels may act as a vector for invasive marine species (IMS), also referred to as invasive marine pests, by transporting non-indigenous organisms outside their natural distribution into the marine environment where the petroleum activity is undertaken. Ballast water is recognised internationally as one of the primary mechanisms by which marine pests are transported across biogeographic boundaries, with thousands of species—including phytoplankton, zooplankton, invertebrate larvae and microbes—capable of surviving uptake, transit and subsequent discharge into new environments if conditions allow, potentially leading to ecological imbalance and loss of native biodiversity (Giakoumi et al 2019).

Successful establishment of an introduced species in a recipient environment depends on the interplay between the biological characteristics of the organism (e.g. reproductive strategy, tolerance ranges), the volume and frequency of propagules discharged, and environmental suitability at the receiving location. Scientific reviews of ballast water-mediated invasions identify that non-indigenous species transported in ballast water have been responsible for significant ecological change in many regions globally, including displacement of native species, alteration of ecosystem structure and function, and disruption of food webs. Once established, invasive marine pests are typically difficult to eradicate or control and can persist indefinitely in the absence of effective management (Kraus 2023).

The potential impacts of ballast-mediated introductions in the offshore environment include competition with native plankton and benthic species for resources, alteration of trophic interactions, predation on native fauna, and the introduction of new pathogens or diseases. Displaced native species and altered community dynamics may cascade through food webs, affecting ecological functions and resilience. In Timor-Leste waters, introduced marine pests are recognised as a threat to marine biodiversity, fisheries, aquaculture and other ocean-dependent socio-economic values, and are subject to national biosecurity measures under the IMO Ballast Water Management Convention standards which aim to mitigate these risks through ballast water exchange and treatment protocols.

Consistent with national and international ballast water management frameworks, appropriate controls such as compliance with the IMO Ballast Water Management Convention standards (e.g. D-2 discharge standards), implementation of a documented Ballast Water Management Plan and certification are required to minimise the risk of introducing IMS. When these management measures are applied effectively, the likelihood of ballast water discharges resulting in viable introductions of non-indigenous species is reduced to as low as reasonably practicable (ALARP). Residual impacts, taking into account the low frequency of ballast water discharge events from the rig and support vessels, are assessed as low consequence, with any ecological effects anticipated to be highly localised and managed through existing biosecurity controls and relevant regulatory mechanisms.

Cooling Water

The characteristics of the drill rig cooling water will not be known until the drill rig has been contracted. For the purposes of this impact assessment, the characteristics of the cooling water to be discharged from the rig have been derived from similar drill rigs. The estimated volume to be discharged is expected to be in the order of 300 m3/hour with a temperature approximately 7 degrees C above the background temperature. With these characteristics cooling water discharged at the surface is expected to return to background temperatures within 50m of the discharge point based on the following mixing calculations:

Assumptions:

Cooling-water discharge

- Discharge rate (Q): 300 m^3/h = 0.083 m^3/s (typical mid-range jack-up estimate)
- Temperature rise across cooling system (ΔT_0): +7°C (commonly cited upper-end value in Environment Plans in Australian waters; many systems are 5–7°C)

Receiving environment

- Ambient seawater temperature: not required (we calculate temperature increase)
- Ambient current speed: 0.1 m/s (low energy / conservative)
- Water depth: 2 0 m
- Initial mixing zone length: 50 m downstream of discharge
- Complete vertical mixing within water column (reasonable for jack-ups in shallow water)

Ambient flow through the mixing zone

- Cross-sectional area of mixing zone: A="depth "×"width"
- Assume a conservative mixing width of 50 m: A=20" m"×50" m"=1,000" " "m" ^2
- Ambient volumetric flow through zone: Ambient=A×u=1,000×0.1=100" " "m" ^3/"s"

Dilution factor

- "Dilution factor"=Ambient/Discharge =100/0.083≈1,200

Resulting temperature increase

- ΔT=(ΔT_0)/"Dilution factor" =7/1,200≈〖0.006〗^∘ "C"
- Predicted temperature increase at ~50 m from discharge is ~0.006°C

Warm water is more buoyant than cooler background waters, therefore the 50m mixing zone will remain near the surface. Plankton are the fauna and flora most likely to be found within this mixing zone. Plankton within the immediate mixing zone may experience brief exposure to elevated temperatures and physical entrainment; however, rapid dilution, short exposure durations, and the high natural turnover and resilience of plankton communities mean effects are localised, transient and not ecologically significant. No measurable population-level impacts are expected in the context of dynamic and rapid reproduction rates of plankton.

Once discharged into the ocean, the cooling water would initially be subject to mixing due to ocean turbulence and some heat transferred to the surrounding waters. The volume of discharge from the rig will be small compared to the receiving waters and so the environmental effects of the elevated temperature of discharged waters is therefore predicted to be insignificant due to the large buffering capacity of the ocean.

The plume will quickly lose heat and water in only a small area around the outfall will have a substantially elevated temperature (Swan et al., 1994).

Brine Water

The characteristics of the drill rig brine discharge will not be known until the drill rig has been contracted. So, for the purposes of this impact assessment, the characteristics of the brine water to be discharged from the rig have been derived from similar drill rigs. The estimated volume to be discharged is expected to be in the order of 120 m3/day based on two reverse osmosis (RO) units. Based on similar studies the following characteristics have been used to assess brine water discharge dilution:

Assumptions:

Brine discharge

- Brine discharge rate: 120 m^3/day = 5 m^3/h = = 0.0014 m^3/s
- Brine salinity: 70 PSU
- Ambient seawater salinity: 35 PSU
- Initial salinity elevation at discharge (ΔS_0): +35 PSU

Receiving environment

- Water depth: 20 m
- Current speed: 0.1 m/s (low-energy, conservative)
- Initial mixing zone length: 50 m
- Effective mixing width: 50 m

Vertical mixing: assumed complete within water column (appropriate for shallow jack-up settings)

Ambient flow through the mixing zone

$$A = 20 \times 50 = 1{,}000 \text{ m}^2$$
$$Q_{ambient} = A \times u = 1{,}000 \times 0.1 = 100 \text{ m}^3/\text{s}$$

Dilution factor

$$\text{Dilution factor} = \frac{Q_{ambient}}{Q_{brine}} = \frac{100}{0.0014} \approx 71{,}000$$

Resulting salinity increase

$$\Delta S = \frac{35}{71{,}000} \approx 0.0005 \text{ PSU}$$

The predicted salinity of 0.0005 PSU is reached within 50m from the discharge location which is within background variation.

Brine generated from the MODU reverse osmosis desalination plant is discharged continuously at approximately 5 m³/h with a salinity of up to 70 PSU. Screening-level dilution calculations indicate that salinity increases of less than 0.001 PSU occur within tens of metres of the discharge point. Given the very low discharge volume, rapid dilution, and the natural tolerance and variability of plankton communities, impacts are expected to be localised, transient and not ecologically significant.

Produced formation water (PFW)

Produced formation water (PFW typically contains elevated salinity relative to ambient seawater, dissolved and dispersed hydrocarbons (predominantly low-molecular-weight aromatics), trace metals and naturally occurring inorganic constituent's characteristic of formation fluids (Neff et al., 2011; OSPAR, 2012).

PFW discharged during flow testing of the well will comprise very small, short-duration volumes associated with verification of reservoir properties. The treatment and handling of PFW is detailed in Section 4 of this EIS.

Given the limited volumes anticipated during flow testing and the offshore, high-energy receiving environment, PFW discharges are expected to undergo rapid initial dilution and dispersion within a small mixing zone adjacent to the discharge point.

Potential physical impacts to pelagic fish and plankton include localised, short-term changes in salinity and density, which may temporarily affect buoyancy or distribution of plankton within the immediate discharge plume. Due to the very low discharge rates and the rapid entrainment and mixing of PFW into the surrounding seawater, salinity anomalies are expected to attenuate to background levels within metres of the discharge. Pelagic fish are highly mobile and are expected to actively avoid the immediate discharge area, while plankton exposed within the near-field mixing zone would experience only brief exposure durations. Consequently, physical effects are expected to be transient, localised and reversible, with no population-level consequences.

Potential toxic impacts to pelagic receptors arise primarily from dissolved aromatic hydrocarbons (e.g. BTEX) present in PFW, which are the principal drivers of acute toxicity to plankton and fish early life stages (Neff et al., 2011; Faksness et al., 2004). At sufficient concentrations, these compounds may cause short-term sub-lethal effects such as narcosis or reduced feeding efficiency, and lethal effects to sensitive planktonic organisms. However, modelling and empirical studies indicate that hydrocarbon concentrations from small-volume PFW discharges rapidly decrease below ecotoxicological thresholds due to dilution, volatilisation and biodegradation (Neff, 2002; OSPAR, 2012). Given the extremely limited volumes associated with flow testing, exceedance of acute toxicity thresholds is expected to be confined to a very small mixing zone and persist for minutes to hours only.

At the population level, impacts to plankton communities are expected to be negligible due to their widespread distribution, high natural variability and rapid turnover rates. Any localised mortality occurring within the near-field mixing zone would represent an insignificant proportion of the regional plankton population and would be rapidly replenished through advection and reproduction. Pelagic fish, including early life stages, are expected to experience minimal exposure due to rapid dilution and avoidance behaviour, and no measurable effects on growth, recruitment or population dynamics are anticipated (Neff et al., 2011; Johnsen et al., 2010).

Taking into account the extremely small volumes of treated PFW, the short duration of discharge during flow testing, the separation from hydrocarbons in the test separator and subsequently treatment through the rig's oily water separator, the high-energy offshore environment and the implementation of standard operational controls, impacts to pelagic fish and plankton are assessed as localised, short-term and of low environmental consequence. Residual impacts are considered acceptable and ALARP, noting that effects would be confined to a small mixing zone and would not result in persistent or population-level impacts to pelagic receptors.

Bilge water discharges

Bilge water from a MODU is a mixture of water, oil, fuel, and chemicals that collects in the lowest compartments of the unit that accumulated from various leaks and operation on the facility. Bilge waters from machinery spaces on the MODU will be routed to the oily water separator, treated before discharge into the sea. Hence, the consequence of the water quality degradation from bilge water discharge is minor.

Deck drainage

Deck drainage from the offshore drilling unit, comprising intermittent releases of wash-down water potentially containing trace hydrocarbons, suspended solids, residual drilling fluids, detergents and metals, has the potential to result in short-term physical and toxic exposure to pelagic fish and plankton within the immediate receiving environment. Physical effects may include a transient increase in turbidity and the presence of fine particulates or surface sheens, which could temporarily interfere with planktonic feeding or respiration; however, the low solids loading and episodic nature of deck drainage limit the magnitude and duration of such effects. Toxic effects to pelagic receptors may arise from dissolved hydrocarbons and other contaminants, potentially causing short-term sub-lethal effects (e.g. narcosis or reduced feeding efficiency) in plankton and early life stages of fish at sufficient concentrations. These potential effects are expected to be confined to a very small mixing zone adjacent to the discharge point, as the low discharge volumes, high energy offshore environment and water column stratification result in rapid dilution to concentrations below ecotoxicological thresholds within metres of release. Pelagic fish are highly mobile and are expected to actively avoid the immediate discharge area, further reducing exposure duration, while plankton populations are resilient at the population level due to rapid turnover and widespread distribution. On this basis, and with implementation of standard deck management and spill prevention controls, impacts to pelagic fish and plankton from deck drainage are assessed as localised, short-term and of minor environmental consequence, consistent with the ALARP principle and acceptable under the regulations.

Drill floor

Water Based Mud system: Drill floor water is generated from routine operations like cleaning the drill floor, shaker room, and pump room. It may contain a mixture of seawater, drilling fluids, drill cuttings, traces of oil, grease, and other chemicals. Discharge of the drill floor water can affect marine water quality, marine life, and seabed quality. However, given the type of drilling fluid used and the duration of the drilling campaign, the consequence from drill floor discharge is expected to be minor.

Synthetic Based Mud System: Any clean-up of the drill floor or where SBM is used and or is comingled with water, will be diverted to the oily water separator and treated in accordance with MARPOL

Hence, the consequence is expected to be minor.

Food waste

Food waste, being biodegradable, will be treated using a macerator with the final disposal having grain size of less than 25mm diameter prior to disposal into the sea. Disposal of food and sewage into the sea should be handled in accordance with MARPOL requirements. While localized organic enrichment may occur, no significant impacts are anticipated from this discharge. Hence, the consequence is expected to be minor.

Greywater

Grey water from an offshore drilling rig comprises wastewater generated from non-toilet domestic sources including showers, hand basins, laundry facilities and galley sinks, as defined by the International Maritime Organization (IMO) and industry practice (i.e., drainage from dishwashing, bathrooms and laundry excluding sewage) (IADC85). Grey water is distinct from sewage (black water) and typically contains organic matter (e.g., food residues, soaps and detergents), nutrients and suspended solids.

The volume of grey water generated is a function of the number of persons on board (POB) and routine domestic water use. Plane engineering estimates and offshore waste inventories suggest generation rates broadly in the range of 30–70 litres per person per day (L/person/day) on oil and gas installations, with combined sewage/grey water rates of around this order reported in operational plans (e.g., 30–40 L per person per day; treated sewage and grey water volumes scale directly with POB) (Santos 2021). Applying this range to a rig with a typical POB of 100–150 personnel yields an estimated grey water generation volume of approximately 3–10 m³/day, with variation depending on accommodation usage patterns, laundry and galley activities and potable water availability.

Grey water is typically discharged overboard at or below the waterline, either directly or via collection and discharge lines, in accordance with relevant marine pollution prevention requirements (e.g., MARPOL Annex IV/Marine Order 96 in Australian waters). As grey water is not regulated as sewage under MARPOL Annex IV but is nevertheless subject to national discharge requirements when within territorial seas, operations ensure that discharges occur in compliance with applicable distance-from-land and water quality standards. Because grey water discharges are relatively low volume and are rapidly diluted in the high-energy offshore environment, any changes to local water quality (e.g., nutrient and biochemical oxygen demand) are expected to be temporary and confined to the immediate vicinity of the discharge point.

Solid waste - Minor

General non-hazardous waste includes scrap materials, packaging, wood and paper and empty containers. These non-hazardous waste materials will be stored on board the vessel in suitable containers (segregated from hazardous waste materials) ahead of transport back to shore for disposal/recycling in accordance with local regulations.

Domestic waste generation, including paper, wood, pallets, cardboard, scrap metal, and packaging materials, is expected to be insignificant due to the short duration of the appraisal drilling activities. All waste will be appropriately sorted, compacted where feasible, and stored based on type and disposal route, for later transfer to shore. Hazardous materials, including those considered 'special wastes', will be stored separately from non-hazardous materials in designated containers. The segregation, compaction, storage, and transfer of waste materials will be short-term and transient in nature, with a low likelihood of waste escaping during transport to shore. All domestic waste will be transferred to shore for proper disposal in accordance with relevant standards and procedures. Improper management of non-hazardous solid wastes could result in unpleasant visual, and odour impacts and may pose safety risks to workers' health and safety.

Table 29 Summary of type of waste produces anticipated during the appraisal drilling project

Waste Type / Volume Used	Volume / Weight
Putrescible waste	1kg/pax/day
Waste water discharge	40 ltr/pax
Haz Chems	500 kg
Non Haz Chems	500 kg

Waste Type / Volume Used	Volume / Weight
Oily rags/waste	300 kg
Scrap metal	1000 kg
Metal drums	500 kg
Plastic receptacles/Drums	200 kg
Recyclables Wood/plastic/paper	8000 kg
Batteries/Accumulators/Electrical waste	200 kg
Lubricants	350 ltr

The effects of discharges of solid or hazardous wastes to the marine environment would vary depending on the nature of the material involved. For example, solid wastes such as plastics are persistent in the environment and have been implicated in the deaths of a number of marine species including marine mammals and turtles. This is due to ingestion, inhalation, or physical entanglement.

Solid and hazardous wastes would be transferred to Timor-Leste or the Australian mainland for onshore recycling or disposal at appropriate locations. Any release of solid and hazardous wastes into the marine environment would be recorded as an environmental incident and treated accordingly by SGBU’s incident investigation and corrective and preventative action processes.

With the effective implementation of SGBU’s policy to transfer solid and hazardous wastes onshore for recycling or disposal, these wastes are not expected to have any impact on the marine environment.

9.3.1.3.2 Mitigation Measures and Measurement Criteria

Table 30 Risk assessment summary, mitigation measures, measurement criteria and ALARP assessment, for different type of discharges

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Chemical and Hydrocarbon Discharges – SBM Spill overboard	All downhole chemicals that do not have a CHARM/OCNS classification and cannot be substituted for a chemical that has one, will undergo a risk assessment based on similar toxicity assessment prior to selection.	• Records demonstrate that all downhole chemicals were subject to OCNS/CHARM classification or a documented equivalent toxicity and environmental risk assessment where substitution was not practicable. • Evidence confirms that chemical selection followed the Company's OCNS/CHARM-compliant chemical selection procedure and aligned with international standards and ANP requirements. • The chemical risk register demonstrates that assessments were completed, reviewed, and submitted to the ANP for regulatory review and acceptance prior to use.	Moderate	Unlikely	Medium	• Use of Chemicals that do not have a CHARM/OCNS classification and that have not been through a risk assessment and approval process • No use of chemicals	Using only chemicals with CHARM/OCNS classification that have been risk assessed and approved is ALARP because it ensures known, controlled and compliant environmental performance. Chemicals without such assessment present unknown or higher hazards and are not reasonably practicable, and using no chemicals at all is not viable as they are essential for safe drilling and well integrity. Selecting only approved, necessary chemicals therefore represent the reasonably practicable option.
	All chemicals on the MODU or Vessel comply with that MODU or facility chemical management procedures including Safety Data Sheets (SDS) available and accessible on MODU or	• Records and observations confirm that all chemicals onboard the MODU and vessels are managed in accordance with approved chemical management and handling procedures.	Minor	Highly Unlikely	Low	• No use of chemicals • Allowing the contractor to operate and manage	Not using chemicals is not reasonably practicable, as essential drilling chemicals are required to maintain well control, stability and integrity. Allowing the

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	vessels, chemicals are handled and disposed of in accordance with the SDS and MODU and vessels chemical handling and management procedures	• Evidence demonstrates that current SDS are readily accessible to personnel at point of use and are actively referenced for safe handling, storage, and disposal. • Any chemical handling non-conformances, near misses, or spill risks were identified, documented, and corrected in accordance with facility procedures.				chemicals without verification of their system and facilities	contractor to manage these chemicals without verification of their systems and facilities is also not acceptable, as it introduces uncontrolled safety and environmental risks. Verifying the contractor's chemical management system and facilities, and ensuring only necessary, approved chemicals are used, provides clear and proportionate risk reduction. This represents the reasonably practicable option, and the residual risk is ALARP.
	A designated and appropriate storage area for chemical and hazardous materials will be provided on the MODU and the vessels. The storage area will be sheltered and bunded to prevent rainwater collection and to contain spills.	• Records and observations confirm that chemicals and hazardous materials are stored in designated, sheltered, and bunded areas that prevent rainwater ingress and provide effective spill containment. • Evidence demonstrates that chemical storage, handling, and transfer activities comply with approved MODU and vessel chemical management procedures. • Any deficiencies in chemical storage or containment arrangements were identified, recorded, and corrected in a timely manner in accordance with facility procedures.	Minor	Highly Unlikely	Low		

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	Spill kits, absorbents materials and containers will be made available for clean-up of oil and grease contamination on deck.	• Records and observations confirm that appropriate spill kits, absorbents, and containers are available at relevant locations and are suitable for the types and quantities of chemicals handled. • Evidence demonstrates that personnel manage chemicals and respond to spills in accordance with approved MODU and vessel chemical management and spill-response procedures. • Any spills, near misses, or deficiencies in spill-response capability were identified, documented, and corrected in a timely manner in accordance with facility procedures.	Minor	Highly Unlikely	Low		
	Any spills and leaks of chemicals or hydrocarbon to deck will be cleaned immediately using absorbent materials and that material will be disposed of in an appropriate manner as hazardous waste.	• Records and observations confirm that spills or leaks to deck were promptly contained and cleaned using appropriate absorbent materials in accordance with procedures. • Evidence demonstrates that contaminated absorbents and residues were handled, labelled, and disposed of as hazardous waste in accordance with approved waste-management arrangements.	Minor	Highly Unlikely	Low		

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		• Any spill, near miss, or non-conformance was documented, investigated, and corrective actions implemented to prevent recurrence.					
	All used oil and chemicals will be collected, treated and disposed of at the approved facilities in Australia.	• Records and observations confirm that used, partially used, and recycled oils and chemicals were segregated, stored, and prepared for return to shore in accordance with approved procedures. • Evidence demonstrates that oils and chemicals were transferred only to approved Australian facilities for treatment and disposal, with appropriate documentation and chain-of-custody records.	Moderate	Remote	Low	• Disposal of oil and chemicals in Timor Leste • That all partially used or recycled chemicals will be disposed of to the MODU holding tank to be treated in oily water separator prior discharge into sea.	All used oil and chemicals will be collected, treated and disposed of at approved facilities in Australia ensuring compliant, environmentally sound handling and eliminates the risk of offshore or in-country contamination. Disposal in TL is not reasonably practicable due to limited licensed treatment capacity and diverting partially used or recycled chemicals to MODU holding tanks for treatment and discharge would introduce unacceptable risk and contravene waste minimisation requirements. Exporting waste chemicals to approved Australian facilities provides clear risk reduction and is the reasonably practicable option; residual risk is ALARP

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	Fugitive chemicals and hydrocarbons that go undetected on deck or in machine spaces will be held in the MODU holding tank to be treated in the oily water separator before being treated under MARPOL Annex 1	• Records and observations confirm that fugitive chemicals and hydrocarbons were captured and routed to the MODU holding tank, with no uncontrolled discharge to sea. • Evidence demonstrates that oily water separator operation and discharge practices complied with MARPOL Annex I requirements and approved MODU procedures.	Slight	Likely	Low	Nil	None required
Wastewater and Sewage Disposal – Water quality degradation	Black and grey water onboard will be treated in the sewage treatment plant before discharge to sea and in accordance with MARPOL Annex IV	• Records and observations confirm that sewage treatment and discharge practices comply with MARPOL Annex IV requirements and approved vessel procedures. • Evidence demonstrates that sewage treatment systems were operated, monitored, and maintained in accordance with manufacturer and vessel requirements • Any malfunction, bypass, or non-compliance of sewage systems was identified, recorded, and rectified promptly in accordance with procedures.	Slight	Highly Unlikely	Low	Nil	None required – conformance to international standard and guidance

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Hazardous, Laboratory and Medical Waste - Biohazardous waste comingled with other waste	Biohazardous waste will be stored so it is isolated, contained, identifiable, and incapable of comingling or accidental release.	• Records and observations confirm that biohazardous waste is stored in designated, contained areas and is not commingled with hazardous or general waste streams. • Evidence demonstrates that biohazardous waste is clearly labelled, secured, and managed under the oversight of the rig medic in accordance with approved procedures. • Any instances of improper segregation, labelling, or storage were identified, documented, and corrected promptly in accordance with waste management procedures.	Minor	Remote	Low	All waste streams are mixed together	Segregating hazardous, laboratory and medical waste and securing it to prevent comingling is ALARP because it ensures safe handling, prevents cross-contamination, and enables compliant disposal through approved waste streams. Mixing these wastes with other hazardous or general waste is not reasonably practicable, as it increases exposure risk, complicates disposal, and elevates the potential for environmental harm. Segregation therefore provides clear, proportionate risk reduction and represents the reasonably practicable option.
Cooling and Brine Water - Water quality degradation	Engine and machinery cooling water and brine water are comingled with other liquid waste water discharges from the MODU	• Records and observations confirm that cooling and brine water are commingled with other wastewater streams as designed, providing effective dilution prior to discharge. • Evidence demonstrates that cooling, brine, and wastewater discharge systems are operated and maintained in accordance	Minor	Likely	Medium	Ship engine cooling water and brine to shore for disposal	Commingling engine cooling water and brine with other liquid wastewater streams for compliant discharge from the MODU is ALARP because these effluents are low hazard once treated through existing onboard systems, and their offshore discharge

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		with approved MODU procedures and design intent.					presents negligible environmental risk. Shipping cooling water and brine to shore would require substantial storage, vessel capacity and logistics, which is grossly disproportionate to any additional risk reduction. Offshore treatment and discharge is therefore the reasonably practicable option, and the residual risk is ALARP.
Produced Formation Water when flowing well- Water quality degradation	Perforate the well at such a distance so that any incursion of a water aquifer underlying the gas reservoir, is mitigated to such an extent so there is no produced formation water.	• Records demonstrate that perforation depth and placement were selected based on reservoir and geotechnical data to mitigate the risk of underlying aquifer incursion. • Evidence confirms that perforation activities were conducted in accordance with the approved drilling and completion programme and supporting well integrity analyses. • Post-perforation reviews confirm no indicators of water production, and any anomalies were assessed and managed in accordance with approved procedures	Moderate	Highly Unlikely	Medium	Ship liquid fraction of PFW to shore for treatment and disposal.	Engineering controls to minimise the introduction of produced formation water, combined with sampling and analysis of any small volumes recovered and commingled discharge through the MODU's approved wastewater system, is ALARP because it provides essential reservoir information while managing minimal, low-hazard quantities using existing treatment capacity. Shipping all produced formation water to shore is not

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		• Evidence confirms that produced formation water, where present, was sampled and chemically analysed to characterise its composition prior to disposal or commingling.					reasonably practicable, as it would require disproportionate storage, vessel logistics and handling effort for negligible environmental gain. The selected approach delivers clear, proportionate risk reduction and is therefore the reasonably practicable option.
Bilge Water Discharge – Water quality degradation	Bilge waters from machinery spaces on the MODU will be held in the MODU holding tank to be treated in the oily water separator before being treated under MARPOL Annex 1	• Records and observations confirm bilge water is routed to holding tanks and treated through the oily water separator in accordance with approved procedures and MARPOL Annex I. • Evidence demonstrates that slops not meeting treatment criteria are identified and transferred to shore using approved arrangements, with no overboard discharge.	Minor	Highly Unlikely	Low	Nil	ALARP demonstrated; controls effective
Deck Drainage – Water quality degradation	The deck drainage system allows for the segregation of water. The deck drainage system is designed to allow clean water (e.g. rainwater) to be	• Records and observations confirm that the deck drainage system effectively separates clean rainwater from potentially contaminated deck runoff.	Minor	Possible	Medium	• All deck drainage water goes overboard • All deck drainage	Holding all oily water in the MODU's dedicated tanks for treatment through the oily water separator in accordance with MARPOL Annex I is

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	discharged directly overboard	• Evidence demonstrates that oily deck drainage is routed to the MODU holding tank and treated via the oily water separator in accordance with approved procedures and MARPOL Annex I.				captured and shipped to shore	ALARP because it ensures controlled removal of oil content, compliant discharge and minimal environmental risk using existing onboard systems.
Drill Floor – Water quality degradation	SBM on the drill floor, comingled with water, will be diverted to the oily water separator and treated in accordance with MARPOL Annex 1	• Records and observations confirm that SBM-contaminated drill-floor drainage is effectively captured and diverted to the MODU holding tank and oily water separator. • Evidence demonstrates that oily water treatment and discharge practices comply with MARPOL Annex I and approved MODU procedures.	Minor	Possible	Medium		Allowing deck drainage to go directly overboard is not reasonably practicable without treatment, as it increases the potential for hydrocarbon release. Capturing and shipping all drainage to shore is also not practicable, as it would require disproportionate storage, vessel logistics and handling effort for limited additional benefit. Treating oily water onboard through approved MARPOL systems is therefore the reasonably practicable option, and the residual risk is ALARP.
Food Waste – Water quality degradation	Biodegradable food waste from galleys, mess rooms, pantries, and accommodation will be treated in accordance with MARPOL Annex V	• Records and observations confirm that food-waste handling, treatment, and any permitted discharge are conducted in accordance with MARPOL Annex V and approved MODU procedures.	Slight	Highly Likely	Low	All food waste shipped to shore	Treating all food waste in accordance with MARPOL Annex V is ALARP because it enables compliant onsite management using established systems, poses minimal

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		• Evidence demonstrates that biodegradable food waste is correctly segregated from other waste streams and managed using approved methods.					environmental risk once processed and discharged as permitted, and avoids unnecessary storage and vessel logistics. Shipping all food waste to shore is not reasonably practicable, as it would require disproportionate handling, storage capacity and transport effort without providing meaningful additional risk reduction. MARPOL-compliant treatment and disposal is therefore the reasonably practicable option, and the residual risk is ALARP.
Solid Waste – Water quality degradation	All Solid waste to be segregated according to comparable characteristics, stored in clearly marked skips for treatment and disposal onshore at approved disposal sites. Nothing overboard	• Records and observations confirm that plastics, domestic waste (e.g. glass, cans, paper), and maintenance wastes (e.g. paint sweepings, oily rags, deck sweepings) are not discharged to sea. • Evidence demonstrates solid wastes are segregated by waste stream and stored in clearly marked offshore skips in accordance with the waste management plan and procedures	Minor	Unlikely	Medium	Standard waste receptacles	Sorting solid rig waste and storing it in covered skips certified to DNV 2.7-1 is ALARP because it ensures secure containment, prevents windblown debris and FOD, and eliminates the risk of rubbish entering the ocean. Using open skips is not reasonably practicable, as it offers no additional operational benefit and significantly increases the likelihood

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	Waste containers and offshore rated rubbish skips to be covered to prevent the loss of waste overboard. Maintenance of good housekeeping mitigates the potential for rubbish overboard and the propagation of Foreign Object Debris (FOD) that could also impact aviation operations	• Records and observations confirm that waste containers and skips are covered, secured, and appropriately located to prevent windblown or accidental loss of waste overboard. • Evidence demonstrates that good housekeeping practices are implemented and maintained on decks and work areas to minimise loose items, rubbish overboard risk, and FOD hazards.	Minor	Possible	Medium		of waste loss to the marine environment. DNV-compliant covered skips therefore provide clear, proportionate risk reduction and represent the reasonably practicable option.

9.3.1.4 Air Emissions

Air quality in Chuditch-2 is good given its remote, non-industrial and offshore location.

Air emissions from the proposed appraisal drilling activities are expected to originate from both primary and secondary sources. Primary sources consist of direct emissions associated with appraisal drilling activities, include:

- Power generation for the drilling rig,
- Fuel transfer activities, including emissions from machinery, fugitive emissions from unsealed containers, maintenance operations, equipment testing, and small-scale engineering works,
- Vessel propulsion and onboard power generation and fugitive emissions from machinery on the MODU and vessels,
- Helicopter fuel
- Flaring during well testing, no significant impacts are anticipated, as DST will only be conducted for a limited duration.

Secondary sources are emissions from associated activities that are required that support the appraisal drilling such as:

- Transportation activities, including increased flights and vehicle traffic
- Manufacturing processes related to drilling operations, such as the production of drilling muds, chemicals, and machinery.

Atmospheric emissions, including greenhouse gases (GHGs) such as carbon dioxide (CO_2) and methane (CH_4), as well as non-GHG pollutants like sulphur dioxide (SO_2) and nitrogen oxides (NO_x), are generated from diesel-fuelled internal combustion engines used for power generation on the MODU, as well as for power generation, propulsion, and on supply and standby vessels and Helicopters.

Appraisal drilling and well testing activities do not involve the use of ozone-depleting substances (ODS). Refrigeration and air-conditioning systems are limited to essential accommodation, control room and cold-storage services and use non-ozone-depleting refrigerants such as R-134a, R-407C, R-410A. The release of ODS is considered a low risk, that is minimised through an implemented Leak Detection And Repair (LDAR) program, managed through established maintenance and handling procedures on the MODU.

Transportation

Diesel will be the main fuel sources used by the supply vessels employed for the drilling operation. Diesel fuel consumption estimates for the Chuditch-2 appraisal well drilling at a distance of approximately 135 Nautical Miles from land, taking an average of $10m^3$/day/vessel (10x44x1 = $440m^3$) so the total fuel diesel consumption is estimated to be approximately $880m^3$for the two vessels directly associated with the drilling activities. This estimate includes towing of MODU to the drilling site, standby vessel duties and support vessels from logistic points to the drilling site.

Estimated Helicopter fuel consumption and Green House Gas (GHG) Emissions are detailed in table 31 based on an estimate of 30 crew change flights over the duration of the drilling operation.

Table 31 GHG Emission summary from Helicopter operations

Parameter	Value
Helicopter flight estimation	
Estimated Crew Change	5 per week
Total Drilling Days	44 days (6 weeks)
Total Crew Change	6 weeks × 5 times/week = **30 trips**
Helicopter Operations Hour Estimation	
One-way Distance per Trip	~270NM (~2 hours at 135-162 Kts)
Return Trip Distance	540 NM (~4 hours)
Total Heli Operation Hours	4 hours × 30 trips = **120 hours**
Type of Helicopter used	
AW 189 Fuel Consumption	137 gal/hr
Average Fuel Consumption Assumed	137 gal/hr
Total Fuel Consumption	120 hrs × 137 gal/hr = 16,440gal
Fuel in Liters	16,440 gal = 62.23 m³ or 62,232 L
Jet Fuel Energy Value	36.8 MJ/L
Total Energy	62,232 L × 36.8 MJ/L = 2,290,138 MJ (2290 GJ)
CO_2 Emission Factor for Jet Fuel	73.1 kg/GJ
Total CO_2 Emissions	2,290 GJ × 73.1 kg/GJ =167,399 kg (167 MT CO_2eq)

Table 32 Diesel fuel consumption & emission summary from MODU and Supply Vessels

Parameter	Value
Total diesel fuel oil consumption	
Supply/Standby Vessel	880 m^3 (880,000 L)
MODU & Drilling Activities	792 m^3 (792,000 L)
Total Fuel Oil Consumption	1,672 m^3 = 1,672,000 L
Marine Diesel Energy Value	38.6 MJ/L
Total Energy	1,672,000 L × 38.6 MJ/L = 64,539,200 MJ (64,539.2 or 64,539 GJ)
CO_2 Emission Factor for Marine Diesel	74.9 kg/GJ
Total CO_2 Emissions	64,539 GJ × 74.9 kg/GJ = 4,834,000 kg (4,834 MT CO_2eq)

Drilling

The entire MODU power supply is provided by diesel generators. The consumption of diesel during drilling activities will result in the emission of combustion gases, smoke, and particulate matter. Based on the estimated operational time for the appraisal well and acknowledging that diesel fuel consumption will change according to the activity being carried out, typical operational average (for Jack-Up MODU's) will consume between 8 – 18 m^3/day (≈8,000–18,000 L/day). This corresponds to a steady electrical demand of roughly 1,500–3,000 kW, which is common and typical for Jack-Up MODU's with 2–3 mud pumps and full drill floor loads operating. On this basis, the MODU's diesel consumption on a worst based outcome (18 m^3/day) for the appraisal drilling well (18m^3x 44 days) is projected to be approximately 792m^3.

For the majority of well testing activities, air emissions are primarily generated from flaring. Flaring emissions typically result in elevated levels of non-methane volatile organic compounds (VOCs), methane (CH_4), sulphur oxides (SO_x), nitrogen oxides (NO_x), and carbon monoxide (CO).

For this appraisal drilling well, flaring will be conducted for a period during the DST, limited to approximately 30 hours in total. Estimated volumes of flaring during the well testing period is given in table 6 which provides estimated flow periods and produced volumes which is 36.67mmscf. The GHG emissions from well testing is given table 33.

The condensate volume is estimated at approximately 146.67bbl. Condensate would flow to the separator/surge tank which is designed to function as storage / separation unit for produced liquids and gases until flared. The planned 3 clean-ups flow are designed for produced gases, fluids, which will be redirected to the test separator. This is where bulk fluids are separated into oil (if present), condensate, gas and water. The separator will also facilitate the separation of any debris, such as sand and other material from the flow.

9.3.1.4.1 Impact Assessment

The primary atmospheric emissions associated with the proposed appraisal drilling activities include carbon dioxide (CO_2), methane (CH_4), nitrogen oxides (NO_x), and volatile organic compounds (VOCs). Additionally, sulphur dioxide (SO_2) may be generated during combustion even with a sulphur content of the fuel up to 0.50% m/m. Hydrogen sulphide (H_2S), where present, is generally associated with sour hydrocarbons rather than products used for combustion in power generation. Among these, CO_2 and CH_4 are key greenhouse gases (GHGs) contributing to climate change.

Table 33 Environmental impacts of different atmospheric releases

Type of Emission	Environmental Impact
Carbon Dioxide (CO_2)	A GHG that is believed to contribute to climate change.
Methane (CH_4)	Enhances low level ozone production, indirectly contributing to climate change.
Carbon Monoxide (CO)	Enhances low level ozone production, indirectly contributing to climate change.
Oxides of Nitrogen (NO_X)	Contributes to acid deposition (e.g. acid rain). May also enhance ground level ozone when mixed with VOCs in sunlight.
Sulphur Dioxide (SO_2)	Contributes to acid deposition (e.g. acid rain). Toxic gas.
Volatile organic compounds (VOCs)	A range of potential impacts, for example hydrocarbons may promote formation of photochemical oxidants. May also be known or suspected carcinogens.

Based on the estimated fuel consumption of 1,672m³ of diesel, 54.5m³ of jet fuel and 36.67mmscf of natural gas flaring for the proposed appraisal drilling program, the total GHG emissions are projected to be approximately 6,912.7 metric tonnes (MT) of CO_2-equivalent (CO_2-eq) as shown in table 34 While this emission volume is negligible compared to the global CO_2 emissions of approximately 37.29 billion MT recorded by Our World in Data, it nonetheless contributes, minimally, to global warming.

Table 34 CO2-eq Estimation for direct emission from the proposed appraisal drilling programme

Source	Fuel	Fuel Consumption (m3)	Energy Value	CO2-eq Emission Factor	Estimated CO2-eq Emission (MT)
MODU 2 Support Vessels	Diesel	792m³ & 880m³	38.6 MJ/L	74.9 kg/GJ	4,834 MT
Helicopter	Jet fuel	62.23m³	36.8 MJ/L	73.1 kg/GJ	167 MT
DST	Natural Gas (82% Methane and 18% CO2)	36.67mmscf	53.96kg CO_2/mmscf	1mmscf of natural gas ≈ 1,037 mmBTU	1932.7 MT
Total					**6,933.7 MT**

Due to the prevailing meteorological conditions, including rapid dispersion and dilution by wind, these emissions are anticipated to be minor, provided that appropriate mitigation measures are implemented.

9.3.1.4.2 Mitigation Measures and Measurement Criteria

Table 35 Risk assessment summary, mitigation measures, measurement criteria and ALARP assessment, for air emission

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
MODU and support vessel operations - fuel combustion	MODU and vessel contractor has a preventative maintenance system to ensure diesel powered generation equipment is maintained and operated within OEM Specification	• Records demonstrate that a preventive maintenance system is implemented and followed for all diesel-powered generation equipment in accordance with OEM requirements. • Evidence confirms engines are operated within OEM parameters (e.g., load management, tuning, alarms) to minimise excessive emissions and inefficient combustion. • Greenhouse Gas (GHG) Reporting. Record volumes of all fuel consumed and for each fuel type	Slight	Highly Likely	Low	Nil	NA
	Optimization of fuel efficiency and minimization of emissions from fired machinery through the use of low-sulphur-content fuels	• Records demonstrate that fuels procured and used onboard the MODU and support vessels meet MARPOL Annex VI sulphur content requirements (0.50%) and are suitable for the installed machinery. • Evidence confirms that fired machinery is operated using compliant fuels in a manner that supports efficient	Slight	Highly Likely	Low	No restriction on type of fuel used	Using low-sulphur diesel to improve fuel efficiency and minimise emissions from fired machinery is ALARP because it provides a clear reduction in SO_x, particulate matter and overall atmospheric impact for minimal additional cost or operational effort. Having no restriction on fuel type

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		combustion and reduced emissions.					is not reasonably practicable, as it would result in higher emissions without offering any safety or operational advantage. Low-sulphur fuel therefore represents the reasonably practicable option, and the residual risk is ALARP.
Fugitive emissions - MODU	Leak detection and repair programs on HVAC and like systems in place.	• Records demonstrate that a formal leak detection and repair program is in place for HVAC and similar systems, including defined inspection methods, frequencies, and responsibilities. • Evidence confirms that identified leaks are repaired promptly and repairs are verified to ensure effective mitigation of fugitive emissions	Minor	Unlikely	Medium	No leak detection equipment or maintenance program in place	Implementing leak detection and repair programs on HVAC and similar systems is ALARP because it provides early identification and correction of refrigerant and fluid losses, reducing environmental emissions, improving system efficiency and preventing equipment degradation. Having no LDAR is not reasonably practicable, as it increases the likelihood of undetected leaks, higher emissions and avoidable failures without offering any operational benefit. A structured LDAR program therefore represents the reasonably practicable option, and the residual risk is ALARP.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Fugitive Emission - Well test package	Handheld gas detection devices are used by the well flowback / testing personnel to routinely monitor for small-scale leaks from the hydrocarbon containing vessels and pipe work	• Records demonstrate that handheld gas detectors are routinely used by well test personnel during flowback and testing activities in accordance with approved procedures. • Evidence confirms that any gas detections are promptly investigated and appropriate corrective actions are implemented to control fugitive emissions.	Slight	Possible	Low	No rejected controls and specific detail are in the SCR and HAZOP for the test package	ALARP demonstrated in SCR and related HAZOP and design studies; controls effective
	Static Dräger gas detection and alarm units will be installed in strategic locations throughout the well flowback / testing area as a means of temporary fixed gas detection during the campaign.	• Records and verification demonstrate that temporary fixed Dräger gas detection and alarm units are installed at strategic locations across the well test package in accordance with the detection layout plan. • Evidence confirms that gas detection units are operational, alarms are active, and personnel respond to alarms in accordance with approved procedures • Documentation demonstrates that gas detectors are tested, calibrated, and maintained in accordance with manufacturer requirements for the duration of the campaign	Slight	Highly Likely	Low	No rejected controls and specific detail are in the SCR and HAZOP for the test package	ALARP demonstrated in SCR and related HAZOP and design studies; controls effective

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Controlled Emissions – Well Test Package	Meter volumes of all fuel consumed for the well testing	• Records demonstrate that fuel consumption for well testing is metered and logged using calibrated equipment for the duration of testing activities. • Evidence confirms that fuel consumption data is reviewed to verify efficient operation of the well test package and identify opportunities to minimise emissions.	Slight	Highly Likely	Low	No rejected controls and specific detail are in the SCR and HAZOP for the test package	ALARP demonstrated in SCR and related HAZOP and design studies; controls effective
	Well flow back procedure (well test package) implemented including a continuous (24/7) flare watch during flaring operations and function testing of continuous ignition system and pilot system.	• Records demonstrate that the approved well flowback and well test procedures were implemented, including continuous flare monitoring during flaring operations. • Evidence confirms that the continuous ignition and pilot systems were function-tested and maintained operational prior to and during flaring to prevent unburnt hydrocarbon release. • Documentation demonstrates that the agreed well test checklist was completed and verified in coordination with the Contractor prior to and during testing activities.	Slight	Highly Likely	Low	No rejected controls and specific detail are in the SCR and HAZOP for the test package	ALARP demonstrated in SCR and related HAZOP and design studies; controls effective
	Utilization of high-efficiency flare burner design	• Documentation demonstrates that the flare burner design is fit-for-purpose, engineered for high combustion efficiency, and suitable for the expected	Slight	Highly Likely	Low	• Conventional open flare • Standard utility flare	ALARP demonstrated in SCR and related HAZOP and design studies; controls effective

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		flow rates and gas composition during well testing. • Evidence confirms that the flare burner operates with stable flame characteristics during testing, with no persistent smoking, flame instability, or incomplete combustion.					

9.3.1.5 Light Pollution

The sources of light are the artificial lighting used on the Rig. High-intensity light will be generated from the operating Rig for a period of approximately 44 days. Low-intensity light will be generated from the supply and standby vessels. The lighting levels are a consequence of providing safe illumination of work and accommodation areas and both MODU and vessels lighting is directed over the work area, which aids in limiting light spill to the marine environment. Light will also be generated during flaring activity although for staggered periods of time, not necessarily after dusk and for a total period of 30 hours, estimated.

9.3.1.5.1 Impact Assessment

Light emissions have the potential to disturb light-sensitive marine fauna, specifically marine turtles, seabirds and migratory bird species, through localised attraction to light that may result in behavioural changes for exposure over time.

There is no practical method of estimating any change in behavioural change over the short duration for operations apart from Vessels and MODU ensuring that sighting reports are made of any persistent changes to normal flight patterns of seabirds and repeated sightings close to the MODU and vessels of Marine turtles and cetaceans as part of the environmental monitoring program and to minimize flaring. Flaring is expected to generate avoidance behaviours in the majority of species.

Marine turtles are particularly sensitive to artificial lighting, which is known to disrupt breeding adult turtles, post-emergent hatchlings and hatchlings dispersing in nearshore waters (Limpus, 1971; Salmon et al., 1992; Limpus, 2007, 2008a, 2008b, 2009a, 2009b; Wilson et al., 2018). However, potential impacts to foraging turtles are limited to local attraction to prey species attracted to light (Kebodeaux, 1994). Marine turtles do not feed during the breeding season (Limpus et al., 2013), and light is not a cue to inter-nesting behaviours. The project area is not within visual distance of any nesting beaches, Therefore, potential impacts of artificial light to inter-nesting turtles are not considered likely.

Seabirds may either be attracted by the light source itself or indirectly as structures in offshore environments tend to attract marine life at all trophic levels, creating food sources and providing artificial shelter for seabirds (Surman, 2002). Offshore light sources may also provide enhanced capability for seabirds to forage at night. Artificial light can disorient seabirds, disrupt natural foraging and migratory behaviours, and potentially cause injury through interaction with infrastructure.

Marine mammals are not known to be attracted to light sources at sea. Cetaceans predominantly use acoustic senses to monitor their environment rather than visual cues (Simmonds et al., 2004). While lighting may have a small effect on some marine life the operation is short term, and the consequence is expected to be minor.

9.3.1.5.2 Mitigation Measures and Measurement Criteria

Table 36 Risk assessment summary, mitigation measures, measurement criteria and ALARP assessment, drilling operation.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
MODU Operations General – Changes to Marine Fauna behaviour due to light emissions	MODU and boats will meet conventional navigation rules for lighting, for the safety of personnel working on the facilities and the safe operation of the facilities in an active maritime environment	• Records and observations confirm that navigation and operational lighting meet applicable maritime navigation rules and safety requirements, with no unnecessary or excessive lighting in use. • Evidence demonstrates that non-essential lighting is minimised or controlled during drilling operations where practicable, without compromising safety.	Minor	Unlikely	Medium	• Fit or remove any directional, shielded and down-facing lighting to minimise horizontal and upward spill. • Fit additional hoods/cowls on floodlights that reduce visibility at distance. • Install additional blackout blinds whilst, where fitted, they are used to ensure internal lights do not spill externally unnecessarily.	The MODU and associated vessels are fitted and operated in accordance with international navigation and safety lighting requirements to ensure personnel safety, collision avoidance and safe operations. Lighting is limited to the minimum necessary to manage navigational and occupational safety risks. Additional measures such as shielding, hoods, cowls or blackout blinds were considered but are not reasonably practicable, as they would compromise visibility, situational awareness and emergency response without a proportionate environmental benefit. Residual impacts are therefore ALARP.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	Minimisation of unnecessary lights directed towards water on supply boats (particularly work lights) when not within the 500M exclusion zone or doing any specific work on the deck of the vessel.	• Records and observations confirm that non-essential deck and work lights on supply vessels are minimised when not required for active deck work or safety. • Evidence demonstrates that vessel crews apply lighting discipline during night transit and while alongside, without compromising navigational or occupational safety. • Discussed at environmental induction around awareness regarding lighting impacts and requirements	Minor	Highly Unlikely	Low	Nil	Artificial lighting from supply vessels at night may cause short-term, localised disturbance to marine fauna within the 500 m exclusion zone. Light discipline, including minimisation of non-essential deck and work lighting during night transit, alongside operations, or periods of inactivity, is a low-cost and readily implementable control consistent with good offshore practice and does not compromise safety. No additional reasonably practicable measures have been identified that would deliver a meaningful further reduction in environmental impact. Residual impacts are therefore ALARP.
	Limit operational activities (where practicable) from November through to March, which is the period where sea turtles typically return to shore to nest, hence minimise potential disturbance to the turtle migratory pathway;	Records demonstrate that operational planning considered the November–March turtle nesting and migration period and incorporated practicable measures to reduce potential disturbance.	Minor	Remote	Low	Nil	Drilling during the cyclone season would increase the risk of disturbance and harm to sea turtles due to elevated vessel activity, lighting, noise and a heightened likelihood of unplanned discharges

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
							and response capability. Avoiding drilling during the cyclone season is a practicable, precautionary measure that removes this risk at source and aligns with good offshore environmental practice. No further practicable controls were identified that would achieve a comparable reduction in risk to sea turtles without being grossly disproportionate; therefore, the residual environmental risk is ALARP.

9.3.1.6 Noise

The sources of noise from operations include thruster and propellor operation from the vessels, engine noise and mechanically generated vibration and noise, drilling top drive system, drill string and shakers and support vessel activities. Vibration, noise, light and heat from the appraisal drilling and ship movements may cause disturbance to the marine life especially sensitive migratory marine species. Nevertheless, the effects are likely to be minimal due to the short duration of drilling program, and the disturbance will stop by the end of the drilling.

The emission of underwater noise from drilling and vessel activity is not considered to be of sufficient amplitude to cause direct harm to marine life. There is, therefore, no requirement for marine observers or acoustic monitoring for standard drilling and vessel operations. Underwater noise from drilling and vessel activity may induce localised behavioural changes in some marine species, however, there is no evidence of significant behavioural changes due to drilling that may impact on the wider ecosystem.

The cumulative impact of increased background noise levels in the marine environment is an ongoing and widespread issue of some concern. The secondary and cumulative impacts in this case are considered negligible when compared to operations such as marine seismic surveys, use of active sonar, pile-driving ad offshore construction or even high intensity fisheries and vessel traffic.

9.3.1.6.1 Impact Assessment

Introduction and noise sources.

Offshore drilling operations generate underwater noise through a combination of continuous and intermittent sources associated with routine rig activities. Primary contributors include diesel generators, mud pumps, drilling machinery and support vessel activity. These sources typically produce predominantly low-frequency, continuous or quasi-continuous noise, with most acoustic energy concentrated below approximately 1 kHz, overlapping with the hearing ranges of many fish species and low-frequency hearing marine mammals (e.g. mysticetes) (Popper et al., 2014; Southall et al., 2019). Examples of typical source levels are presented in Table 37.

Underwater noise emissions from offshore drilling rigs are generally lower in peak level than impulsive sources such as seismic airguns or pile driving, but may persist over extended durations. The potential impacts on marine fauna are therefore primarily associated with behavioural disturbance and temporary auditory effects, rather than permanent injury, and are dependent on received sound levels, frequency content, exposure duration, distance from source and species-specific hearing sensitivity.

Table 37 Typical noise levels associated with drilling activities

Vessel	Source pressure level (dB re 1µPa@1 metre)	Dominant frequency range (Hz)[1]
Offshore MODU[2] during drilling	117 @ 125m from MODU	<100
Support Vessel[3]	108 – 135 (without thrusters)	20 – 1000

[1] Frequencies measured maybe in 1/3 octave bands, octave bands or spectrum levels. Comparison is therefore prone to inaccuracy.

[2] Quoted from McCauley (1998)

[3] Quoted from Environmental Statement: Development of the Forvie and Jura Area (Total, 2004) “The Survey vessel engines and dynamic positioning thrusters are capable of generating sound at levels between 108 and 182dB re 1µPa at 1 mat dominant frequencies between 50 Hz and 7 kHz has the potential to expose sound sensitive marine fauna to localised changes in underwater noise levels”. (Simmonds et al. 2004; McCauley 1998)

Vessel	Source pressure level (dB re 1µPa@1 metre)	Dominant frequency range (Hz)[1]
	121 – 182 (with thrusters)	20 – 1000
Helicopter[4]	-	<500
Fishing Trawler[5] (For reference)	158	100

Acoustic propagation and exposure context.

In the offshore environment, sound propagation is influenced by water depth, seabed type, water column stratification and ambient noise conditions. Continuous drilling noise attenuates with distance due to geometric spreading and absorption, with rapid reductions in received level occurring within the near field of the rig. Modelling and empirical measurements from offshore drilling units indicate source levels typically in the order of 170–190 dB re 1 µPa @1 m (broadband), with received levels decreasing to near ambient conditions within several kilometres under typical offshore conditions (McCauley, 2015; Richardson et al., 1995).

Given the stationary nature of the rig and the high mobility of many marine receptors, exposure durations are further moderated by avoidance behaviour and natural movement patterns.

Impacts to fish.

Hearing sensitivity and exposure pathways.

Fish species exhibit diverse hearing capabilities, ranging from species that primarily detect particle motion to those capable of detecting sound pressure through specialised anatomical structures. The most sensitive species generally detect frequencies below 1–2 kHz, overlapping with drilling noise spectra (Popper et al., 2014). Potential impacts include behavioural responses, stress responses and auditory effects, depending on received levels and exposure duration.

Behavioural disturbance thresholds.

Behavioural effects in fish, such as startle responses, avoidance, changes in schooling behaviour or altered feeding, have been observed at received sound pressure levels of approximately 120–150 dB re 1 µPa (rms) for continuous noise sources (Popper et al., 2014; Hawkins et al., 2015). These effects are typically short-term and reversible, and their ecological significance is influenced by the spatial extent and duration of exposure.

For offshore drilling rigs, behavioural disturbance thresholds for fish are generally expected to occur within hundreds of metres to approximately 1–2 km of the rig, depending on source levels and propagation conditions. Beyond this range, received levels are typically within the range of natural ambient variability and vessel traffic noise.

TTS and PTS thresholds for fish.

Temporary threshold shift (TTS) in fish hearing has been reported at cumulative sound exposure levels (SELcum) of approximately 158–170 dB re 1 µPa²·s, depending on species and exposure conditions, while permanent threshold shift (PTS) occurs at higher exposure levels, generally exceeding 170–180 dB re 1 µPa²·s (Popper et al., 2014; Popper & Hawkins, 2019).

Given the relatively low intensity and continuous nature of drilling noise, combined with rapid attenuation and the mobility of fish, TTS is unlikely except in the immediate vicinity of the rig, typically within tens to a few hundred metres, and PTS is considered highly unlikely under normal drilling operations. No population-level impacts to fish communities are expected.

[4] Sound recorded from Griffin Venture FPSO (BHP Billiton 2006)

[5] Quoted in Oceans of Noise (WDCS, 2003)

Impacts to marine mammals.

Hearing groups and sensitivity.

Marine mammals are categorised into functional hearing groups based on audiometric sensitivity: low-frequency cetaceans (LF), mid-frequency cetaceans (MF), high-frequency cetaceans (HF) and pinnipeds (Southall et al., 2019). Offshore drilling noise predominantly overlaps with LF and MF cetacean hearing ranges.

Behavioural disturbance.

Behavioural disturbance is the most likely impact pathway for marine mammals exposed to drilling noise. Observed responses include changes in dive behaviour, altered vocalisation patterns, temporary displacement and avoidance of noise sources. Southall et al. (2019) and NMFS (2018) identify behavioural response thresholds for continuous noise in the order of:

- ~120 dB re 1 μPa (rms) – onset of behavioural disturbance for some cetaceans
- ~140 dB re 1 μPa (rms) – more consistent behavioural responses across species

For offshore drilling rigs, these behavioural thresholds are typically expected within 1–5 km of the rig, with variability depending on species sensitivity, ambient noise levels and behavioural context (e.g. feeding, migration).

Behavioural responses are expected to be temporary, with animals resuming baseline behaviour once exposure ceases or as animals move away from the source.

TTS thresholds for marine mammals.

The NMFS (2018) Technical Guidance defines TTS onset for continuous noise based on cumulative SEL (SELcum), with indicative thresholds of approximately:

- **LF cetaceans**: ~179 dB re 1 $\mu Pa^2 \cdot s$
- **MF cetaceans**: ~178 dB re 1 $\mu Pa^2 \cdot s$
- **HF cetaceans**: ~173 dB re 1 $\mu Pa^2 \cdot s$
- **Pinnipeds (water)**: ~181 dB re 1 $\mu Pa^2 \cdot s$

Given the attenuation of drilling noise and the requirement for prolonged close-range exposure to reach these cumulative levels, TTS is expected to be confined to a small near-field zone, typically within hundreds of metres of the rig. Marine mammals are expected to avoid this zone, further reducing exposure duration.

PTS thresholds for marine mammals.

PTS thresholds for continuous noise are higher than TTS thresholds and are defined by NMFS (2018) as approximately:

- **LF cetaceans**: ~199 dB re 1 $\mu Pa^2 \cdot s$
- **MF cetaceans**: ~198 dB re 1 $\mu Pa^2 \cdot s$
- **HF cetaceans**: ~198 dB re 1 $\mu Pa^2 \cdot s$
- **Pinnipeds (water)**: ~201 dB re 1 $\mu Pa^2 \cdot s$

Exposure to drilling noise at levels sufficient to cause PTS would require extended residence extremely close to the noise source, which is not considered credible given the behavioural avoidance exhibited by marine mammals and the relatively moderate source levels of drilling operations. As such, PTS is assessed as not credible for routine offshore drilling activities.

Population-level and cumulative considerations.

At the population level, impacts from drilling noise are expected to be negligible. Behavioural disturbance zones are spatially limited, exposure durations are short relative to life history timescales, and no long-term habitat exclusion is anticipated. For migratory species, drilling noise represents a temporary and localised disturbance within a broader acoustic environment that already includes vessel traffic and natural noise sources.

Cumulative noise exposure is considered low relative to other offshore activities such as seismic surveys, and drilling noise does not introduce novel acoustic stressors to the environment.

Impact significance and acceptability.

Taking into account the characteristics of drilling noise, species hearing sensitivities, behavioural avoidance, rapid attenuation with distance and the offshore setting, impacts to fish and marine mammals are assessed as:

- Behavioural disturbance: Localised, temporary and reversible
- TTS: Unlikely and confined to a small near-field zone
- PTS: Not credible

With the application of standard operational controls and vessel management measures consistent with good oilfield practice, underwater noise impacts are considered low environmental consequence, reduced to ALARP, and acceptable under the Environment Plan, consistent with NOPSEMA expectations.

9.3.1.6.2 Mitigation Measures and Measurement Criteria

Table 38 Risk assessment summary, mitigation measures, measurement criteria and ALARP assessment, noise & vibration pollution during drilling

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
MODU Operations Drilling – Changes to marine fauna behaviour due to noise emissions	Mechanically generated subsea noise and vibration are minimised when machinery is maintained to minimise operational noise and vibration in accordance with OEM specifications,	• Records demonstrate that noise- and vibration-critical machinery is maintained and operated in accordance with OEM specifications to minimise operational noise. • Evidence confirms that abnormal noise or vibration is identified promptly and addressed through maintenance or operational adjustment. • Any machinery-related noise issues or non-conformances are documented, investigated, and rectified in accordance with approved procedures.	Slight	Highly Likely	Low	Nil	Mechanically generated subsea noise and vibration are reduced to ALARP by maintaining all machinery in accordance with OEM specifications to minimise operational noise and vibration, and by optimising thruster operation and vessel speed management through the Master during transit and MODU operations. These measures represent established industry good practice, provide effective control of noise at source, and achieve meaningful risk reduction without disproportionate cost or operational impact. No further reasonably practicable controls have been identified; therefore, residual noise impacts are ALARP.
MODU Operations Working Supply Vessels -	DP2 boats minimises manual intervention to hold station	• Records demonstrate DP2 capability is utilised to maintain station with minimal manual intervention, avoiding unnecessary thruster activity.	Slight	Highly Likely	Low	Boats that are not DP2	DP2 vessels provide redundant, automated station-keeping that significantly reduces the risk of loss of position,

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Changes to marine fauna behaviour due to noise emissions		• Evidence confirms Masters apply appropriate speed and thruster management when steaming to and working alongside the MODU to minimise unnecessary underwater noise • Any instances of excessive thruster use, abnormal noise, or operational inefficiency are identified, documented, and corrected in accordance with vessel procedures.					collision, anchor drag and unplanned discharges compared with non-DP or manually controlled vessels, particularly during operations near offshore installations. This proven, practicable control minimises reliance on manual intervention and anchoring, thereby reducing environmental risk to seabed habitats and marine waters. No further reasonably practicable measures have been identified that would achieve a comparable reduction in environmental risk without being grossly disproportionate; therefore, the preference for DP2 vessels is ALARP.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
MODU Operations Drilling, Helicopter Operations Take-off and Landing - Changes to marine fauna behaviour due to noise emissions	Optimised flight scheduling to minimise the total number of take-off and landings	• Records demonstrate that helicopter movements are planned to minimise the number of take-offs and landings consistent with operational requirements. • Evidence confirms helicopters idle down on the helideck where practicable and operate primarily during daylight hours, except for SAR or Medevac. • Documentation demonstrates the use of modern helicopters with improved noise performance, and any deviations are justified and approved.	Slight	Highly Likely	Low	• Limit hovering time, • avoidance of circling • weather based optimisation	Helicopter noise impacts are reduced to ALARP by optimising flight scheduling to minimise the number of take-offs and landings, requiring helicopters to idle down on the helideck, restricting operations to daylight hours except for SAR or medevac, and using modern, lower-noise aircraft. Additional measures such as limiting hovering time, avoidance of circling and weather-based optimisation were considered but are not reasonably practicable, as these factors are governed by aviation safety requirements and meteorological conditions beyond the Company’s control. With the practicable controls in place, residual impacts are ALARP.
Well test package - Short term behavioural / disruption impacts on local wildlife	Flaring times optimised to achieve the least amount of flaring while still achieving the DST objectives	• Records demonstrate that well test and DST procedures were planned to minimise flaring duration while still meeting technical test objectives. • Evidence confirms that flaring was limited to periods	Minor	Likely	Medium		Optimising flaring to the minimum duration and volume required to achieve DST objectives reduces cumulative noise and vibration by limiting flare intensity and operating time. This is a

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
including noise vibration		necessary for data acquisition, with no unnecessary extension of flaring activities.					practicable and effective control, whereas alternative restrictions may prolong operations and increase overall exposure. No further reasonably practicable measures have been identified that would deliver a comparable reduction; therefore, optimised flaring is ALARP.
Well test package - Versatile Seismic Imager Tool (SLB)	Completed in accordance with the agreed Company and Vendor procedure. VSI tool selected rather than older version VSP.	• Records demonstrate that the VSI tool was selected in preference to older VSP technology based on reduced noise footprint and suitability for the required data acquisition • Evidence confirms VSI deployment and operation were conducted in accordance with the approved Company and Vendor procedures, including defined operating parameters. • Any deviations from approved VSI procedures or operating parameters were documented, technically assessed, and approved prior to implementation	Minor	Highly Unlikely	Low	Use of older technology	A Versatile Seismic Imager Tool reduces cumulative noise and emissions by enabling shorter, more efficient surveys with fewer repeat runs than older technology. This is a practicable and effective control, and no further reasonably practicable measures have been identified that would achieve a comparable reduction; therefore, its use is ALARP.

9.3.1.7 Socio Economic Development

Timor-Leste faces considerable challenges in developing its infrastructure and creating employment opportunities for young people entering the workforce. The development of oil and gas resources in offshore waters has been an important component of government revenues since the restoration of independence, funding many state services and resulting directly and indirectly in the creation of employment.

Article 5.4 of PSC-TL-SO-19-16 includes clear obligations for SGBU to provide some opportunity to suppliers based in Timor-Leste and give preference in employment to Timor- Leste nationals and permanent residents. There is limited opportunity to incorporate significant local content into the drilling program due to the nature of the work and the short duration of the program. However, SGBU endeavours to incorporate local content wherever feasible. For example, crew changes are intended to be conducted via helicopter based in Dili. SGBU will continue to liaise with Timor-Leste stakeholders to identify and develop local content opportunities, particularly if the Chuditch-2 appraisal well proves the economic viability of the project.

Socio-economic variables of interest identified in the EIA interdisciplinary team meeting are outlined in table 36. These variables were identified through literature reviews and discussions with key informants.

Table 39 Socio-Economic variables of interest

Variables of Interest	Description
Influx of temporary workers	There are expected to be some temporary workers in Timor-Leste and Darwin due to the development of the supply base with fuel arrangements. This will include preparation of the EIS/EMP/EBS study period, pre-drilling phase and the actual investigative drilling phase.
Disruption in daily living and movement patterns	There is the potential for impacts to daily living and movement patterns; these would mainly be indirect impacts in Timor-Leste and Darwin rather than direct impacts in the Timor-Leste EEZ area as it is ~ 184nm offshore.
Formation of attitudes towards the project	A number of NGOs in Timor-Leste would like to see more consultation with civil society in regard to petroleum related activities.
Change in occupational opportunities	This Project provides the potential for employment opportunities for Timorese and Darwin residents. With approximately 44 days of drilling occurring in the PSC SO-19-16 area there is very limited potential impacts to fishing practices as it is ~ 184nm offshore. There is the potential for increased business to goods and service-related industries such as accommodation providers, food suppliers and Environmental consultancies in the short to medium term.
Effects on known cultural, historical, sacred and archaeological resources	There are customary rituals that are often conducted in Timor-Leste prior to fishing or other activities in the ocean. These should be considered prior to undertaking any investigative drilling activities, however, due to the distance offshore such customs are arguably non-relevant in this instance.

9.3.1.7.1 Impact Assessment

Influx of Temporary workers

Some of the operations like company office, engagement with environmental consultancies, employment of locally qualified engineers, geologists and permanent managerial and office support will have positive impact on the local economy. The exact number of temporary workers is unknown, however, some opportunities for temporary employment is expected. It is expected that a large number of workers engaged on the drilling and logistics phase will be workers of International / Australian nationality due to the specialist knowledge, training and experience required. Due to the above factors and the very limited duration of the current drilling program, there is very limited practical scope to engage with and train local personnel to a level required to conduct activities in a high-risk environment such as offshore oil and gas appraisal drilling activities or in associated support services or to obtain the required offshore qualifications which would allow participation.

Disruption in daily living and movement patterns

Logistics services will be based in Darwin, Australia where equipment, fuel, water supply, etc. will be obtained and delivered to the drilling site. Service vessels will take on and discharge deck cargo at the Darwin location. The actual drilling will occur approximately 184 nm from the nearest Timor-Leste coastline. It is considered that the drilling campaign will have a negligible disruption to the local population’s daily living and movement patterns.

Change in occupational opportunities

It is expected that a large number of workers engaged on the drilling and logistics phase will be workers of International / Australian nationality due to the specialist knowledge, training and experience required for work in the offshore oil and gas sector. Due to the very limited duration of the current drilling program, there is very limited practical scope to engage with and train local personnel to a level required to conduct activities in a high-risk environment such as offshore oil and gas appraisal or in associated support services or to obtain the required offshore qualifications which would allow local participation.

Given that the majority of Timor-Leste fishing is of an artisanal nature where local fishermen, generally do not venture out of sight of the Timor-Leste landmass, it is considered there will be no impact to either artisanal or commercial fishing activities as the appraisal drilling location is approximately 184nm offshore, where commercial fishing activity is minimal or absent. The overall impact is expected to be low to non-existent.

Nevertheless, accidental pollution—such as oil spills, improper waste disposal, or ballast water discharge could negatively affect fisheries, should a major spill occur.

Tourism

No known tourist or recreational fishing occurs in the area of the Chuditch appraisal well. Apart from the possibility of occasional passing private motor vessels, yachts or merchant vessels, there are no known tourism interests in the area. Thus, impacts on tourism activities are non-existent and not expected to occur.

9.3.1.7.2 Mitigation Measures and Measurement Criteria

Table 40 Risk assessment summary, mitigation measures, measurement criteria and ALARP assessment, for socio-economic development.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Socio Economic Development – Disruption in daily living and movement patterns	Development of OH&S policies and procedure;	• Evidence confirms that activities with potential to affect local movement or daily routines are identified, assessed, and managed in accordance with OH&S procedures.	Minor	Highly Unlikely	Low	Nil	Nil
	Notify appropriate maritime authorities of the drilling work prior to commencing, with the ANP to advise maritime regulator and all other regulatory agencies of the MODU and support vessels to the PSC contract area and Timor-Leste Territory.	• Records demonstrate that advance notification of drilling activities and vessel movements was provided through the ANP to relevant maritime authorities prior to mobilisation • Evidence confirms that notifications clearly described vessel locations, schedules, and operational activities sufficient to inform other marine users.	Minor	Highly Unlikely	Low	Company advises	The option for the Company to advise all regulatory offices was also, as all inter-agency communication must be coordinated through the ANP under established regulatory protocols. No further practicable controls were identified; therefore, the residual risk is ALARP
	Records showing appropriate authorities have been informed.	• Records demonstrate that relevant authorities were formally notified of drilling activities and associated movements prior to commencement. • Notifications contain sufficient information on timing, location, and nature of activities to enable authorities to manage potential impacts	Minor	Highly Unlikely	Low	Company advises	

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		on community movement patterns.					
Socio Economic Development - Changes in occupational opportunities	Prioritize, where practical, local employment by actively sourcing workers from Timor-Leste.	• Records demonstrate that recruitment processes actively consider and promote employment of suitably qualified Timor-Leste nationals. • Evidence confirms that all locally recruited personnel meet role competency, training, and safety requirements.	Minor	Highly Unlikely	Low	Mandating employment	Mandatory employment of Timor-Leste personnel for all shore and MODU roles was considered but rejected as not reasonably practicable due to the specialised nature of the roles and the disproportionate safety, operational and environmental risk that would be introduced in such a short campaign.
	Implement training programs where possible to enhance the skills of Timor-Leste's workforce.	• Records demonstrate that training opportunities were identified and implemented for Timor-Leste personnel where practicable. • Evidence confirms that training provided is relevant to assigned roles and supports safe and effective participation in drilling activities as applicable. • Training outcomes, limitations, and lessons learned are documented and used to inform future workforce development initiatives	Minor	Highly Unlikely	Low	Not employ or train any local personnel	Company has a number Timorese staff that are trained as appropriate to their job requirement and task
	Develop and enforce robust pollution and waste management plan.	• Records demonstrate that an approved Waste Management Plan is	Minor	Highly Unlikely	Low	Not have a waste management plan	A detailed waste management plan will be developed in accordance

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		implemented, communicated to personnel, and enforced throughout drilling operations • Evidence confirms that waste handling, storage, and disposal practices are managed to prevent adverse effects on local communities, fisheries, and other socio-economic receptors. • Any pollution incidents, non-conformances, or waste management deficiencies are recorded, investigated, and corrected in accordance with the Plan.					with the requirements as stated in this EIS
	Maintain detailed records of any employment and training provided to workers from Timor-Leste.	• Records demonstrate that employment and training provided to Timor-Leste workers are accurately documented, current, and traceable. • Employment and training records are retained in accordance with Company document control procedures and are available for internal review and regulatory inspection if required. • Records are reviewed to inform workforce planning, training effectiveness, and future socio-economic development initiatives.	Minor	Highly Unlikely	Low	Nil	Nil

9.3.2 Unplanned Activities

9.3.2.1 Uncontrolled Release of Hydrocarbons at Surface

An uncontrolled release of hydrocarbons at surface, commonly referred to as a blowout can occur when formation fluids (oil, gas, or condensate) flow into the wellbore and reach the surface without being safely contained. This typically happens due to a breakdown in well control barriers. The main causes can be summarised as follows:

- Potential gas flow (“shallow gas blowout”) can occur while drilling the surface hole section. The potential for this at Chuditch 2 is considered remote as the surface location has been selected to be clear of any shallow gas accumulations.
- Hydrostatic pressure imbalance: If the pressure exerted by the drilling mud column is less than the formation pressure, hydrocarbons can enter the wellbore (a “kick”), which may escalate to surface if not controlled.
- Failure to detect and control a kick: Delays or errors in recognising early warning signs—such as pit gain, flow without pumps, or pressure anomalies—allow the influx to grow.
- Blowout preventer (BOP) failure: If the BOP system does not seal the well due to mechanical failure, improper maintenance, or incorrect operation, hydrocarbons can escape at surface.
- Human error and procedural lapses: Inadequate monitoring, poor decision-making, or deviation from standard well control procedures can prevent timely intervention.
- Equipment or barrier failure: Defective mud pumps, poor cementing, casing leaks, or surface equipment failure may compromise containment.

In essence, an uncontrolled release at surface results from loss of well integrity combined with failure of detection and containment systems, allowing high-pressure hydrocarbons to escape into the atmosphere.

9.3.2.1.1 Surface Gas Leak

Gas bubbles have the potential to escape the while drilling the 17-1/2” hole section if a gas pocket is encountered. The rig position has been selected to avoid gas pockets during the drilling of this section; therefore, the likelihood of encountering gas is very low.

9.3.2.1.1.1 Risk Assessment

An uncontrolled release of gas from the top section of the well would have relatively benign environmental impacts. The bubbles of gas rising from the seabed would not have any material impact on the marine environment. Once at the water’s surface any gas would escape into the atmosphere and contribute to greenhouse gas emissions. Due to its drilling location and mitigations in placed the likelihood for the surface gas leak to occur is remote, the consequence is minor, hence, the risk ranking is low.

9.3.2.1.1.2 Mitigation Measures and Measurement Criteria

Table 41 Risk assessment summary, mitigation measures, measurement criteria and ALARP assessment, for a surface gas leak.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Uncontrolled release of Hydrocarbons at surface - Well blow out at 17 ½ inch mud line	Bubble watch for potential gas with ROV on location; kill weight mud available as necessary. Allow the pocket to deplete	• Records demonstrate that an ROV bubble watch was maintained during drilling of the mudline section to identify any shallow gas or hydrocarbon release indicators at the seabed. • Evidence confirms that kill-weight mud was available and that well control responses were implemented in accordance with approved procedures and good oilfield practice. • Any indication of gas was assessed by competent personnel, with documented decisions supporting controlled depletion and prevention of escalation to a surface release.	Major	Highly Unlikely	Medium	Nil	An ROV bubble watch with kill-weight mud immediately available provides effective early detection and rapid response to any surface gas, while allowing a small, monitored pocket to safely deplete avoids unnecessary intervention and additional risk. No further reasonably practicable measures would deliver a comparable risk reduction without being grossly disproportionate; therefore, this approach is ALARP.

9.3.2.1.2 Well Blow out

Oil spills are the most significant potential threat to the environment from drilling projects. Oil spills can potentially occur from a number of sources ranging from a major spill, such as a well blowout, down to smaller leaks and spills from equipment and piping. The International Association of Oil & Gas Producers (IOGP) recently issued incident frequency data for offshore exploration drilling activities, using data sources representing the last 20 to 30 years of oil and gas operations. Two types of incidents were considered:

- "Well releases", where hydrocarbons flowed from the well at some point where flow was not intended, and the flow was stopped by use of the barrier system that was available on the well at the time of the incident
- "Blowouts", where formation fluid flowed out of the well or between formation layers after all the predefined technical well barriers failed.

Incident frequencies for drilling activities are listed in table 42. These indicate that accidental well releases or blowouts are very rare, occurring two or three times for every 1,000 to 10,000 wells drilled. In the history of the Australian oil and gas industry, around 1,500 offshore wells have been drilled, with seven incidents of well blowouts, including the Montara incident in 2009.

Table 42 Historic frequency of blowouts during exploration drilling worldwide (Source IOGP 2010)

Incident	Frequency			Unit
	Average	Gas	Oil	
Blowout	3.1×10^{-4}	3.6×10^{-4}	2.5×10^{-4}	Per drilled well
Well release	2.5×10^{-3}	2.9×10^{-3}	2.0×10^{-3}	Per drilled well

* This data represents activities carried out to "North Sea standard", where operations are performed with BOPs installed, including shear ram, and following the two-barrier principle

Properties of Hydrocarbons

Hydrocarbons usually comprise hundreds of mainly carbon-based chemical structures. The relative balance of the constituent substances influences both their chemical and physical properties, which in turn affect their potential or environmental impact on marine biota. In general, hydrocarbons comprise four main groups:

- Alkanes: paraffin (acyclic) saturated hydrocarbons with director branched chains of carbon atoms;
- Naphthalene (cycloparaffins): saturated cyclic and polycyclic compounds in which hydrogen atoms maybe replaced by alkyl groups;
- Arenes: aromatic unsaturated cyclic compounds from the benzene order where the hydrogen atoms may be also replaced by alkyl groups; and
- Alkenes (olefins): unsaturated acyclic hydrocarbons with direct or branched chains and double carbon connection (the compounds of this group are not part of crude oil but are the main products of its cracking).

Condensate

Based on the Chuditch-1 discovery, it is anticipated that the Chuditch-2 appraisal well will only encounter dry gas. Most condensate from the Bayu-Undan and Kitan fields are light oil with an API of 57° and a specific gravity of 0.75 (table 43). The distillation cuts indicate that about 80% of the oil is volatile or semi-volatile (those boiling off at less than 265°C) meaning that it will evaporate readily. It is classified as a Group 1 oil (ITOPF, 2002) and if spill into the sea, would be expected to spread rapidly on the sea surface, due to its low density, and degrade through evaporation and dispersion into the water column.

Table 43 Properties of Crude Oil (from ADIOS2 database)

Parameter			Value
		API (°)	56
		Specific Gravity (g/cc)	0.75
		Kinematic Viscosity @15°C (cSt)	1.24
		Pour Point (°C)	< -400
Distillation Cuts			
Temperature (°C)	Vol (%)	Temperature (°C)	Vol (%)
22	3	180	3
70	12	220	6
100	24	260	11
120	33		31
135	42	330	63
160	53	400	89

Diesel

Diesel is a light petroleum distillate with an API of 30°- 32° and a specific gravity in the range 0.84 to 0.88 (table 44). As such they are classed as Group II oils (ITOPF, 2002) such as light persistent oils. Diesels are expected to undergo a rapid spreading with moderate evaporation loss in tropical waters and, consequently, slicks are likely to break up. Diesel oils tend not to form emulsions at the temperatures likely to be found in the Timor Sea and so these will not inhibit spreading of the slick or evaporation rates.

Weathering and dispersibility studies on Australian marine diesel indicate that in the case of a spill approximately 50% of the mass will be evaporated (Kagi et al., 1988). The prediction weathering behaviour from the ADIOS2 model for a constant wind speed of 4ms-1 Evaporation rates are initially high with just under 50% evaporating within the first 24 hours. Vertical dispersion rates are also high with the majority of diesel being removed from the sea surface within three days.

Table 44 Properties of Diesel Fuel Oil (from ADIOS2 database)

Parameter	Value
API (°)	30 - 32
Specific Gravity (g/cc)	0.84 to 0.88
Kinematic Viscosity @15°C (cSt)	4
Pour Point (°C)	-14
Distillation Cuts	
Temperature (°C)	Vol (%)
160	3
180	6
200	11
250	31
300	63
350	89

9.3.2.1.2.1 Oil Spill Modelling

The Oil Spill Modelling Study for Chuditch-2 Appraisal drilling Well in the Timor Sea was conducted using MuTeknologi Software (PT. MuTeknologi Komputasi Hidraulika). The modelling used for the simulation is stochastic modelling which aims to predict the spill's movement, spreading, weathering, and coastal impact where the spill is condensate, diesel, base oil, and SBM/NADF in the marine environment. The spill modelling was simulated for the February (West Season/Monsoon) and June (East Season/Dry Season).

Importance of Oil Spill Modelling in Offshore Drilling:

Oil spill modelling is an essential component of offshore environmental management. It predicts the movement, dispersion, and impact of potential hydrocarbon releases under different scenarios. This information informs spill contingency planning, response strategies, and mitigation measures, ensuring the protection of marine ecosystems, fisheries, and coastal communities.

Key Spill Scenarios Analysed:

The modelling study simulated multiple spill scenarios based on different failure types, including:

- Transfer Hose Failures: Small-scale spills of diesel, base oil, and synthetic-based mud (SBM).
- Tank Rupture: A larger spill of diesel (723 barrels) due to structural failure.
- Mud Tank Discharge: Release of 400 barrels of SBM.
- Well Control Events (Blowouts): Major hydrocarbon releases from uncontrolled well flow, modelled at three increasing rates (25, 50, and 75 million standard cubic feet per day).

Each scenario was simulated for both the West Season (February) and East Season (June), accounting for prevailing oceanographic and meteorological conditions in the two dominant seasons.

Simulation Results and Environmental Impact:

Spill Dispersion:

- Diesel and base oil spills were predicted to disperse offshore, with a significant portion evaporating (~43% for diesel and ~20% for base oil).
- Synthetic-based mud (SBMg) settled on the seabed, affecting benthic habitats but undergoing biodegradation (~23% within five days).
- Condensate from well blowouts showed 82% evaporation within five days, with the remainder dispersing in the water column.

Geographic Impact:

- In the West Season, spills tended to drift toward Australia's Exclusive Economic Zone (EEZ), with potential effects on the Oceanic Shoals Marine Special Purpose Zone.
- In the East Season, spills moved northwest, impacting Timor-Leste's EEZ rather than Australian waters.

Timeframe for Spill Effects:

- Most hydrocarbons reached their maximum spread within five days.
- Surface oil thickness decreased below 0.034mm, rendering it invisible to the naked eye.

Key findings from the hydrodynamics and oil spill simulation using MoTuM are summarized as follows:

a) The fates simulation results show that diesel and condensate will evaporate about 75% of the total spill after 5 days of oil spill release.
b) For base oil, the fates simulation results show that 57% will stay in the offshore for 5 days. During those 5 days, 23 % of the base oil will be biodegradable and the remaining base oil will evaporate.
c) During the West Season (February), the Diesel, Base Oil, SBM and Condensate will spread to the Oceanic Marine Special Purpose Zone, Oceanic Marine Multiple Zone and Australia's EEZ. The spill will remain offshore, and the spread will be to the East of the Chuditch-2 Well.
d) During the East Season (June), the Diesel, Base Oil, SBM and Condensate will also spread to the Oceanic Marine Special Purpose Zone and Australia's EEZ. But the dominant spreading is to Timor-Leste's EEZ
e) For each season and scenario, the oceanic shoals Marine National Park Zone will not be affected by the spill the Diesel, Base Oil, SBM and Condensate.

For the Well Control Event Scenario: A well control event occurs, where a spill of 1,500 barrels (bbls) of NADF occurs for 3 hours, and then a spill of 18,000bbls of condensate is released for 60 days in the West Season (February) and East Season (June). The simulation results for this scenario are presented as:

- Figure 45 showing dispersion of NADF at surface in February.
- Figure 46 showing dispersion of NADF concentration (ppm) at near bottom in February.
- Figure 47 showing fates simulation in percentage for condensate after 5 days of release in February /West Season.
- Figure 48 showing dispersion of NADF concentration (ppm) at surface in June.
- Figure 49 showing dispersion of NADF concentration (ppm) at near bottom in June.
- Figure 50 showing fates simulation in percentage for condensate after 5 days of release in June /East Season.

Figure 44 Dispersion of NADF concentration (ppm) at surface in February

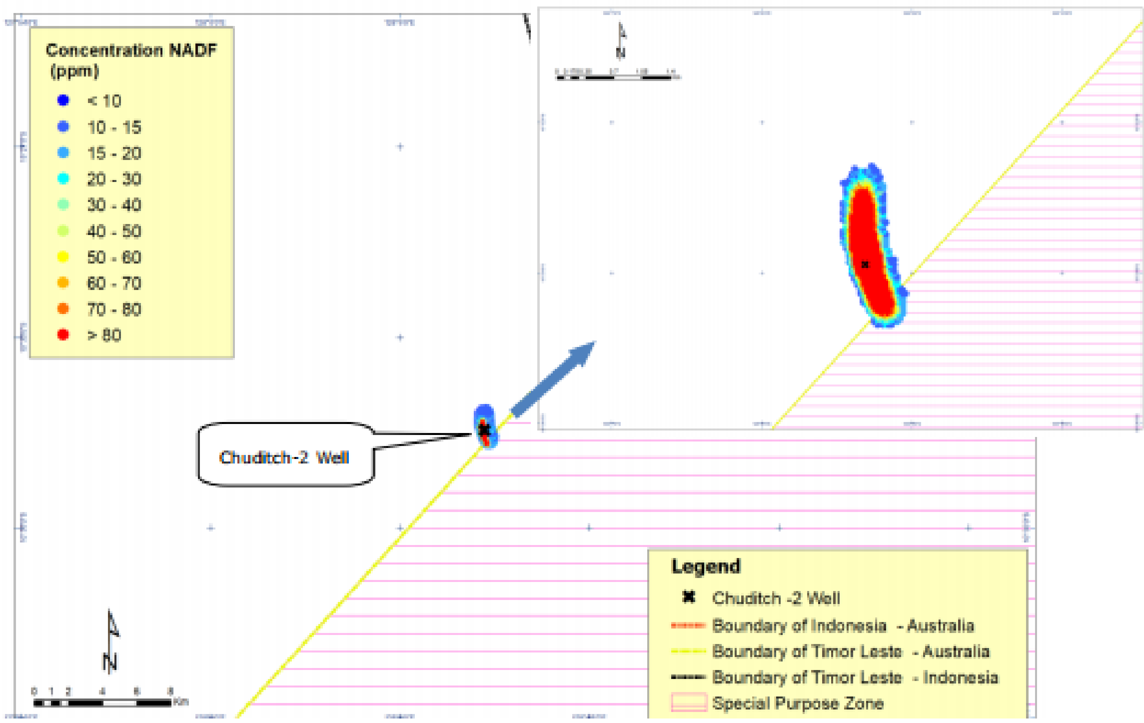


Figure 45 Dispersion of NADF concentration (ppm) at near bottom in February

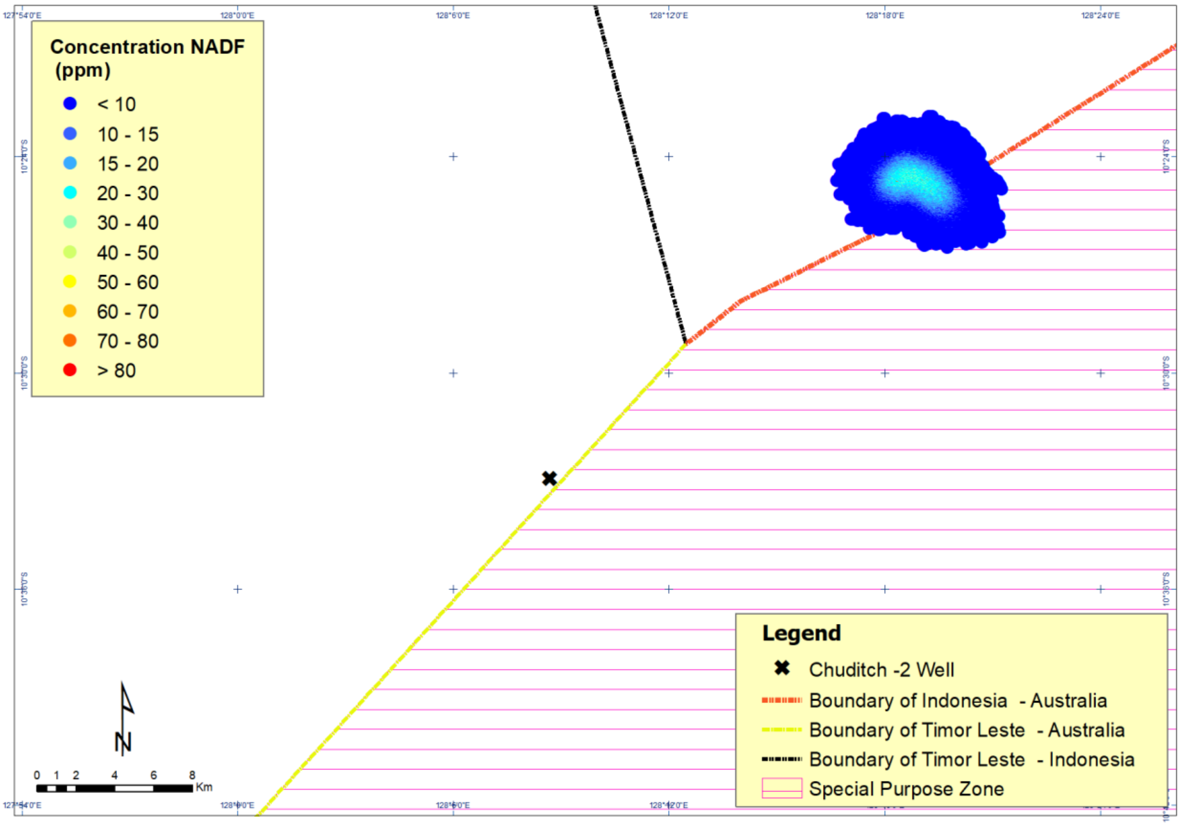


Figure 46 Fates simulation in percentage for condensate after 5 days of release in February/West Season

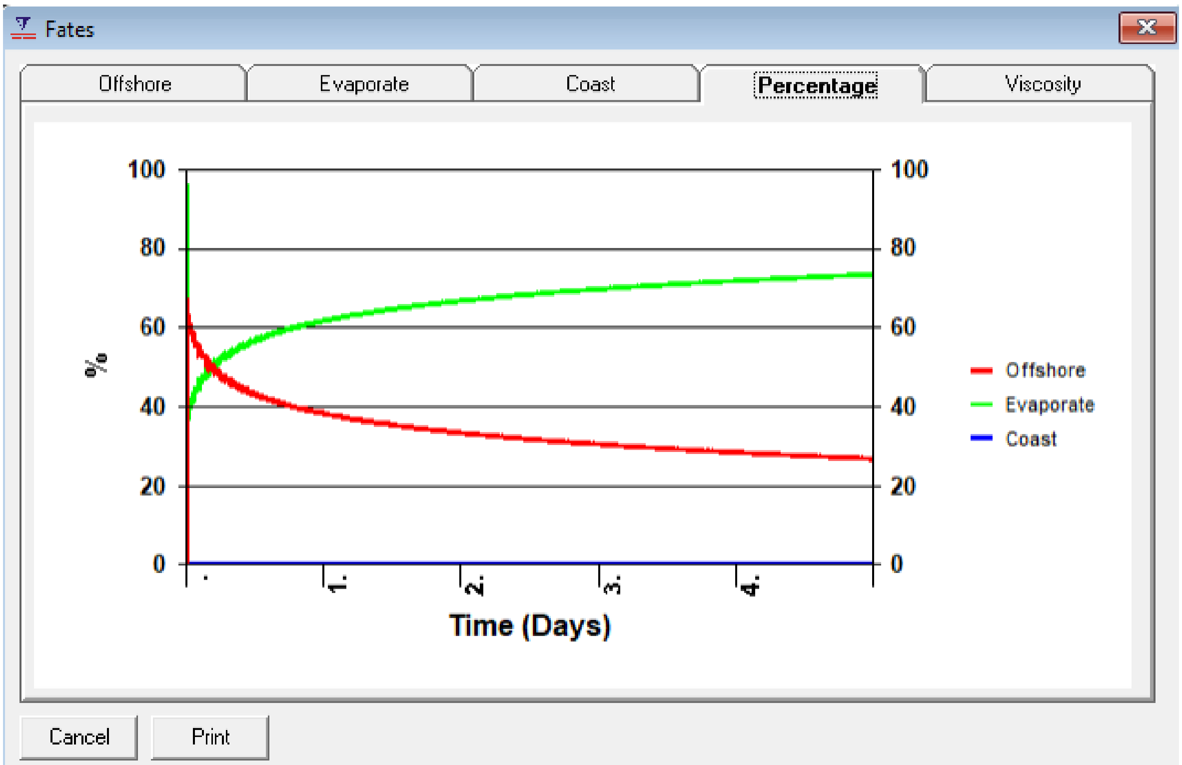


Figure 47 Dispersion of NADF concentration (ppm) at surface in June

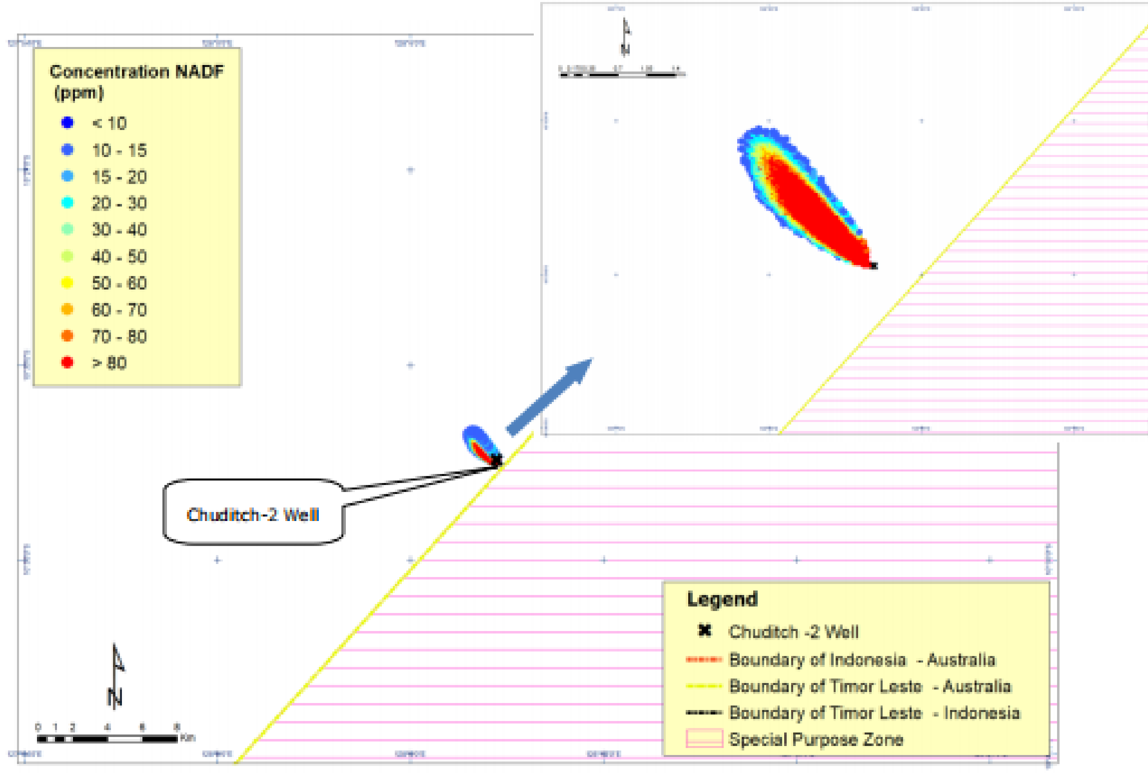


Figure 48 Dispersion of NADF concentration (ppm) at near bottom in June

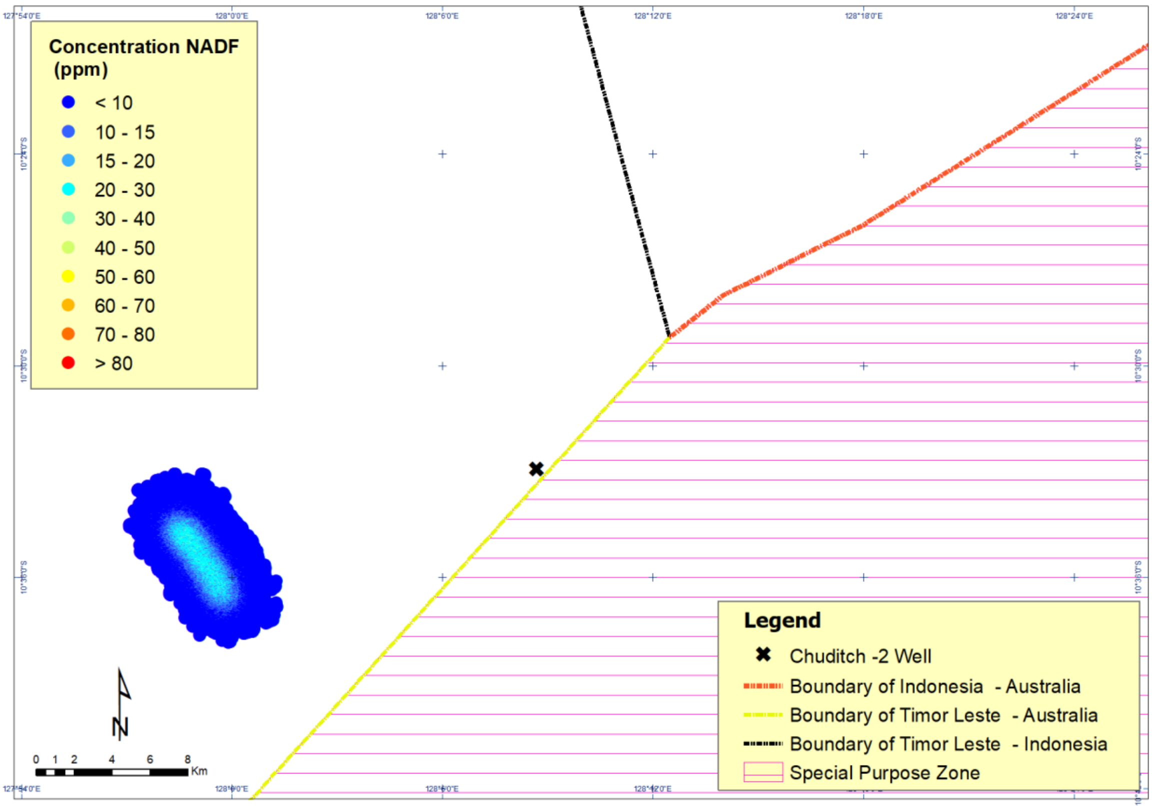
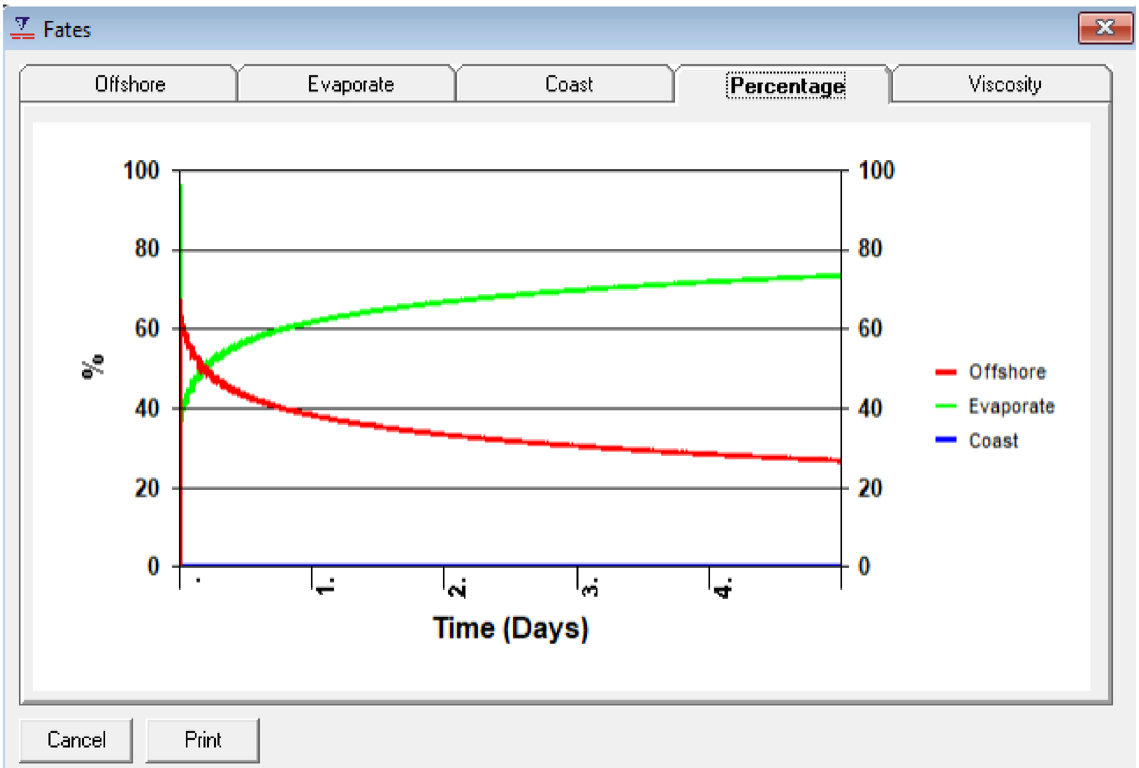


Figure 49 Fates simulation in % for condensate after 5 days of release in June/East Season



9.3.2.1.2.2 Impact Assessment

An unplanned release of marine diesel oil (MDO) or condensate from the offshore facility, including from surface operations or as a result of a loss of well control, has the potential to result in acute exposure of marine environmental receptors to dissolved and dispersed hydrocarbons within the surface layer and upper water column. MDO is a light refined petroleum product with high evaporation rates and relatively low persistence, whereas condensate is characterised by an even higher proportion of low-molecular-weight and aromatic hydrocarbons (e.g. BTEX), resulting in increased acute water-column toxicity despite rapid evaporation (ITOPF, 2014; NOAA, 2016).

A low consequence impact is defined in NOPSEMA guidance as an impact that is *localised, short-term and reversible, with no detectable population- or habitat-level effects* (NOPSEMA, 2020; NOPSEMA, 2023). For both MDO and condensate, this threshold is characterised by dissolved hydrocarbon concentrations <10 µg/L (TPH or dissolved aromatic hydrocarbon equivalent), persisting for hours only and confined to the immediate vicinity of the release point. Concentrations below this level are generally consistent with reported no observed effect concentrations (NOECs) for plankton, pelagic invertebrates and fish early life stages, with effects limited to transient sub-lethal responses such as mild narcosis or temporary avoidance behaviour (French-McCay, 2002; CONCAWE, 2016). No mortality or population-level effects are expected, and no shoreline contact would occur. Impacts at this concentration are therefore considered consistent with *low consequence* thresholds applied in NOPSEMA-accepted EPs.

A medium consequence impact aligns with NOPSEMA definitions of *local to regional impacts of short- to medium-term duration, with recovery expected* (NOPSEMA, 2020). This threshold would be reached where dissolved hydrocarbon concentrations are approximately 10–100 µg/L, persisting for hours to days within a local to regional area. Concentrations within this range may exceed chronic or sub-lethal toxicity thresholds for sensitive planktonic organisms and fish larvae, potentially resulting in localised mortality of plankton and early life stages and short-term impairment of feeding, growth or behaviour (French-McCay, 2002; NOAA, 2016). For condensate, this threshold is more readily achieved in the near-field of a release due to the higher aromatic content and solubility, increasing the likelihood of short-term lethal effects to sensitive receptors. Nevertheless, impacts are expected to remain spatially limited, with recovery occurring over weeks to months due to rapid dilution, degradation and biological resilience.

A high consequence impact corresponds to definitions of *widespread, long-term and potentially irreversible impacts*, including population or habitat-level effects (NOPSEMA, 2020; NOPSEMA, 2023). This threshold is associated with dissolved hydrocarbon concentrations >100 µg/L, potentially reaching several hundreds of µg/L in the immediate vicinity of a large or prolonged release prior to dilution. Concentrations at this level are within the range of reported acute toxicity thresholds (e.g. LC50 values) for plankton, pelagic invertebrates and fish early life stages and may result in significant mortality (French-McCay, 2002; ITOPF, 2014). For condensate, exceedance of this threshold is considered more plausible under blowout conditions, particularly for subsea releases where hydrocarbons may be entrained within the water column.

Oil spill trajectory modelling has shown that any spill of either condensate or diesel from the proposed drilling area is highly likely to dissipate before it could contact a shoreline. Thus, nearshore marine communities and habitats of the Timor-Leste and Indonesian coastlines (which may contain corals, seagrasses, mangroves, turtle nesting beaches, intertidal and subtidal communities) are not considered to be at significant risk from the drilling program.

Given the oceanic environment, the resources considered to be most at risk are pelagic Phyto- and zooplankton, pelagic fish, cetaceans, marine turtles and surface-feeding seabirds. Oil can affect marine biota in a variety of ways through acute toxicity, and sub-lethal chronic effects on morphology, physiology and behaviour, some of which may ultimately lead to mortality. Weathering influences the toxicity of oil and its constituents. Weathering processes include spreading, evaporation, dissolution, dispersion into the water column, formation of oil-in-water emulsions, photochemical oxidation, microbial degradation, absorption to suspended particulate matter and stranding on the shore or sedimentation to the seafloor.

Relatively lighter, more volatile, mobile and water-soluble compounds will tend to evaporate fairly quickly into the atmosphere. The lighter components of oil are usually the most toxic but are also those most readily lost through evaporation and the rate of evaporation loss increases with temperature. Consequently, weathered oil is generally less toxic than fresh oil (Swan et al., 1994) and so lethal concentrations of toxic components that could lead to death of marine organisms are relatively rare, localized and short-lived.

Swan et al., (1994) reviewed the environmental effects of oil spills across abroad spectrum of marine organisms and communities. Their review indicated that the response of phyto- and zooplankton to oil varied between species. However, phyto and zooplankton could be generally characterized as having a high tolerance and rapid recovery (no long-term effects). Thus, the risk of an oil spill occurring and persisting at toxic concentrations for a sufficient period of time to have long-term effects on phyto- and zooplankton is considered to be negligible.

Organisms inhabiting the water column such as cetaceans, marine turtles and fish may be exposed to oil in the event of an oil spill. Pelagic fish are highly mobile and capable of diving to avoid exposure to oil, so the threat of significant effects is considered low. Cetaceans and marine turtles would be more likely to come into contact with oil as they return to the surface to breathe. The effects of oil on cetaceans and marine turtles would include oiling of parts of the body, irritation of the eyes, inhalation of volatile oil components and ingestion.

Inhalation and ingestion are likely to have a more significant effect on individuals that come into contact with oil than surface contact (Swan et al., 1994). Being mobile, however, these organisms would be expected to be able to move away from heavily oiled areas. It is difficult to predict with certainty the number of cetaceans or turtles that would be likely to be exposed in the event of an oil spill. However, in the open ocean environment, it is probable that only a small number of individuals would be exposed. In the event of an oil spill, SGBU's priority would be to protect breeding and feeding areas to avoid impacts on populations. As per the EBS study there is no breeding and feeding area near the Chuditch-2 drilling well.

Swan et al., (1994) identifies seabirds as being the most vulnerable organisms to an oil spill in oceanic environments. Oil spills can have a variety of effects including fouling of the plumage, ingestion of oil, effects on reproduction and physical disturbance. Many of the species that occur offshore are surface-feeding or plunge diving pelagic birds, so that oil slicks would potentially interfere with feeding and increase exposure risk. Preening to remove oil would also expose the birds to direct ingestion of oil. Given the open oceanic location of the drilling site, remote from any landmass, the number of seabirds likely to be exposed in the event of an oil spill is expected to low.

The release of liquid hydrocarbons has the potential to cause direct, indirect, and cumulative environmental impacts, including physical oiling and toxicity effects on wildlife, localized mortality of Phytoplanktons and Zooplanktons such as krill, eggs, and larvae, habitat degradation, disruptions to fishing and tourism, transboundary political concerns, and the accumulation of oil in the food chain and sediments. Oil contamination in sediments, whether from accidental spills or drill cuttings, can lead to physical smothering or long-term pollution of benthic habitats. Additionally, contamination or the loss of food sources may have temporary effects on the marine food chain.

Preliminary modelling results for various spill scenarios, including a minor fuel transfer hose leak (30 barrels) and a vessel bunker loss (723 barrels), indicate that approximately 40–50% of the spilled volume evaporates or disperses within 48 hours, with full dissipation occurring within five days (MuTek, 2024). The modelling predicts a northwest/southeast drift depending on tidal phases. In all modelled scenarios, the spill remains offshore and does not impact any areas of known environmental significance.

A fuel spill may occur during refuelling operations. Such spills are expected to be small, localized, and subject to rapid dispersion and volatilization. While fuel spills can temporarily impact surrounding waters, their effects are short-lived due to natural mixing and dissipation.

Overall, the risk ranking for oil spills medium with a major consequence but remote likelihood due to the location of Chuditch-2.

9.3.2.1.2.3 Mitigation Measures and Measurement Criteria

Table 45 Risk assessment summary, mitigation measures, measurement criteria and ALARP assessment, oil spill incident.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Uncontrolled release of Hydrocarbons at surface - Well blowout 12 1/4-inch section - Toxic and physical impacts from hydrocarbons on marine fauna and flora	Fluid (Mud) Column - Primary Barrier: Bespoke mud system designed and developed to maintain well bore pressure by effectively managing formation fluid pressures and strength of subsurface formations Blow out Preventer (BOP) Secondary Barrier: Inclusive of: • Third-party verification and certification of the complete BOP stack to API Standard 53 • Certification of the BOP Control system, Choke and Kill System, Diverter system, Well control instrumentation, high pressure mud system	• Records demonstrate the drilling fluid system was engineered and maintained to balance formation pressures and formation strength for the 12¼-inch section. • Documentation confirms third-party verification and certification of the complete BOP stack to API Standard 53 prior to use and evidence confirms choke and kill systems, diverter system, and high-pressure mud system were installed, tested, and ready for immediate use • Records demonstrate BOP control systems and well control instrumentation were function-tested and maintained in accordance with OEM and API requirements and Independent verification reports confirm compliance of well control equipment and barriers prior to and during drilling operations	Massive	Remote	Medium	Nil	The combination of a bespoke mud system providing primary well control, a fully certified and independently verified BOP and associated control systems, and comprehensive well control procedures, training and verification provides multiple, robust and independent barriers against an uncontrolled surface hydrocarbon release. Continuous monitoring, IWCF-certified personnel, third-party and SCE verification, bridging arrangements and routine testing ensure barrier integrity is maintained throughout operations. No additional reasonably practicable measures have been identified that would achieve a

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	Comprehensive well control procedures including continuous monitoring of pressure reading during drilling to detect any abnormal pressures	• Approved well control procedures covering the 12¼-inch section are implemented and communicated to relevant personnel. • Records demonstrate continuous monitoring of key pressure parameters (e.g. standpipe pressure, casing pressure, pit volume) during drilling and evidence confirms that abnormal pressure trends or indicators were promptly recognised and assessed by competent personnel. • Any abnormal pressure indication triggered timely response actions in accordance with approved well control procedures, while pressure monitoring instruments and alarms are maintained, tested, and fit for purpose in accordance with OEM and API requirements.					meaningful further reduction in blowout risk without being grossly disproportionate; therefore, the residual risk is ALARP.
	Drilling contractor and company personnel are appropriately trained and certified to IWCF level 4 or 3 depending on role and responsibility. This requirement also includes ongoing evidence of well control training and drills	• Records demonstrate role-to-competency mapping (who requires IWCF 3 vs 4) and verification of valid certification prior to commencing the 12¼-inch section. • Evidence confirms well control drills are conducted to an approved schedule and					

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		include realistic scenarios relevant to the 12¼-inch section. • Drill debriefs capture lessons learned, corrective actions, and updates to practices where needed and records demonstrate competent, timely responses during monitoring, drills, or actual anomalies, consistent with well control procedures.					
	Third party & verification, including an independent verification body (confirming BOP compliance, control system operability, manifold integrity and diverter operability); SCE verification; and record verification	• Documentation confirms that an independent verification body has verified compliance of the BOP stack, control system, choke and kill manifold, and diverter system prior to drilling the 12¼-inch section. • Records demonstrate that well control–related SCEs are identified, performance standards defined, and verification activities completed in accordance with the Safety Case. • Evidence confirms functional testing and verification of BOP control systems, choke and kill manifolds, and diverter operability in accordance with approved procedures and verification reports and records are complete, traceable, and retained in accordance with					

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		document control requirements.					
	Well control bridging document outlines agreed bridge between the drilling contractor and the company.	• Records demonstrate the well control bridging document was jointly agreed, approved, and available to relevant personnel prior to commencement of drilling • The bridging document clearly defines well control roles, decision authority, communication protocols, and escalation pathways between Company and contractor. • Evidence confirms relevant Company and contractor personnel were briefed on the bridging arrangements prior to drilling					
	Verification of SCE Performance Standards	• Records demonstrate that well control SCEs for the 12¼-inch section are identified and have approved performance standards (functionality, reliability, availability, survivability). • Evidence confirms SCE verification activities (inspection, testing, certification) were completed against the defined performance standards before and during the section. • Records demonstrate SCEs remained available and fit-for-purpose throughout drilling,					

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		with any degradations managed under approved procedures.					
	Periodical test and maintenance on the BOP during the operations.	• Records demonstrate that a BOP testing and maintenance program was implemented and aligned with the drilling program and API Standard 53 requirements. • Evidence confirms that BOP components (rams, annular, control system) functioned as intended during tests and operations. • Any BOP defects or test failures were documented, assessed, and rectified in accordance with approved maintenance procedures prior to resuming drilling.					
Uncontrolled release of Hydrocarbons at surface - Well blowout 12 1/4-inch section - Toxic and physical impacts from hydrocarbons on marine fauna and flora	Development of contingency plan for relief well and incident - SGBU-GEN-OPS-0034 Relief Well Plan - Chuditch 2. Wild Well Control will be contracted who will use their WWCI ERP which is designed to support response preparations to well control emergencies and establish a process for responding to safely managing them using a standard uniform approach. It includes the equipment	• Records demonstrate that an approved Relief Well Plan is in place and that Wild Well Control's ERP is aligned with Company emergency response arrangements and well control scenarios • Evidence confirms that Wild Well Control is contracted and capable of providing specialist personnel, equipment, and procedures for rapid response to a well control incident. • Contingency arrangements demonstrate preparedness to	Massive	Remote	Medium	Not having a contingency plan, nor having a specialised well control contractor	Maintaining a relief well control and contingency plan and contracting Wild Well Control, supported by a proven emergency response process, that provides a standardised and coordinated approach to well control emergencies, ensures preparedness for credible worst-case scenarios and effective escalation if primary controls fail. This arrangement is a practicable and industry-

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	and procedures to address a range of well control scenarios necessitating immediate mobilisation of intervention equipment and personnel.	safely manage a range of well control scenarios without escalation.					accepted control that materially reduces the consequences of a well control incident. No further reasonably practicable measures have been identified that would achieve a meaningful additional reduction in risk without being grossly disproportionate; therefore, this contingency approach is ALARP
Uncontrolled release of Hydrocarbons at surface - Well blowout 12 1/4-inch section - Toxic and physical impacts from hydrocarbons on marine fauna and flora	Development of Emergency Response Plan (ERP) and Oil Spill Contingency Plan (OSCP) that address all risks and contingencies and Emergency response training for the company IMT and CMT and drills conducted to ensure familiarisation with the documents	• Records demonstrate that approved ERP and OSCP documents are in place, current, and address credible well control and hydrocarbon release scenarios relevant to the 12¼-inch section. • Evidence confirms IMT and CMT personnel have received training and familiarisation on the ERP and OSCP relevant to their roles. • Records demonstrate emergency response drills were conducted, debriefed, and lessons learned incorporated into plans or procedures.	Major	Highly Unlikely	Medium	Nil	A comprehensive ERP and OSCP, supported by trained IMT and CMT personnel and regular drills, provides effective preparedness and response to minimise toxic and physical impacts of hydrocarbons on marine fauna and flora. No further reasonably practicable measures would achieve a comparable reduction in environmental risk without being grossly disproportionate; therefore, the risk is ALARP.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	Shipboard Oil Pollution Emergency Plan (SOPEP) in place and Drilling Crews familiarised with facility ERP and SOPEP and are familiarised with the Company OSCP and ERP	• Records demonstrate that a current, approved SOPEP is in place on the MODU and integrated with the facility ERP and Company OSCP. • Evidence confirms drilling crews have been familiarised with the SOPEP, facility ERP, and Company OSCP relevant to their roles.	Major	Highly Unlikely	Medium	Crew not trained in SOPEP or familiarised with OSCP and ERP	A SOPEP, supported by drilling crews familiarised with the facility ERP and the Company OSCP and ERP, provides an effective and practicable framework for rapid and coordinated response to hydrocarbon releases, minimising toxic and physical impacts on marine fauna and flora. No further reasonably practicable measures would achieve a comparable reduction in environmental risk without being grossly disproportionate; therefore, the risk is ALARP.
Uncontrolled release of Hydrocarbons at surface - Well blowout 12 1/4-inch section - Toxic and physical impacts from hydrocarbons on marine	Monitor and communicate with vessels approaching drilling site to reduce the risk of vessel collision.	Records demonstrate continuous monitoring of vessel traffic in the vicinity of the MODU using available bridge surveillance and tracking systems. Evidence confirms that approaching vessels were contacted in a timely manner and advised of the MODU location and 500 m exclusion zone requirements.	Major	Remote	Medium	Nil	Continuous vessel monitoring and communication, supported by regulated bridge watchkeeping on the MODU, AHSV and PSVs in accordance with international maritime requirements and contractor procedures, provides an effective and

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
fauna and flora	Watch keeping and operation controlled by international regulation and contracted vessels systems and procedures	• Records and observations demonstrate that bridge watchkeeping and lookout arrangements are maintained in accordance with applicable international maritime regulations and vessel procedures. • Evidence confirms contracted vessels operate under approved navigation, collision-avoidance, and exclusion-zone procedures aligned with international requirements.	Major	Remote	Medium	Nil	practicable control to reduce collision risk. No further reasonably practicable measures would achieve a comparable reduction without being grossly disproportionate; therefore, the risk is ALARP.
	Notice to mariners and maintain on going communication with other mariners on the presence and progress of the drilling activity. ANP to develop and issue a notice to mariners and advise maritime regulator and all other regulatory agencies of the MODU and support vessels to the PSC contract area and Timor-Leste Territory	• Records demonstrate the ANP issued a Notice to Mariners and formally advised maritime regulators and relevant agencies of the MODU and support vessel activities prior to commencement. • Evidence confirms ongoing communication with mariners regarding MODU location, exclusion zone, and activity status throughout drilling operations.	Major	Highly Unlikely	Medium	Company advises all regulatory offices	The option for the Company to advise all regulatory offices was rejected, as all inter-agency communication must be coordinated through the ANP under established regulatory protocols. No further practicable controls were identified; therefore, the residual risk is ALARP

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	Development of Emergency Response Plan (ERP) and Oil Spill Contingency Plan (OSCP) that address all risks and contingencies and Emergency response training for the company IMT and CMT and drills conducted to ensure familiarisation with the documents	• Records demonstrate that current, approved ERP and OSCP documents explicitly address vessel-collision and hydrocarbon-release contingencies relevant to MODU operations. • Evidence confirms IMT and CMT personnel are trained and familiarised with ERP/OSCP roles, responsibilities, and collision response scenarios.	Major	Highly Unlikely	Medium	Nil	A comprehensive ERP and OSCP, supported by trained IMT and CMT personnel and regular drills, provides effective preparedness and response to minimise toxic and physical impacts of hydrocarbons on marine fauna and flora. No further reasonably practicable measures would achieve a comparable reduction in environmental risk without being grossly disproportionate; therefore, the risk is ALARP.
Uncontrolled release of Hydrocarbons at surface - Vessel to vessel and vessel to MODU Collision in 500m exclusion zone resulting in uncontrolled release of hydrocarbons	DP 2 vessels only allowed into the 500M radius of the petroleum safety zone	• Records demonstrate that only DP2-certified vessels were authorised to enter and operate within the 500 m petroleum safety zone. • Evidence confirms DP2 certification and operational readiness of vessels were verified prior to entry into the safety zone. • Records demonstrate vessel movements within the safety zone were managed without loss of station-keeping control or collision risk.	Major	Highly Unlikely	Medium	No limitation on vessels entering the 500M exclusion zone	Restricting entry within the 500 m petroleum safety zone to DP2 vessels provides an effective and practicable reduction in collision and position-loss risk through redundant, automated station-keeping. No further reasonably practicable measures would achieve a comparable risk reduction without being grossly disproportionate, and the control is therefore ALARP.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	Double hull and double-skinned (or inboard-located) hydrocarbon product tanks that reflect MARPOL Annex I	• Records demonstrate that vessels operating within the 500 m exclusion zone are fitted with double-hulled, double-skinned, or inboard-located hydrocarbon product tanks consistent with MARPOL Annex I design intent. • Evidence confirms vessel design compliance was verified and accepted prior to authorisation to operate within the exclusion zone.	Major	Highly Unlikely	Medium	Older vessels with a single-skin tank arrangements within a double hull	Using anchor handling and supply vessels fitted with double hulls and double-skinned or inboard hydrocarbon tanks in accordance with MARPOL Annex I provides a practicable and effective reduction in pollution risk compared with single-skin arrangements. No further reasonably practicable measures would achieve a comparable reduction without being grossly disproportionate, the control is ALARP.
	Navigation lighting and watch aboard the MODU. The MODU and boats will meet conventional navigation rules for lighting, for the safety of personnel working on the facilities and the safe operation of the facilities in an active maritime environment	• Records and observations confirm the MODU and support vessels display navigation and operational lighting in accordance with applicable international navigation rules at all times. • Evidence confirms continuous bridge and lookout watchkeeping is maintained on the MODU and support vessels in accordance with approved procedures.	Minor	Remote	Low	Nil	Compliance with conventional navigation lighting & watchkeeping requirements on the MODU & vessels provides a practicable and effective means of ensuring safe operations and collision avoidance in an active maritime environment. No further reasonably practicable measures would achieve a comparable risk reduction without being grossly disproportionate, and the control is therefore ALARP.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	Verification of Vessel and MODU systems through specification and independent verification through OVID audit and independent audit of SCE and performance standards of the MODU	• Records demonstrate completion and acceptance of independent verification of vessel and MODU systems against specifications, including an OVID audit and independent SCE verification. • Evidence confirms collision-prevention and hydrocarbon-containment SCEs are identified, have approved performance standards, and are verified as compliant prior to operations.	Minor	Highly Unlikely	Low	Nil	Independent verification of vessel and MODU systems through specification compliance, OVID audits, and SCE and performance standard verification provides an effective and practicable reduction in operational risk. No further reasonably practicable measures would achieve a comparable reduction without being grossly disproportionate; therefore, the control is ALARP.
	Open radio and satellite phone contact between MODU and supply vessels at all times.	• Records and observations confirm that open radio and satellite phone communication channels are maintained between the MODU and supply vessels at all times during operations. • Evidence demonstrates that communication protocols are actively used to coordinate vessel approach, positioning, and departure within the exclusion zone.	Minor	Highly Unlikely	Low	Nil	Continuous radio and satellite comms between the MODU and vessels, supported by redundant systems and an always-manned bridge watch, provide an effective and practicable means of maintaining situational awareness and rapid response. No further reasonably practicable measures would achieve a comparable risk reduction without being grossly disproportionate; therefore, this control is ALARP.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	Where practicable, all MODU and Vessel operations will occur on the leeward side of the MODU	• Records demonstrate that prevailing environmental conditions (wind, sea state, current) were assessed and leeward-side operations were planned and implemented where practicable. • Any operations conducted other than on the leeward side are agreed by both the vessel master and the OIM and documented with operational or safety justification	Major	Highly Unlikely	Medium	Operations occur on the Windward or Leeward side of the MODU	Restricting as reasonably practicable, MODU and vessel operations to the leeward side provides a practicable and effective reduction in environmental and vessel-interaction risk by minimising exposure to wind and sea conditions, compared with allowing operations on either side. No further reasonably practicable measures would achieve a comparable risk reduction without being grossly disproportionate; therefore, this control is ALARP.
	Maintain update weather forecast information on the MODU and Vessels	• Records demonstrate that up-to-date meteorological and oceanographic forecasts (e.g. wind, sea state, currents) are available on the MODU and vessels	Minor	Highly Unlikely	Low	Nil	NA
	Development of Emergency Response Plan (ERP) and Oil Spill Contingency Plan (OSCP) that address all risks and contingencies and Emergency response training for the company IMT and CMT and drills conducted to ensure	• Records demonstrate that current, approved ERP and OSCP documents are in place and explicitly address vessel-collision and hydrocarbon-release contingencies relevant to MODU operations. • Evidence confirms IMT and CMT personnel are trained	Major	Highly Unlikely	Medium	Nil	A comprehensive ERP and OSCP, supported by trained IMT and CMT personnel and regular drills, provides effective preparedness and response to minimise toxic and physical impacts of hydrocarbons on marine fauna and

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	familiarisation with the documents	and familiarised with ERP/OSCP roles, responsibilities, and collision-response scenarios					flora. No further reasonably practicable measures would achieve a comparable reduction in environmental risk without being grossly disproportionate; therefore, the risk is ALARP.
	Shipboard Oil Pollution Emergency Plan (SOPEP) in place and Drilling Crews familiarised with facility ERP and SOPEP and are familiarised with the Company OSCP and ERP	• Records demonstrate a current, approved SOPEP is in place on the MODU and relevant vessels and is aligned with the facility ERP and Company OSCP. • Evidence confirms drilling crews are familiarised with SOPEP activation, roles, and interfaces with the facility ERP and Company OSCP.	Major	Highly Unlikely	Medium	Crew not trained in SOPEP or familiarised with OSCP and ERP	A SOPEP, supported by drilling crews familiarised with the facility ERP and the Company OSCP and ERP, provides an effective and practicable framework for rapid and coordinated response to hydrocarbon releases, minimising toxic and physical impacts on marine fauna and flora. No further reasonably practicable measures would achieve a comparable reduction in environmental risk without being grossly disproportionate; therefore, the risk is ALARP.
Uncontrolled release of Hydrocarbons at surface - Spillage during refuelling -	Schedule refuelling activities during daylight hours and during calm weather and suitable sea-state conditions and at the	• Records demonstrate refuelling activities were planned for daylight and suitable weather/sea-state conditions and formally	Moderate	Unlikely	Medium	Nil	Conducting refuelling only in daylight and favourable sea-state conditions, with Master and OIM veto authority, provides an effective and

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Vessel to MODU resulting in uncontrolled release of hydrocarbons	discretion of the Vessel Master and OIM.	authorised by the Vessel Master and OIM. • Evidence confirms current weather and sea-state conditions were assessed and deemed suitable immediately prior to refuelling. • Number of hydrocarbon spill incidents during vessel-to-MODU refuelling operations is zero.					practicable reduction in spill and safety risk. No further reasonably practicable measures would achieve a comparable reduction without being grossly disproportionate; therefore, this control is ALARP.
	Hose and couplings checked for integrity prior to refuelling and form part of the MODU PM program and in certification	• Records demonstrate that refuelling hoses and couplings are inspected for integrity and suitability immediately prior to each refuelling operation. • Evidence confirms refuelling hoses and couplings are included in the MODU PM program and maintained and certified in accordance with manufacturer and industry requirements. • Number of hydrocarbon spill incidents during refuelling attributable to hose or coupling failure: zero.	Moderate	Unlikely	Medium	Not checking	Integrity checks, dry-break couplings, flotation collars and continuous visual and flow monitoring during refuelling provide effective and practicable controls to prevent and detect spills. No further reasonably practicable measures would achieve a comparable risk reduction without being grossly disproportionate; therefore, the risk is ALARP.
	Dry break couplings installed on all hydrocarbon and SBM lines and couplings form part of the MODU PM program and in certification	• Records demonstrate dry-break couplings are installed and used on all hydrocarbon and SBM transfer lines during refuelling operations. • Evidence confirms dry-break couplings are included in the	Moderate	Unlikely	Medium	No dry break couplings installed	

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		MODU PM program and maintained and certified in accordance with manufacturer and industry requirements. • Number of hydrocarbon or SBM spill incidents during refuelling attributable to coupling failure or disconnection: zero.					
	Installation of flotation collars on all hoses, with the collars forming part of the MODU PM program and in certification	• Records demonstrate that flotation collars are installed on all hoses used for hydrocarbon and SBM transfer during refuelling operations. • Evidence confirms flotation collars are included in the MODU PM system and are inspected and certified in accordance with manufacturer and industry requirements. • Number of hydrocarbon or SBM spill incidents during refuelling attributable to hose submergence or flotation failure: zero.	Moderate	Unlikely	Medium	No flotation collars installed	
	Continuous visual monitoring of hoses, couplings and sea surface during refuelling to monitor potential spill and leakage and continuous monitoring of fuel flow gauges on the MODU	• Records and observations confirm continuous visual monitoring of hoses, couplings, and the surrounding sea surface throughout refuelling operations	Moderate	Unlikely	Medium	No watch posted when refuelling	

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		• Evidence demonstrates that MODU fuel flow gauges are actively monitored during refuelling to verify expected transfer rates and detect anomalies. • Number of hydrocarbon spill incidents during refuelling attributable to undetected leaks or flow anomalies: zero.					
	Development of Emergency Response Plan (ERP) and Oil Spill Contingency Plan (OSCP) that address all risks and contingencies and Emergency response training for the company IMT and CMT and drills conducted to ensure familiarisation with the documents	• Records demonstrate that current, approved ERP and OSCP documents are in place and explicitly address vessel-to-MODU refuelling spill scenarios. • Evidence confirms IMT and CMT personnel are trained and familiarised with ERP/OSCP roles, spill response actions, and refuelling-related contingencies.	Major	Highly Unlikely	Medium	Nil	A comprehensive ERP and OSCP, supported by trained IMT and CMT personnel and regular drills, provides effective preparedness and response to minimise toxic and physical impacts of hydrocarbons on marine fauna and flora. No further reasonably practicable measures would achieve a comparable reduction in environmental risk without being grossly disproportionate; therefore, the risk is ALARP.
	Shipboard Oil Pollution Emergency Plan (SOPEP) in place and Drilling Crews familiarised with facility ERP and SOPEP and are familiarised with the Company OSCP and ERP	• Records demonstrate a current, approved SOPEP is in place onboard the MODU and relevant vessels and is aligned with the facility ERP and Company OSCP.	Major	Highly Unlikely	Medium	Crew not trained in SOPEP or familiarised with OSCP and ERP	A SOPEP, supported by drilling crews familiarised with the facility ERP and the Company OSCP and ERP, provides an effective and practicable framework for rapid and

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
		• Evidence confirms drilling crews and relevant vessel personnel are familiarised with SOPEP activation, refuelling spill response actions, and interfaces with the ERP and OSCP.					coordinated response to hydrocarbon releases, minimising toxic and physical impacts on marine fauna and flora. No further reasonably practicable measures would achieve a comparable reduction in environmental risk without being grossly disproportionate; therefore, the risk is ALARP.
Uncontrolled release of Hydrocarbons at surface - Flare Burner drop out resulting in uncontrolled release of hydrocarbons	Installation of high energy flare ignition system comprised of an ignition panel and a propane bottle rack for the pilot flame on the burner boom. A single thermocouple is used to detect the flame of each pilot. Three pilots are fitted, one pilot on each side of the burner head and one pilot on the gas line exit. The thermocouple sends a signal to the main control unit as an indication that a flame is present. The pilot lights on the burner booms are maintained in continual operation during well	• Records confirm a high-energy ignition system is installed, comprising an ignition panel, propane supply, and three pilot flames (two on the burner head and one on the gas exit), each fitted with thermocouple flame detection. • Evidence demonstrates pilot flames are maintained in continuous operation during well flowback/testing and flame presence is continuously monitored via thermocouple feedback to the control system. • Number of uncontrolled hydrocarbon releases or flare dropouts during DST	Minor	Unlikely	Medium	No rejected controls and specific detail are in the SCR and HAZOP for the test package	ALARP demonstrated in SCR and related HAZOP and design studies; controls effective

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	flowback / testing operations	attributable to ignition system failure: zero.					
	Development of Emergency Response Plan (ERP) and Oil Spill Contingency Plan (OSCP) that address all risks and contingencies and Emergency response training for the company IMT and CMT and drills conducted to ensure familiarisation with the documents	• Records demonstrate approved, current ERP and OSCP are in place and explicitly address DST flaring, ignition loss, and uncontrolled release contingencies. • Evidence confirms IMT and CMT personnel are trained and familiarised with ERP/OSCP roles, DST flare-related response actions, and escalation protocols.	Major	Highly Unlikely	Medium	Nil	A comprehensive ERP and OSCP, supported by trained IMT and CMT personnel and regular drills, provides effective preparedness and response to minimise toxic and physical impacts of hydrocarbons on marine fauna and flora. No further reasonably practicable measures would achieve a comparable reduction in environmental risk without being grossly disproportionate; therefore, the risk is ALARP.
	Shipboard Oil Pollution Emergency Plan (SOPEP) in place and Drilling Crews familiarised with facility	• Records demonstrate a current, approved SOPEP is available onboard and aligned with the facility ERP	Major	Highly Unlikely	Medium	Crew not trained in SOPEP or familiarised with OSCP and ERP	A SOPEP, supported by drilling crews familiarised with the facility ERP and the Company OSCP and

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	ERP and SOPEP and are familiarised with the Company OSCP and ERP	and Company OSCP for DST flaring scenarios. • Evidence confirms drilling and well-test personnel are familiarised with SOPEP activation, ERP roles, and OSCP interfaces relevant to flare ignition loss					ERP, provides an effective and practicable framework for rapid and coordinated response to hydrocarbon releases, minimising toxic and physical impacts on marine fauna and flora. No further reasonably practicable measures would achieve a comparable reduction in environmental risk without being grossly disproportionate; therefore, the risk is ALARP.
Uncontrolled release of SBM	Inadvertent discharge of Synthetic Based Mud (SBM) during displacement via overboard lines including diverted lines. All overboard lines are locked during SBM displacement Diverter and overboard lines will be walked and line up checked prior to the commencement of operations by senior drilling supervisor and OIM	• Records demonstrate all overboard and diverted discharge lines were positively locked and isolated prior to and throughout SBM displacement activities. • Evidence confirms diverter and overboard line-ups were physically walked, checked, and verified by the Senior Drilling Supervisor and OIM prior to commencement of SBM displacement. • Records demonstrate SBM displacement was completed without loss of containment or discharge to the marine environment.	Minor	Unlikely	Medium	Not locking or walking the discharge lines	Locking all overboard and diverted lines during SBM displacement provides an effective and practicable control to prevent inadvertent discharge to the marine environment. No further reasonably practicable measures would achieve a comparable risk reduction without being grossly disproportionate; therefore, the risk is ALARP.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
	Development of Emergency Response Plan (ERP) and Oil Spill Contingency Plan (OSCP) that address all risks and contingencies and Emergency response training for the company IMT and CMT and drills conducted to ensure familiarisation with the documents	• Records demonstrate approved, current ERP and OSCP documents are in place and explicitly address SBM spill and containment scenarios associated with DST activities. • Evidence confirms IMT and CMT personnel are trained and familiarised with ERP/OSCP roles, SBM spill response actions, and escalation procedures.	Major	Highly Unlikely	Medium	Nil	A comprehensive ERP and OSCP, supported by trained IMT and CMT personnel and regular drills, provides effective preparedness and response to minimise toxic and physical impacts of hydrocarbons on marine fauna and flora. No further reasonably practicable measures would achieve a comparable reduction in environmental risk without being grossly disproportionate; therefore, the risk is ALARP.
	Shipboard Oil Pollution Emergency Plan (SOPEP) in place and Drilling Crews familiarised with facility ERP and SOPEP and are familiarised with the Company OSCP and ERP	• Records demonstrate a current, approved SOPEP is available onboard and aligned with the facility ERP and Company OSCP for SBM spill scenarios during DST. • Evidence confirms drilling and DST personnel are familiarised with SOPEP activation, ERP roles, and OSCP interfaces relevant to SBM loss-of-containment.	Major	Highly Unlikely	Medium	Crew not trained in SOPEP or familiarised with OSCP and ERP	A SOPEP and drilling crews familiarised with the ERP and the SGBU OSCP and ERP, provides a practicable & effective framework for a rapid response to hydrocarbon releases, minimising impacts on marine fauna and flora. No further reasonably practicable measures would achieve a comparable reduction in environmental risk without being grossly disproportionate, and the risk is therefore ALARP.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Contained and localised Oil Spill	Placing of drip trays and sump trays under engines to contain leaks. Activation of SOPEP	• Records and inspections confirm drip trays and sump trays are installed and correctly positioned beneath engines and oil-containing equipment. • Evidence demonstrates SOPEP is activated promptly for any oil spill exceeding routine housekeeping, with response actions implemented as per plan.	Slight	Possible	Low	Nil	NA

9.3.2.2 Introduction of Invasive Marine Species

The introduction of invasive marine species during offshore drilling is commonly through releasing of ballast water at the drilling location. The ballast water within the vessel might contained foreign species from the original location where the ship docked. As the ship arrived at the drilling location, it releases the ballast water into the marine water hence introducing non-native species to the surrounding ecosystem.

9.3.2.2.1 Impact Assessment

The impact from introducing invasive marine species into Chuditch-2 location is that these non-native species will harm the existing ecosystems by competing with the native species for food and habitat leading to a decline number of native population. Additionally, the lack of natural predators in the new environment will lead to uncontrol growth of the invasive species.

Therefore, the consequence of the introduction of invasive marine species is massive and the likelihood is remote, hence, the risk ranking is medium.

9.3.2.2.2 Mitigation Measures and Measurement Criteria

Table 46 Risk assessment summary, mitigation measures, measurement criteria and ALARP assessment, of invasive marine species.

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Introduction of Invasive Marine Species (IMS) from Ballast Water	MODU and Vessels have an approved ballast water management plan and valid ballast water management certificate. Audit of ballast water management plan prior to mobilisation	• Records demonstrate the MODU and all support vessels hold a current, approved Ballast Water Management Plan and valid Ballast Water Management Certificate (or approved exemption) acceptable for Australian port entry, with documentation available for inspection. • Evidence confirms ballast water operations are conducted in accordance with the approved plan and Australian biosecurity requirements (e.g. exchange, treatment, or discharge controls as applicable). • Records demonstrate no Australian biosecurity non-compliances, detentions, or corrective actions related to ballast water management.	Massive	Highly Unlikely	High	Nil	ALARP demonstrated, controls effective Although Timor-Leste does not currently regulate vessel biofouling, the supply vessels supporting the MODU operate for extended periods at low speed in warm tropical waters, making rapid macro-fouling accumulation likely and creating a foreseeable risk of transferring invasive species when they subsequently enter Australian ports, where strict biosecurity requirements apply. Non-compliance by a vessel entering an Australian port can lead to vessel detention, directed

Impact	Existing or Proposed Control or Mitigation Measure	Measurement Criteria	Consequence	Likelihood	Risk Ranking	Rejected Mitigation Measures	ALARP Justification
Introduction of Invasive Marine Species (IMS) Biofouling on MODU and Vessel Hulls	SGBU has a Biofouling Management Plan (BMP) that is a requirement under Australian Legislation for vessels entering and exiting Australian waters and that provides all controls and that all vessels will be audited against prior to Operations. Records to be retained within a biofouling record book in accordance with the Biosecurity Amendment (Biofouling Management) Regulations 2021 and the Australian biofouling management requirements and in Timor Leste through the relevant regulatory jurisdiction	• Records demonstrate the MODU and all support vessels have an approved BMP compliant with Australian biofouling requirements and have undergone audit prior to operations. • Evidence confirms a Biofouling Record Book is maintained and updated in accordance with the Biosecurity Amendment (Biofouling Management) Regulations 2021 and Australian biofouling management requirements, with records retained and available for inspection. • Records demonstrate no Australian biosecurity non-compliances, detentions, or corrective actions related to hull biofouling.	Massive	Highly Unlikely	High		offshore cleaning, refusal of entry, and significant commercial and environmental consequences. Implementing recognised controls—such as a Biofouling Management Plan, Biofouling Record Book, periodic underwater inspections and proactive cleaning represents a low-cost, well-established and effective risk-reduction approach, with no alternative measures offering equivalent benefit. Accordingly, adopting structured biofouling management is considered reasonably practicable and reduces the risk to a level that is ALARP.

10 Social Impact Assessment

Timor-Leste confronts substantial challenges in revitalizing its infrastructure and generating employment opportunities for the youth entering the labour market. The exploitation of oil and gas resources in offshore waters has commenced to augment government revenues, thereby facilitating job creation. To assist the economic development of Timor-Leste Article 5.4 of PSC-TL-SO-19-16 delineates explicit obligations for SGBU to provide opportunities to suppliers based in Timor-Leste and to prioritize employment for Timor-Leste nationals and permanent residents.

10.3 Introduction

This chapter presents the comprehensive Social Impact Assessment (SIA) of the proposed offshore drilling activity in the Timor-Leste Exclusive Economic Zone (EEZ), aligned with Annex IV of Ministerial Diploma No. 46/2017. The assessment synthesizes data on demographic structure, economic development, social well-being, cultural heritage, public health, and local governance to evaluate potential social impacts and outline mitigation measures. The Chuditch-2 appraisal drilling site is located approximately 184 nautical miles offshore, and while geographically distant, the project could bring economic, infrastructural, and socio-cultural ripple effects, particularly in Dili and adjacent districts if successful.

10.4 Methodology

The Environmental Impact Assessment (EIA) team applied a mixed-methods approach, involving literature reviews, statistical analysis, community consultation, and expert opinion. The EIA team's methodology also integrated official data sources (e.g., INE, WHO, World Bank), policy documents, and stakeholder feedback, to map the baseline and to forecast social effects. The assessment followed the structure required by Annex IV of the Ministerial Diploma No. 46/2017, including special attention to vulnerable groups, cultural values, and community development.

Annex IV establishes the minimum content requirements for Social Impact Assessments (SIAs) in Timor-Leste. It mandates a structured and participatory approach to identifying, evaluating, and managing the social consequences of projects subject to environmental licensing.

Key provisions include the obligation to:

- Conduct detailed baseline studies of demographic and population composition, living standards housing, clean water, and electricity, health status, education, transportation, social structure and language in affected areas.
- Assess direct, indirect, and cumulative social impacts on individuals, communities, and institutions.
- Engage meaningfully with stakeholders, including vulnerable and marginalized groups
- Propose mitigation measures, enhancement strategies, and monitoring frameworks that align with national development goals and community well-being
- Ensure that gender equity, and cultural heritage protection are integral components of impact management.

10.5 Baseline Social Context in Timor-Leste

The social description of Timor Leste is detailed in section 6.4 of this EIS. The data describes demographic and population composition, ethnic and linguistic diversity, living standards and infrastructure, housing, water & sanitation, electricity, transport, health profile, life expectancy, maternal mortality, healthcare access, education, economic Indicators, GDP, GDP per capita, information on sectors like Oil & gas, agriculture, services, employment, youth unemployment, labour force participation, cultural heritage and social norms, traditions, cultural crafts, and customary governance.

10.6 Potential Social Impacts of Offshore Drilling

Table 47 Potential social impacts of drilling

Impact	Source	Affected Groups	Nature and Duration	Significance	Mitigation Strategy
Influx of Temporary Workers	Offshore and onshore workforce mobilization	Urban residents in Dili	Short-term, indirect	Moderate	Encourage local hires where possible.
Disruption of Local Transport	Helicopter traffic to/from Dili	Local commuters	Short-term	Low	Traffic coordination with authorities
Occupational Skill Gaps	Offshore work requires specialization	Timorese job seekers	Structural	High	Establish technical training programs
Economic Multiplier	Procurement, logistics, accommodation	Local SMEs	Short- to medium-term	Positive	Preferential contracts for local businesses
Civil society perceptions and Attitudinal shift towards project	NGOs, media, local communities	Indirect	Medium term	Variable	Proactive engagement, grievance mechanism
Fishing Conflicts	Pollution risk, zone exclusion	Coastal artisanal fishers	Low-likelihood, high-consequence	Moderate	Compensation and communication plans
Cultural Concerns	Perceived disruption of marine customs	Traditional leaders	Perceptual	Low	Cultural sensitivity induction

- Public Health and Safety: Offshore workers to receive induction on health, safety, and environmental protocols.
- Education and Capacity Building: Opportunities for internships, apprenticeships, and vocational training in partnership with local institutions. Awareness programs on offshore careers for high school graduates.
- Gender and Social Inclusion: Prioritize women in support roles and develop inclusive workplace environments. Promote female-owned SME participation.
- Cultural Heritage Management: Cultural mapping indicates no marine heritage sites near Chuditch-2. Continued liaison with cultural ministries to monitor for unforeseen impacts.

- Long-Term Socio-Economic Benefits: Tax and royalty revenues to fund education, health, and infrastructure. Upskilling of Timorese workforce for long-term employment. Stimulation of ancillary industries: catering, transport, facility management.

10.7 Monitoring and Reporting

Social indicators tracked quarterly:

- Percentage of national workers (by gender)
- Grievance cases resolved
- Training hours completed
- SME procurement value
- Stakeholder engagement reports submitted biannually

10.8 Conclusion

While direct social impacts of the offshore drilling activity are limited by geographic distance, secondary and induced effects particularly in Dili are notable. With proactive capacity development, equitable employment practices, and inclusive community engagement, the Chuditch-2 project can act as a catalyst for sustainable socio-economic progress in Timor-Leste.

There is limited scope for the utilisation or integration of any significant local content into the drilling program due to the specialized nature of the work and the program's brief duration. Nevertheless, SGBU is committed to incorporating local content wherever practicable. SGBU will continue collaborating with Timor-Leste stakeholders to identify and cultivate local content opportunities, particularly if the Chuditch 2 Appraisal well demonstrates economic viability.

This assessment is in compliance with the requirements of Annex IV of Ministerial Diploma No. 46/2017.

11 Economic Assessment

11.1 Introduction

This Economic Assessment for the offshore drilling initiative at the Chuditch-2 appraisal well site in the Timor Sea is conducted in accordance with Annex IV of Ministerial Diploma No. 46/2017, which mandates the identification, measurement, and evaluation of economic repercussions likely to ensue from the proposed endeavour. As part of the environmental licensing process, this chapter evaluates both the direct and indirect contributions of the project to the national and regional economy, sector-specific ramifications, employment generation, infrastructure demands, and long-term economic resilience.

11.2 Methodology

The economic assessment was executed utilizing a mixed-methods framework that encompassed:

- The utilization of World Bank, ADB, and national statistics to evaluate baseline economic trends.
- The estimation of multiplier effects on national GDP and local economies.
- Engagement with stakeholders from government agencies, NGOs, and other relevant entities.
- Comparative case studies of analogous offshore projects within the Asia-Pacific region.

11.3 Baseline Economic Context in Timor-Leste

- GDP (2023): Nominal: USD 3.16 billion; Real: USD 2.25 billion (World Bank).
- GDP Growth: -17.49% in 2022; projected +3.1% (2024) and +3.9% (2025) by ADB.
- **GDP per Capita (2023):** USD 1,502.50
- Main sectors: Oil & gas, agriculture, services, with oil contributing over 90% of public revenue.
- Labor Force Participation: 30.5% (ILO, 2021), with significant gender disparity (men: 36.9%, women: 24.2%).
- Youth Unemployment: 12.31% ages 15–24. (ILO, 2019)

11.4 Potential Economic Impacts

11.4.1 Direct Economic Impacts

Table 48 Direct Economic Impacts

Impact Category	Description	Economic Value / Outcome
Revenue Generation	Royalties, taxes, and PSC revenues	Funds national budget for health, education, infrastructure
Employment	Direct jobs in drilling, logistics, support	High-wage, specialized roles + indirect SME job creation
Local Procurement	Contracts for catering, transport, fuel	Boost to local SMEs and service sector
Infrastructure Use	Helicopter operations, port usage	Increased throughput at Dili and Suai/Tibar Bay Port
Knowledge Transfer	Technical upskilling of national workforce	Long-term productivity enhancement

11.4.2 Sectoral Effects

- Fisheries: Anticipated disruptions are minimal owing to the considerable 184 nautical miles offshore distance; nevertheless, compensation schemes are established to address any indirect loss of access or ecological disturbances.
- Tourism: The offshore location precludes any direct adverse impacts; potential spill risks are effectively mitigated by stringent environmental protocols.
- Shipping and Ports: Augmented activity through helicopter support and marine logistics is expected to enhance throughput at Dili, Suai, and Tibar Bay Port, as well as Dili and Suai Heliport.
- Agriculture and Forestry: While no direct effects are anticipated, the influx of income from the oil and gas sector may catalyse demand for local agricultural products and logistical services.

11.4.3 Economic Multipliers and Spillover Effects

Input-output modelling from IFC (2013), World Bank (2021), and ADB (2022) suggest that for every USD 1 million spent on offshore drilling operations, an estimated USD 1.9 million in total economic activity is generated (multiplier: 1.9).

Key spillovers include:

- Increased household income leading to higher retail and services demand.
- Rise in hospitality usage (accommodation, catering).
- Strengthening of transport and warehousing sectors.

11.5 Economic Risk and Mitigation

Table 49 Economic Risk and Mitigations

Risk	Description	Mitigation Strategy
Oil price volatility	Revenue fluctuations due to Brent price	Fiscal buffers; sovereign wealth management (Petroleum Fund)
Limited local capacity	Potential underutilization of local businesses	Capacity building; supplier development programs
Short project duration	Limited job longevity	Focus on transferable skills and future oilfield planning

11.6 Compliance with Ministerial Diploma No. 46/2017

The following Annex IV of Ministerial Diploma (MD) No. 46/2017 economic criteria are fulfilled:

1. Identification of impacted economic sectors,
2. Estimation of economic benefits to local communities,
3. Employment generation potential analysis,
4. Long-term benefit evaluation through tax revenues and infrastructure growth, and
5. Risk mitigation measures proposed.

11.7 Conclusion

The Chuditch-2 offshore drilling operation represents a moderate-to-high economic opportunity for Timor-Leste. Despite its remote location, the project will stimulate national revenue, generate high-value employment, and contribute to local business growth through supply chain linkages. When integrated with inclusive policies and vocational upskilling initiatives, the project aligns with national development goals and offers a resilient pathway to economic diversification.

This chapter fulfils all regulatory requirements under Annex IV of Ministerial Diploma No. 46/2017 and provides a sound economic justification to support environmental licensing.

12 Summary of the Environmental Management Plan

The summary of the Environmental Management Plan is to assist and provide an understanding to the reader of this EIS, how the project will be carried out while ensuring environmental protection and worker safety. It explains the purpose of the project, the benefits, possible environmental impacts, and the steps taken to reduce and or mitigate harm.

The detailed EMP is in a separate document (SGBU.1916.HSSE.0016) as per annexure 6 of the Ministerial Diploma No. 46/2017 Regulation on the Detailed Requirements for Environmental Management Plans (EMP). The EMP is a detailed plan that outlines how SGBU and its contractors will comply with environmental laws and ensure that the drilling activities do not cause long-term damage to the marine environment. The EMP provides guidelines on safety measures, waste disposal, emergency preparedness, and community engagement.

The primary objectives of the EMP are:

- To provide the necessary framework to effectively mitigate against environmental impacts during the appraisal well construction activities.
- To provide the means to ascertain the effectiveness of environmental protection / conservation measures identified in the EIS study, which will form the basis for additional / modified provisions to meet the stipulated limits where these are expected.
- To provide guidance for environmental management so that the work is carried out in accordance with legislative requirements and in meeting the overall environmental objectives of the Project.
- Ensures that drilling activities follow environmental laws.
- Reduces harm to marine life and natural habitats.
- Keeps workers and nearby communities safe.
- Establishes a plan for responding to emergencies such as oil spills.
- Helps monitor and report environmental impacts.

12.1 Environmental Performance Objectives and Standards

The environmental impact assessment for the appraisal drilling project at Chuditch-2 is presented in section 9.3 of this EIS, along with the corresponding mitigation measures and measurement criteria. The impact assessment, mitigation measures, and measurement criteria outlined in the EMP are complemented by the addition of environmental performance objectives and standards, which are summarized in the tables 50 and 51.

Table 50 Environmental performance objectives, standards and responsible person for Planned Activities

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
MODU Positioning	Seabed disturbance and smothering / Corals, seabed invertebrates, benthic habitats.	Reduce or avoid physical damage to sensitive seabed habitats such as coral reefs, seagrass beds, benthic communities	A detailed multibeam bathymetry baseline seabed survey shall inform selection of the least sensitive MODU location and orientation, avoiding sensitive seabed features and minimising seabed disturbance, in accordance with DL 32/2016 and MD 46/2017.	Well Operations Manager
			The approved drilling contractor Rig Move Procedure shall be followed during MODU rig move and positioning activities to minimise seabed disturbance and prevent avoidable environmental impact, in accordance with DL 32/2016 and MD 46/2017.	Drilling Superintendent
			Seabed sediment and geotechnical sampling shall be undertaken as part of the EIS program to characterize baseline seabed conditions and support environmental impact assessment and control selection, in accordance with DL 32/2016 and MD 46/2017.	Well Operations Manager
			Pre-load testing shall be undertaken in accordance with approved MODU procedures during jack-up operations to confirm seabed stability and minimise unplanned seabed disturbance, in accordance with DL 32/2016 and MD 46/2017.	Senior Drilling Supervisor
Drilling - Commercial Marine traffic	Vessel collision with MODU / Marine fauna (fish, mammals, turtles and seabirds), benthic habitats, fisheries and socio-economic receptors	Limit or avoid interference or disruption to commercial vessels and other marine users arising from MODU and associated support vessel activities.	The Company shall ensure that all required notifications and operational information relating to MODU and support vessel activities are prepared and submitted to the ANP in a timely manner to enable onward distribution to relevant ministries, including facilitating the issuance of a Notice to Mariners. Marine user communications shall be maintained for the duration of activities to minimise interference with other marine users, in accordance with Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	Drilling Superintendent
			A 500 m exclusion zone around the MODU shall be actively monitored and maintained by a dedicated shadow support vessel during drilling and associated marine operations to prevent unauthorised vessel entry and minimise interference with other	Senior Drilling Supervisor

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
			marine users, in accordance with DL 32/2016 and MD 46/2017.	
Drilling - Rig mobilisation			The Company shall ensure that written notifications containing planned shipping routes, vessel schedules, and drilling location details for the MODU and support vessels are prepared and submitted to the ANP in a timely manner to enable onward distribution to relevant ministries and facilitate marine user notification. Marine activities shall be communicated and managed to minimise interference or disruption to commercial vessels and other marine users, in accordance with Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	Drilling Superintendent
			The Company will ensure that timely and accurate notifications, including MODU and support vessel routes, schedules and drilling location details, are prepared and submitted to the ANP to enable onward distribution to relevant ministries and maritime authorities. Marine activities shall be communicated and coordinated to minimise interference with commercial vessels and other marine users, in accordance with Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	Drilling Superintendent
Drilling - Commercial Marine traffic	Vessel collision with MODU / Marine fauna (fish, mammals, turtles and seabirds), benthic habitats, fisheries and socio-economic receptors		The MODU bridge shall be continuously manned, and a shadow support vessel maintained on location to manage marine communications and vessel approaches, thereby minimising interference with other marine users during MODU operations, in accordance with DL 32/2016 and MD 46/2017.	OIM
Drilling - Local marine traffic	Collision, entanglement with subsea infrastructure, interference with emergency response / Fisheries and socio-economic receptors	To minimise interaction with local and artisanal fishing vessels and prevent collision, entanglement, and socio-economic impacts arising from MODU activities	The Company will ensure that notifications and relevant operational information relating to the proposed commencement and completion of the appraisal drilling program are prepared and submitted to the ANP in a timely manner to enable onward consultation with and notification of the Fisheries Department. Engagement and information sharing shall be undertaken to support awareness of MODU activities and minimise interaction with local and	Drilling Superintendent

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
			artisanal fishing vessels, thereby reducing the risk of collision, entanglement and socio-economic impacts, in accordance with Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	
			The Company will ensure that notifications and relevant operational details relating to the commencement and completion of appraisal drilling are prepared and submitted to the ANP in a timely manner to enable onward consultation with and notification of the Fisheries Department. Information sharing shall support awareness of MODU activities and minimise interaction with local and artisanal fishing vessels and associated socio-economic impacts, in accordance with Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	Well Operations Manager
			The Company will ensure that the information, notifications and operational details required to support the issuance of Notices to Mariners, including accessible notifications for local and artisanal fishing communities, are prepared and submitted to the ANP in a timely manner to enable onward distribution to relevant ministries and authorities. Notifications shall support awareness of MODU activities and minimise interaction with local and artisanal fishing vessels, thereby reducing the risk of collision, entanglement and associated socio-economic impacts, in accordance with Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	Drilling Superintendent
Drilling - Flaring	Flaring can reduce a vessel operator's ability to accurately perceive navigation cues at night and may cause a visual distraction / Air quality, Marine fauna (behavioral disturbance), Avifauna (sea birds and migratory birds), marine	To minimise the potential for flaring-related high-intensity flame and glow to interfere with the safe navigation of nearby vessels, by reducing visual distraction and avoiding impairment of vessel operators' ability to accurately perceive navigation cues during night-time operations.	The Company will ensure that flaring notifications and relevant operational details are provided to the ANP in a timely manner to facilitate the issuance of Notices to Mariners and shall maintain local marine communications to minimise flaring-related visual distraction or navigational risk during night-time MODU operations, in accordance with Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	Drilling Superintendent

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
	water quality, benthic habitats, thermal radiation, light pollution and socio-economic receptors			
Drilling – Dropped Object	Dropped Object on Benthic Habitat	To prevent dropped objects during drilling activities, in order to avoid seabed disturbance and potential damage to benthic habitats, while maintaining safe operations, effective equipment control, and compliance with applicable environmental protection and operational requirements.	Dropped objects during drilling activities shall be prevented so far as is reasonably practicable through the use of tool tethering, certified lifting equipment, secondary retention where practicable, compliant lifting procedures, and controlled material transfer systems, including DNV 2.7-1 certified containers and secured loads in open-top baskets, to avoid seabed disturbance and potential damage to benthic habitats, in accordance with good oilfield practice, API guidance, and applicable Timor-Leste environmental and maritime legislation.	Drilling Superintendent
Drilling	Loss of well control or hydrocarbon release / Air quality, Marine fauna (fish, turtles' marine mammals), Seabirds and Avifauna, marine water quality, benthic habitats and subsea ecosystems, thermal radiation and socio-economic receptors	To maintain effective hydrocarbon containment during drilling, plug and abandonment, and the cutting and retrieval of well infrastructure, in order to prevent loss of well control and any unplanned release of hydrocarbons to the environment.	Plug and abandonment activities, including cutting and retrieval of well infrastructure, shall be planned and executed in accordance with industry best-practice well abandonment requirements and the approved Drilling Program to maintain hydrocarbon containment and prevent loss of well control or unplanned hydrocarbon release.	Drilling Superintendent
			Well abandonment activities, including cutting and retrieval of well infrastructure, shall be based on the as-constructed well condition and undertaken only in accordance with an abandonment programme reviewed and approved by the ANP pursuant to Decree-Law No. 32/2016, Article 39, to maintain hydrocarbon containment and prevent loss of well control or unplanned hydrocarbon release.	Drilling Superintendent
Drilling – Drilling fluid discharges (WBM)	Water quality degradation / Smothering of benthic habitats and biota, water quality degradation, Increased local turbidity	To manage and control the discharge of water-based drilling fluids, cuttings, and cement during drilling operations so as to protect water quality and prevent or minimise degradation of the marine environment.	Approved water-based muds (WBM), cuttings, and cement shall be discharged at the mudline in accordance with the approved Drilling Program, with ROV verification and water-quality monitoring implemented as per the agreed monitoring plan to protect water quality and minimise marine environmental degradation.	Drilling Superintendent

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
Drilling - Drilling Fluid Discharges (SBM)	Water quality degradation / Smothering of benthic habitats and biota, water quality degradation, Increased local turbidity	To protect water quality and minimise marine environmental degradation by ensuring that the average synthetic-based mud (SBM) retained on discharged cuttings does not exceed 9%, and that drilling fluid discharges are managed in accordance with approved limits and good oilfield practice.	Only approved synthetic-based mud (SBM) with demonstrated low environmental toxicity shall be used, informed by a detailed ecotoxicity and environmental fate assessment, and managed such that the average SBM retained on discharged cuttings does not exceed 9%, in accordance with the approved Drilling Program, OCNS requirements, and good oilfield practice	Drilling Superintendent
			High-efficiency triple-deck shale shakers and centrifuges shall be operated and maintained to maximise recovery of synthetic-based mud (SBM) from cuttings prior to discharge, ensuring the average SBM retained on discharged cuttings does not exceed 9% and protecting water quality in accordance with approved limits and good oilfield practice.	Drilling Superintendent
			'Cuttings shall be discharged via a dedicated cuttings caisson positioned below the lowest hull/spud-can interface and below the splash zone, with the discharge point configured to avoid leg bracing, spud-can structures, and hydrodynamic turbulence, to prevent plume recirculation and ensure the average SBM retained on discharged cuttings does not exceed 9%.	Drilling Superintendent
Drilling - Drilling Fluid Recycling (SBM)	Water quality degradation / Smothering of benthic habitats and biota, water quality degradation, Increased local turbidity	To protect water quality and minimise marine environmental degradation by ensuring that synthetic-based mud (SBM) is effectively recovered, recycled, and reused during drilling operations, thereby reducing the volume of SBM requiring discharge or disposal.	Synthetic-based mud (SBM) shall be recovered, stored, and returned to an approved shore base at the end of the drilling campaign for treatment and reuse, in compliance with OEM requirements and applicable shore-based handling and discharge approvals, to minimise SBM discharge and protect water quality.	Drilling Superintendent
Drilling - Chemical and Hydrocarbon Discharges	SBM Spill overboard / Marine water column, marine fauna, fisheries and socio-economic receptors	To prevent the release of synthetic-based mud (SBM) and other chemicals or hydrocarbons to the marine environment during drilling operations, by ensuring effective containment, handling,	Only approved downhole chemicals that have undergone OCNS/CHARM classification, or an equivalent toxicity-based risk assessment shall be selected and used in accordance with the Company's chemical selection procedure and international standards, with all assessments documented in a chemical risk register and provided	Well Operations Manager

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
		and spill-prevention controls are in place to protect water quality and the marine environment.	to the ANP for review and approval, to prevent SBM, chemical, or hydrocarbon spills to the marine environment.	
			All chemicals stored or used on the MODU, and support vessels shall be managed, handled, and disposed of in accordance with approved facility chemical management procedures and applicable Safety Data Sheets (SDS), with SDS readily accessible at point of use, to prevent the release of SBM, chemicals, or hydrocarbons to the marine environment	Drilling Superintendent
			All chemicals stored or used on the MODU, and support vessels shall be managed in accordance with approved chemical management procedures and stored in designated, sheltered, and bunded storage areas to contain spills and prevent runoff, thereby preventing the release of SBM, chemicals, or hydrocarbons to the marine environment	Drilling Superintendent
			All chemicals used or stored on the MODU, and support vessels shall be managed in accordance with approved facility chemical management procedures, with spill kits, absorbent materials, and suitable containers readily available and maintained to enable immediate response and containment of oil, grease, SBM, or chemical spills, thereby preventing release to the marine environment	Drilling Superintendent
			All chemicals used or stored on the MODU, and support vessels shall be managed in accordance with approved chemical management procedures, with any chemical or hydrocarbon spills or leaks to deck immediately contained, cleaned using absorbent materials, and disposed of as hazardous waste, to prevent release to the marine environment	Drilling Superintendent
Drilling - Chemical and Hydrocarbon Discharges	SBM Spill overboard / Marine water column, benthic habitats and biota, marine fauna, fisheries and socio-		All used oils and chemicals, and where practicable partially used or recycled chemicals, shall be collected, stored, and returned to approved facilities in Australia for treatment and disposal, in accordance with approved waste-management procedures, to prevent release of SBM, chemicals, or	Logistics Manager

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
	economic receptors		hydrocarbons to the marine environment	
			Fugitive chemicals and hydrocarbons from deck or machinery spaces shall be contained, collected to the MODU holding tank, and treated through the oily water separator in accordance with MARPOL Annex I prior to any discharge, to prevent release to the marine environment and protect water quality	OIM
Drilling - Wastewater and Sewage Disposal	Water quality degradation / Marine water quality, benthic habitats and biota, marine fauna, fisheries and socio-economic receptors	To manage and control wastewater and sewage generated during drilling operations so as to protect water quality and prevent or minimise degradation of the marine environment, in accordance with applicable marine pollution prevention requirements.	All black and grey water generated onboard the MODU, and support vessels shall be treated through the approved sewage treatment plant and discharged only in accordance with MARPOL Annex IV, with system operation verified to ensure protection of water quality and prevention of marine environmental degradation.	OIM
Drilling - Hazardous, Laboratory and Medical Waste	Biohazardous waste comingled with other waste / Marine water quality. Marine Fauna, Terrestrial and Human Receptors, Fisheries and Socio-Economic Receptors	To segregate, manage, and dispose of hazardous, laboratory, and medical wastes generated during drilling operations in a manner that prevents commingling of biohazardous waste with other waste streams, thereby protecting personnel, preventing environmental contamination, and avoiding adverse impacts on the marine environment.	Biohazardous waste generated during drilling operations shall be segregated, labelled, secured, and stored in designated contained areas on the MODU, under the control of the rig medic, to prevent commingling with other waste streams and protect water quality and the marine environment.	OIM
Drilling - Cooling and brine water	Water quality degradation and potential alteration of marine environment through localised increase in water temperature with engine cooling water / Marine water	To manage and control cooling and brine water discharges generated during drilling operations so as to protect water quality and minimise localised thermal impacts, including changes to ambient seawater temperature, thereby preventing degradation or	Engine and machinery cooling water and brine water generated by the MODU will be commingled with other approved liquid wastewater discharges and released in accordance with approved operational procedures, ensuring adequate dilution and dispersion to protect water quality and prevent localised thermal impacts on the marine environment.	Drilling Superintendent

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
	quality, benthic habitats and biota, marine fauna, fisheries and socio-economic receptors	alteration of the marine environment.		
Drilling - Produced Formation Water when flowing well	Water quality degradation / Marine water quality, benthic habitats and biota, marine fauna, fisheries and socio-economic receptors	To manage and control any produced formation water generated during well flow operations so as to protect water quality and prevent degradation of the marine environment during drilling and testing activities.	Well perforation shall be designed and executed to avoid production of formation water, and where any formation water is produced, it will be separated from hydrocarbons in the test separator and subsequently treated through the rig's oily water separator, before being comingled with other liquid waste streams. Solids and Slops from the Oily Water Separator will be disposed of onshore in accordance with the waste management plan. Oil in water concentration of liquids discharged to the sea will not exceed 15mg/l. PFW will also be sampled and chemically analysed.	Well Test Supervisor
Drilling - Bilge water discharges		To manage and control bilge water generated during drilling operations so as to protect water quality and prevent degradation of the marine environment, in accordance with applicable marine pollution prevention requirements.	Bilge water from MODU machinery spaces shall be contained, treated via the oily water separator in accordance with MARPOL Annex I, and any slops not adequately treatable onboard shall be transferred to shore for approved handling and disposal, to protect water quality and prevent marine environmental degradation.	OIM
Drilling - Deck Drainage		To manage and control bilge water generated during drilling operations so as to protect water quality and prevent degradation of the marine environment, in accordance with applicable marine pollution prevention requirements.	The MODU deck drainage system shall segregate clean and oily water, allowing uncontaminated rainwater to be discharged directly overboard while all oily water is captured in holding tanks and treated through the oily water separator in accordance with MARPOL Annex I, to protect water quality and prevent marine environmental degradation.	OIM
Drilling - Drill floor		To manage and control drill floor drainage during drilling operations so as to prevent contamination of deck runoff and protect water quality, thereby avoiding degradation of the marine environment.	Drill-floor drainage containing synthetic-based mud (SBM) and water shall be captured, routed to holding tanks, and treated through the oily water separator in accordance with MARPOL Annex I, with no uncontrolled discharge to sea, to protect water quality and prevent marine environmental degradation.	OIM

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
Drilling - Food Waste		To manage and control food waste generated during drilling operations so as to prevent discharge to the marine environment, protect water quality, and avoid degradation of the marine environment, in accordance with applicable marine pollution prevention requirements.	Biodegradable food waste generated from galleys, mess rooms, pantries, and accommodation areas shall be managed, treated, and discharged only in accordance with MARPOL Annex V, to prevent marine pollution, protect water quality, and avoid degradation of the marine environment during drilling operations.	OIM
Drilling - Solid Waste	Water quality degradation / Marine water quality, benthic habitats and biota, marine fauna, fisheries and socio-economic receptors	To manage and control solid waste generated during drilling operations so as to prevent discharge to the marine environment, protect water quality, and avoid degradation of the marine environment, in accordance with applicable marine pollution prevention requirements.	All solid waste generated during drilling operations shall be segregated, clearly labelled, securely stored, and returned to shore for treatment and disposal at approved facilities, with no plastics, domestic waste, or maintenance waste discharged overboard, to protect water quality and prevent marine environmental degradation.	Logistics Manager
			Solid waste containers and offshore-rated rubbish skips shall be covered, secured, and managed under good housekeeping practices to prevent loss of waste overboard and the generation of foreign object debris (FOD), thereby protecting water quality, the marine environment, and aviation operations, in accordance with applicable marine pollution prevention requirements.	Logistics Manager
MODU and support vessel operations - fuel combustion	Increase the cumulative impact on air quality and climate change / Atmospheric air quality, global system (global receptors),	To minimise emissions from fuel combustion associated with MODU and support vessel operations during drilling activities, so as to limit impacts on air quality, through efficient operations and compliance with MARPOL Annex VI and the environmental protection requirements of Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	Diesel-powered generation equipment on the MODU and support vessels shall be maintained and operated within OEM specifications under a preventive maintenance system to minimise air emissions from fuel combustion, in compliance with MARPOL Annex VI and the environmental protection requirements of Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	Drilling Superintendent
			Fuel combustion associated with MODU, and support vessel fired machinery shall utilise low-sulphur-content fuels to optimise fuel efficiency and minimise atmospheric emissions, in compliance with MARPOL Annex VI and the environmental protection requirements of Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	Well Operations Manager

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
MODU - Fugitive emissions	Increase the cumulative impact on air quality and climate change / Atmospheric air quality, global system (global receptors)	To minimise fugitive emissions from the MODU during drilling operations, including unintentional releases from equipment, systems, and processes, so as to limit cumulative impacts on air quality and greenhouse gas emissions, consistent with efficient operations and applicable environmental protection requirements.	Fugitive emissions from MODU HVAC and similar systems shall be minimised through an implemented leak detection and repair (LDAR) program, with timely identification, repair, and verification of leaks, to limit impacts on air quality and greenhouse gas emissions	Drilling Superintendent
Well Test Package - Fugitive Emission	Increase the cumulative impact on air quality and climate change / Atmospheric air quality, global system (global receptors)	To minimise fugitive emissions from the well test package during drilling and testing operations, including unintentional releases from valves, connections, and associated equipment, so as to limit cumulative impacts on air quality and greenhouse gas emissions, consistent with efficient operations and applicable environmental protection requirements.	Fugitive emissions from the well test package shall be minimised through routine leak monitoring using handheld gas detection devices by well flowback and testing personnel, enabling early identification and control of small-scale leaks from hydrocarbon-containing vessels and pipework to limit impacts on air quality and greenhouse gas emissions.	Well Test Supervisor
			Fugitive emissions from the well test package shall be detected and controlled using temporary fixed Dräger gas detection and alarm units installed at strategic locations throughout the well flowback and testing area, to enable early identification of leaks and minimise impacts on air quality and greenhouse gas emissions.	Well Test Supervisor
Well Test Package - Controlled Emission	Increase the cumulative impact on air quality and climate change / Atmospheric air quality, global system (global receptors).	To manage and minimise controlled emissions from the well test package during drilling and testing operations, so as to limit cumulative impacts on air quality and greenhouse gas emissions, through efficient operation of testing equipment and adherence to applicable environmental protection requirements.	Controlled emissions from the well test package shall be managed through metering and recording of all fuel consumed during well testing, to enable verification of efficient operation and minimisation of air quality and greenhouse gas impacts in accordance with applicable environmental protection requirements.	Well Test Supervisor
			Controlled emissions from the well test package shall be managed through implementation of the approved well flowback and testing procedures, including continuous (24/7) flare watch, verified operation of continuous ignition and pilot systems, and use of an agreed well test checklist, to ensure efficient	Well Test Supervisor

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
			combustion and minimise air quality and greenhouse gas impacts.	
			Controlled emissions from the well test package shall be minimised through the use of a high-efficiency flare burner design to promote stable combustion and maximise destruction efficiency, thereby limiting impacts on air quality and greenhouse gas emissions during drilling and testing operations.	Well Test Supervisor
MODU – General Operations	Changes to marine fauna behaviour due to light emissions / Marine fauna, Avifauna (including flying and surface feeding birds), Plankton.	To manage and minimise light emissions from general MODU operations during drilling activities so as to avoid or reduce disturbance to marine fauna and prevent changes to natural behaviour patterns, while maintaining safe operations and compliance with applicable environmental protection requirements.	Lighting on the MODU and support vessels shall be limited to those required for safe operations and navigation, and configured to meet conventional navigation rules, to minimise unnecessary light emissions and reduce disturbance to marine fauna while maintaining personnel safety and maritime operational safety.	Drilling Superintendent
			Lighting on supply vessels shall be managed to minimise non-essential deck and work lights directed toward the water, particularly when vessels are outside the 500 m exclusion zone, transiting at night, or alongside, while maintaining lighting required for safe navigation and deck operations, to reduce disturbance to marine fauna.	Senior Drilling Supervisor
			Where practicable, MODU operational activities shall be limited or scheduled to minimise disturbance during the November–March sea turtle nesting and migration period, to reduce potential disruption to turtle migratory pathways while maintaining safe and efficient drilling operations.	Well Operations Manager
MODU Operations Drilling	Changes to marine fauna behaviour due to noise emissions / Marine Mammals, Marine Turtles, Fish, Seabirds, Plankton communities, Benthic Habitats and Biota and Fisheries resources	To manage and minimise noise emissions from MODU drilling operations so as to avoid or reduce disturbance to marine fauna and prevent changes to natural behaviour patterns, while maintaining safe and efficient drilling activities and compliance with applicable environmental protection requirements.	Underwater noise and vibration from MODU drilling operations and associated support vessels shall be minimised through maintenance of noise-generating machinery in accordance with OEM specifications and optimised support-vessel thruster use and speed management, to reduce disturbance to marine fauna while maintaining safe and efficient operations.	OIM

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
MODU Operations - Working Supply Vessels	Changes to marine fauna behaviour due to noise emissions / Marine Mammals, Marine Turtles, Fish, Seabirds, Plankton communities, Benthic Habitats and Biota and Fisheries resources	To manage and minimise noise emissions arising from MODU operations involving support and supply vessels during drilling activities, so as to avoid or reduce disturbance to marine fauna and prevent changes to natural behaviour patterns, while maintaining safe and efficient marine operations and compliance with applicable environmental protection requirements.	Noise emissions from MODU support and supply vessel operations shall be minimised through use of DP2 vessels to reduce manual station-keeping intervention and optimised thruster operation and speed management by the vessel Master, to limit disturbance to marine fauna while maintaining safe and efficient marine operations.	Vessel Master
MODU Operations - Helicopter Take-off and Landing	Changes to marine fauna behaviour due to noise emissions / Marine Mammals, Marine Turtles, Fish, Seabirds, Plankton communities, Benthic Habitats and Biota and Fisheries resources	To manage and minimise noise emissions from helicopter take-off, landing, and flight operations associated with drilling activities, so as to avoid or reduce disturbance to marine fauna and prevent changes to natural behaviour patterns, while maintaining aviation safety and operational efficiency	Noise from helicopter take-off, landing, and flight operations shall be minimised through optimised flight scheduling, reduced idling on the helideck, daylight-only operations (except SAR/Medevac), and use of modern aircraft, to limit disturbance to marine fauna while maintaining aviation safety and operational efficiency.	Drilling Superintendent
Well Test Package	Short term behavioural / disruption impacts on local wildlife including noise vibration / Marine Mammals, Marine Turtles, Fish, Seabirds, Plankton communities, Benthic Habitats and Biota and Fisheries resources	To manage and minimise noise and vibration generated by the well test package during drilling and testing operations, so as to avoid or reduce short-term behavioural disturbance to local wildlife, while maintaining safe, efficient operations and compliance with applicable environmental protection requirements.	Noise and vibration from the well test package shall be minimised by optimising flaring duration and timing to achieve DST objectives with the least practicable flaring, thereby reducing short-term behavioural disturbance to local wildlife while maintaining safe and efficient operations.	Well Test Supervisor
Well test package - Versatile Seismic	Changes to marine fauna behaviour due to noise emissions /	To manage and minimise noise emissions associated with deployment and operation of the well	Noise emissions from deployment and operation of the Versatile Seismic Imager (VSI) tool shall be minimised by using the lower-impact VSI tool in preference to	Drilling Superintendent

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
Imager Tool (SLB)	Marine Mammals, Marine Turtles, Fish, Seabirds, Plankton communities, Benthic Habitats and Biota and Fisheries resources	test package Versatile Seismic Imager (VSI) tool during drilling and testing activities, so as to avoid or reduce disturbance to marine fauna and prevent changes to natural behaviour patterns, while maintaining data quality, operational safety, and compliance with applicable environmental protection requirements.	older VSP technology and by executing operations strictly in accordance with the agreed Company and Vendor procedures, to reduce disturbance to marine fauna while maintaining data quality and operational safety.	
Socio-Economic Development	Disruption in daily living and movement patterns / Primary Human and Socio-Economic Receptors, Institutional and governance receptors	To manage drilling activities in a manner that minimises disruption to local communities' daily living and movement patterns, while supporting socio-economic development, maintaining safe operations, and complying with applicable regulatory and stakeholder engagement requirements.	Drilling activities shall be conducted under approved OH&S policies and procedures that manage work practices, movements, and interfaces with the public to minimise disruption to local communities' daily living and movement patterns, while supporting socio-economic development and maintaining safe operations.	Drilling Superintendent
			Prior to commencement of drilling activities, the ANP shall notify relevant maritime authorities and regulatory agencies of the presence and movements of the MODU and support vessels within the PSC contract area and Timor-Leste Territory, to minimise disruption to marine traffic and local movement patterns while supporting safe operations and socio-economic activity.	Drilling Superintendent
			Drilling activities shall be conducted only after appropriate authorities have been formally informed, with records maintained to demonstrate timely notification, to minimise disruption to local communities' daily living and movement patterns while supporting safe operations and socio-economic activity	Drilling Superintendent
Socio-Economic Development	Changes in occupational opportunities / Primary Human and Community receptors, Economic Receptors,	To support socio-economic development by promoting fair and transparent access to occupational opportunities associated with drilling activities, while minimising adverse	Where practicable, employment opportunities arising from drilling activities will prioritise suitably qualified workers from Timor-Leste, through transparent recruitment processes, to support socio-economic development while maintaining operational safety and competence.	Managing Director

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
	Institutional and governance receptors	effects on existing livelihoods and complying with applicable regulatory and stakeholder engagement requirements.	Where practicable, training and skills-development programs shall be implemented for Timor-Leste personnel engaged in drilling activities to enhance workforce capability, support socio-economic development, and maintain operational safety and competence.	Managing Director
			Drilling activities shall be conducted in accordance with a robust, implemented, and enforced Waste Management Plan, to prevent contamination, protect existing livelihoods, and support socio-economic development while complying with applicable regulatory and stakeholder engagement requirements	Drilling Superintendent
			Employment and training opportunities provided to Timor-Leste workers during drilling activities shall be formally recorded and maintained, to demonstrate transparent access to occupational opportunities and support socio-economic development while complying with regulatory and stakeholder engagement requirements.	Managing Director

Table 51 Environmental performance objectives, standards and responsible person for each Unplanned Activities.

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
Drilling - Uncontrolled release of Hydrocarbon at surface - Well blow out at 17 1/2-inch mud line	GHGs to the atmosphere, toxic and physical impacts from hydrocarbons on marine fauna and flora / Global Climate System, Air Quality Receptors, Marine Water Column, Benthic Habitats and Biota, Marine Fauna, Human and Socio-Economic Receptors including fisheries and coastal communities	To prevent any uncontrolled release of hydrocarbons at surface during drilling operations, including a potential well blowout at the 17½-inch mudline section, in order to avoid greenhouse gas emissions to the atmosphere and prevent toxic, physical, and ecological impacts on marine fauna and flora, while maintaining well integrity, safe operations, and compliance with applicable regulatory and environmental protection requirements.	During drilling of the 17½-inch mudline section, potential shallow gas shall be identified early and managed to prevent uncontrolled surface hydrocarbon release through implementation of continuous ROV bubble watch, availability of appropriate kill-weight mud, and controlled management of any gas pocket to allow safe depletion without escalation, in accordance with good oilfield practice, Decree-Law No. 32/2016, Ministerial Diploma No. 46/2017, and relevant industry standards (including API Standard 53 and IADC well control guidance).	Drilling Superintendent
Drilling - Uncontrolled release of Hydrocarbon at surface - Well blowout 12 1/4-inch section	GHGs to the atmosphere, toxic and physical impacts from hydrocarbons on marine fauna and flora / Global Climate System, Air Quality Receptors, Marine Water Column, Benthic Habitats and Biota, Marine Fauna, Human and Socio-Economic Receptors including fisheries and coastal communities	To prevent any uncontrolled release of hydrocarbons to surface during drilling of the 12¼-inch section, including a potential well blowout, in order to avoid greenhouse gas emissions to the atmosphere and prevent toxic, physical, and ecological impacts on marine fauna and flora, while maintaining well integrity, safe operations, and compliance with applicable regulatory and environmental protection requirements.	During drilling of the 12¼-inch section, uncontrolled surface release of hydrocarbons shall be prevented through effective primary and secondary well barriers, comprising a bespoke drilling fluid system to maintain wellbore pressure integrity and a fully functional, independently verified BOP and well control system, designed, certified, and operated in accordance with good oilfield practice, Decree-Law No. 32/2016, Ministerial Diploma No. 46/2017, API Standard 53, and relevant IADC well control guidance.	Well Operations Manager
			During drilling of the 12¼-inch section, uncontrolled surface release of hydrocarbons shall be prevented through implementation of comprehensive well control procedures, including continuous monitoring and verification of well pressures to detect abnormal conditions at the earliest practicable stage, in accordance with good oilfield practice, Decree-Law No. 32/2016, Ministerial Diploma No. 46/2017, API Standard 53, and relevant IADC well control guidance	Drilling Superintendent
			During drilling of the 12¼-inch section, well control competency shall be assured by ensuring drilling	Well Operations Manager

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
			contractor and Company personnel are trained, assessed, and certified to IWCF Level 3 or Level 4 as appropriate to their role, with ongoing well control training and drills conducted and recorded, in accordance with good oilfield practice, Decree-Law No. 32/2016, Ministerial Diploma No. 46/2017, and relevant IADC well control guidance (and consistent with the competency expectations supporting API Standard 53 well control system integrity)	
			During drilling of the 12¼-inch section, uncontrolled surface release of hydrocarbons shall be prevented through independent third-party verification of safety-critical well control systems, including the BOP stack, control system, choke and kill manifold, diverter system, and associated safety-critical elements (SCEs), with verification records maintained, in accordance with good oilfield practice, Decree-Law No. 32/2016, Ministerial Diploma No. 46/2017, API Standard 53, and relevant IADC well control guidance	Drilling Superintendent
			A well control bridging document shall be prepared, approved, and implemented prior to drilling the 12¼-inch section, clearly aligning roles, responsibilities, procedures, and interfaces between the Company and the drilling contractor, to ensure consistent application of good oilfield practice and effective well control in accordance with Decree-Law No. 32/2016, Ministerial Diploma No. 46/2017, API Standard 53, and relevant IADC well control guidance.	Drilling Superintendent
			During drilling of the 12¼-inch section, uncontrolled surface release of hydrocarbons shall be prevented through verification that all well control–related Safety-Critical Elements (SCEs) meet their defined Performance Standards, confirming functionality, reliability, availability, and survivability, in accordance with good oilfield practice, Decree-Law No. 32/2016, Ministerial Diploma No. 46/2017, API Standard 53, and relevant IADC well control guidance	Drilling Superintendent
			During drilling of the 12¼-inch section, uncontrolled surface release of hydrocarbons shall be prevented through periodic testing, inspection, and maintenance of the Blowout	Drilling Superintendent

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
			Preventer (BOP) system, to verify continued functionality and integrity of the primary well control barrier, in accordance with good oilfield practice, Decree-Law No. 32/2016, Ministerial Diploma No. 46/2017, API Standard 53, and relevant IADC well control guidance.	
			Uncontrolled surface release of hydrocarbons during drilling of the 12¼-inch section shall be mitigated through established and maintained well control contingency arrangements, including an approved Relief Well Plan (SGBU-GEN-OPS-0034 – Chuditch-2) and a contracted specialist well control provider (Wild Well Control Inc.), with documented procedures, equipment, and mobilisation capability in place to respond promptly and effectively to a well control emergency, consistent with good oilfield practice and applicable regulatory requirements.	Well Operations Manager
			During drilling of the 12¼-inch section, uncontrolled surface release of hydrocarbons shall be prevented and effectively managed through approved and implemented Emergency Response and Oil Spill Contingency arrangements, including a comprehensive ERP and OSCP addressing credible well control and spill scenarios, supported by trained Incident Management Team (IMT) and Crisis Management Team (CMT) personnel and regular drills, to ensure preparedness and timely response in accordance with applicable regulatory requirements and good oilfield practice.	WOM OIM Vessel Masters Drilling Superintendent
			During drilling of the 12¼-inch section, uncontrolled surface release of hydrocarbons shall be prevented and effectively managed through an approved Shipboard Oil Pollution Emergency Plan (SOPEP), with drilling crews trained and familiarised with the facility ERP, SOPEP, and the Company OSCP, to ensure prompt, coordinated response to any hydrocarbon release in accordance with applicable regulatory requirements and good oilfield practice.	WOM OIM Vessel Masters Drilling Superintendent

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
Drilling - Uncontrolled release of Hydrocarbon at surface - Errant Vessel enters 500M exclusion zone - collision with MODU resulting in uncontrolled release of hydrocarbon	GHGs to the atmosphere, toxic and physical impacts from hydrocarbons on marine fauna and flora / Global Climate System, Air Quality Receptors, Marine Water Column, Benthic Habitats and Biota, Marine Fauna, Human and Socio-Economic Receptors including fisheries and coastal communities	To prevent uncontrolled release of hydrocarbons resulting from vessel collision with the MODU, including an errant vessel entering the 500 m exclusion zone during drilling operations, in order to avoid greenhouse gas emissions to the atmosphere and prevent toxic and physical impacts on marine fauna and flora, while maintaining facility integrity, navigational safety, and compliance with applicable maritime and environmental protection requirements.	The risk of vessel collision with the MODU shall be minimised through continuous vessel traffic monitoring, proactive communication with approaching vessels, and compliant watchkeeping in accordance with international maritime regulations and contracted vessel procedures, to prevent unauthorised entry into the 500 m exclusion zone and avoid uncontrolled hydrocarbon release while maintaining navigational safety and facility integrity	OIM Vessel Masters
			The risk of vessel collision with the MODU shall be minimised through formal notification and continuous communication with marine users, including issuance of a Notice to Mariners by the ANP and coordination with maritime regulators and relevant authorities regarding the presence, location, and progress of drilling activities within the PSC Contract Area and Timor-Leste Territory, in accordance with good marine and oilfield practice, relevant API guidance, and the environmental protection requirements of Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	Drilling Superintendent
			The risk of uncontrolled hydrocarbon release arising from vessel collision with the MODU, including unauthorised entry into the 500 m exclusion zone, shall be managed and mitigated through approved Emergency Response and Oil Spill Contingency arrangements, comprising a comprehensive ERP and OSCP addressing collision-related spill scenarios, supported by trained Incident Management Team (IMT) and Crisis Management Team (CMT) personnel and regular drills, in accordance with good oilfield practice, relevant API guidance, and the environmental protection requirements of Timor-Leste legislation.	WOM OIM Vessel Masters Drilling Superintendent

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
Drilling - Uncontrolled release of Hydrocarbon at surface - Vessel to vessel and vessel to MODU Collision in 500m exclusion zone resulting in uncontrolled release of hydrocarbon	GHGs to the atmosphere, toxic and physical impacts from hydrocarbons on marine fauna and flora / Global Climate System, Air Quality Receptors, Marine Water Column, Benthic Habitats and Biota, Marine Fauna, Human and Socio-Economic Receptors including fisheries and coastal communities	To prevent any uncontrolled release of hydrocarbons resulting from vessel-to-vessel or vessel-to-MODU collisions within the 500 m exclusion zone during drilling operations, in order to avoid greenhouse gas emissions to the atmosphere and prevent toxic and physical impacts on marine fauna and flora, while maintaining facility integrity, navigational safety, and compliance with applicable maritime and environmental protection requirements.	The risk of vessel-to-vessel and vessel-to-MODU collision within the 500 m petroleum safety zone shall be minimised by restricting entry to DP2-class vessels only, ensuring enhanced station-keeping capability and collision avoidance, in accordance with good marine and oilfield practice, relevant API guidance, and the environmental protection requirements of Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	Well Operations Manager
			The risk of uncontrolled hydrocarbon release arising from vessel-to-vessel or vessel-to-MODU collision within the 500 m petroleum safety zone shall be minimised through the use of double-hulled or double-skinned (or inboard-located) hydrocarbon product tanks, providing passive impact protection and containment integrity, in accordance with MARPOL Annex I, good marine and oilfield practice, relevant API guidance, and the environmental protection requirements of Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	Well Operations Manager
			The risk of vessel-to-vessel and vessel-to-MODU collision within the 500 m exclusion zone shall be minimised through continuous navigation lighting and watchkeeping on the MODU and support vessels, with lighting and lookout arrangements compliant with international navigation rules, to maintain vessel awareness, prevent collision, and avoid uncontrolled hydrocarbon release, in accordance with good marine and oilfield practice, relevant API guidance, and Timor-Leste environmental protection legislation.	OIM and Masters
			The risk of vessel-to-vessel and vessel-to-MODU collision within the 500 m exclusion zone shall be minimised through specification-based verification and independent assurance of vessel and MODU systems, including independent audits (e.g., OVID) and verification of Safety-Critical Elements (SCEs) against approved performance standards, to ensure collision-prevention and containment systems are fit-for-purpose, in accordance with good marine and oilfield practice,	Well Operations Manager

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
			relevant API guidance, and Timor-Leste environmental protection legislation.	
			The risk of vessel-to-vessel and vessel-to-MODU collision within the 500 m exclusion zone shall be minimised by maintaining continuous, open radio and satellite phone communication between the MODU and all supply vessels, to ensure timely coordination of vessel movements, preserve navigational safety, and prevent uncontrolled hydrocarbon release, in accordance with good marine and oilfield practice, relevant API guidance, and Timor-Leste environmental protection legislation.	OIM and Masters
			Where practicable, MODU and support vessel operations shall be conducted on the leeward side of the MODU to reduce relative vessel motion, improve station-keeping stability, and minimise collision risk within the 500 m exclusion zone, thereby preventing uncontrolled hydrocarbon release, in accordance with good marine and oilfield practice, relevant API guidance, and Timor-Leste environmental protection legislation.	OIM and Masters
			The risk of vessel-to-vessel and vessel-to-MODU collision within the 500 m exclusion zone shall be minimised by maintaining current and accurate weather forecast information on the MODU and all vessels and using that information to plan and manage vessel movements and operations, in accordance with good marine and oilfield practice, relevant API guidance, and Timor-Leste environmental protection legislation.	OIM and Masters
			The risk of uncontrolled hydrocarbon release arising from vessel-to-vessel or vessel-to-MODU collision within the 500 m exclusion zone shall be managed and mitigated through approved Emergency Response and Oil Spill Contingency arrangements, including a comprehensive ERP and OSCP addressing collision and spill scenarios, supported by trained Incident Management Team (IMT) and Crisis Management Team (CMT) personnel and regular drills, in accordance with good oilfield practice, relevant API guidance, and	WOM OIM Vessel Masters Drilling Superintendent

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
			Timor-Leste environmental protection legislation	
			The risk of uncontrolled hydrocarbon release arising from vessel-to-vessel or vessel-to-MODU collision within the 500 m exclusion zone shall be managed through an approved Shipboard Oil Pollution Emergency Plan (SOPEP) and effective crew familiarisation with the facility ERP, SOPEP, and Company OSCP, to ensure prompt, coordinated response to any collision-related spill, in accordance with good marine and oilfield practice, relevant API guidance, MARPOL Annex I (SOPEP), and Timor-Leste environmental protection legislation (including Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017).	WOM OIM Vessel Masters Drilling Superintendent
Drilling - Uncontrolled release of Hydrocarbon at surface - Spillage during refuelling - Vessel to MODU resulting in uncontrolled release of hydrocarbon	GHGs to the atmosphere, toxic and physical impacts from hydrocarbons on marine fauna and flora / Global Climate System, Air Quality Receptors, Marine Water Column, Benthic Habitats and Biota, Marine Fauna, Human and Socio-Economic Receptors including fisheries and coastal communities	To prevent any uncontrolled release of hydrocarbons during vessel-to-MODU refuelling operations associated with drilling activities, in order to avoid greenhouse gas emissions to the atmosphere and prevent toxic and physical impacts on marine fauna and flora, while maintaining safe transfer operations, facility integrity, and compliance with applicable maritime and environmental protection requirements.	Vessel-to-MODU refuelling operations shall be planned and conducted only under suitable environmental and operational conditions, including daylight hours and calm weather/sea state, and authorised at the discretion of the Vessel Master and OIM, to minimise the risk of hydrocarbon spillage and prevent environmental harm, in accordance with good marine and oilfield practice, relevant API guidance, and Timor-Leste environmental protection legislation (including Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017).	OIM and Vessel Masters
			Vessel-to-MODU refuelling operations shall be conducted using fuel hoses and couplings that are inspected, maintained, and certified as fit-for-purpose, with integrity checks completed prior to transfer and ongoing maintenance managed through the MODU Planned Maintenance (PM) system, to prevent loss of containment and uncontrolled hydrocarbon release, in accordance with good marine and oilfield practice, relevant API guidance, and Timor-Leste environmental protection legislation (including Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017).	OIM and Senior Day Supervisor
			Vessel-to-MODU refuelling operations shall be conducted using dry-break couplings on all hydrocarbon and synthetic-based mud (SBM) transfer lines, with couplings maintained, certified, and	OIM and Senior Day Supervisor

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
			managed through the MODU Planned Maintenance (PM) system, to prevent loss of containment and uncontrolled release during connection, disconnection, or emergency separation, in accordance with good marine and oilfield practice, relevant API guidance, and Timor-Leste environmental protection legislation (including Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017).	
			Vessel-to-MODU refuelling operations shall be conducted using fuel and SBM transfer hoses fitted with flotation collars, with collars maintained, inspected, and certified through the MODU Planned Maintenance (PM) system, to prevent hose submergence, loss of control, and uncontrolled hydrocarbon release, in accordance with good marine and oilfield practice, relevant API guidance, and Timor-Leste environmental protection legislation (including Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017).	OIM and Senior Day Supervisor
			Vessel-to-MODU refuelling operations shall be continuously monitored for loss of containment through active visual surveillance of hoses, couplings, and the sea surface, together with real-time monitoring of fuel flow gauges on the MODU, to enable immediate detection and response to any leak or spill, in accordance with good marine and oilfield practice, relevant API guidance, and Timor-Leste environmental protection legislation (including Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017).	OIM and Vessel Masters
			The risk of uncontrolled hydrocarbon release during vessel-to-MODU refuelling operations shall be managed through approved emergency preparedness and response arrangements, including a current Emergency Response Plan (ERP) and Oil Spill Contingency Plan (OSCP) that explicitly address refuelling and spill scenarios, supported by trained and exercised Incident Management Team (IMT) and Crisis Management Team (CMT), in accordance with good oilfield practice, relevant API guidance, and Timor-Leste environmental protection legislation (including Decree-Law No.	WOM OIM Vessel Masters Drilling Superintendent

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
			32/2016 and Ministerial Diploma No. 46/2017).	
			Vessel-to-MODU refuelling operations shall be supported by an approved Shipboard Oil Pollution Emergency Plan (SOPEP) and effective crew familiarisation with the facility Emergency Response Plan (ERP) and Company Oil Spill Contingency Plan (OSCP), to ensure rapid, coordinated response to any loss of containment during fuel transfer, in accordance with good marine and oilfield practice, MARPOL Annex I, relevant API guidance, and the environmental protection requirements of Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	WOM OIM Vessel Masters Drilling Superintendent
DST - Uncontrolled release of Hydrocarbon at surface - Flare Burner drop out resulting in uncontrolled release of hydrocarbon	GHGs to the atmosphere, toxic and physical impacts from hydrocarbons on marine fauna and flora / Global Climate System, Air Quality Receptors, Marine Water Column, Benthic Habitats and Biota, Marine Fauna, Human and Socio-Economic Receptors including fisheries and coastal communities	To prevent any uncontrolled release of hydrocarbons at surface during drill stem testing (DST) arising from flare burner dropout or loss of ignition, in order to avoid greenhouse gas emissions to the atmosphere and prevent toxic and physical impacts on marine fauna and flora, while maintaining well control, safe testing operations, and compliance with applicable environmental protection, safety, and operational requirements.	During drill stem testing (DST), uncontrolled hydrocarbon release due to flare burner dropout or loss of ignition shall be prevented through the installation and continuous operation of a high-energy flare ignition system, including multiple continuously lit pilots with flame detection and automatic status feedback, ensuring reliable ignition and safe combustion of hydrocarbons, in accordance with good oilfield practice, relevant API guidance, and Timor-Leste environmental protection legislation (including Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017).	Well Test Supervisor
			The risk of uncontrolled hydrocarbon release at surface during drill stem testing (DST) arising from flare burner dropout or loss of ignition shall be managed through approved emergency preparedness and response arrangements, including a current Emergency Response Plan (ERP) and Oil Spill Contingency Plan (OSCP) that explicitly address DST flaring and loss-of-ignition scenarios, supported by trained and exercised Incident Management Team (IMT) and Crisis Management Team (CMT) personnel, in accordance with good oilfield practice, relevant API guidance, and Timor-Leste environmental protection legislation (including Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017).	WOM OIM Vessel Masters Drilling Superintendent

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
			During drill stem testing (DST), the risk of uncontrolled hydrocarbon release at surface resulting from flare burner dropout or loss of ignition shall be managed through an approved Shipboard Oil Pollution Emergency Plan (SOPEP) and effective crew familiarisation with the facility Emergency Response Plan (ERP) and Company Oil Spill Contingency Plan (OSCP), ensuring prompt, coordinated response to any loss of containment, in accordance with good oilfield practice, relevant API guidance, MARPOL Annex I, and the environmental protection requirements of Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	WOM OIM Vessel Masters Drilling Superintendent
DST - Uncontrolled release of SBM	Temporary physical and toxic effects of SBM on marine fauna and flora / Marine water Quality, benthic habitats and biota, marine fauna.	To prevent any uncontrolled release of synthetic-based mud (SBM) during drill stem testing (DST) activities, in order to avoid temporary physical smothering and toxic effects on marine fauna and flora, while maintaining safe testing operations, effective containment of fluids, and compliance with applicable environmental protection and operational requirements.	During drill stem testing (DST), uncontrolled release of synthetic-based mud (SBM) shall be prevented by positive isolation of all overboard and diverted discharge lines and formal verification of line-up and isolation prior to SBM displacement, ensuring full containment of SBM in accordance with good oilfield practice, relevant API guidance, and the environmental protection requirements of Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	Senior Drilling Supervisor Tool Pusher
			During drill stem testing (DST), the risk of uncontrolled release of synthetic-based mud (SBM) shall be managed through approved emergency preparedness and response arrangements, including a current Emergency Response Plan (ERP) and Oil Spill Contingency Plan (OSCP) that explicitly address SBM loss-of-containment scenarios, supported by trained and exercised Incident Management Team (IMT) and Crisis Management Team (CMT) personnel, in accordance with good oilfield practice, relevant API guidance, and the environmental protection requirements of Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	WOM OIM Vessel Masters Drilling Superintendent
			During drill stem testing (DST), the risk of uncontrolled release of synthetic-based mud (SBM) shall be managed through an approved Shipboard Oil Pollution Emergency Plan (SOPEP) and effective crew familiarisation with the facility	WOM OIM Vessel Masters Drilling Superintendent

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
			Emergency Response Plan (ERP) and Company Oil Spill Contingency Plan (OSCP), ensuring prompt, coordinated response to any SBM loss-of-containment event, in accordance with good oilfield practice, relevant API guidance, MARPOL Annex I, and the environmental protection requirements of Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	
Drilling - Contained and localised Oil Spill	Temporary physical and toxic effects of oil on marine fauna and flora / Marine water quality, benthic habitats and biota, marine fauna.	To effectively manage and minimise the consequences of any contained and localised oil spill arising from drilling activities, in order to limit the duration and extent of temporary physical smothering and toxic effects on marine fauna and flora, while maintaining safe operations and ensuring timely response in accordance with applicable environmental protection and spill response requirements.	Any contained and localised oil spill arising from drilling activities shall be prevented from escalating and promptly managed through the use of drip trays and sump trays beneath engines and equipment to contain leaks, together with immediate activation of the Shipboard Oil Pollution Emergency Plan (SOPEP), in accordance with good oilfield practice, relevant API guidance, MARPOL Annex I, and the environmental protection requirements of Decree-Law No. 32/2016 and Ministerial Diploma No. 46/2017.	OIM and Vessel Master
Drilling Operations - Introduction of Invasive Marine Species (IMS) from Ballast Water	Changes in the marine ecology / Benthic Habitat and Biota, Native Fish Populations, fisheries and Socio-Economic Receptors and Protected areas and Biodiversity Values	To prevent the introduction and spread of invasive marine species (IMS) through ballast water associated with drilling activities, in order to protect native marine ecosystems and avoid adverse changes to marine ecology, while ensuring ballast water management is conducted safely and in compliance with applicable environmental protection and biosecurity requirements.	Ballast water associated with the MODU and all support vessels shall be managed to meet Australian biosecurity entry requirements, including carriage and implementation of an approved Ballast Water Management Plan and valid Ballast Water Management Certificate (or approved exemption), with records available for inspection, to prevent the introduction of invasive marine species, consistent with Australia's ballast water biosecurity framework under the Biosecurity Act 2015 and the Australian Ballast Water Management Requirements administered by the Australian biosecurity authority (formerly AQIS, now within DAFF).	Well Operations Manager

Activity	Impact	Performance Objective	Performance Standard	Responsible Person
Drilling Operations - Introduction of Invasive Marine Species (IMS) Biofouling on MODU and Vessel Hulls	Changes in the marine ecology / Benthic Habitat and Biota, Native Fish Populations, fisheries and Socio-Economic Receptors and Protected areas and Biodiversity Values	To prevent the introduction and establishment of invasive marine species (IMS) through biofouling on MODU and support vessel hulls during drilling activities, in order to protect native marine ecosystems and avoid adverse changes to marine ecology, while maintaining safe marine operations and compliance with applicable biosecurity and environmental protection requirements.	The introduction of invasive marine species (IMS) via hull biofouling shall be prevented by ensuring the MODU and all support vessels implement and comply with an approved Biofouling Management Plan (BMP) that meets Australian biosecurity requirements administered by Australian Quarantine and Inspection Service (now DAFF), including pre-operation vessel audits, maintenance of a Biofouling Record Book in accordance with the Biosecurity Amendment (Biofouling Management) Regulations 2021, and retention of records for inspection. Controls shall be applied consistently for vessels entering or exiting Australian waters and aligned with applicable Timor-Leste regulatory requirements, in accordance with good marine practice and relevant API guidance.	Well Operations Manager

12.2 Cost of Mitigation Measures

SGBU has budgeted for all anticipated and credible mitigation measures and monitoring requirements to be correctly implemented.

Table 52 Summary of estimated mitigation costs

Activity	Timing	Estimated Cost (USD)
EIA including spill and cuttings modelling	April 2024 - Current	$130,000.00
EBS including SOW.	January 2025	$634,000.00
Tier 1/Tier 2/Tier 3	July 2025	To be determined
Drilling Environmental Monitoring Plan	Q/2 2026	$150,000.00
Post Drilling EBS Survey	Q2 2026	$250,000.00
Total		**$1,164,000.00**

12.3 Environmental Monitoring Program

The proposed environmental performance monitoring activities are based on the environmental performance objectives, standards, and measurement criteria through inspections and record keeping.

Additionally, environmental quality monitoring survey is proposed to occur after drilling has been completed and before the MODU demobilises from site. The primary objective of an environmental monitoring program after drilling is to determine the extent of drill cuttings and disturbance to the seabed in the vicinity of the MODU. The sampling will be conducted using similar methods and sampling design to the baseline survey. The outcome of the environmental monitoring will be compared with baseline data gathered during EBS, which presented in description of the existing environment.

The scope of the monitoring program will be agreed with ANP prior to drilling. SGBU envisage that the monitoring plan will employ a similar sampling design and analysis techniques as employed during the recent environmental baseline survey in regard to sediment sampling and video transects so as to obtain comparative samples assessments of impacts.

12.4 Institutional Roles and Responsibilities

Table 53 Roles and Responsibilities for HSE

Position	Responsibility
SGBU Chief Executive Officer & Managing Director.	• Provides strategic leadership and accountability for environmental performance. • Endorses and upholds the company's Environmental Policy and sustainability objectives. • Ensures environmental compliance and adequate resources for implementation. • Holds management accountable for meeting environmental performance standards. • Reviews performance reports and drives continual improvement across operations. • Represents the company in environmental and regulatory matters. • Obtain the Authority's permission and approval with regards to the relevant environmental requirements • Verify that contractor's environmental policies, standards and procedures are acceptable and conform to applicable laws and regulations

Position	Responsibility
SGBU Well Operations Manager (WOM)	• Provides overall leadership to ensure drilling operations comply with all environmental laws, permits, and company standards. • Approves drilling programs and Environmental Plans with appropriate environmental risk controls. • Monitors environmental performance and ensures corrective actions are implemented for any non-conformances. • Ensures adequate resources, training, and competence for environmental management within the drilling team. • Oversees environmental incident response, reporting, and communication with regulatory authorities. • Promotes continual improvement and the integration of environmental stewardship into all drilling activities. • To ensure that suitable management processes are in place to carry out the operations safely and in an environmentally sound manner and to reduce risk to ALARP as reasonable and practicable • To provide environmental emergency support, including emergency response plans, equipment and professional support for Tier 2 and Tier 3 emergencies. • To review actions undertaken in response to any non-conformance or complaints received from the public in accordance with this plan and consider whether additional mitigation measures are required with respect to the operation of the work • To report environmental related incidents to the ANP and other relevant agencies in accordance with SGBU Incident Management Procedure. • To engage an Environmental Consultant in conducting environmental monitoring and verification of environmental performance on site
SGBU Drilling Superintendent	• Ensure all drilling operations comply with this EMP, Oil Spill Contingency Plan and relevant environmental permits or licences. • Promote environmental awareness and good stewardship among offshore and onshore teams. • Ensure operations meet company and regulatory environmental performance standards and objectives. • Incorporate environmental protection measures into drilling programs, logistics, and operational planning. • Identify potential environmental risks and ensure appropriate mitigation controls are in place before operations commence. • Review and approve waste management, spill prevention, and chemical management plans. • Ensure spill prevention and response systems are available, functional, and tested. • Lead or support the response to environmental incidents or non-conformances, ensuring timely reporting, investigation, and corrective actions. • Oversee environmental monitoring programs (e.g., waste tracking, discharge logs, emissions records). • Ensure accurate and timely submission of environmental reports to regulatory authorities and company management. • Ensure contractors and supply vessels operate in accordance with environmental procedures and permit conditions. • Verify that third-party operations, such as fuel transfer or waste disposal, follow approved environmental standards and this plan. • Ensure all drilling and marine personnel are trained in environmental requirements, including spill response and waste segregation. • Communicate environmental expectations, objectives, and performance outcomes to crews and contractors. • Responsible for safe execution of all operations on the rig including rig moving, well construction, well testing and maintenance of facilities on rig. • Ensure the Offshore Drilling Supervisor and MODU personnel, carry out environmental hazard's identification, assessment and any preventative or mitigation plans to prevent recurrence of issues

Position	Responsibility
SGBU HSE Manager	• Ensures compliance with all environmental legislation, permits, and company environmental standards. • Oversees the development and implementation of Environmental Plans, Waste Management Plans, and SOPEPs. • Monitors environmental performance, audits compliance, and reports to management and regulators. • Leads environmental incident investigations and ensures corrective actions are implemented. • Promotes environmental awareness and provides training to operational personnel. • Drives continual improvement in environmental management and performance across operations.
SGBU Senior Drilling Supervisor	• Ensure all drilling operations comply with the Environmental Management Plan and relevant regulatory requirements. • Promote environmental awareness among drilling crews and contractors through daily leadership and supervision. • Ensure that environmental controls such as containment systems, waste segregation, and spill prevention measures are implemented and maintained at the rig site. • Verify that mud systems, chemical handling, and waste management activities are carried out according to environmental procedures. • Identify and communicate potential environmental risks during planning and execution of drilling activities. • Ensure mitigations (e.g., closed-loop systems, zero-discharge controls, proper waste storage) are in place prior to operations. • Review and verify daily drilling reports, waste manifests, and mud system data to ensure accurate environmental records are maintained. • Conduct or participate in “walk the line” checks before transfers of SBM, fuel, or waste to confirm environmental controls are in place. • Ensure immediate action is taken in the event of an environmental spill or discharge. • Report all environmental incidents, near misses, or non-conformances promptly to the OIM and onshore management. • Ensure drilling crews are familiar with environmental procedures relevant to their tasks. • Reinforce compliance through toolbox talks, pre-job meetings, and supervision during high-risk operations.
SGBU Environmental Advisor and Consultants	• Provide expert advice to the Drilling Manager, HSE Manager, and offshore personnel on environmental obligations and best practices. • Maintain awareness of applicable legislation and regulatory requirements, ensuring any updates are communicated to the offshore team. • Review, verify, and consolidate environmental data and reports received from the offshore MODU (e.g., waste tracking, discharge logs, emissions reports, fauna observations). • Prepare and submit environmental compliance and performance reports to regulatory authorities and company management. • Maintain accurate environmental records for audit and regulatory inspection purposes. • Provide onshore coordination and technical support during environmental incidents, including notification, investigation, and reporting. • Ensure root cause analysis and corrective actions are implemented and tracked to closure. • Liaise with regulators and stakeholders on environmental incidents and corrective actions as required. • Contribute to environmental risk assessments, drilling programs, and project planning to ensure environmental risks are identified and managed proactively.

Position	Responsibility
	• Review and endorse environmental sections of operational plans, contractor procedures, and bridging documents. • Develop and deliver environmental training and awareness materials for offshore and onshore personnel. • Support offshore HSE teams in promoting environmental stewardship and continual improvement. • Facilitate regular environmental meetings or briefings with offshore teams and management. • Identify trends and opportunities for improvement in environmental performance and assist in implementing best practices. • Support the integration of environmental management into the company's operational and HSE systems.
Offshore Installation Manager (OIM)	• Provide visible environmental leadership and ensure offshore operations are conducted in accordance with the Environmental Plan, SOPEP, and company environmental standards. • Ensure compliance with all applicable environmental legislation and permit conditions. • Oversee implementation of all environmental controls related to drilling, waste management, and marine activities. • Ensure environmental risks are identified, mitigated, and communicated to all personnel and contractors. • Ensure effective response to any environmental incident, including activation of the SOPEP and notification of relevant onshore management. • Lead or support environmental incident investigations and implement corrective actions. • Ensure environmental records such as waste tracking, discharge logs, and marine fauna observations are maintained and accurate. • Verify that daily reports capture environmental compliance activities and any deviations. • Promote environmental awareness among all personnel through inductions, toolbox talks, and supervision. • Ensure crew and all personnel understand the facilities environmental obligations and reporting procedures. • Ensure that the drillers are aware of all environmental requirements and abide with the best environmental practices in carrying out drilling and associated activities
Barge Master	• Ensure all marine operations, including ballasting, fuel transfers, and waste handling, comply with the Environmental Management Plan, Ballast Water Management Plan, and SOPEP. • Maintain valid ballast water and pollution prevention certificates onboard. • Oversee all bunkering and fluid transfer operations to prevent spills or leaks. • Ensure appropriate containment systems (e.g., drip trays, flotation collars, dry-break couplings) are in place and functional. • Maintain accurate records of fuel transfers, ballast water exchanges, waste storage, and discharges. • Ensure logs and documentation are kept up to date and available for inspection. • Ensure all spill response equipment is available, maintained, and ready for use. • Lead initial actions in the event of a spill or discharge in accordance with the SOPEP. • Ensure marine crew are trained and competent in pollution prevention and spill response procedures. • Promote awareness of environmental controls during daily marine operations.
Facility HSE Advisor	• Advise the OIM and supervisors on environmental requirements, controls, and permit conditions. • Ensure compliance with the Environmental Management Plan, SOPEP, and waste management procedures.

Position	Responsibility
	• Conduct regular environmental inspections of waste segregation areas, containment systems, and pollution prevention equipment. • Monitor discharges, waste streams, and emissions to ensure they are within approved limits. • Assist in the response to environmental incidents or near misses, ensuring accurate reporting and documentation. • Provide environmental inductions, toolbox talks, and awareness campaigns to offshore personnel and contractors. • Reinforce company environmental policies and ensure personnel understand their responsibilities • Identify opportunities for environmental improvement and support implementation of corrective actions following inspections or audits.

13 Public Consultation and Information Disclosure

The public consultation for a Category A project, such as Chuditch-2 Appraisal Drilling is a requirement per Decree Law No. 39/2022 first amendment of Decree Law No. 5/2011 of Environmental License, for environmental assessment involving the preparation of the Environmental Impact Statement (EIS) and Environmental Management Plan (EMP). This requirement is aimed at addressing the public's concern, understanding, and acceptance of the project, especially on how the project may affect them positively and/or negatively.

13.1 Purpose of the Consultation Process

Public Consultation process for the Environmental Impact Assessment (EIA) is carried out in accordance with the Ministerial Diploma No. 47/2017 for the Regulation on the Public Consultation Procedures and Requirements during the environmental assessment process. Based on the aforementioned Ministerial Diploma, the objective of the public consultation is to disseminate information on the result of Environmental Baseline Survey (EBS) as part of EIA and Environmental Management Plan.

13.2 Methodology and Approach

The methodology and approach for public consultation:

13.2.1 Methodology

Preparation includes date and venues, invitations, coordination, presentation materials and identification of Stakeholders:

1. Autoridade Nacional do Petroleo (ANP)
2. Ministry of Petroleum and Mineral Resources (MPRM)
3. Ministry of Tourism and Environment
4. Unidade de Policia Maritima (UPF-PNTL)
5. Unidade Policia Esplosivo
6. Autoridade Maritima Nacional
7. Direcção Nacional de Transporte and Maritima
8. Gabinete das Fronteiras Tereste e Maritima
9. Asosiasaun Peskas no Marina Timor-Lorosa'e (APM-TL)
10. Port Custom (Ministry of Finance)
11. Port Authority (APORTIL)
12. Ministry of Agriculture and Fisheries
13. Forca Componente Marinha/Naval de Falintil Forca da Defesa de Timor-Leste (F-FDTL)
14. Ministry of Health
15. Australian Embassy
16. Civil Society Organizations – CSOs (e.g. Lao Hamutuk)
17. Ministry of Foreign Affairs
18. Quarantine
19. Direção Nacional da Protecção Civil – Bombeiros TL
20. Direção Nacional de Meteorologia e Geofísica
21. Autoridade Municipal de Dili
22. SANTOS
23. Eni Timor-Leste S.PA
24. UNTL – Faculdade Educação – Departamento Biologia.

13.2.2 Approach

- Public Notice published through ANP's website, proponent's website, any social networks such as Facebook, LinkedIn, Newspaper, Radio, and Televisions on the day of the EIS and EMP drafts submission.
- Through Public Notice: giving anyone the right to review and provide their written comments by e-mail, letter or in-person at the office of the Environmental Authority - ANP, Project Proponent – SGBU.
- SGBU will organize a formal meeting where result from the Environmental Baseline Survey (EBS) results, EIA, and potential impacts as well as mitigation measures will be presented to stakeholders identified in section 13.2.1 of this chapter.

13.3 Summary of Consultation

Public Notice for Draft Term of Reference (TOR)

Publication of Public Notice for draft TOR was published on 13 June 2024 in the Timor Post newspaper and was announced on GMA television. A public notice was also published on SGBU's social media platform as well as the environmental consultant's platform.

Public Notice for Draft EIS and EMP

The public notice for draft EIS and EMP was published on 11 April 2025.

Public Consultation for Draft EIS and EMP (Appendix 8)

Date:	22 April 2025
Venue:	Suai Room Timor-Plaza.
	Rua Presidente Nicolao Lobato, Comoro, Dom Aleixo, Dili
Time:	08.30 am to Finish

Public Consultation for EIS and EMP (Appendix 9)

Date:	23 June 2025
Venue:	Delta Nova. Rua Presidente Nicolao Lobato, Comoro, Dom Aleixo, Dili
Time:	08.30 am to Finish

13.4 Summary of Main Comments

The objective of this public consultation is to ensure transparency and responsibility in oil and gas exploration. Through this public consultation, everyone has the right to review and submit their concerns, if any, regarding the appraisal drilling campaign in Chuditch-2.

A few comments arose during the public consultation:

- Disturbance of marine life biodiversity from underwater noise pollution cause by drilling activity
- Publicity of EBS results
- Collaboration with UPM, UPF, and National Naval authority if any illegal activity is observed during drilling campaign
- Economic viability of Chuditch field
- Contingency planning for unplanned events during the drilling campaign
- Challenges faced by SGBU in the delay of drilling operations

- Technical preparation for ensuring safety and integrity during the campaign
- Marine environmental study.

13.5 Summary of Public Acceptance of the Project

During the Public Consultation and public notice, there was no opposition stated to the Chuditch-2 drilling campaign. On the contrary, there was broad acceptance of this campaign by the public, judging by the number of attendees and their proactive participation during the consultation event.

13.6 Adoption of concerns raised by stakeholders

The merits of the concerns raised by stakeholders were assessed (Appendix 8 and 9) and where the concerns were considered a credible risk to the environment, control measures were adopted through the ENVID process.

13.7 Press Release

On April 11th, 2025, Jeremy Beckman published an article in Offshore Magazine, titled "SundaGas submits draft of preparation for Chuditch well Offshore Timor-Leste." (https://www.offshore-mag.com/print/content/55282573)

On June 16th, 2025, an article published in energy-pedia news, titled "Timor-Leste: Sunda Energy provides Chuditch update." (https://www.energy-pedia.com/news/timor-leste/sunda-energy-provides-chuditch-update-200180)

13.8 Recommendations for Future Consultation

SGBU will continue to collaborate with ANP and stakeholders to share any changes on any amendments on potential environmental impacts and any mitigation measures within EIS and EMP. Public/stakeholders will be updated through SGBU's platform, newspaper, and TV when the project is commencing and when any changes occur. Complaints and grievances mechanism is provided in the subsequent chapter where public/stakeholders can use to submit any concerns and participate throughout the duration of the project.

Lessons Learnt

The lesson learned process is a structured, continuous improvement process used to capture knowledge from incidents, near misses, audits, forums and operational experience, analyse the underlying causes, and convert those insights into corrective and preventive actions that improve future performance. SGBU acknowledges this and has identified and documented three key learnings:

- The benefit of initiating consultation earlier in the planning cycle,
- Providing clearer and more accessible explanations of technical activities, and
- Improving the tracking and closure of issues raised by stakeholders.

SGBU also recognises that an effective lessons learned process requires open, two-way communication between all parties involved. SGBU are committed to maintaining transparent and timely communication and welcome constructive feedback from stakeholders and regulatory bodies to help strengthen future engagement. SGBU would appreciate any observations or suggestions the ANP may wish to share from the consultation rounds, as this input is essential to improving the overall consultation process and ensuring that future activities continue to meet regulatory expectations and community needs.

Improvement in future consultation

Lessons learned will be incorporated into future consultation plans to improve transparency, responsiveness and overall effectiveness of engagement with communities, government authorities and other interested parties.

13.9 Photos at Public Consultation Meeting

Figure 50 Photos taken during Public Consultation for Draft EIS and EMP 22 April 2025.

Figure 51 Photos taken during Public Consultation for Draft EIS and EMP 23 June 2025

14 Difficulties Encountered

Some of the challenges encountered during the assessment included limited access to historical climate data and the uncertain nature of future climate events. SGBU scanned for related information from NOPSEMA environment plans for drilling activities and filled the gaps. Regarding uncertainty of future climate events, the impacts of appraisal drilling programme is limited to drilling for approximately 44 days and have assessed the various future climate events such as air temperature, sea surface temperature, pH, rainfall, waves, currents, tides, sea level and noted that the MODU and its operations will not have any effects. The only common occurrence is cyclones and that will be monitored and action taken for safety purpose. Other than that, as Chuditch-2 appraisal drilling is of short duration and planned in Q2 of 2026, the information and data is sufficient for the proposed activity and assessment.

Understanding the regulatory requirements during the preparation of the Terms of Reference, the necessity of environmental baseline studies for such a short duration (44 days) single well drilling project was challenging. Validation of the oil spill modelling and drill cutting dispersion modelling involved many discussions to obtain clarity of the scope of work, modelling parameters and modelling output and report. SGBU working in Timor-Leste and preparing for the drilling project constrained in understanding the local infrastructure and legislative requirement to conduct an early EBS which caused delay in preparing this EIS. This was overcome by continuous discussion with the ANP and allocating adequate budget for carrying out the EBS.

The public consultation process defined by ANP and discussing with stakeholders was another area that required added focus. SGBU overcome this by actively participating in the several public consultations meetings and considered all relevant suggestions and comments during the TOR, review of the draft and final EIS and EMP along with the EC panel.

With the above, SGBU was able to resolve the above difficulties encountered, improve the transparency and completeness of the assessment and facilitate regulatory review.

15 Conclusion and Recommendations

The Environmental Impact Statement (EIS) evaluates the potential risks arising from the proposed appraisal drilling program and outlines mitigation measures to address environmental, social, and economic impacts. Generally, the assessment has been conducted based on the drilling operational program and drilling method. The EIS is prepared in accordance with the Terms of Reference submitted by SGBU and approved by ANP.

The existing environment of the Project site has been assessed mainly based on combination of secondary data and primary data for marine water quality, ambient air, seabed sediment and marine microbiological data from the field sampling conducted in February 2025. Other areas of interest in respect to the proposed activities in the offshore environment include marine ecology, meteorological conditions, oceanography, bathymetry, fisheries and shipping activities. Environmental impacts associated with the proposed appraisal Chuditch-2 drilling project were assessed and the magnitude of impacts against the existing environment were discussed in Chapter 9.

The impact assessed was assessed to be minor for seabed disturbance and interactions with other users from physical presence of the MODU on the Chuditch-2 location. Modelling studies indicate that discharged drill cuttings settle within a 200m radius, with Total Suspended Solids (TSS) concentrations dropping to background levels (≤25 ppm) within 50m. Due to localized impact and short-term drilling campaign, the risk was deemed to be minor.

The impact assessment for other discharges such as liquid, solid and hazardous discharges are expected to be minor, once all procedural and mitigation measures are rigorously implemented. The greenhouse gas emissions from the MODU and Support Vessels; as well as flaring during the DST are assessed to be minor, due to the amount of GHG produced in comparison to the global emission. Similarly, the light and noise pollutions are expected to have a minor impact on the marine life and environment with the proposed mitigation measures in place. The impact assessment for socio-economic development is minor due to the drilling operation’s offshore location.

For unplanned activities, both the likelihood and consequence of potential impacts were assessed to establish a risk ranking. For the surface gas leak during the appraisal drilling is expected to be low due to the remote likelihood of an event and the minor effects on the environment. Potential oil spill consequences were assessed as a major consequence, and the likelihood of the event was assessed as remote, resulting in a risk ranking of medium. The oil spill scenarios included a a well blowout and transfer hose failure. Despite the significance of these events the risk to the environment is medium due to the remote likelihood of the event and only a major consequence/impact due to the volatility (rapid evaporation) of condensate or diesel.

The risk of introduction of invasive marine species through vessel/MODU biofouling and ballast water discharges was assessed as medium. The likelihood of this event is remote however the potential consequence is massive. However, the mitigation measures in place and the relatively deep waters of the drilling activity significantly reduce the likelihood of this event occurring. The conclusion and recommendation of this EIS are that for the high and medium risk impacts, the proponent is to integrate the proposed environmental mitigation measures as in Chapter 9 into the drilling operation procedures as per the ENVID worksheet detailed in Appendix 7.

The mitigation measures proposed for all the impacts identified are aimed at protecting the physical, biological, and socio-economic environments. An Environmental Management Plan (EMP) has been developed to manage the potential impacts of the proposed activities and ensure that they remain at acceptable levels throughout the course of the program. With the nature of the proposed appraisal drilling project, which is of short duration (44 days) with no permanent structures, the impacts are considered temporary and localised.

In conclusion, through implementation of mitigation measures and environmental management monitoring, all the identified inherent risks are reduced to ALARP. The Chuditch-2 Appraisal drilling well project may proceed with appropriate mitigation and monitoring in place.

16 Non-Technical Summary

Table 54 Non-technical summary - English and Tetum

Non-Technical Summary	Sumariu Naun-Tekniku
Introduction SundaGas Banda Unipessoal, Lda (SGBU) and TIMOR GAP Chuditch Unipessoal, Lda (TIMOR GAP) were awarded a Production Sharing Contract (PSC) in 2019 to explore petroleum resources in Timor-Leste's offshore waters. The Chuditch field spans approximately 3,571 km² in the Timor Sea, located about 185 km south of Timor-Leste. This offshore region has significant potential for natural gas extraction, which could contribute to the country's energy sector and economic development. To assess the presence of hydrocarbons, SGBU plans to drill an appraisal well, Chuditch-2, in 68 meters of water using a jack-up MODU. The well is expected to reach 3,010m in depth to analyse gas reserves and confirm commercial viability. Given its potential environmental impact, the project has been classified as Category A, requiring a full Environmental Impact Assessment (EIA) to formulate Environmental Impact Statement (EIS) and Environmental Management Plan (EMP) to ensure sustainable and responsible appraisal drilling activities. The drilling campaign is scheduled for Q2 2026 with the MODU mobilization, drilling and well testing anticipated to last around 44 days. SGBU will obtain all regulatory approvals and have mitigation strategies in place before execution. The successful completion of this well will provide critical data for the future development of Timor-Leste's natural gas resources. The project will include necessary infrastructure for drilling support, such as logistics centres and supply bases in Australia. The well abandonment and demobilisation would be undertaken upon completing drilling, the well will be plugged and abandoned using cement slurries and a bridge plug. The MODU will then be decommissioned and moved out of Timor-Leste waters. **Environmental Consideration** The EIA assesses potential risks, develops mitigation strategies, ensures compliance with environmental laws, and involves stakeholder engagement. It will guide the creation of an EMP and Environmental Monitoring Program. An Environmental Baseline Survey (EBS) was conducted in January 2025 to evaluate marine water and sediment quality, and benthic habitat . The EBS assessed the existing environmental conditions in the project area to establish a reference point for evaluating potential impacts. Marine water quality in the Timor Sea remains pristine, with high dissolved oxygen levels and minimal pollution. The area does not contain significant amount of marine life except for some sponges and octocorals, reducing concerns about direct habitat	**Introdusaun** SundaGas Banda Unipessoal, Lda (SGBU) no TIMOR GAP Chuditch Unipessoal, Lda (TIMOR GAP) hetan Kontratu Fahe Produsaun *(Production Sharing Contract – PSC)* iha 2019 atu esplora rekursu petrolíferu iha Tasi Timor. Kampu Chuditch nia luan maizumenus 3,571 km² iha Tasi Timor, lokaliza maizumenus 185 km husi parte súl Timor-Leste nian. Parte tasi Timor ida ne'e iha potensiál signifikante ba estrasaun gás naturál, ne'ebé bele kontribui ba setór enerjia no dezenvolvimentu ekonómiku nasaun nian. SGBU planeia atu fura posu avaliasaun ida Chuditch-2 ho tasi nia kle'an metru 68 uza *jack-up rig*, hodi avalia prezensa hidrokarnonetu iha kampu refere. Perfurasaun ida ne'e sei too profundidade metru rihun tolu sanulu hodi analiza reserva gás no konfirma viabilidade komersiál iha area kontratu refere. Bazeia ba impaktu ambientál, projetu ne'e klasifika ona hanesan Kategoria A, ne'ebé presiza Avaliasaun Impaktu Ambientál (AIA) kompletu ida hodi formula Deklarasaun Impaktu Ambientál (DIA) no Planu Jestaun Ambientál (PJA) hodi asegura atividade esplorasaun ne'ebé sustentável no responsável. Kampaña perfurasaun sei hala'o iha Q2 2026 ho mobilizasaun Rig, perfurasaun no teste posu nian ne'ebé antisipa sei dura loron 44. SGBU sei hetan aprovasaun regulatóriu sira no prepara ona estratéjia mitigasaun nian molok ezekusaun. Bainhira perfurasaun ne'e susesu, nia rezultadu sei fornese dadus krítiku ba futuru dezenvolvimentu rekursu gás naturál iha Timor-Leste . Projetu ne'e sei persiza infraestrutura nesesária ba apoiu perfurasaun, hanesan sentru lojístika no baze fornesimentu iha Austrália. Posu refere sei taka no abandona uza simentu nia maran, hafoin, *rig* ne'e sei dekomisaun no muda sai husi tasi Timor. **Konsiderasaun Ambientál** AIA avalia risku sira, dezenvolve estratéjia mitigasaun nian, asegura kumprimentu ho lei ambientál sira, no inklui envolvimentu hosi parte interesada sira *(stakeholders)*. Ida-ne'e sei sai guia ba kriasaun PJA no Programa Monitorizasaun Ambientál. Levantamentu Baze Ambientál (EBS) ne'ebe hala'o iha Janeiru 2025, avalia kualidade tasi-been no sedimentu, no biodiversidade tasi nian. EBS avalia kondisaun ambientál sira ne'ebé eziste iha área projetu nian hodi estabelese pontu referénsia no avalia impaktu potensiál. Kualidade bee tasi nian iha Tasi Timor moos, ho nível oksijéniu dissolvidu aas no poluisaun mínimu. Área ne'e la kontein kuantidade signifikativu hosi vida tasi nian exetu ba esponja sira no oktokorál sira, nune'e hamenus preokupasaun kona-ba destruisaun direta ba habitat. Maibé, prezensa hosi

Non-Technical Summary	Sumariu Naun-Tekniku
destruction. Even though, marine megafauna were not observed during EBS protective measures were required to prevent disturbances. Air quality impacts are expected to be minimal, as offshore drilling operations allow for the rapid dispersion of emissions. The project's remote offshore location also ensures that socio-economic activities such as fisheries and tourism will not face significant disruptions. Overall, the study confirms that while some environmental risks exist, they can be effectively managed through best industry practices and strict regulatory compliance. **Potential Environmental Impacts and Mitigation Measures** Discharges from drilling fluids, waste, or accidental oil spills can pose risks to marine ecosystems. To mitigate these risks, the project will use low toxicity drilling fluids, implement advanced waste management systems to separate and treat drill cuttings, and establish oil spill response planning. These plans will provide a best practice response employing advice from global leaders in oil spill response and recovery, Oil Spill Response Limited (OSRL) the deployment of oil spill response equipment and deployment of emergency response teams to manage potential spills efficiently. Air emissions from drilling and vessel operations will be controlled through the use of fuel-efficient engines and continuous emissions monitoring. The project also aims to minimize flaring activities during the testing, which can contribute to greenhouse gas emissions. Additionally, efforts will be made to reduce disturbances to marine life caused by noise and lighting. Routine environmental monitoring will ensure that all emissions remain within regulatory limits and that mitigation measures are effectively implemented throughout the project duration. The EIS highlights potential impacts such as air emissions, marine pollution, and ecological disturbance. Mitigation strategies include adopting low-emission engines, routine monitoring, and using water-based and synthetic-based muds. **Conclusion** The Chuditch-2 project represents a major step toward unlocking Timor-Leste's offshore energy potential. With strict environmental safeguards in place, the project aims to balance economic benefits with sustainable resource management. Through careful planning, regulatory compliance, and responsible operational practices, the project seeks to ensure minimal environmental impact while contributing to Timor-Leste's long-term energy security and economic growth.	mamíferu tasi nian no espésie ikan sira presija medida protesaun hodi prevene perturbasaun. Tuir ekspektasaun, impaktu ba kualidade ar nian sei mínimu, tanba atividade perfurasaun ne'e iha tasi-klaran no emisaun hirak ne'ebe akontese bele dispersa ka lakon lalais. Lokalizasaun projetu ne'ebe remota iha tasi-klaran mós garante katak atividade sosio-ekonómiku sira hanesan peskador sira no turizmu sei la hasoru interupsaun signifikativu. Jeralmente, estudu ne'e konfirma katak enkuantu risku ambientál balu eziste, impaktu sira ne'e bele jere ho efetivu liuhosi prátika indústria ne'ebé di'ak no kumprimentu regulatóriu ne'ebé rigorozu. **Impaktu Ambientál no Medida Metigasaun** Descarga hosi fluidu perfurasaun nian, lixu, ka derramamentu mina-rai husi asidenti bele hamosu risku ba ekosistema tasi nian. Atu hamenus risku sira-ne'e, projetu sei uza fluidu perfurasaun ho toxisidade ki'ik, implementa sistema jestaun lixu avansadu hodi haketak no trata fluidu perfurasaun *(drill cuttings)*, no estabelese planu hodi resposta ba derramamentu mina-rai. Planu sira-ne'e sei fornese resposta prátika ne'ebé di'ak liu no uza konsellu hosi líder globál sira ba resposta no rekuperasaun bainhira akontese derramamentu mina-rai, *Oil Spill Response Limited* (OSRL) kolokasaun ekipamentu resposta ba derramamentu mina-rai no kolokasaun ekipa resposta emerjénsia hodi hatan ba derramamentu ne'ebe karik akontese ho efisiente. Emisaun ar husi perfurasaun no operasaun ró nian sei kontrola liuhosi utilizasaun motór ne'ebé efisiente iha kombustível no kontinua monitorizasaun ba emisaun hirak ne'e. Projetu ne'e iha intensaun atu minimiza ahi-lakan *(flaring)* durante teste, ne'ebé bele kontribui ba emisaun *greenhouse gas*. Sei iha mós esforsu atu hamenus perturbasaun ba moris tasi nian ne'ebé hosi barullu no iluminasaun. Monitorizasaun ambientál rutina sei garante katak emisaun hotu-hotu mantein tuir limite regulatóriu no medida mitigasaun sei implementa ho efetivu durante projetu. DIA destaka impaktu potensiál hanesan emisaun ar, poluisaun tasi, no perturbasaun ekolojia. Estratéjia mitigasaun inklui uza motór sira ho emisaun ki'ik, monitorizasaun rutina, no uza fluidu perfurasaun ho baze bee *(Water-Based Mud)* no sintétiku *(Synthetic-Based Mud)*. **Konklusaun** Projetu Chuditch-2 reprezenta pasu boot ida hodi loke Timor-Leste nia potensiál enerjétiku iha tasi-laran. Ho protesaun ambientál ne'ebé rigorozu, projetu ne'e sei halo balansu entre benefísiu ekonómiku ho jestaun rekursu ne'ebé sustentável. Liuhosi planeamentu rigorozu, kumprimentu regulatóriu, no prátika operasionál ne'ebé responsavel, projetu ne'e garante mínimu impaktu ambientál, enkuantu kontribui nafatin ba Timor-Leste nia seguransa enerjétika ba tempu naruk no kreximentu ekonómiku.

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Appendix 1: Marine Water Quality

The details results and analysis of the marine water quality are reproduced from the Chuditch-2 Environmental Baseline Survey (EBS) Technical Report dated March/April 2025 conducted by WA Marine Pty Ltd trading as O2 Marine, Western Australia. The data, figures, tables and information are reproduced from that report as primary information around the Chuditch-2 Appraisal Well Program.

Marine water quality profiles and data:

1. Physiochemical Profiles

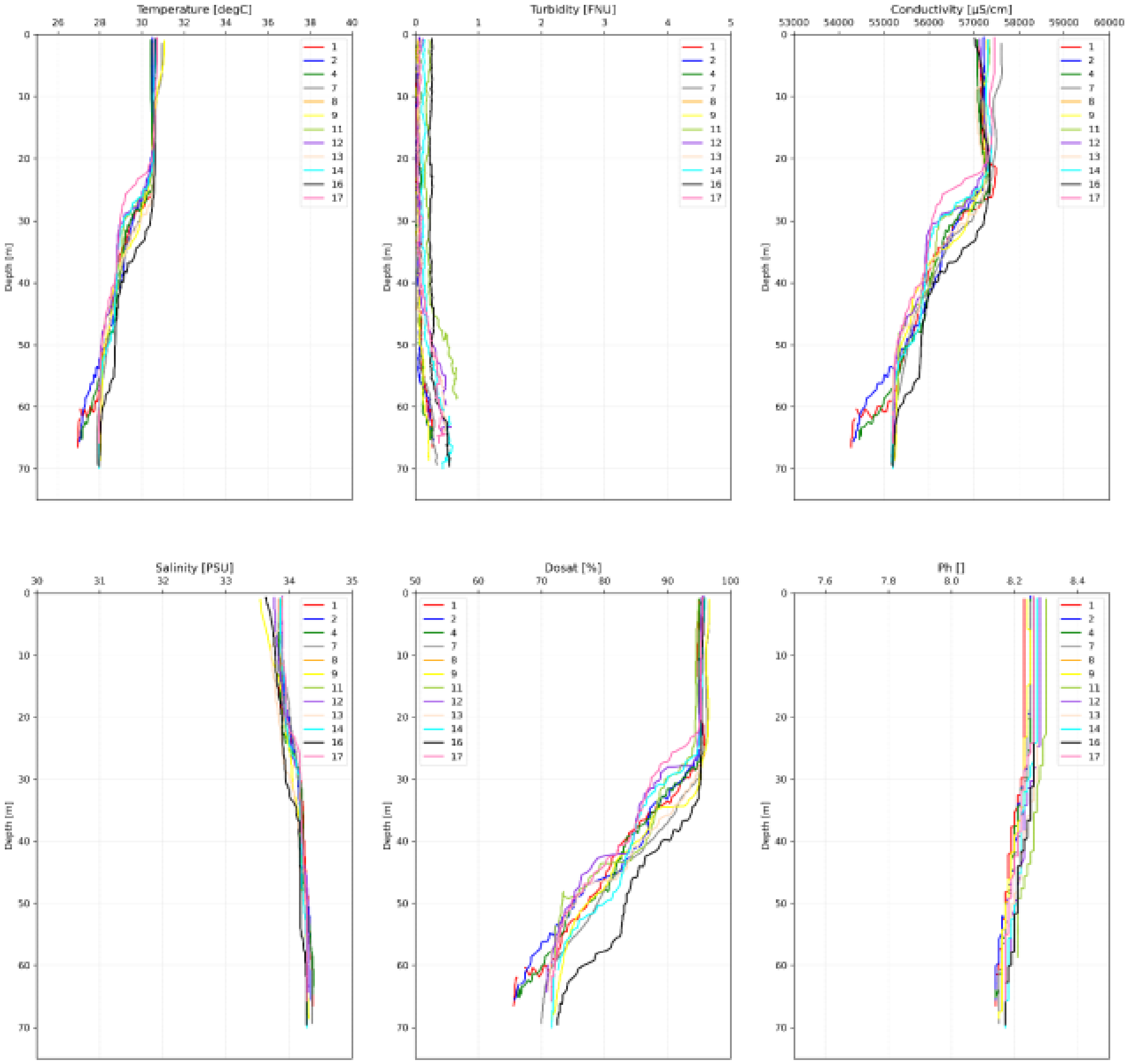
Summary statistics calculated from physiochemical water column profiles are presented in table 55 whilst water column profiles are displayed in figure 52 in summary:

- pH results ranged from between 8.21 and 8.26
- Salinity results ranged between 34.05 and 34.19
- Temperature values ranged between 28.77 and 30.39
- Conductivity results ranged between 51990.00 and 52147.10
- Turbidity values ranged between 0.06 and 0.26

Table 55 Median physiochemical profile results for profiles sampled on 29th of January 2025

Site	Ph	Salinity	Temperature	Conductivity	DOsat	Turbidity
Units		PPT				
IMCRA (2018)		34.7				
1	8.23	34.07	30.29	52025.30	94.80	0.07
2	8.21	34.16	29.27	52110.50	87.20	0.06
3	8.22	34.19	29.30	52147.10	89.70	0.06
4	8.22	34.19	29.18	52132.70	89.80	0.08
5	8.22	34.17	29.33	52115.30	91.10	0.08
6	8.21	34.19	28.97	52079.85	87.40	0.06
7	8.26	34.17	29.05	52111.40	87.90	0.22
8	8.24	34.18	28.90	52118.15	86.35	0.07
9	8.24	34.13	29.18	52067.70	88.90	0.07
10	8.22	34.18	28.84	52121.45	84.70	0.16
11	8.25	34.05	29.98	51990.00	94.30	0.26
12	8.21	34.19	28.77	52128.05	83.10	0.11
13	8.22	34.18	29.18	52113.35	88.40	0.08
14	8.26	34.19	30.29	52147.10	94.80	0.26
15	8.21	34.05	28.77	51990.00	83.10	0.06
16	0.02	0.05	0.45	46.94	3.49	0.07
17	8.23	34.07	30.29	52025.30	94.80	0.07
Median	8.21	34.16	29.27	52110.50	87.20	0.06
Maximum	8.22	34.19	29.30	52147.10	89.70	0.06
Minimum	8.22	34.19	29.18	52132.70	89.80	0.08
St-Dev	8.22	34.17	29.33	52115.30	91.10	0.08

Figure 52 Physiochemical water quality profiles



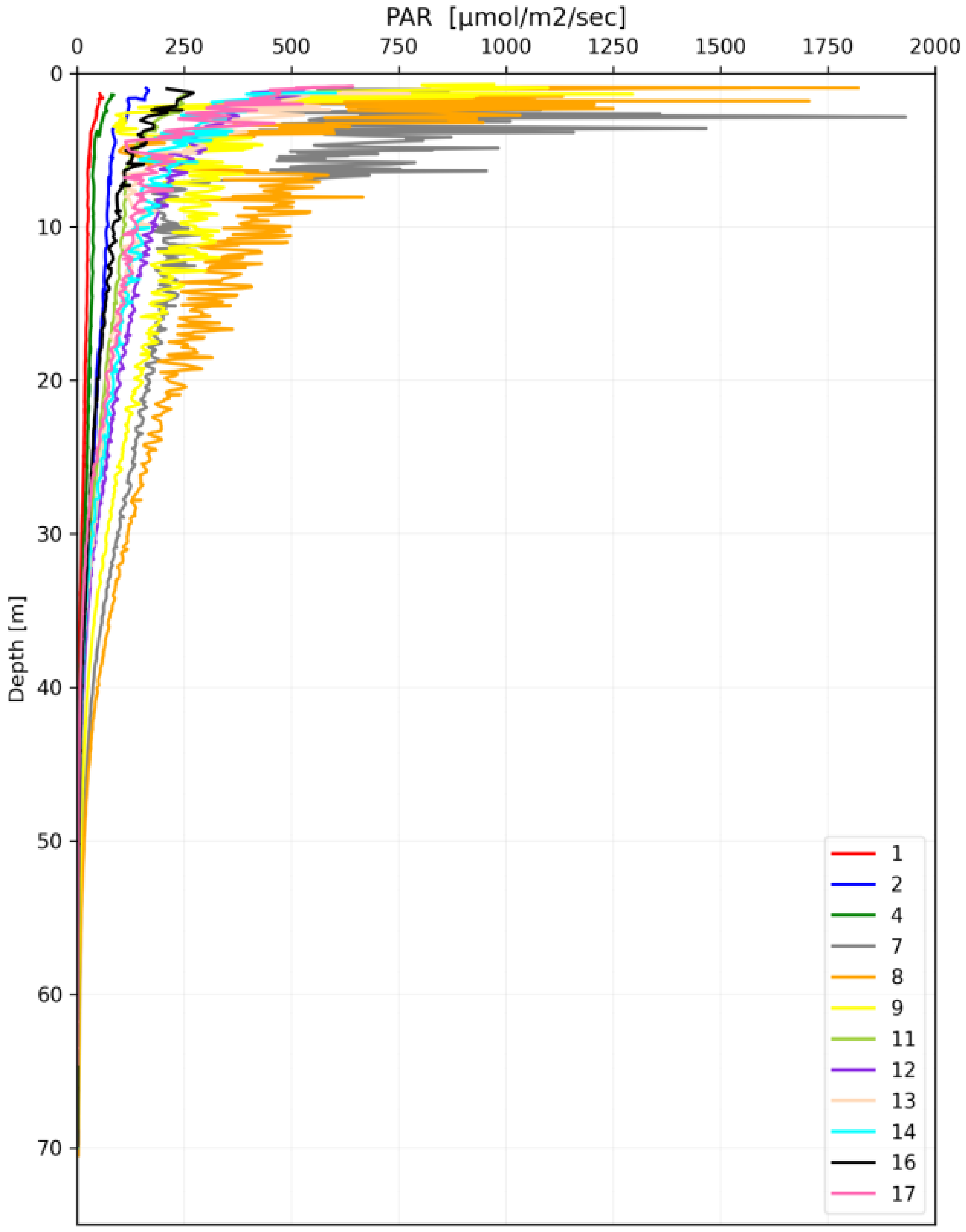
2. PAR Profiles

Results from the light (PAR) from water column profiles are summarized in table 56 and presented in figure 53.

Table 56 PAR summary results. Surface PAR results include values from the first meter of the profile and bottom PAR results include values from the last meter of the profile.

Site	Ph Surface	Salinity Bottom
1	92.79	0.57
2	225.99	1.76
3	127.58	1.14
4	899.13	2.98
7	1115.80	2.70
8	983.63	1.98
9	232.00	1.21
11	363.75	1.56
12	630.66	0.97
13	315.44	0.66
14	150.67	0.82
16	468.90	0.73
17	467.20	1.42
Median	1115.80	2.98
Maximum	92.79	0.57
Minimum	357.21	0.80
St-Dev	92.79	0.57

Figure 53 Water column PAR profile



3. Water Quality Profiling

Water quality profiling results collected across the project area display a very low level of spatial variability, with all sites displaying very similar concentrations and results. Temperature, salinity, turbidity and pH were observed to stable for surface to seafloor, with minimal variability evident at all sites. Conductivity generally decreased from around the 25m mark, which also corresponded with DO % decreases, and very minor decreases of pH.

Temperature profiles across all locations were relatively consistent, ranging from 28.77°C to 30.29°C, with surface water averaging 27.4°C. The presence of a very minor thermocline can be observed at around the 22- 25 m depth contributing to a gradual decline in temperature to the seafloor. The conductivity pH and DO% profiles closely mirrored the temperature patterns, with all presenting a decrease from approximately the same depth to the seafloor, observed quite apparently for DO % and conductivity.

Salinity values remained stable across all sampling areas, with a median value of 34.18 PPT and a range of only 0.14 PPT. The observed consistency in salinity suggests minimal freshwater intrusion or significant oceanographic mixing processes affecting the sampled locations. Similarly, pH values were stable, ranging from 8.21 to 8.26, with median of 8.22 across all sites.

Turbidity levels were generally very low with a maximum of 0.26 NTU, and a range of only 0.2 NTU. As expected, all profiles were slightly higher closer the profile end when compared to the surface. Despite these minor observations, turbidity levels indicate minimal sediment resuspension and low particulate matter concentrations as to be expected within the deeper open ocean waters.

DO levels across the surveyed areas were generally high with all surface to ~25 m DO % recording around 95 %. As described above, DO levels began to slowly decrease from around ~25 m, resulting in a maximum calculated range of 11.7%. This pattern suggests a stratified water column with oxygen consumption occurring below the thermocline. However, DO concentrations remained well above hypoxic thresholds, indicating a healthy and well-oxygenated marine environment

As is to be expected PAR results were highly variable at the surface and all reduced to very similar results at the seafloor, Surface results ranged from 92.79 to 1115.80, with an average of 467.20 ± 357.21, whilst seafloor PAR had an average of 1.42 ± 0.80. Variability was observed to be high for surface PAR; however, this was merely a function of sampling time and date with sites 7, 8 and 9 displaying far higher surface PAR than sites sampled early in the morning. Sites sample data similar time of day, but on a different date would have been impacted by cloud cover reducing photosynthetic light.

4. Dissolved Metals in Water Samples

Dissolved metals results are presented in table 57, in summary:

- Gold, mercury, and manganese results were reported below the LOR in all samples.
- Remaining metals were all reported at low concentration below ANZG (2018) 95% and 99% SPLs, except which was slightly elevated at Site 2 surface sample and Zinc which was slightly elevated above the 99% SPL in mid-water samples at site 1 and 4.

Table 57 Dissolved metals results from water samples collected on the 27th and 28th of January 2025. Values that exceed 99% are highlighted light blue.

Site	As	Ag	Ba	Cd	Co	Cu	Cr	Fe	Pb	Mn	Hg	Ni	Sb	Se	Zn
	Units (mg/L)														
95% SPL	-	-	-	0.002	0.001	0.0013	-	-	0.0044	-	0.0004	0.07	-	-	0.008
99% SPL	-	-	-	0.0007	0.001	0.0003	-	-	0.0022	-	0.0001	0.007	-	-	0.0033
1_S	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	0.0003	0.0004	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	0.002
1_M	0.0017	<0.1	0.02	0.0006	<0.00005	0.0003	0.0003	0.02	0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	0.004
1_B	0.0018	<0.1	< 0.01	< 0.0001	<0.00005	0.0003	0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	0.001
2_S	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	0.0004	0.0003	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	0.002
2_M	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	0.0003	0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	0.002
2_B	0.0016	<0.1	0.01	< 0.0001	<0.00005	<0.0002	0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	<0.001
4_S	0.0017	<0.1	0.01	< 0.0001	<0.00005	<0.0002	0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	0.002
4_M	0.0017	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0002	0.02	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.001	< 0.001	0.004
4_B	0.0017	<0.1	0.01	< 0.0001	<0.00005	<0.0002	0.0004	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	<0.001
7_S	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	0.0002	0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	0.001
7_M	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0003	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	0.001
7_B	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	0.001
8_S	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	0.0002	0.0003	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	0.003
8_M	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0003	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	0.001
8_B	0.0018	<0.1	< 0.01	< 0.0001	<0.00005	0.0002	0.0003	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	<0.001
9_S	0.0015	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0003	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	0.002
9_M	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	<0.0002	0.02	0.002	< 0.005	< 0.0001	0.001	0.001	0.001	0.002
9_B	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0004	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	0.001
11_S	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	0.0003	<0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	0.001
11_M	0.0017	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	0.001
11_B	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	<0.001

Site	As	Ag	Ba	Cd	Co	Cu	Cr	Fe	Pb	Mn	Hg	Ni	Sb	Se	Zn
	Units (mg/L)														
12_S	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	<0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	0.002
12_M	0.0017	<0.1	0.01	< 0.0001	<0.00005	<0.0002	0.0003	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	0.001
12_B	0.0017	<0.1	0.01	< 0.0001	<0.00005	0.0002	0.0007	0.02	< 0.001	< 0.005	< 0.0001	0.001	< 0.001	< 0.001	0.001
13_S	0.0017	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0003	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	0.002
13_M	0.0016	<0.1	< 0.01	< 0.0001	<0.00005	0.0002	0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	0.002
13_B	0.0017	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0003	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	<0.001
14_S	0.0017	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	0.001
14_M	0.0017	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0004	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	<0.001
14_B	0.0017	<0.1	0.02	< 0.0001	0.00006	<0.0002	0.0004	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	<0.001
16_S	0.0016	<0.1	0.01	< 0.0001	<0.00005	0.0002	0.0004	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	0.002
16_M	0.0017	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0003	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	0.001
16_B	0.0017	<0.1	< 0.01	< 0.0001	<0.00005	<0.0002	0.0004	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	<0.001
17_S	0.0017	<0.1	< 0.01	< 0.0001	<0.00005	0.0002	0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	0.001	0.001	0.002
17_M	0.0017	<0.1	0.01	< 0.0001	<0.00005	<0.0002	0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	0.002
17_B	0.0016	<0.1	0.01	< 0.0001	<0.00005	<0.0002	<0.0002	0.02	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.001	<0.001
Median	0.00165	-	0.005	0.00005	0.000025	0.0001	0.0003	0.008	0.0005	-	-	0.0005	0.00075	0.00075	0.002
Max	0.0018	-	0.02	0.0006	0.00006	0.0004	0.0007	0.04	0.002	-	-	0.001	0.001	0.001	0.004
Min	0.0015	-	0.005	0.00005	0.000025	0.0001	0.0001	0.005	0.0005	-	-	0.0005	0.0005	0.0005	0.001
St-Dev	0.00007	-	0.004	0.00009	-	0.00008	0.00012	0.011	0.0003	-	-	0.0001	0.0003	0.0002	0.001

5. Hydrocarbons

Hydrocarbon results from water samples are presented in table 58 (TRH), table 59 (BTEXN, VOCs), and table 60(TOC, TSS).

Table 58 Total Recoverable Hydrocarbons (TRH) reported in all sample sites.

Site	C6-C9	C10-C14	C15-C28	C29-C36	C10-C36 (Total)	C6-C10	C6-C10 less BTEX	>C10-C16	>C10-C16 less Naphthalene	>C16-C34	>C34-C40	>C10-C40 (Total)	Naphthalene
LOR	0.02	0.02	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.001
	(Unit mg/L)												
1_S	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
1_M	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
1_B	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
2_S	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
2_M	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
2_B	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
4_S	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
4_M	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
4_B	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
7_S	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
7_M	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
7_B	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
8_S	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
8_M	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
8_B	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
9_S	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
9_M	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
9_B	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001

Site	C6-C9	C10-C14	C15-C28	C29-C36	C10-C36 (Total)	C6-C10	C6-C10 less BTEX	>C10-C16	>C10-C16 less Naphthalene	>C16-C34	>C34-C40	>C10-C40 (Total)	Naphthalene
LOR	0.02	0.02	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.001
	(Unit mg/L)												
11_S	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
11_M	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
11_B	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
12_S	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
12_M	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
12_B	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
13_S	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
13_M	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
13_B	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
14_S	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
14_M	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
14_B	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
16_S	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
16_M	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
16_B	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
17_S	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
17_M	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001
17_B	<0.02	<0.02	<0.04	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.001

Table 59 Volatile Organic Compounds (VOCs) reported in all sample sites were the same values

Compound	LOR	Unit	Result
Benzene	0.5	ug/L	< 0.5
Carbon tetrachloride	0.5	ug/L	< 0.5
Chlorobenzene	0.5	ug/L	< 0.5
DCM	5	ug/L	< 5
Ethylbenzene	0.5	ug/L	< 0.5
Hexachlorobutadiene	0.5	ug/L	< 0.5
Methyl-tert-Butyl Ether	0.5	ug/L	< 0.5
Styrene	0.5	ug/L	< 0.5
Perchloroethene (PCE)	0.5	ug/L	< 0.5
Toluene	0.5	ug/L	< 0.5
Trichloroethylene(TCE)	0.5	ug/L	< 0.5
Vinyl Chloride	0.2	ug/L	< 0.2
Xylenes (Total)	3	ug/L	< 3
1.1-Dichloroethane	0.5	ug/L	< 0.5
1.2-Dichloroethane	0.5	ug/L	< 0.5
1.1-Dichloroethene	0.5	ug/L	< 0.5
cis-1.2-Dichloroethene	0.5	ug/L	< 0.5
trans-1.2-Dichloroethene	2	ug/L	< 2
1.1.1-Trichloroethane	0.5	ug/L	< 0.5
1.1.1.2-Tetrachloroethane	0.5	ug/L	< 0.5
1.1.2.2-Tetrachloroethane	0.5	ug/L	< 0.5
1.2-Dichlorobenzene	0.5	ug/L	< 0.5
1.3-Dichlorobenzene	0.5	ug/L	< 0.5
1.4-Dichlorobenzene	0.5	ug/L	< 0.5
1.2.3-Trichlorobenzene	0.5	ug/L	< 0.5
1.2.4-Trichlorobenzene	0.5	ug/L	< 0.5
1.3.5-Trichlorobenzene	0.5	ug/L	< 0.5

6. Hydrocarbons

Chlorophyll-α results are presented in table 60. Chlorophyll-α was reported below the LOR in all water quality samples.

7. Hydrocarbons

Oil and Grease water sample results are presented in table 60. In summary:

- Oil and Grease values ranged between <5mg/Land 9mg/L
- Median oil and grease results across all sampling sites was <5mg/L

8. Sulphur

Sulphur water quality results are presented in table 60. In summary:

- Sulphur results ranged between 3.3 mg/L and 1300 mg/L
- Sulphur results reported at site 9 (3.3 mg/L) represented an outlier when compared against results obtained at other sampling locations.
- With the exception of the middle sample collected at site 9, sulphur results were generally consistent between sites and across depths.

Table 60 Oil & Grease, Sulphur, Chlorophyll-a, TOC, and TSS (dried at 103-105°C) reported in all sample sites.

Site	Oil & Grease	Sulphur	Chlorophyll-a	TOC	TSS
LOR	5	0.1	0.001	5	5
	(Unit mg/L)				
1_S	< 5	1100	<0.001	<5	18
1_M	< 5	1100	<0.001	<5	20
1_B	< 5	1100	<0.001	<5	12
2_S	< 5	1100	<0.001	<5	17
2_M	< 5	970	<0.001	<5	22
2_B	< 5	1100	<0.001	<5	19
4_S	< 5	1000	<0.001	<5	22
4_M	< 5	1100	<0.001	<5	18
4_B	< 5	1000	<0.001	<5	17
7_S	< 5	1100	<0.001	<5	20
7_M	< 5	1000	<0.001	<5	19
7_B	< 5	1100	<0.001	<5	20
8_S	< 5	1000	<0.001	<5	16
8_M	< 5	1000	<0.001	<5	18
8_B	< 5	1000	<0.001	<5	13
9_S	< 5	1000	<0.001	<5	14
9_M	< 5	3.3	<0.001	<5	22
9_B	< 5	980	<0.001	<5	9.0
11_S	< 5	930	<0.001	<5	16
11_M	< 5	990	<0.001	<5	28
11_B	< 5	960	<0.001	<5	17
12_S	9	970	<0.001	<5	12
12_M	8	970	<0.001	<5	18
12_B	9	1000	<0.001	<5	15
13_S	8	1200	<0.001	<5	15
13_M	5	1100	<0.001	<5	19
13_B	5	1200	<0.001	<5	18
14_S	5	1100	<0.001	<5	16

Site	Oil & Grease	Sulphur	Chlorophyll-a	TOC	TSS
14_M	< 5	1100	<0.001	<5	11
14_B	< 5	1200	<0.001	<5	8.0
16_S	< 5	1300	<0.001	<5	6.0
16_M	< 5	1200	<0.001	<5	7.0
16_B	< 5	1200	<0.001	<5	<5
17_S	< 5	1200	<0.001	<5	15
17_M	5	1200	<0.001	<5	12
17_B	< 5	1200	<0.001	<5	20

9. Discussion and Conclusion on Marine Environmental Quality

Water Quality Samples

Water quality samples collected across the project area generally showed low dissolved metal concentrations, with most metals either below the Limit of Reporting (LOR) or ANZG (2018) 95% and 99% Species Protection Levels (SPLs). The only exception was copper (one exceedance) and zinc (two exceedances). Limited water quality data exist for the project area, with the nearest comparable marine water sampling conducted at the Barossa gas fields, approximately 450 km away (Jacobs 2015). Baseline surveys at Barossa reported similarly low dissolved metal concentrations (Jacobs 2016a). Despite the three minor exceedances of the 99% SPL, copper and zinc levels at the Chuditch-2 project area were highly comparable to those observed at Barossa during baseline surveys (Jacobs 2016a).

Hydrocarbons and Chlorophyll-α were not detected above the laboratory LOR in any samples, while oil and grease were either detected in very low concentrations or below the LOR. Median Sulphur concentration across water quality samples was 1100mg/L, where samples did not vary significantly in concentration. One outlier result was reported for Sulphur in sample 9_M; however, this result was considered likely to represent laboratory reporting error.

Appendix 2: Analysis of Marine Sediment Quality

The details results and analysis of the marine sediment quality are reproduced from the Chuditch-2 Environmental Baseline Survey (EBS) Technical Report dated March 2025 conducted by WA Marine Pty Ltd trading as O2 Marine, Western Australia. The data, figures, tables and information are reproduced from that report as primary information around the Chuditch-2 Appraisal Well Program.

Sediment Quality:

1. Particle Size Distribution (PSD)

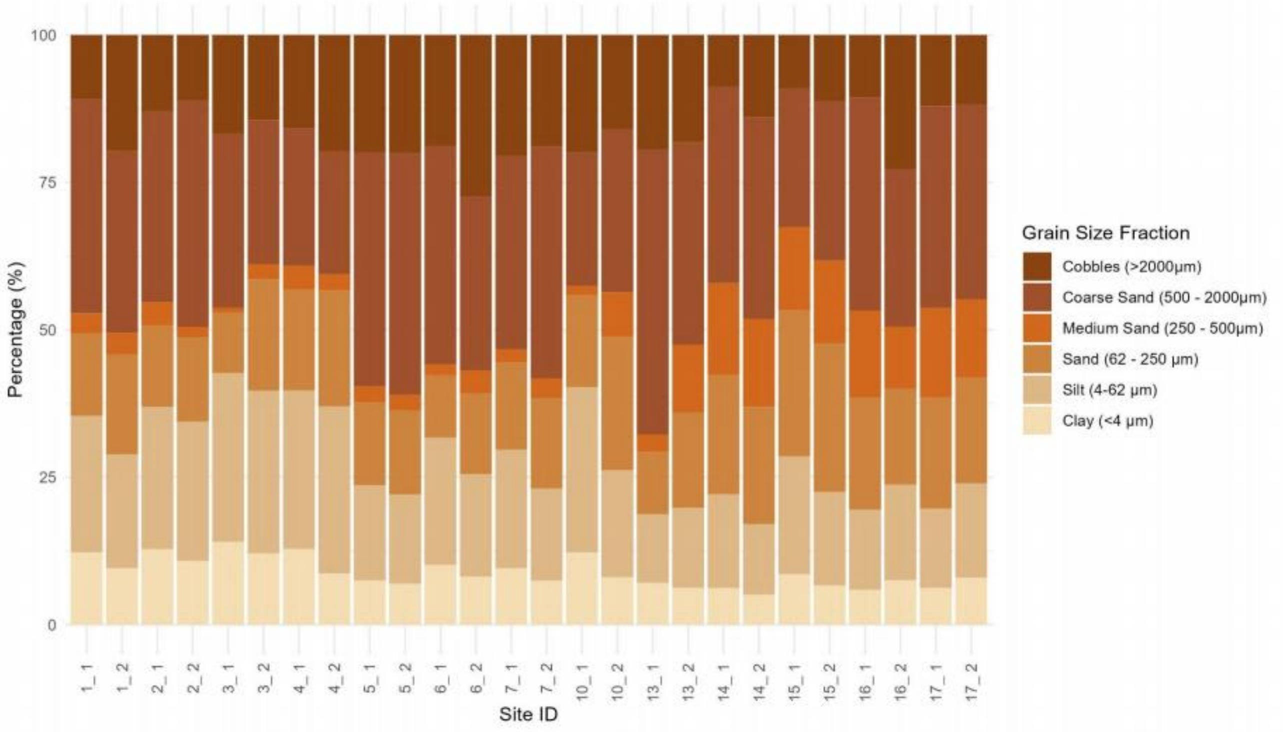
Particle size distribution (PSD) results are presented in table 61 and in figure 54. Field sediment photos and descriptions are presented in Appendix 5. Sediment PSD was generally uniform across sampling locations, where coarse grained sand (500µm-2000µm) was typically the most dominant fraction, followed by silt (4µm-62µm). Medium grained sand generally comprised the lowest fraction of grains across all sample sites, and while no sites appeared to be significantly different in their PSD composition sites 13 to 17 appeared to have a higher content of medium grained sand (250µm-500µm) and a lower proportion of clay sized particles (<4µm) when compared with sites 1 to 10.

Table 61 Sediment Particle Size Distribution (PSD) results. Cells highlighted in blue represent the dominant particle size fraction.

Site ID	Clay (<4 µm)	Silt (4-62 µm)	Sand (62-250 µm)	Medium Sand (250-500µm)	Coarse Sand (500-2000µm)	Cobbles (>2000µm)
Units	%					
1_ 1	12.27	23.15	14.04	3.37	36.28	10.89
1_ 2	9.57	19.33	16.9	3.69	30.79	19.72
2_ 1	12.83	24.12	13.79	3.97	32.41	12.88
2_ 2	10.84	23.61	14.27	1.76	38.35	11.17
3_ 1	14.07	28.63	10.19	0.83	29.63	16.65
3_ 2	12.13	27.55	18.88	2.58	24.42	14.44
4_ 1	12.86	26.88	17.11	3.99	23.27	15.89
4_ 2	8.71	28.3	19.69	2.77	20.83	19.7
5_ 1	7.53	16.14	14.01	2.74	39.66	19.92
5_ 2	6.95	15.15	14.21	2.67	40.98	20.04
6_ 1	10.17	21.55	10.54	1.87	37.05	18.82
6_ 2	8.16	17.42	13.63	3.94	29.45	27.4
7_ 1	9.57	20.14	14.7	2.26	32.84	20.49
7_ 2	7.5	15.58	15.34	3.34	39.37	18.87
10_ 1	12.26	28.06	15.59	1.52	22.61	19.96
10_ 2	8.07	18.13	22.67	7.53	27.67	15.93
13_ 1	7.11	11.63	10.59	2.89	48.25	19.53
13_ 2	6.26	13.57	16.1	11.57	34.37	18.13
14_ 1	6.22	15.9	20.2	15.59	33.24	8.85
14_ 2	5.12	11.96	19.87	14.9	34.23	13.92
15_ 1	8.57	19.97	24.74	14.18	23.5	9.04
15_ 2	6.67	15.86	25.16	14.06	27.03	11.22
16_ 1	5.93	13.58	19.06	14.67	36.19	10.57

Site ID	Clay (<4 µm)	Silt (4-62 µm)	Sand (62-250 µm)	Medium Sand (250-500µm)	Coarse Sand (500-2000µm)	Cobbles (>2000µm)
16_ 2	7.56	16.18	16.26	10.54	26.71	22.75
17_ 1	6.24	13.47	18.83	15.17	34.25	12.04
17_ 2	8.02	15.95	17.95	13.26	33.04	11.78

Figure 54 Sediment Particle Size Distribution



2. Total Metals

Total metals concentrations are presented in table 62. In summary:

- Mercury, cobalt, selenium, silver, and cadmium were reported below the LOR in all samples.
- Remaining metals were reported below ANZG (2018) DGVs where available.
- NB: Values reported below the LOR have been halved for calculation of summary statistics

Table 62 Sediment samples, total metals results

	Al	Sb	As	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Ni	Se	Ag	V	Zn
Units	**mg/kg**															
DGV (ANZG 2018)	-	2	20	1.5	80	-	65	-	50	-	0.15	21	-	1	-	200
1_ 1	5700	< 2	3.4	< 1	16.0	< 5	< 5	7900	5.3	160	< 0.1	8.7	< 5	< 1	< 10	8.3
1_ 2	4500	< 2	2.5	< 1	13.0	< 5	< 5	6900	< 5	160	< 0.1	7.1	< 5	< 1	< 10	7.9
2_ 1	3500	5.4	2.5	< 1	9.0	< 5	< 5	5100	< 5	120	< 0.1	< 5	< 5	< 1	< 10	< 5
2_ 2	5500	< 2	4.0	< 1	15.0	< 5	< 5	8200	< 5	140	< 0.1	8.4	< 5	< 1	< 10	7.0
3_ 1	5000	< 2	< 2	< 1	13.0	< 5	< 5	6700	< 5	100	< 0.1	6.8	< 5	< 1	< 10	5.8
3_ 2	4400	2.1	2.9	< 1	12.0	< 5	< 5	7500	< 5	110	< 0.1	6.8	< 5	< 1	< 10	6.0
4_ 1	3600	< 2	< 2	< 1	10.0	< 5	< 5	5600	< 5	87	< 0.1	5.7	< 5	< 1	< 10	7.0
4_ 2	7700	< 2	2.7	< 1	21.0	< 5	6.2	11000	< 5	170	< 0.1	12.0	< 5	< 1	12.0	13.0
5_ 1	6400	< 2	3.7	< 1	19.0	< 5	5.6	11000	< 5	180	< 0.1	11.0	< 5	< 1	11.0	12.0
5_ 2	4500	< 2	2.8	< 1	13.0	< 5	< 5	6800	< 5	120	< 0.1	7.3	< 5	< 1	< 10	6.4
6_ 1	4000	< 2	< 2	< 1	11.0	< 5	< 5	5900	< 5	95	< 0.1	6.0	< 5	< 1	< 10	8.2
6_ 2	5100	< 2	2.3	< 1	14.0	< 5	< 5	6700	< 5	120	< 0.1	7.8	< 5	< 1	< 10	6.7
7_ 1	4600	< 2	3.3	< 1	13.0	< 5	< 5	6600	< 5	120	< 0.1	7.0	< 5	< 1	< 10	6.1
7_ 2	8500	5.6	6.3	< 1	26.0	< 5	7.8	16000	5.1	200	< 0.1	15.0	< 5	< 1	18.0	15.0
10_ 1	4100	< 2	< 2	< 1	9.8	< 5	< 5	5400	< 5	80	< 0.1	5.7	< 5	< 1	< 10	5.5

	Al	Sb	As	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Ni	Se	Ag	V	Zn
Units	mg/kg															
10_ 2	5900	< 2	< 2	< 1	16.0	< 5	5.0	8200	< 5	130	< 0.1	9.6	< 5	< 1	< 10	10.0
13_ 1	4000	< 2	2.3	< 1	11.0	< 5	< 5	5000	< 5	120	< 0.1	5.6	< 5	< 1	< 10	< 5
13_ 2	5800	< 2	4.1	< 1	17.0	< 5	< 5	8000	< 5	160	< 0.1	8.7	< 5	< 1	< 10	8.5
14_ 1	3900	< 2	2.7	< 1	9.6	< 5	< 5	6400	< 5	98	< 0.1	5.8	< 5	< 1	< 10	< 5
14_ 2	4800	< 2	2.2	< 1	13.0	< 5	< 5	6400	< 5	130	< 0.1	7.6	< 5	< 1	< 10	6.2
15_ 1	4500	< 2	< 2	< 1	12.0	< 5	< 5	6300	< 5	100	< 0.1	6.7	< 5	< 1	< 10	5.6
15_ 2	3200	< 2	< 2	< 1	7.8	< 5	< 5	4300	< 5	75	< 0.1	< 5	< 5	< 1	< 10	< 5
16_ 1	4600	< 2	< 2	< 1	12.0	< 5	< 5	6300	< 5	100	< 0.1	6.6	< 5	< 1	< 10	6.0
16_ 2	8100	< 2	3.3	< 1	22.0	< 5	6.7	12000	< 5	190	< 0.1	13.0	< 5	< 1	13.0	14.0
17_ 1	6900	< 2	3.1	< 1	20.0	< 5	5.7	10000	< 5	170	< 0.1	11.0	< 5	< 1	11.0	11.0
17_ 2	1900	< 2	2.0	< 1	5.7	< 5	< 5	3500	< 5	61	< 0.1	< 5	< 5	< 1	< 10	< 5
Median	4600.0	5.4	2.9	-	13.0	-	6.0	6700	5.2	120.0	-	7.3	-	-	12.0	7.0
Max	8500.0	5.6	6.3	-	26.0	-	7.8	16000	5.3	200.0	-	15.0	-	-	18.0	15.0
Min	1900.0	2.1	2.0	-	5.7	-	5.0	3500	5.1	61.0	-	5.6	-	-	11.0	5.5
St Dev	1542.1	2.0	1.0	-	4.7	-	1.0	2695.5	0.1	37.3	-	2.6	-	-	2.9	3.0

3. Moisture

Moisture content of sediment samples is presented in table 60. In summary:

- Moisture content ranged between 33% (Site 3) and 44% (Site 13). The median moisture content across all sample sites was 39%, while there was a low standard deviation in % moisture content between samples (2%).

4. Oil and Grease

- Oil and grease results are presented in table 60. In summary:
- Oil and grease was generally reported below the LOR (<500 mg/kg) however was detected in low concentrations at Site 5 (690 mg/kg) and at Site 16 (630 mg/kg).

5. Sulphur

Sulphur results are presented in table 63. In summary:

- Sulphur concentrations ranged between 2100 mg/kg (Site 17) and 6100 mg/kg (Site7).
- Median concentrations of sulphur across all samples was 3500 mg/kg, while the standard deviation was 1217 mg/kg.

6. Hydrocarbons

Results for hydrocarbons in sediments are presented in table 63. In summary:

- BTEXN, Aliphatic and Aromatic Hydrocarbon, and Polyaromatic Hydrocarbon (PAH) concentrations were reported below the LOR at all sample sites
- Total recoverable hydrocarbons (TRH) were detected in low concentrations at several sample sites, normalized TRH concentrations were reported below the ANZG (2018) DGV.

Table 63 Sediment Samples

Site	Moisture Content	Oil and Grease	Sulphur	TRH C10-C36 (Total)	TOC	TRH (C10-C36) Normalised to 1% OC
Units	**%**	**mg/kg**	**mg/kg**	**mg/kg**	**%**	**mg/kg**
DGV (ANZG 2018)	-	-	-	-	-	280
1_1	39	< 500	5600	57	6.9	8.3
1_2	38	< 500	3400	< 50	5.7	-
2_1	41	< 500	2900	< 50	6.6	-
2_2	38	< 500	4900	< 50	7.8	-
3_1	33	< 500	3300	55	7.6	7.2
3_2	36	< 500	2800	< 50	7.2	-
4_1	38	< 500	2200	< 50	6.4	-
4_2	40	< 500	4100	< 50	7.2	-
5_1	40	< 500	5400	< 50	8.5	-
5_2	40	690	4900	< 50	7.2	-
6_1	38	< 500	2700	< 50	11.0	-
6_2	39	< 500	4300	137	10.0	13.7
7_1	38	< 500	3600	< 50	9.6	-
7_2	38	< 500	6100	70	9.2	7.6

Site	Moisture Content	Oil and Grease	Sulphur	TRH C10-C36 (Total)	TOC	TRH (C10-C36) Normalised to 1% OC
10_ 1	40	< 500	2500	470	7.6	61.8
10_ 2	39	< 500	3400	< 50	9.2	-
13_ 1	41	< 500	4400	480	8.3	57.8
DGV (ANZG 2018)	-	-	-	-	-	280
13_ 2	44	< 500	6100	71	8.6	8.3
14_ 1	39	< 500	3100	< 50	7.6	-
14_ 2	39	< 500	4100	< 50	11.0	-
15_ 1	39	< 500	3300	< 50	7.1	-
15_ 2	39	< 500	2300	< 50	6.8	-
16_ 1	38	630	3300	< 50	5.1	-
16_ 2	37	< 500	5200	< 50	10.0	-
17_ 1	39	< 500	5100	160	10.0	16.0
17_ 2	39	< 500	2100	72	7.1	10.1
Median	39	-	3500	25	7.6	10.1
Max	44	-	6100	480	11	61.8
Min	33	-	2100	25	5.1	7.2
St Dev	2	-	1217	122	1.5	22.1

NB: Values reported below the LOR have been halved for calculation of summary statistics

Discussion and Conclusion on Marine Sediment Quality

Sediment Quality Samples

Sediments collected across the project area were generally consistent in physical attributes and properties, predominantly brown/grey in color, with shell fragments and minimal visible organic content. They primarily comprised of sand-sized grains (60 µm-2000 µm) but also contained moderate proportions of clay and silt- sized particles.

When compared against ANZG (2018) default guideline values (DGVs), total metals concentrations in sediment was low, with values generally reported below the DGVs or the LOR. While limited data exists to contextualize total metals concentrations in the region, Jacobs (2015b) generally reported similar to slightly higher natural levels of metals. Sulphur content in marine sediment samples ranged between 2100 and 6100 mg/kg, with a median value of 3500 mg/kg.

Hydrocarbon results from sediment samples collected during this survey were generally reported below the LOR. TRH (C10-C36) was, however, detected in very low concentrations in a number of samples with detections assumed to be of natural origin based on the limited ability for any anthropogenic influence in the project area. In all sediment samples TRH concentrations normalized against organic carbon content in sediments were reported below ANZG (2018) DGVs.

Appendix 3: Marine Fauna

A detail information of marine fauna including habitat and characteristics of benthic habitats and detail information on the characteristics and abundances of the filter feeders encountered during the EBS are placed described below.

1. Benthic Infauna

Benthic infauna identification, classification, and analysis is presented in table 64.

Table 64 Number of still images with sediment burrows and/or holes and associated density

	No Sediment	Sparse (<10)	Low (10-20)	Moderate (20-50)	High (>50)
T10	0	15	3	2	0
T11	2	18	0	0	0
T12	0	13	1	3	3
T15	2	15	3	0	0
T17	0	17	3	0	0
T1A	0	11	4	4	1
T1B	0	12	5	3	0
T4	0	7	5	6	2

The marine benthic survey collected 192 individuals from 62 taxonomic morphological species. The three most abundant species across all sites were the bristle worm Anthuridae (n=13), the Litocorsa sp1 (n=11) and, the Apseudidae (n=11).

2. Diversity Indices

Four indices are selected: Margalef's species richness, Shannon-H species diversity, Evenness, and Dominance-D. Since only two samples were collected at each survey site, statistical variation analysis could not be conducted. This limits the ability to statistically confirm if there are differences in communities across the survey sites.

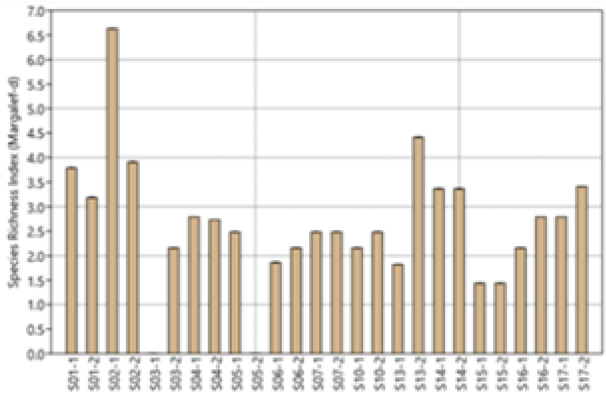
Across the survey area, the species richness index (Margalef) had the lowest value at sites 3-1 (0.0) and 5-2 (0.0) and the highest value at site 2-1 (6.636) (figure 55 a). The species diversity index (Shannon-H) had the lowest value at sites 3-1 (0.0) and 5-2 (0.0) and the highest value at site 2-1 (3.086) (figure 55 b). The evenness index and the dominance index are correlated. All the sites presented very high evenness values between 0.913 and 1.0, indicating a complete even distribution (figure 55 c). Dominance values were low across most sites, from 0.05 to 0.5 (figure 55 d). This indicates an even distribution of individual counts among different species, with no single species dominating the communities across the survey area. However, samples 3-1 and 5-2 had complete evenness (value=1) and complete dominance (value=1), due to only one individual from one taxon being collected.

3. Faunal Composition

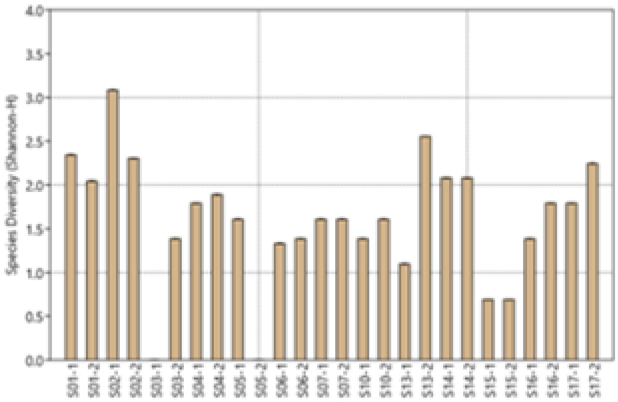
The MDS plot of all samples had a stress value of 0.15, which gives a potentially useful ordination, although it should not be relied upon in great detail (figure 56). Most sites were grouped with a 5% similarity in the faunal community. Sites 3, 15, and 16 were outliers from the main group. However, without three sample replications, it is difficult to determine the cause of these outliers.

Figure 55 Species richness index (Margalef's-d) for all sites b) Species diversity (Shannon-H) for all sites c)Evenness values for all sites d)Dominance-D values for all sites

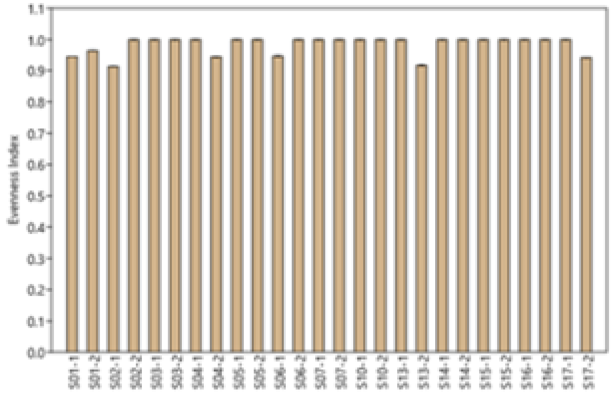
a)



b)



c)



d)

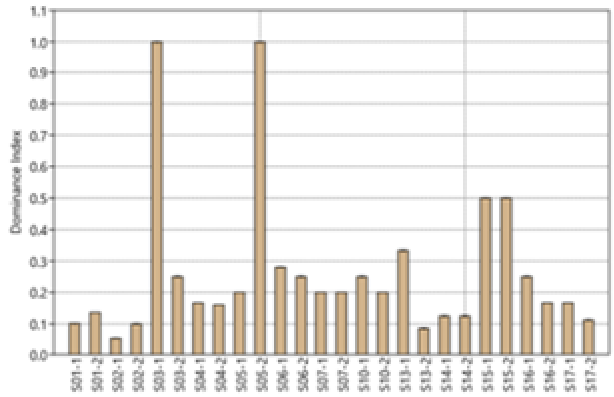
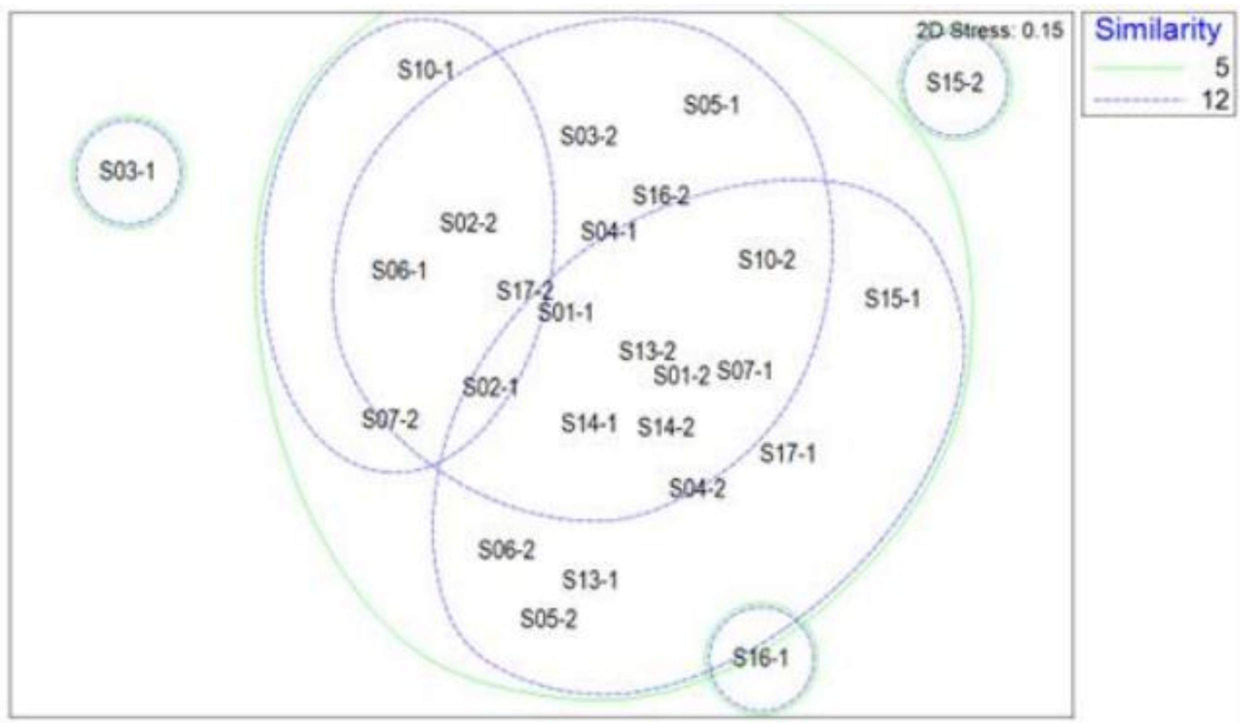


Figure 56 MDS ordination of faunal composition



Discussion and Conclusion on Benthic Infauna

Benthic infauna samples collected from replicate sediment samples at the Chuditch-2 project area consisted of a total of 192 individuals from 62 taxonomic, morphological groups, with the most abundant species across all sites being the Anthuridae, the Litocorsa sp1, and the Apseudidae.

Statistical analysis of benthic infauna was limited as only 2 samples were collected from each site, meaning variation analysis could not be accurately conducted. Samples from sites 3 and site 5 had the lowest species richness and diversity while sample 1 from site 2 reported the highest. The majority of infauna sample locations reported an even distribution in individual counts among different species, while no single species was observed to be more dominant across any of the sites or samples. Benthic community assemblage across the survey area was therefore considered to be heterogenous, whilst patchy.

Appendix 4: Benthic Habitat Assessment

A detail information of benthic habitat assessment around the Chuditch-2 drilling well during the EBS are placed described below.

Analysis of the towed video footage collected by ROV classified a total of 4,542 points from the eight (8) transects. The number and proportion of classified points and the distribution of these classifications are presented for substrate (table 65 and figure 57), dominant biota (table 66 and figure 58), percent cover (table 67 and figure 59), and an overall benthic habitat class (table 68 and figure 60).

Of the 4,542 classified points, 3,772 were assigned substrate information, which largely comprised of Sand / Mud (59.4%), while similar proportions were assigned as Rock (20.9%) and Pebble / Gravel – Rubble (49.1%), with Cobbles (0.6%) the only other substrate classification recorded.

Mixed Filter Feeders comprised 96.4% of all points assigned with dominant biota information, with Black & Octocorals (2.3%), Sponges (cup) (0.7%), Black & Octocorals - Fan (2D) (0.4%), and Sponges (mixed) (0.1%) collectively comprising the remaining 3.4%.

Information of percent cover of biota was assigned to 3,692 points, with 53.5% classified as Sparse/Low in cover. Relatively similar proportions of benthic biota cover were classified as Moderate (15.5%), Bare (14.1%), and High (12.2%), while 4.2% was classified as Dense, and 0.4% of classified points had None Recorded assigned to percent cover.

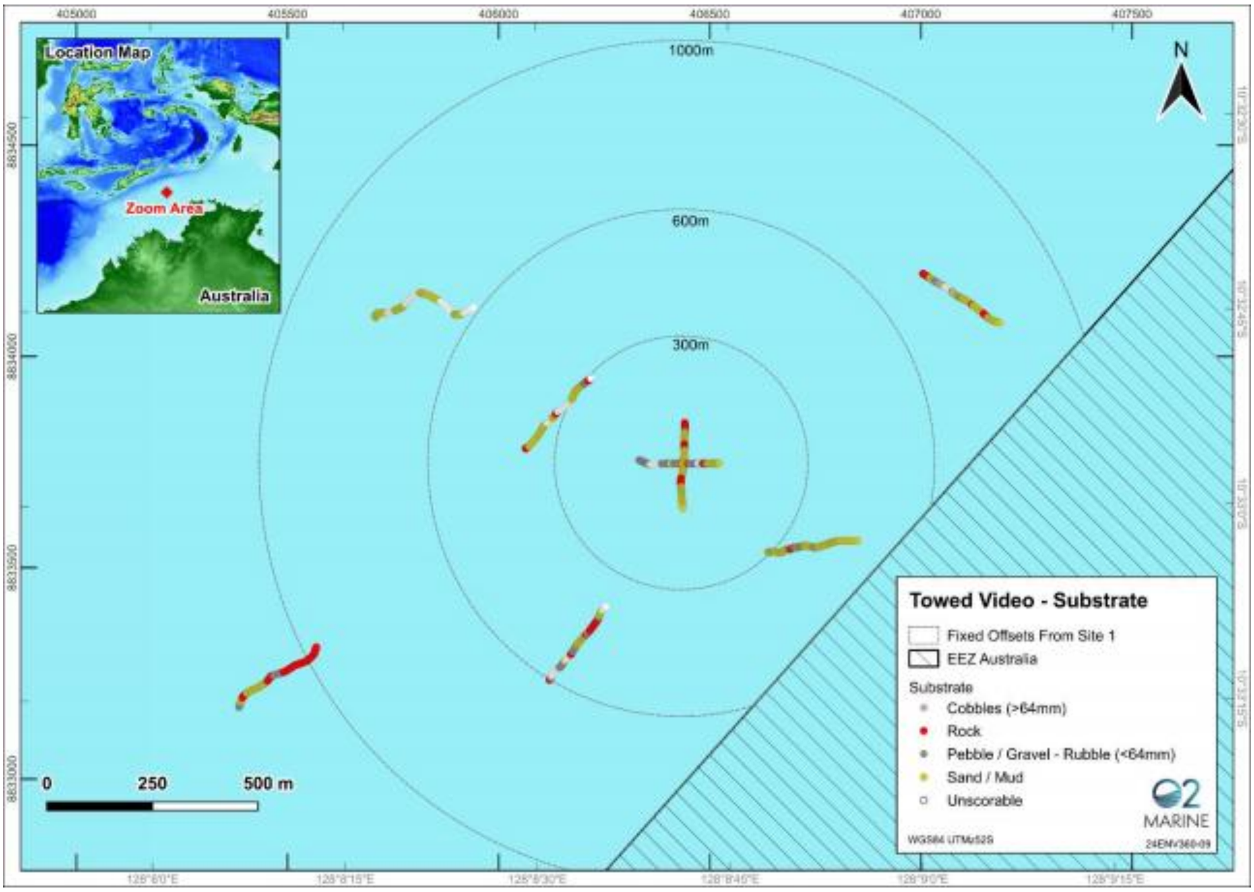
A broad summary classifying the benthic habitat was assigned to 3,752 points which was largely allocated to the Sediment with Sparse Filter Feeders (48.6%) and Filter Feeders (mixed habitat) (21.1%) classifications, followed by Reef with Mixed Assemblage (14.9%), Bare Sediment (bioturbated) (12.9%), and Bare Sediment (2.6%).

1. Substrate

Table 65 Number of classified points (substrate).

Substrate	Number of classified points	Proportion of classified points
Cobbles (>64mm)	21	0.6%
Rock	787	20.9%
Pebble / Gravel - Rubble (<64mm)	722	19.1%
Sand / Mud	2,242	59.4%
Total	3,772	100.0%

Figure 57 Overview of substrate classifications assigned along each transect.

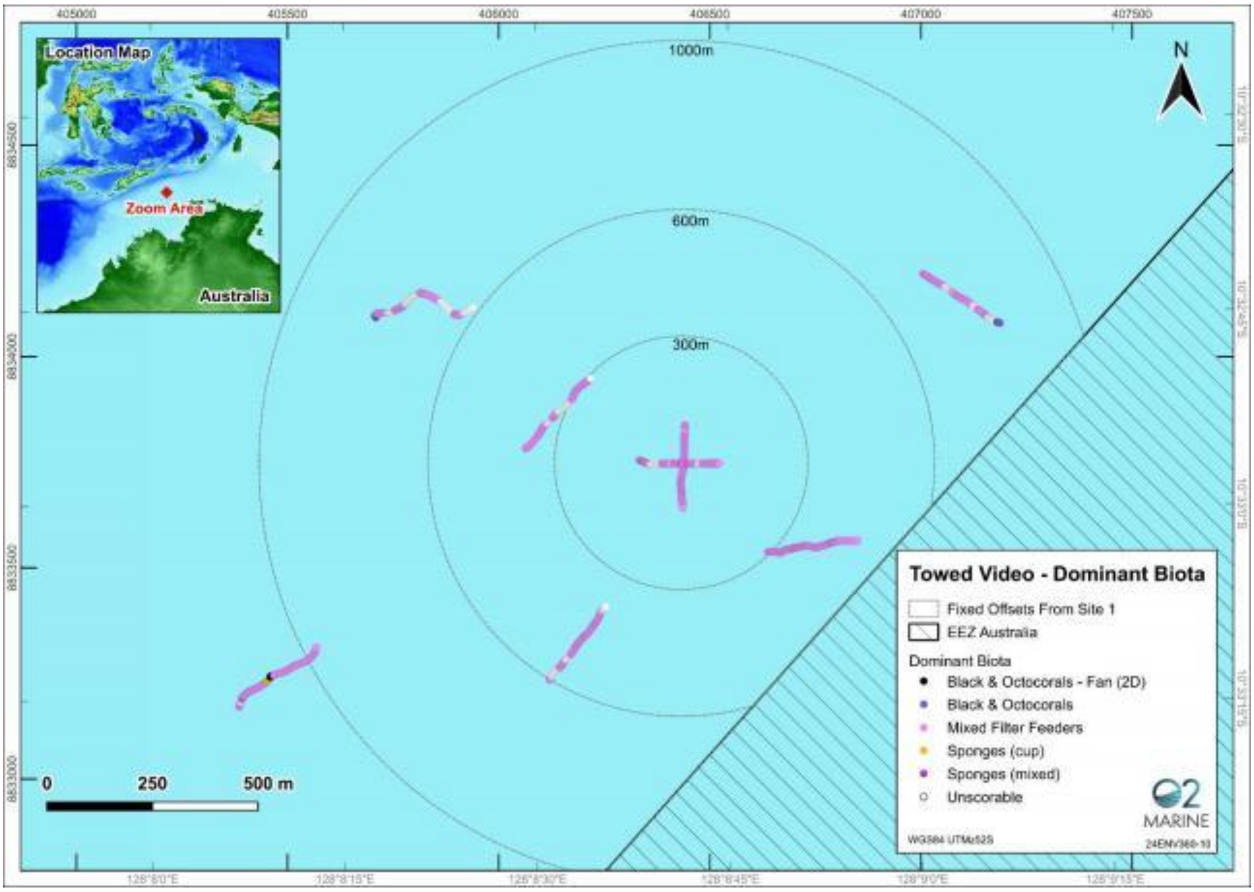


2. Dominant Biota

Table 66 Number of classified points (dominant biota)

Dominant Biota	Number of classified points	Proportion of classified points
Black & Octocorals - Fan (2D)	16	0.4%
Black & Octocorals	86	2.3%
Mixed Filter Feeders	3,528	96.4%
Sponges (cup)	25	0.7%
Sponges (mixed)	5	0.1%
Total	3,660	100.0%

Figure 58 Overview of dominant biota classifications assigned along each transect

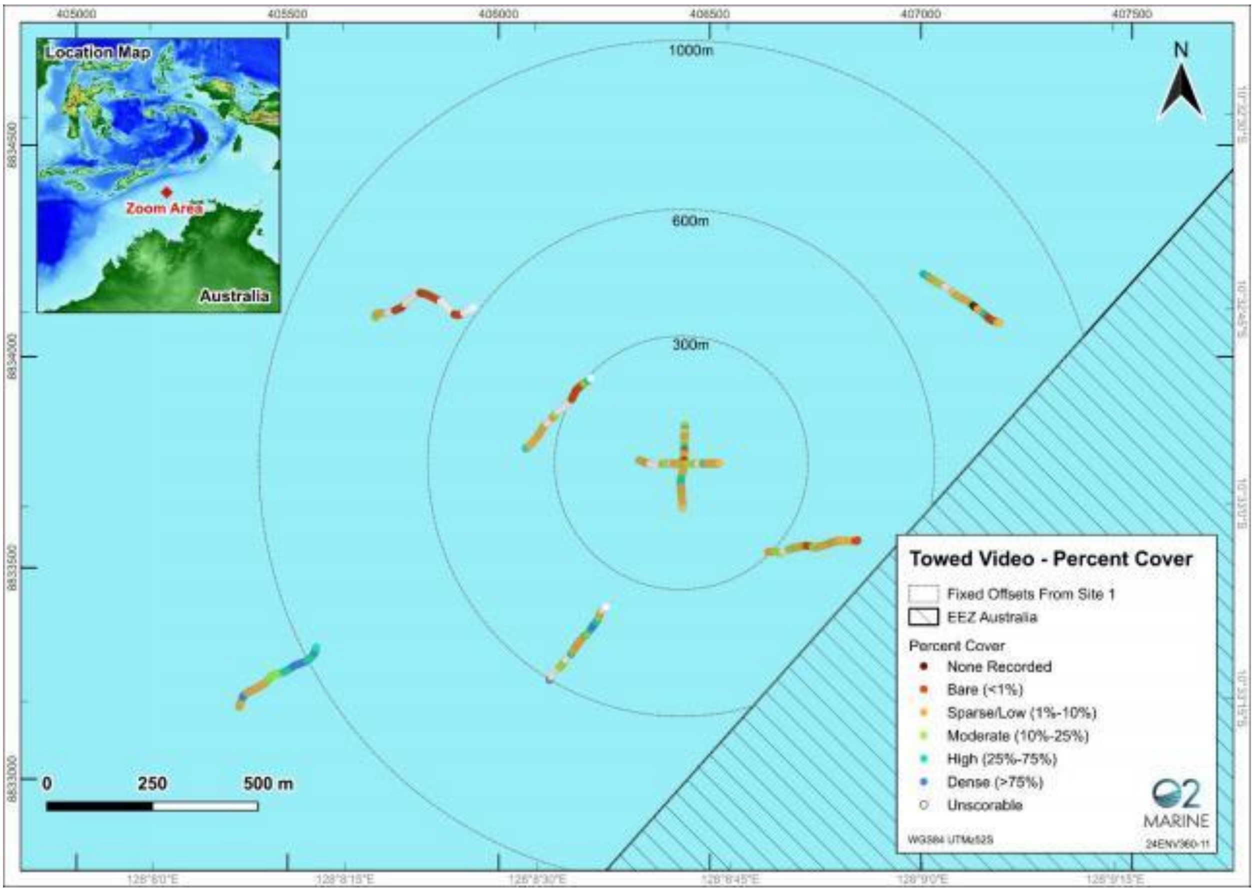


3. Percent Cover (Biota)

Table 67 Number of classified points (percent cover)

Percent Cover (Biota)	Number of classified points	Proportion of classified points
None Recorded	16	0.4%
Bare (<1%)	522	14.1%
Sparse/Low (1%-10%)	1,975	53.5%
Moderate (10%-25%)	573	15.5%
High (25%-75%)	451	12.2%
Dense (>75%)	155	4.2%
Total	3,692	100.0%

Figure 59 Overview of total biota percent cover assigned along each transect

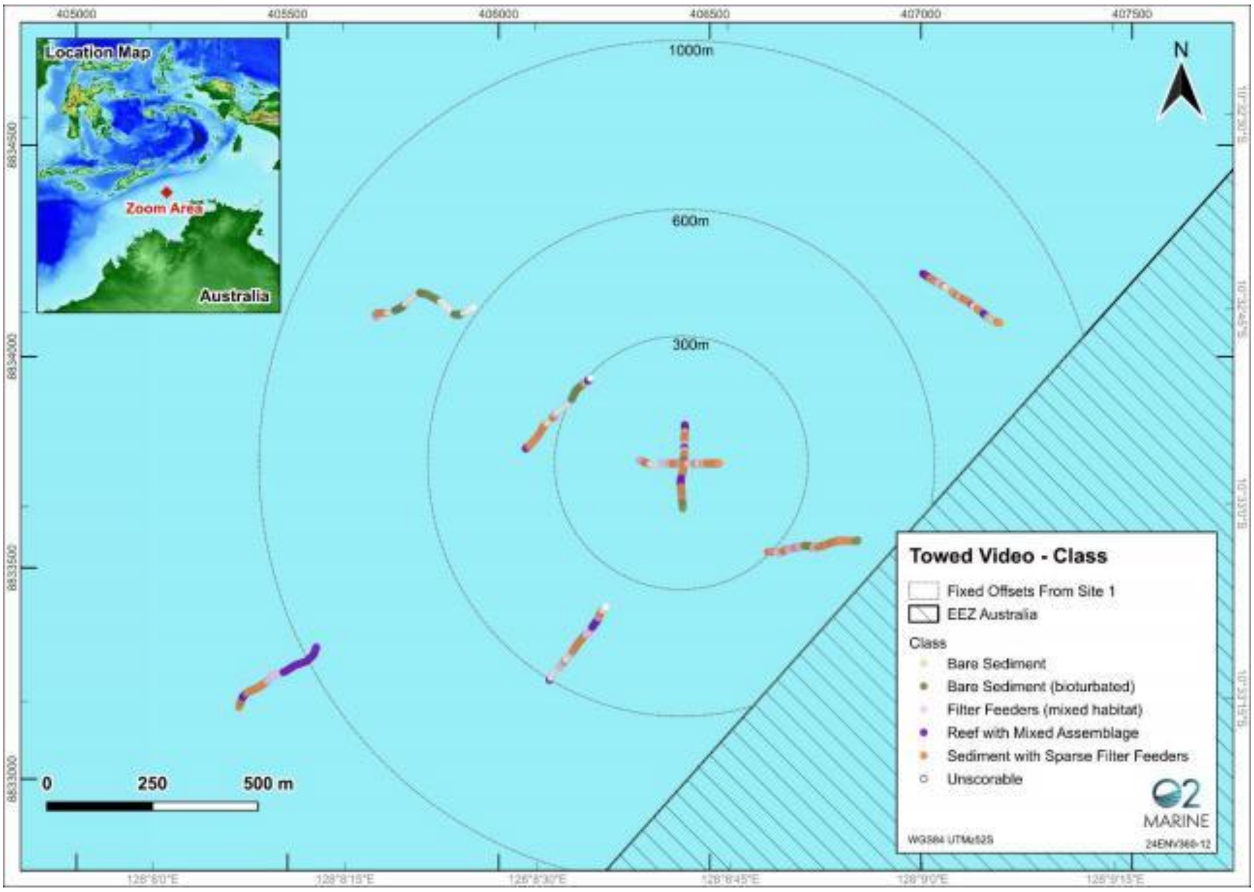


4. Habitat Classification

Table 68 Number of classified points (habitat class)

Habitat Class	Number of classified points	Proportion of classified points
Filter Feeders (mixed habitat)	792	21.1%
Reef with Mixed Assemblage	558	14.9%
Sediment with Sparse Filter Feeders	1,822	48.6%
Bare Sediment	96	2.6%
Bare Sediment (bioturbated)	484	12.9%
Total	3,752	100.0%

Figure 60 Overview of habitat classifications assigned along each transect



5. Benthic Cover

Analysis of 20 still images along each transect (n = 160) was undertaken to provide additional benthic habitat information. Benthic habitat characteristics were classified into four broad categories with their relative proportion of cover along each transect presented in Figure 12. Soft Substrate was the dominant characteristic across all transects, comprising between 81.8% (T11 and T15) and 99.2% (T10). Filter Feeders were the only other characteristic which was recorded along all transects within the still images, with benthic cover highest at T15 (7.7%) and T11 (7.2%), and lowest at T10 and T1B (both 0.8%). Hard Substrate was highest within T11 (10.7%) and T15 (10.5%), with cover decreasing at T12 (9.5%), T1B (5.0%), and T17 (2.2%), while Hard Substrate was absent from all other transects. Benthic characteristics which were classified as 'unconfirmed' were absent from T15 and T17, comprised <0.1% at T10, and ranged between 0.1% (T12) and 0.4% (T1B) for the remaining transects.

Discussion and Conclusion on Benthic Habitat Assessment

Substrate along T1A was largely classified as Pebble / Gravel - Rubble with areas of Sand / Mud and Rock found on the eastern portion of the transect. The substrate along T1B was dominated by Sand / Mud with segments of rock and a small area of Pebble / Gravel - Rubble. The substrate along both, T1A and T1B, was dominated by Mixed Filter Feeder assemblages which were predominantly comprised of relatively equal dominance of filter feeders such as sponges and octocorals. The percent cover of biota along T1A was predominantly sparse (1-10%) although cover increased to moderate (10-25%) and high (25-75%) over areas of Rock or Rubble. Similarly, areas of substrate classified as Rock or Rubble along T1B aligned with areas of moderate and high biota cover, whereas Sand / Mud aligned with sparse or bare (<1%) cover.

The benthic habitat along transect T1A fluctuated between Sediment with Sparse Filter Feeders and Filter Feeders (mixed habitat), with some areas along T1A un-scorable, while all five habitat classes were present along T1B. The distribution of Filter Feeders (mixed habitat) along T1A was typically found with Pebble / Gravel - Rubble and Rock substrate, while Sediment with Sparse Filter Feeders typically aligned with Sand / Mud substrate along both, T1Aand T1B, with areas of Bare Sediment (bioturbated) along T1B also aligning with the distribution of Sand / Mud. Areas with Rock substrate along T1B aligned with the Reef with Mixed Assemblage habitat classification which also aligned with the areas of moderate and dense biota cover. The composition of benthic habitat features along T1B and T1A tend to be reflected in the benthic cover analysis which found 5.0% of hard substrate along T1B whereas hard substrate was not recorded within T1A.

The benthic habitat along T17 was primarily classified as Sediment with Sparse Filter Feeders, and Bare Sediment (bioturbated), with Reef with Mixed Assemblage at each end. Filter Feeders (mixed habitat) was classified in two small segments along the transect, while a considerable proportion of the transect was classified as un-scorable. Sand / Mud substrate aligned with Sediment with Sparse Filter Feeder habitat and Bare Sediment (bioturbated) habitat, while Rock substrate aligned with Reef with Mixed Filter Feeder habitat. Majority T17 comprised of bare and sparse/low biota cover. Moderate and high biota cover was classified in areas of Reef with Mixed Filter Feeder or Filter Feeders (mixed habitat). All dominant biota classified along T17 was categorised as Mixed Filter Feeders. The results of benthic cover from the downward facing camera suggests a composition of 96.0% soft substrate with 2.2% hard substrate and 1.8% filter feeders.

T04 comprised relatively featureless benthic habitat with Sediment with Sparse Filter Feeders the dominant benthic habitat class, with Filter Feeders (mixed habitat) subdominant and Bare Sediment (bioturbated) classifications least abundant. Small areas of Rock and Pebble / Gravel - Rubble were found in areas of Filter Feeders (mixed habitat), however, Sand / Mud comprised majority of the substrate along T04. Biota cover was predominantly <10% (bare or sparse/low) although areas classified as Filter Feeders (mixed assemblage) typically ranged between 10-25% (moderate) cover. Dominant biota was consistently classified along T04, all of which was classified as Mixed Filter Feeders. The lack of hard substrate was reflected in benthic cover results (where it was not recorded), whilst soft substrate comprised 95.3% and filter feeders accounted for 4.4%, with 0.3% remaining unconfirmed.

The proportion of benthic habitat along T12 was relatively evenly distributed between Sediment with Sparse Filter Feeders, Filter Feeders (mixed habitat), Reef with Mixed Assemblage, and un-scorable. Rock and Pebble / Grave - Rubble comprised majority of the substrate wit marginally lower composition of Sand / Mud classified. The considerable presence of hard substrate along T12 aligned with biota cover typically ranging between moderate and high cover, with areas of dense (>75%) biota cover was recorded over some areas classified as Reef with Mixed Assemblage. The remaining biota cover was scored as sparse/low or un-scorable. Mixed Filter Feeders were the dominant biota along T12 with the only other dominant biota information pertaining to areas classified as un-scorable. These results were largely reflected in the benthic cover results which recorded a considerably low cover of soft substrate (85.4%) while hard substrate (9.5%) and filter feeders (5.0%) scored considerably high in cover.

Sediment with Sparse Filter Feeders was the dominant benthic habitat classified along T15, with areas of Reef with Mixed Assemblage, Filter Feeders (mixed habitat), and Bare Sediment also classified along with areas which were un-scorable in classification. As expected, Sand / Mud was the dominant substrate along T15, with the proportion of substrate classified as Cobbles, Rock, and Pebble / Gravel - Rubble, all relatively similar. High biota cover was recorded over areas with Rock substrate, while Cobbles and Pebble / Gravel - Rubble mostly facilitated moderate biota cover. The remaining cover of biota was largely sparse/low, with some areas being recorded with <1% (bare) biota cover, or with no biota cover (none recorded). Mixed Filter Feeders were the dominant biota along majority of the classified areasofT15, with the exception of a small portion which was classified with Black & Octocorals as the dominant biota. Benthic cover results were also somewhat reflective for T15 which recorded the equal lowest cover of soft substrate (81 .8%), the highest cover of filter feeders (7.7%) and a considerable cover of hard substrate (10.5%).

Majority of the benthic habitat along T10 was classified as Un-scorable. Where habitat characteristics were scored, Bare Sediment (bioturbated) was the dominant classification followed by Sediment with Sparse Filter Feeders. Sand / Mud was the only substrate classified along T10, which largely aligned with bare (<1%) biota cover, with a small area of sparse/low cover, all of which, was assigned to Mixed Filter Feeders as dominant biota. The lack of biota and hard substrate was evident in the benthic cover results which classified 99.2% of T10 as soft substrate, with only filter feeders (0.8%) and unconfirmed (<0.1%) also scored.

Majority of the benthic habitat along T11 was classified as Reef with Mixed Assemblage, which aligned with Rock substrate, with Sediment with Sparse Filter Feeders, Filter Feeders (mixed habitat), and Bare Sediment (bioturbated) also classified. Filter Feeders (mixed habitat) comprised of a mixed between Rock and Pebble / Gravel - Rubble substrates, whilst Bare Sediment (bioturbated) was over Sand / Mud substrates. Sediment with Sparse Filter Feeders was predominantly over Sand / Mud, with a small proportion aligning with Pebble / Gravel- Rubble substrate. Relatively structurally complex reef features (classified as Reef with Mixed Assemblage) on the northeast portion of T11 are indicated by the biota cover which alternates between high and dense, before declining to moderate over Filter Feeders (mixed habitat) and then to sparse/low over Sediment with Sparse Filter Feeders. Mixed Filter Feeders were assigned to the dominant biota along majority of T11 with small areas of dominance of gorgonian corals (Black & Octocorals - 2D Fan), cup sponges, and mixed Black & Octocorals recorded. T11 also recorded the lowest soft substrate (81.8%) in the benthic cover results, with the highest cover of hard substrates (10.7%) and considerable cover of filter feeders (7.2%).

Majority of the benthic habitat across the eight transects comprise of relatively featureless structure and provides little habitat for the wider area. However, areas were found along T1B, T15, T12, T17 and T11 which would be considered highly valuable for across the local ecosystem as they are structurally complex, provide enhanced biodiversity, and appear to be inconsistently found across the transects. Limited regional published datasets are available to further contextualise the results from this survey, however limited benthic bathymetry available note that greater diversity of substrate type further afield from the project area would most certainly host more structurally complex and diverse BCH in comparison.

6. Marine Fauna Observations

No opportunistic marine megafauna was observed by O2 Marine field staff or Offshore Unlimited vessel crew during survey operations.

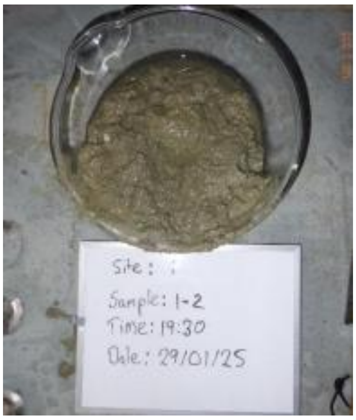
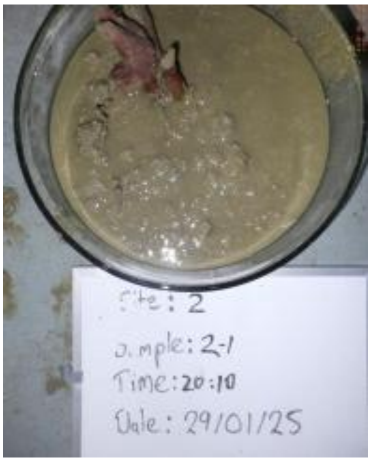
Discussion and Conclusion on Marine Fauna Observations

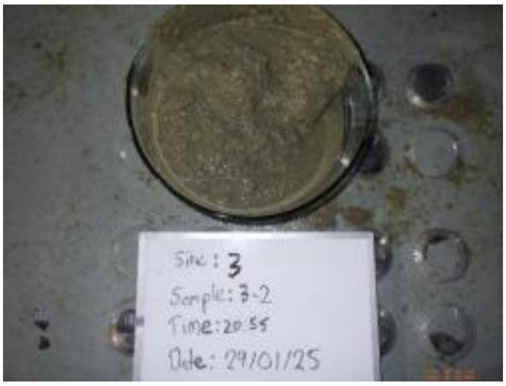
No marine megafauna was observed during field survey operations. Field survey sites were restricted to a small remote area and therefore there was limited opportunity to observe marine megafauna. Fauna observations were generally limited to small fish and sea snakes; however, these were rarely observed.

Appendix 5: Sediment Sample Photos

A detail information of sediment sample photos around the Chuditch-2 drilling well during the EBS survey are presented as figure 61

Figure 61 Sediment sample photos and descriptions

Sample ID	Description	Photo
1_1	Brown/Grey, moderate plasticity, mixed grain sediment, fine sand/moderate sand, shell grit present, no visible organic matter or odour.	
1_2	Brown/Grey, moderate plasticity, mixed grain sediment, fine sand/moderate sand, shell grit present, no visible organic matter or odour.	
2_1	Brown/Grey, moderate plasticity, mixed grain sediment, fine sand/moderate sand, shell grit present, no odour.	

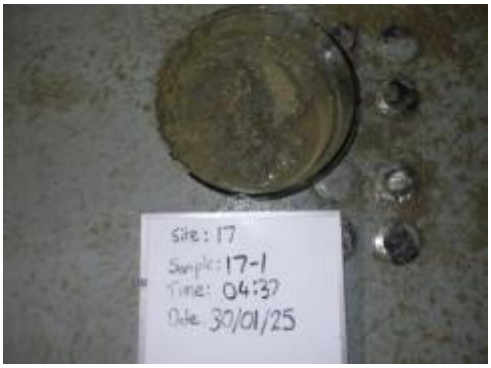
Sample ID	Description	Photo
3_1	Brown/Grey, moderate plasticity, mixed grain sediment, fine sand/moderate sand, shell grit present, no visible organic matter or odour.	
3_ 2	Brown/Grey, medium/high plasticity, fine sand/clay, shell grit present, no visible organic matter or odour.	
4_ 1	Brown/Grey, medium/high plasticity, fine sand/clay, shell grit present, no visible organic matter or odour.	
4_2	Brown/Grey, low plasticity, medium/coarse sand, high shell grit content, some filter feeders present, no odour.	

Sample ID	Description	Photo
5_1	Brown/Grey, low plasticity, mixed grain size, shell grit present, no visible organic matter or odour.	
5_2	Brown, moderate plasticity, mixed grain sediment, silt/moderate sand, shell grit present, no visible organic matter or odour.	
6_1	Brown/grey, moderate plasticity, mixed grain sediment, silt/moderate sand, shell grit present, no visible organic matter or odour.	
6_2	Brown/grey, moderate plasticity, mixed grain sediment, silt/moderate sand, shell grit present, no visible organic matter or odour.	

Sample ID	Description	Photo
7_1	Brown/grey, moderate/high plasticity, mixed grain sediment, silt/moderate sand, shell grit present, no visible organic matter or odour.	
7_2	Brown/grey, moderate/high plasticity, mixed grain sediment, silt/moderate sand, shell grit present, no visible organic matter or odour.	
10_1	Brown/grey/olive, high plasticity, fine sand/silt, shell grit present, no visible organic matter or odour.	
10_2	Brown/grey/olive, high plasticity, fine sand/silt, shell grit present, no visible organic matter or odour.	

Sample ID	Description	Photo
13_1	Brown/grey/olive, moderate plasticity, fine sand/silt, shell grit present, no visible organic matter or odour.	
13_2	Brown/grey/olive, moderate plasticity, fine sand/silt, shell grit present, no visible organic matter or odour.	
14_1	Brown/olive, moderate plasticity, fine sand/silt/mixed, shell grit present, no visible organic matter or odour.	
14_2	Brown/olive, moderate plasticity, fine sand/silt/mixed, shell grit present, no visible organic matter or odour.	

Sample ID	Description	Photo
15_1	Brown/olive, high plasticity, fine sand/silt/mixed, shell grit present, no visible organic matter or odour.	
15_2	Brown/olive, high plasticity, fine sand/silt/mixed, shell grit present, no visible organic matter or odour.	
16_1	Brown/olive, moderate plasticity, fine, medium grain sediment, shell grit present, no visible organic matter or odour.	
16_2	Brown/olive, moderate plasticity, fine, medium grain sediment, shell grit present, no visible organic matter or odour.	

Sample ID	Description	Photo
17_1	Brown/olive, moderate plasticity, fine, medium grain sediment, shell grit present, no visible organic matter or odour.	
17_2	Brown/olive, moderate plasticity, fine, medium grain sediment, shell grit present, no visible organic matter or odour.	

Appendix 6: ENVID Participants

SundaGas Banda
Unipessoal Lda

Participation Register

Title:	SundaGas Chuditch 2 Drilling Campaign 2025 - ENVID Participation Register		
Date:	14 and 15 August 2025		
Venue:	Online Meeting		
Co-Facilitator	Bruce Anderson - SundaGas HSE Advisor	Signed:	Digitally signed by Bruce Anderson Date: 2025.08.19 11:36:13 +08'00'
Co-Facilitator	Matt Fraser – SundaGas Environmental Advisor	Signed:	Matthew Fraser Digitally signed by Matthew Fraser Date: 2025.08.19 15:25:37 +10'00'

#	Name	Title / Position	Company Represented	Verified By
1.	Bruce Anderson	HSE Manager	SundaGas	Matt Fraser
2.	Matt Fraser	Environmental Advisor	SundaGas	Bruce Anderson
3.	Tony De Barr	Drilling Superintendent	Sundagas	Bruce Anderson
4.	Sean Curnow	Well Operations Manager	SundaGas	Bruce Anderson

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SundaGas Banda
Unipessoal Lda

Participation Register

5.	Belazario Gusmao	Geoscientist	SundaGas	Bruce Anderson
6.	Pascoela Sequeira	Consultant	Halona Serena	Bruce Anderson
7.	AwiNash	Consultant	Halona Serena	Bruce Anderson
8.	Eurico Ediana da Costa	Consultant	Halona Serena	Bruce Anderson
9.	Maria Rosales	Consultant	Halona Serena	Bruce Anderson
10	Joctan Lopes	Consultant	Halona Serena	Bruce Anderson

Attendees Thursday 14 August 2025

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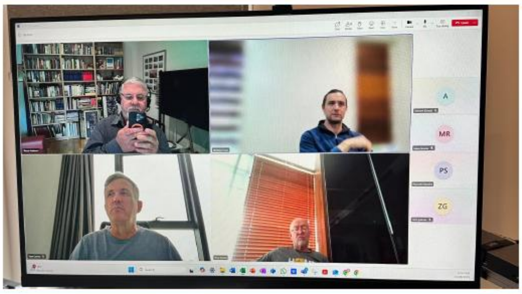
Participation Register

	Attendees Thursday 15 August 2025	

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Appendix 7: Environmental Risk Register, Performance Objectives, Standards and Measurement Criteria is appended as SGBU.GEN.HSSE.0047

Appendix 8: Public Consultation for Draft EIS and EMP 22 April 2025 Comments and Summary of Inputs

Name and Organisation	Section and Topic	Question / Comment	Response
anonymous · 78741722	Project Overview – Introduction to the proposed activity	Suggestion: Priority should be placed on: · Impact mitigation mechanisms (pollution control measures and continuous biodiversity monitoring) · Participation of local communities in the decision-making process · Consideration to applicable national laws and relevant regulations	Refer to the EIS for further information
Rita Celestina da Silva · UNTL · +67076110045		This activity serves as an excellent introduction for all of us as it allows us for direct engagement with research findings, thereby enabling effective implementation in the future	Noted as comment
Sofia Fernandes · UNTL · Sofiafernandes254@gmail.com		The introductory section must include the principles of environmental safety and the precautionary principle as fundamental part of the overall vision of the project, given that the operation will take place in open waters and has the potential to impact marine biodiversity. How can we ensure effective environmental monitoring during the exploration phase?	Environmental monitoring will be undertaken as detailed and agreed in the EMP
Viriato F. de Sousa · UNTL · 76026293		Gas well drilling is a technological process used to explore and extract natural gas from underground reservoir. This activity plays a significant role in national economic development by generating substantial revenue for the state. However, it may also cause environmental impacts such as contamination, habitat destruction, and alterations in bathymetry (seafloor topography).	Refer to the EIS for further information
Zezinho A. Pinto · Society of Petroleum Engineering (SPE) · 75143054		If issues such as fire, stuck pipe, or lost circulation occur during the drilling process, do these incidents count within the designated 40-day drilling timeline? Or is it the 40-day period calculated excluding any time lost due to such complications?	The 44-day period has some contingencies but any major operational delays outside of the drilling program would be more than the planned P&A
Romero da P. Freitas · Assosiasaun Marineiro Timor-Leste (AMTL) · 76073629		The activity was highly effective and continued to motivate the participants.	Noted as comment
Herquelisia Cardoso Marques · Graduada UNTL · 74161051		An introductory overview of the activity aimed at exploring petroleum resources in the Timor Sea.	Noted as comment
Luis da Costa · UNTL · 73576230 · luisdacosta@gmail.com		The introduction is well-prepared however it requires a thorough clarification of the impacts, incorporating the main reasons behind the drilling operation.	Refer to section 4 and 9 of the EIS

Name and Organisation	Section and Topic	Question / Comment	Response
Gil da Costa Gomes Soares · UNTL · 75509626 · gilsoares424@gmail.com		The National Petroleum Authority (ANP) works to properly preserved the core samples obtained from each well drilled both offshore and onshore. These samples are used as essential reference data to help understand subsurface geological formations in subsequent studies.	Refer to the ANP
Andre Pacheco Noronha · UNITAL · 75258521 · alahypacheco@gmail.com		Public Consultation concerning the Environmental Impact Statement (EIS) and the Environmental Management Plan (EMP).	Noted as comment
Ageu Soares · APM-TL · 77498883		A clear and concise explanation of the Environmental Management Plan (EMP) for the Chuditch-2 offshore drilling project In Timor-Leste.	Noted as comment
Helena Gomes · APM-TL · 76146081		This document provides a clear and straightforward explanation of the Environmental Management Plan (EMP) for offshore drilling project and Chuditch-2 offshore in Timor-Leste.	Noted as comment
Elizario S. Filira · APM-TL · 75716829 · elizariosoaresfilira@gmail.com		This public consultation document helps us understand the upcoming offshore gas drilling activities, thereby facilitate us to evaluate their environmental impacts on the Benthic ecosystem.	Noted as comment
anonymous · 78741722	Project scope, timeline and drilling site location	Recommendation for the project scope: · Prioritize careful consideration of the drilling location and adjacent areas where vulnerable ecosystem may be susceptible to environmental impacts.	Refer to the EIS for further information
Rita Celestina da Silva · UNTL · +67076110045		An overall of the project timeline and drilling sites, identified specifically to detect and explore potential hydrocarbons or minerals resources within the onshore areas.	Noted as comment
Viriato F. de Sousa · UNTL · 76026293		Scope: Drilling activities, environmental impact assessment, safety protocols, and collection of bathymetric data. Timeline: The preparation, operational, and post-drilling phases, spanning one year. - Location: Offshore in the Timor Sea and adjacent coastal regions where applicable.	Noted as comment
Ananias F. M. da C. Pereira · IOB · 75256466		I think that the timeline and location to be crucial elements for effectively conveying clear information regarding the potential impacts and benefits of this project.	Noted as comment

Name and Organisation	Section and Topic	Question / Comment	Response
Zezinho A. Pinto · Society of Petroleum Engineering (SPE) · 75143054		Does SundaGas assure that the Chuditch-2 Well is economically viable? If so, what is the expected duration of this economic viability? Additionally, can they guarantee the completion of the drilling operation within 40 days?	Economic viability will be ddetermined once the DST is completed and broader modelling finalised. No operator can guarantee an exact date to finalise a well, however offset data has been used to develop the drilling program and best endeavours will be made to bring the well in on time and budget
Herquelisia Cardoso Marques · Graduada UNTL · 74161051		The project scope and locations originate from onshore region, currently progressing within the upstream phase of development.	Noted as comment
Luis da Costa · UNTL · 73576230 · luisdacosta@gmail.com		The project framework is well-defined, given the established ownership and partnership with the Government; however, prior to commencing drilling operation, a thorough identification and detailed analysis of biodiversity must be conducted, incorporating considerations of its referenced economic value.	Refer to the EIS for further information
Gil da Costa Gomes Soares · UNTL · 75509626 · gilsoares424@gmail.com		Recommended to the ANP to establish a central facility at the base location to house its equipment and resources appropriately. This will also facilitate academic students in the future by providing them with opportunities to understand and study the available resources.	Refer to the ANP
Andre Pacheco Noronha · UNITAL · 75258521 · alahypacheco@gmail.com		Project scope, timeline, and drilling location for the Chuditch-2 subsequent to the evaluation conducted for PS TL-SO-19-16.	Refer to the EIS for further information
Ageu Soares · APM-TL · 77498883		This project possesses natural gas reserves aimed at supporting future production activities In Timor-Leste.	Noted as comment
Helena Gomes · APM-TL · 76146081		The Chudtih-2 drilling site is located approximately 5 Kilometres from the Chuditch-1 discovery well. The anticipated gas column thickness is 1.49 meters, relative to the 30 meters of gas column identified at Chuditch-1.	Noted as comment
Elizario S. Filira · APM-TL · 75716829 · elizariosoaresfilira@gmail.com		The drilling location lies within the Exclusive Economic Zone (EEZ), approximately 280 Kilometres off the eastern coastline. This area is characterized by significant biodiversity, with depths that sustain epifauna and various marine species inhabiting the seabed. Additionally, the presence of a coral reef ecosystem provides critical support to the local biodiversity and associated food chain.	Noted as comment

Name and Organisation	Section and Topic	Question / Comment	Response
anonymous · 78741722	Phases of offshore appraisal well drilling and testing operations.	Recommendations: Outline technical measures - Reinject contaminated water into the well. - Employ technologies that comply with international environmental standards - Conduct continuous monitoring upon detection of any environmental impacts	Refer to the EIS for further information
Rita Celestina da Silva · UNTL · +67076110045		The drilling and testing phases for appraisal wells within the oil and gas industry constitute essential components of the exploration process.	Noted as comment
Viriato F. de Sousa · UNTL · 76026293		Objective: To confirm the presence of gas and assess its commercial viability Activities: Drilling of the well, sample collection, and flow testing - Significance: Does it serve as the foundational basis for ongoing project decision-making? Safety: Rigorous Environmental control measures are imperative.	Noted as comment
Ananias F. M. da C. Pereira · IOB · 75256466		The plan involves conducting drilling and testing of the appraisal well, as well as additional drilling activities, as these constitute integral components of the development phase.	Noted as comment
Zezinho A. Pinto · Society of Petroleum Engineering (SPE) · 75143054		Will the Chudtich-2 be categorized as a vertical drilling or a horizontal drilling operation?	Chuditch 2 is a vertical well
Herquelisia Cardoso Marques · Graduada UNTL · 74161051		Drilling and appraisal testing phase (offshore): - Contingent upon governmental decisions - Dependent on the frequency of occurrences.	Refer to the EIS for further information
Luis da Costa · UNTL · 73576230 · luisdacosta@gmail.com		Evaluation is critically important for all drilling activities, particularly regarding gas and oil. It must be thoroughly assessed and meticulously analysed, as inaccurate evaluations can result in significant environmental impacts.	Noted as comment
Ageu Soares · APM-TL · 77498883		To understand the outcomes of the drilling, the focus is on the gas-related segment.	Noted as comment
Helena Gomes · APM-TL · 76146081		Conduct drilling and testing of Chuditch-2 to assess the resource and perform flow tests that quantify the reservoir, analysing primary hydrocarbons as they flow to the surface though the string test.	Noted as comment
Elizario S. Filira · APM-TL · 75716829 · elizariosoaresfilira@gmail.com		Based on the drilling and testing results, if no gas is discovered, the company will determine the appropriate course of action, including environmental remediation and the restoration for affected biodiversity.	Refer to the EIS for further information

Name and Organisation	Section and Topic	Question / Comment	Response
anonymous · 78741722	Summary of Key Findings in the Environmental Impact -Current environmental conditions and Principal Observations	To provide commentary on: · Broad considerations to justify decision-making: support with documented scientific data, assess to mapping of environmentally sensitive areas · Within the findings, it is crucial to clearly identify major impacts and assign priority to appropriate mitigation measures	Refer to the EIS for further information
Rita Celestina da Silva · UNTL · +67076110045		Understanding existing environmental conditions and key findings is essential for the planning, development, and implementation of agricultural or infrastructure projects.	Noted as comment
Viriato F. de Sousa · UNTL · 76026293		Current environmental Conditions: water resources, vegetation, biodiversity, and bathymetric data. Key Oversight Entities: local communities, the national Environmental Authority, and relevant regulatory agencies. Significance: these elements provide a foundation for effective planning, environmental mitigation strategies, and sustainable environmental management	Noted
Ananias F. M. da C. Pereira · IOB · 75256466		In my view, the current environmental condition requires further cleanup efforts, as it is evident that the marine environment is being neglected and could be considered polluted.	Refer to the EIS and EMP for further information
Herquelisia Cardoso Marques · Graduada UNTL · 74161051		The existing environmental conditions and key considerations specific to the offshore zone.	Noted as comment
Luis da Costa · UNTL · 73576230 · luisdacosta@gmail.com		Understanding the initial environmental conditions is essential to establish a baseline for subsequent processes, thereby facilitating effective monitoring, particularly of marine biodiversity.	Noted as comment
Florencio Quintos · Department Eng. Geologia – UNITAL · 76612230		Environmental risks require a rigorous and well-structured plan to safeguard natural ecosystems and biodiversity.	Refer to the EIS and EMP for further information
Andre Pacheco Noronha · UNITAL· 75258521 · alahypacheco@gmail.com		Suggestion: to manage the marine environmental conditions effectively	Noted as comment
Ageu Soares · APM-TL · 77498883		The environment constitute a critical component of the offshore and onshore drilling project, ensuring that all measures taken lead to positive and sustainable outcomes for the ecosystem.	Noted

Name and Organisation	Section and Topic	Question / Comment	Response
Helena Gomes · APM-TL · 76146081		Given the project's potential environmental impact, it has been classified as a Category A project, which requires a comprehensive Environmental Impact Assessment (EIA) to develop both the Environmental Impact Statement (EIS) and the Environmental Management Plan (EMP), ensuring that the exploration activities are carried out in a responsible and sustainable manner.	Noted and correct
anonymous · 78741722	Environmental Aspects (Routine and Non-Routine)	Comment: Environmental impacts arising from routine operational activities may accumulate cumulatively over time, including: - Marine Pollution - Air pollution - Ecological disturbance (Routine) - management system (Drilling) - efficient technologies (air emission) - monitoring Non-Routine: unforeseen activities including Oil spills - alert system Explosions - training Technical Failures - existing	Refer to the EIS and EMP for further information
Rita Celestina da Silva · UNTL · +67076110045		Environmental Aspects: - Example of routine activities: machinery operation, distribution processes, and consumption of water and energy resources - Example of non-routine activities: environmental accidents, emergency situations.	Noted as comment
Viriato F. de Sousa · UNTL · 76026293		- Routine activities: regular operation, noise generation, emissions, and pollution. - Non-routine activities: emergency incidents such as spills and accidents. - Significance: serve as the foundational elements for designing mitigation and environmental management.	Noted as comment
Herquelisia Cardoso Marques · Graduada UNTL · 74161051		Routine Activities: - Require thorough assessment - Necessitate evaluation of their environmental impacts.	Noted as comment
Luis da Costa · UNTL · 73576230 · luisdacosta@gmail.com		The relationship with the living environment (biotic factors) requires broad consideration of all aspects with the drilling area (both biotic and abiotic) in relation to routine operations.	Noted as comment
Ageu Soares · APM-TL · 77498883		Environmental aspects include water quality indicators when data corresponding to the related activities are available.	Noted

Name and Organisation	Section and Topic	Question / Comment	Response
Maria da Costa Pereira - Autoridade Municipal Dili - 75632819	Potential Environmental Impacts and risks associated with the evaluation drilling and well testing operations at Chuditch-2.	The operating company must provide comprehensive details regarding site treatment within the Environmental Management Plan (EMP), as the referenced documents merely mention transporting waste to a landfill prior to drilling. This detailed information is essential for Environmental Impact Assessment Commission to adequately assess both the potential impacts and benefits.	Refer to the EIS and EMP for further information
anonymous · 78741722		The potential impact of the deep-sea environment is significant due to the offshore location, requiring rigorous environmental management: - Mitigation measures (impact-minimizing technologies, a comprehensive drilling management plan, and an oil spill response plan) - A detailed contingency plan - Ongoing continuous environmental monitoring	Refer to the EIS and EMP for further information
Sofia Fernandes · UNTL Sofiafernandes254@gmail.com		Suggestion: Should additional data become available, it is recommended to incorporate it to provide a comprehensive overview.	Noted as comment
Rita Celestina da Silva · UNTL · +67076110045		The drilling and evaluation testing activities at the Chuditch-2 present potential environmental impacts and risks that may adversely affect the surrounding ecosystems, local communities, and threats to biodiversity, including endangered flora and fauna species.	Refer to the EIS and EMP for further information
Viriato F. de Sousa · UNTL · 76026293		- Impacts: Noise, pollution, and disruption to the marine ecosystem - Potential risks: Oil spills and operational accidents.	Noted as comment
Ananias F. M. da C. Pereira · IOB · 75256466		Regarding the impacts and risks, I believe it is essential to give higher priority since SundaGas lacks technology capable of ensuring full protection and safety measures.	Sunda Gas is employing state of art equipment and facilities and under strict safety and environmental laws. Sunda Gas gives safety the highest priority and takes its environmental responsibilities seriously.
Herquelisia Cardoso Marques · Graduada UNTL · 74161051		Potential impacts and risks associated with drilling and testing the evaluation well at Chuditch-2 may cause adverse effects on the region’s biodiversity.	Refer to the EIS and EMP for further information
Luis da Costa · UNTL · 73576230 · luisdacosta@gmail.com		If adequate precautions are not taken during drilling operations, significant impacts may occur due to the presence of numerous chemicals. This can adversely affect the health of marine biodiversity, including local communities.	Refer to the EIS and EMP for further information

Name and Organisation	Section and Topic	Question / Comment	Response
Florencio Quintos · Department Eng. Geologia – UNITAL · 76612230		Mitigation measures must be implemented to prevent adverse effects.	Refer to the EIS and EMP for further information
Andre Pacheco Noronha · UNITAL · 75258521 · alahypacheco@gmail.com		Question: How can geological fault/fractures zones be effectively managed in areas designated for drilling?	Refer to section 4.3.3.1 of the EIS
Ageu Soares · APM-TL · 77498883		The company will implement a systematic placement system to prevent disruptions in the benthic environment.	Refer to the EIS and EMP for further information
Helena Gomes · APM-TL · 76146081		- Conduct routine maintenance of equipment - Install advanced combustion technology - Develop and maintain fuel injection systems with thorough inspection protocols - Perform routine operation of flare burners to ensure high efficiency and reduced emissions.	Noted as comment
Elizario S. Filira · APM-TL · 75716829 · elizariosoaresfilira@gmail.com		- CO_2 emissions are expected to rise, contributing to ocean acidification, thereby further testing is required due to the anticipated increase in CO_2 Levels. - The release of toxic methane (CH_4) is a potential risk during drilling operations. - Seismic noise pollution significantly impacts marine species such as fish and whales, disrupting feeding behaviors and leading to decreased biodiversity. - In response to the impacts from CO_2 and CH_4 emissions as well as noise pollution, the operating company is obliged to implement mitigation and recovery measures to protect affected species during drilling activities.	Refer to the EIS for further information
anonymous · 78741722	Proposed Control and Mitigation Measures, and Summary of Residual Risk	It has been established that the mitigation measures outlined in the Environmental Impact Statement document are essential; however, there is a need to reinforce: - a thorough assessment of the effectiveness of these measures - Post-operation monitoring to obtain conclusive evidence regarding whether the environmental impacts are effectively control	Noted. Refer to the EIS
Rita Celestina da Silva · UNTL · +67076110045		The proposed control and mitigation measures to manage and prevent erosion involve residual waste management, through segregation, specifically such as oil and chemical materials.	Noted as comment

Name and Organisation	Section and Topic	Question / Comment	Response
Romero da P. Freitas · Assosiasaun Marineiro Timor-Leste (AMTL) · 76073629		Mitigation measures are highly effective; strong collaboration among all relevant entities and stakeholders is needed.	Noted as comment
Herquelisia Cardoso Marques · Graduada UNTL · 74161051		- The EIS emphasizes potential negative impacts such as gaseous emissions, air pollution, and ecological disturbances. - The mitigation strategies involves utilizing low-emission engines to reduce environmental harm.	Noted as comment
Luis da Costa · UNTL · 73576230 · luisdacosta@gmail.com		The risks associated with sediments and other materials, require thorough control and management. Improper handling of such waste can adversely affect marine habitats, including liquid waste discharges. Therefore, comprehensive environmental assessments are essential to evaluate and mitigate these significant risks.	Noted. Refer to the EIS
Ageu Soares · APM-TL · 77498883		To mitigate these risks, the project will use low-toxicity fluids and implement advanced waste management systems for the proper collection and treatment of drilling fluids.	Noted. Refer to the EIS
anonymous · 78741722	Executive Summary of the Key conclusions derived from the Environmental Management Plan (EMP) - Framework of the Environmental Management Plan (EMP) and the strategic approach for its implementation.	Overall, the EMP is well-structured; however, it requires a concrete and operational implementation strategy to ensure that environmental impacts do not escalate, and risks remain effectively managed.	Noted. Refer to the EIS
Rita Celestina da Silva · UNTL · +67076110045		Structure of the Environmental Management Plan (EMP) and implementation Strategy includes: - Introduction - Project Description - Environmental Conditions - The structure of the EMP: environmental aspects, mitigation measures, monitoring, and emergency response. - The implementation strategy: communication, training, routine inspections, and reporting. - Objective: to ensure effective and sustainable environmental management	Noted as comment
Herquelisia Cardoso Marques · Graduada UNTL · 74161051		The structure of EMP and its implementation strategy aim to develop comprehensive mitigation measures, ensure compliance with environmental legislation, and incorporate the involvement of relevant stakeholders.	Noted as comment

Name and Organisation	Section and Topic	Question / Comment	Response
Luis da Costa · UNTL · 73576230 · luisdacosta@gmail.com		An effective strategy is required to ensure successful implementation, particularly to mitigate potential opposition to offshore oil and gas drilling, so that it does not negatively affect the outcomes of the implementation.	Noted. Refer to the EIS
Ageu Soares · APM-TL · 77498883		The Chuditch-2 project represents a significant milestone in unlocking Timor-Leste's offshore energy potential.	Noted as comment
anonymous · 78741722	Executive Summary of the Key conclusions derived from the Environmental Management Plan (EMP) -Environmental monitoring and reporting requirements.	Overall, it is advisable to strengthen the monitoring and reporting aspects of the Chuditch-2 project as an integral component of environmental management. This approach will help to: - Prevent uncontrolled environmental impacts - Increase the confidence of relevant stakeholders - Demonstrate the company's accountability and transparency	Noted. Refer to the EIS
Rita Celestina da Silva · UNTL · +67076110045		Environmental monitoring and reporting requires the development of a monitoring that clearly specifies the environmental parameters to be assessed, such as water quality indicators.	Noted. Refer to the EIS
Romero da P. Freitas · Assosiasaun Marineiro Timor-Leste (AMTL) · 76073629		Request the ANP to conduct thorough inspections of the rigs designated for drilling operation, ensuring that their certifications and equipment comply fully with established standards. This will help minimize issues during the drilling process.	This will be completed under Decree Law 32 Article 35 Part 2
Herquelisia Cardoso Marques · Graduada UNTL · 74161051		- Routine environmental monitoring will ensure that all emissions remain within regulatory limits, - Regular monitoring and management of drilling fluids and water discharge. - The project intends to minimize fire incidents.	Noted as comment
Luis da Costa · UNTL · 73576230 · luisdacosta@gmail.com		The initial, procedural, and final drilling reports are crucial for public awareness as they detail the relationship and impacts on both biotic and abiotic components of the environment.	Noted as comment
Ageu Soares · APM-TL · 77498883		The project will conduct regular verification and reporting concerning water and air quality. Sea water samples, previously established, will be tested, and continuous environmental monitoring will be carried out throughout the drilling program to assess the drilling process.	Noted. Refer to the EIS
Helena Gomes · APM-TL · 76146081		- The environmental report ensures the project's environmental safety and quality. - Regulations mandate verification and reporting on water and air in accordance with established manufacturer standards.	Noted. Refer to the EIS

Name and Organisation	Section and Topic	Question / Comment	Response
anonymous · 78741722	Executive Summary of the Key conclusions derived from the Environmental Management Plan (EMP) – Oil Spill Contingency Plan	Recommendation: to establish a structured oil contingency framework as a dedicated annex to the EIS. This should include: · a worst-case scenario: potential spill extent and emergency response actions · a sensitivity map identifying vulnerable areas · detailed cleanup and environmental restoration procedures · cooperation with local and international institutions	Noted. Refer to the EIS, EMP
Rita Celestina da Silva · UNTL · +67076110045		Contingency measures for oil spills are essential to prevent the release of oil into the environment, primarily through the development of a detailed oil spill response plan and the implementation of regular training exercises.	Noted. Refer to OSCP
Viriato F. de Sousa · UNTL · 76026293		- Prevention: regular monitoring of noise levels, gas emissions, water quality, and adherence to technical safety standards. - Mitigation: restricting operations in environmentally sensitive zones and implementing effective sediment control measures	Noted. Refer to the EIS
Ananias F. M. da C. Pereira · IOB · 75256466		Prioritize addressing oil spills, as they can result in significant negative impacts on marine and coastal ecosystems.	Noted. Refer to the EIS
José Crisanto da Costa · IOB · 75023993		In the event of a sudden technical failure during offshore drilling operations, what measures should be implemented to effectively prevent environmental contamination?	Noted. Refer to the EIS
Romero da P. Freitas · Assosiasaun Marineiro Timor-Leste (AMTL) · 76073629		-Timor-Leste lacks the necessary resources and capacity to effectively respond to an offshore oil spill. Therefore, we request the deployment of a specialized rescue team to manage the incident and support response efforts. - The ANP should coordinate with the relevant Ministry to establish a dedicated rescue unit capable of responding to maritime emergencies, such as offshore rig fires and oil spills.	Refer to the ANP
Herquelisia Cardoso Marques · Graduada UNTL · 74161051		The company will be held accountable of any oil spill and must take all necessary measures to safeguard the marine environment.	Noted
Luis da Costa · UNTL · 73576230 · luisdacosta@gmail.com		An effective strategy and comprehensive plan are essential to mitigate risks in the marine environment, as the sea contains not only oil and gas but numerous other hazards. Therefore, well-developed strategies and plans are crucial for ensuring successful outcomes.	Noted. Refer to the EIS
Ageu Soares · APM-TL · 77498883		Ensure an efficient and timely response in the event of a spill.	Noted. Refer to the EIS

Name and Organisation	Section and Topic	Question / Comment	Response
Helena Gomes · APM-TL · 76146081		Oil Spill Contingency Plan (OSCP): - A comprehensive document that coordinates response actions and provide a structured framework. - Preparedness and response strategy for potential hydrocarbon spills during the Chuditch-2 drilling operations.	Noted as comment
Elizario S. Filira · APM-TL · 75716829 · elizariosoaresfilira@gmail.com		The company must consider the oil spill contingency measures and conduct modeling analyses to ensure that significant threats to the marine environment and habitats are avoided.	Noted. Refer to the EIS
Alberto F. Pereira - Direção Nacional Transporte Marítima (DNTM-MTC) - 78308454 - pereira.alberto525@gmail.com	General Comment - Additional observations or overall recommendations	IMO Convention (OPRC-SAR) Recommendations: To ensure effective implementation of the Emergency Response Plan: 1. Timor-Leste is advised to ratify the OPCR Convention on Oil Pollution Preparedness, Response, and Cooperation. 2. Timor-Leste is encouraged to ratify the SAR (Search and Rescue) Convention. 3. Timor-Leste should establish a trilateral Memorandum of Understanding (MOU) with Australia and Indonesia concerning the OPCR framework. 4. Timor-Leste should also formalize a trilateral MOU for cooperation on SAR operations	Refer to the ANP
anonymous · 78741722		Prioritize the integration of local information, precise impact definitions, and accountable parties to establish a feasible and effective implementation mechanism.	Noted
Rita Celestina da Silva · UNTL · +67076110045		Public consultation on the Environmental Impact Statement and Environmental Management Plan is crucial as it provides an opportunity for local communities, relevant authorities, organizations, and interested parties to share their concerns and recommendations about the project.	Noted as comment
Romero da P. Freitas · Assosiasaun Marineiro Timor-Leste (AMTL) · 76073629		This drilling will take place within Timor-Leste's exclusive zone. As an organization committed to promoting Timorese resources, we seek clarity on the extent of Timorese workforce involvement and their participation in these activities. It is our intention to support and empower our people, hence we request that companies demonstrate a firm commitment to local content issues.	Noted. Refer to the EIS
Galiano da Costa · Assosiasaun Marineiru Timor-Leste (AMTL) · 77318874 · dacostagaliano@gmail.com		We would like to request the authorities to ensure that when the SundaGas rigs commence marine drilling operations, it contributes to reducing unemployment within our nation. Currently, there are 203 marine workers registered with AMTL who are prepared and available to provide their services.	Noted. Refer to the EIS

Name and Organisation	Section and Topic	Question / Comment	Response
Nelson Maia · Servisu Migração · 77333225		Suggestion: We kindly request that SundaGas company collaborate closely with the Migration Authorities to facilitate the processing of work permits or special visas for foreign technical personnel who will be engaged as partners in drilling operations. Note: Foreign nationals (expatriates) intending to work in Timor-Leste must possess the appropriate visa documentation.	Noted
Luis da Costa · UNTL · 73576230 · luisdacosta@gmail.com		The ANP needs to establish a decree law regarding the management of resources (both renewable and non-renewable) within Timor-Leste. Particularly concerning resource exploration: - Renewable resources may be extracted or exported internationally for production purposes - Non-renewable resources should not be extracted or exported internationally for production purposes; however, if certain companies express interest, they must establish factories within Timor-Leste, thereby creating employment opportunities for the local workforce	Refer to the ANP
Ageu Soares · APM-TL · 77498883		Keep promoting our marine resources to provide a better livelihood for all Timorese and to ensure the protection of the marine and coastal environment in accordance with the regulations established by our nation.	Noted as Comment
Helena Gomes · APM-TL · 76146081		The Chuditch-2 project represents a significant milestone in unlocking Timor-Leste's offshore energy potential, while adhering to stringent environmental safeguards. This project aims to achieve a balanced synergy between economic benefits and environmental protection.	Noted as Comment
Elizario S. Filira · APM-TL · 75716829 · elizariosoaresfilira@gmail.com		The gas drilling operation occurs offshore, exploiting non-renewable gas resources that exist for a finite duration. However, the company undertaking the drilling must exercise caution and implement effective mitigation measures to minimize impacts on marine biodiversity and prevent ecological degradation. This approach is essential to ensure the project's sustainability and to preserve renewable marine resources with minimal environmental footprint.	Noted as Comment

Appendix: 9 Public Consultation for EIS and EMP 23 June 2025 Comments and Summary of Inputs

Name and Organisation	Question	Response
Luis da Costa Alcino Director of the Department of Biology	Previously there was a test before drilling the quality of fish and species living there the quality of how the test is finished if normal or not quality or not show results for us to see before and after drilling, we can know very important to our lives that so, there is also drilling for oil can also contamination entered the gas after drilling?	A detailed Environmental Baseline Survey (EBS) was conducted in February 2025 at the Chuditch 2 well site by Sunda Gas. The EBS looked at water quality, sediment, benthic habitat and Infauna. A post drilling survey is planned to determine what if any impact occurred because of the activity.
Jemi Cartel Moniz dos Reis. NGO Transparency Corps	We look at the drilling we also look at security because I see we are almost in Australia. We also look at illegal fishing and need to put good management of these issues. Today my colleagues are talking about the impact. I think it is important to manage the impacts well, because if we don't the resources in the sea will be damaged. What have you done about the law on environmental change?	Sunda Gas works within the laws of Timor-Leste and fully complies with all laws and directions from the independent regulator ANP.
	I think we need a big ship to monitor this activity to conduct seismic surveys.	There will be no seismic activity other than localised as laid out in the ENVID and EIS
Mario da silva Institute guide	Explain in detail about the feasibility research that has been done, is it economically commercial or not?	Comprehensive research has been undertaken during the EBS and EIS phases which has informed our approach and planning to mitigate the effects of climate change. These are discussed in the EIS.
	We also talk about marine ecosystems, because we know the impact of climate change on those however, we do not know what the next five or ten years that migrate back there fishing activities is they go in the future they go to do fishing they do climate change future study is there or not?	This aspect is discussed in detail in the EIS.
Fonsiano da Costa de Jesus Association GIS-Timor Leste	We know that Timor Leste is an island country that is impacted by climate change, that affects severely so have you also consulted with local NGOs and agencies that are responsible for talking about climate change in Timor Leste?	Comprehensive research has been undertaken during the EBS and EIS phases which has informed our approach and planning to mitigate the effects of climate change. These are discussed in the EIS.
	We also talk about marine ecosystems, because we know the impact of climate change on those however, we do not know what the next five or ten years that migrate back there fishing activities is they go in the future they go to do fishing they do climate change future study is there or not?	This aspect is discussed in detail in the EIS.
Petronela Jargo Petroleum DIT	I just want to ask that as of today as explained, that Sunda Gas has existed in Timor since 2018. In 2019, because of Covid cannot commence or reach other activities. So, what are the biggest	Sunda Gas has worked diligently with our joint venture partner to address and work with the government of Timor Leste and the regulatory authorities to bring the project to fruition. The process for

Name and Organisation	Question	Response
	challenges that Sunda Gas has faced during this time and how has it to overcome this until today, to be able to drill next month in June.	drilling and conducting a DST is comprehensive and time consuming and nothing has or will be left to chance.
Sandra Pereira DIT Petroleum Engineering	Do you know that drilling in the fault is a big risk so what Sunda Gas has prepared to drill through the fault.	Sunda Gas is aware of the risks in drilling in any geological formation and plans accordingly. This is dealt with under section 4.3.3.1 of the EIS. Detailed plans are developed and will be made available to the regulator prior to drilling commencing.
Gilberto Correia Soares ANLA.IP	Based on the explanation on the part of the Sunda Gas consultant. There are two points that talk about the environmental impact statement and the environmental management plan. This is a category A Project, meaning that this project has a big impact on the environment. Has Sunda Gas undertaken a study on the marine environment or not?	A detailed Environmental Baseline Survey (EBS) was conducted in February 2025 at the Chuditch 2 well site by Sunda Gas. The EBS looked at water quality, sediment, benthic habitat and Infauna.
Helena Ana Maria Nunes UNTL Geology	What happens when structural problems occur in the benthic environment and fauna?	There is no suggestion that "structural problems" will occur as a result of this activity. However, a detailed Environmental Baseline Survey (EBS) was conducted in February 2025 at the Chuditch 2 well site. The EBS looked at water quality, sediment, benthic habitat and Infauna. A post drilling survey is planned to determine what if any impact occurred because of the activity.
	Based on data from CTI / CTZ that the coral reef grows from 3 meters to 75 meters, so the areas have the potential to be impacted when drilling. What solutions will Sunda-Gas provide when this impact occurs?	The environmental baseline survey of the drilling area found there is very little coral inhabiting the seabed near the drilling location. The are no coral reefs, but rather sparse isolated coral colonies and sea whips and therefore the impacts will be limited. The impact assessment predicts that seabed smothering from drilling sediments could occur a few hundred metres from the well site. Since these impacts are expected to be localised, any impacts to the sparse corals and associated biota are also expected to localised. All the other aspects of the drilling program will be manged so that impacts to corals are not expected to occur.
	What solutions will Sunda-Gas provide when this (above mentioned comment) impact occurs?	This is addressed in the response above.
Eliu De Araujo Unital Pescas	Impact on the environment and natural and non-natural resources and there is something that is linked to each other and need to be done in depth to the study because it is very important to see the information.	A detailed Environmental Baseline Survey (EBS) was conducted in February 2025 at the Chuditch 2 well site by Sunda Gas. The EBS looked at water quality, sediment, benthic habitat and Infauna. A

Name and Organisation	Question	Response
		post drilling survey is planned to determine what if any impact occurred because of the activity.
	When this happens in the underwater environment, what solutions will solve these problems and through what means?	As above.
Luis Amaral ANLA.IP	What methods do you use to identify species in the project areas?	A detailed Environmental Baseline Survey (EBS) was conducted in February 2025 at the Chuditch 2 well site by Sunda Gas. The EBS looked at water quality, sediment, benthic habitat and Infauna.
Dr. Manuel da Costa Quarantine	How to get oil and gas to get a lot of money to contribute to national development?	Drill and conduct a Drill Stem Test (DST) to determine the makeup and content of the target areas, and as a result, then determine if there is a commercial opportunity to further develop the field.
	Where is the gas? one on land or in the sea? According to the data shows that there is more gas in Oe-Cussi and Sunda-Gas has been identified in Oe-Cussi or not?	Sunda Gas Chuditch 2 well is offshore in the Timor Sea.
	What is Jack Up? And do you need to explain clearly about this?	A jack-up drilling rig is a mobile, self-elevating offshore platform used primarily for exploration and development drilling in shallow water environments (typically up to ~120 m, though some modern rigs can operate in 150–170 m). Many jack Ups and Semi-Submersible drilling rigs are also known as Mobile Offshore Drilling Units (MODU). Throughout the EIS and EMP, the Jack Up is referred to as a MODU. A Jack Up consists of three main structural elements: **Hull (Barge):** This provides buoyancy during transit, Houses drilling equipment, power systems, mud processing units, and living quarters and is designed to withstand wave loading once elevated. **Legs:** Large steel lattice or column-type structures that extend down to the seabed and transfer vertical and lateral loads. The number of legs is usually three (triangular stability), but some rigs have four. **Jacking System:** A rack-and-pinion or hydraulic system that raises/lowers the hull relative to the legs and elevates the hull above the wave zone to provide a stable drilling platform.
	And this is for drilling in which area? In Timor, who has produced gas and entered it on a small or large scale.	Timor Sea at the Chuditch 2 well site.
Eliu De Araujo Fisheries UNITAL	It is necessary to look closely at marine issues including species habitats because drilling can damage benthic ecosystems that are very numerous and also need to consider marine species because	A detailed Environmental Baseline Survey (EBS) was conducted in February 2025 at the Chuditch 2 well site by Sunda Gas. The EBS looked at water quality, sediment, benthic habitat and Infauna. This is also covered in the EIS.

Name and Organisation	Question	Response
	they are innocent and vulnerable and some have entered the category of Red-List (or rare species).	
Elvira Odete da Luz DIT-Petroleum	According to the plan to drill to get gas, but when there is a lot of oil and liquid what will you do?	Refer to the EIS section 4.3 for detail.
	In field studies there is a lot of talk about risk but why not mention it? And there are a lot of problems that happen to the communities in Suai.	Section 9.2.2 and 9.3 of the EIS details the risk and assessment overview and approach.
Elizariu Soares APM-TL	How to mitigate ocean acidification when the oil spill spills into the sea?	There is no known scientific basis for linking ocean acidification, a phenomenon caused by increasing CO2 in the atmosphere, with oil spills which have the potential to have other environmental impacts.
	What solutions are there regarding noise pollution when it occurs in the deep sea?	Refer to section 9.3.1.6 of the EIS.
	Seismic survey must be conducted to determine the underwater species because this drilling will be carried out in the deep sea or enter the Exclusive Economic Zone (EEZ).	There will be no seismic activity other than localised as laid out in the ENVID and EIS
Celestino Gusmao Ngo La'o Hamutuk	I have questions about the socio-economic and how much budget is spent on this project. Timor-Gap is a government institution, so I need to know how many percent of Timor-Gap has invested in the project?	Table 4 of the EIS details that SundaGas Banda Unipessoal, Lda is a 60% partner and TIMOR GAP Chuditch Unipessoal, Lda is a 40% partner.
	If it is better, Sunda-Gas needs to look again and conduct a more specific study in socio-economic to know its benefits to the state and the people. Because this is a research phase to develop the project to be realized in the future and can open jobs in this country.	Refer to section 9.3.1.7 of the EIS
Agustino Silva Ribeiro Law Finalist Student	More detailed explanation of this issue needs to be seen one by one because animals living in benthic areas are not the same as animals that live in coral reefs. And you need to explain clearly about the maps.	It is unclear what issue is specifically being referred to in this comment. An environmental baseline survey has been conducted to assess the existing condition of water quality, sediment quality and benthic habitats. The impact assessment predicts that seabed smothering from drilling sediments could occur a few hundred metres from the well site. Since these impacts are expected to be localised, any impacts to fish and other biota are also expected to localised. The EIS and EMP contain extensive environmental controls that are designed to prevent or mitigate impacts to the environment. These controls have been developed through a comprehensive risk assessment process and employing

Name and Organisation	Question	Response
	When an oil spill occurs in the environment, what solutions will you give to solve this problem?	This is a gas well, not an Oil well. Notwithstanding Sunda Gas has a detailed Oil Spill Contingency Plan that addresses all number of contingencies around the potential for a condensate and other hydrocarbon spills
Dr. Luis da Costa Director of the Department of Biology	When this drilling occurs, what problems will happen to the biodiversity species under the sea? What solutions do you have to offer?	A detailed Environmental Baseline Survey (EBS) was conducted in February 2025 at the Chuditch 2 well site by Sunda Gas. The EBS looked at water quality, sediment, benthic habitat and Infauna. A post drilling survey of the same areas is due to be conducted at the end of the well to see what if any impact there has been
	I also ask about the social aspect, when this drilling event is oil spill happens and its impacts on fishermen because the measurement of 68 meters deep refers to artisanal fishermen and artificial they will be able to do fishing activities there. What solution will Sunda-Gas solve this problem?	This is a gas well, so no oil is expected in any unplanned release
	When the plankton that feeds fish and other species is affected, it means that the problem of fish food in the sea is damaged and fish and other species will migrate immediately. So, prevent before this happens.	Noted and the reason Sunda Gas has conducted an EBS to identify the in-situ baseline.
Jemi Cartel Moniz NGO?	The safety part? How to work together with UMP, UPF, Naval. And this we will also see illegal fishing and need to put good management of these issues.	Sunda Gas will work closely with the ANP to ensure that the ANP can play its role in coordinating between the Sunda Gas and the various government agencies.
	It is also necessary to see a large vessel to monitor these activities and to conduct seismic surveys.	There will be no seismic activity other than localised as laid out in the ENVID and EIS. Sunda Gas will always have a stand-by vessel on location to assist in maintaining the 500m exclusion zone around the facility.
Mario da Silva Institute La'o Hamutuk	Explain in detail about this feasibility research?	A DST will be conducted to determine the flow rates of any reservoir to determine the fields overall feasibility.
	Because Timor-Gap also invested 40% for this project but economically for this country how much benefit from the 40% that Timor-Gap invested?	Table 4 of the EIS details that SundaGas Banda Unipessoal, Lda is a 60% partner and TIMOR GAP Chuditch Unipessoal, Lda is a 40% partner.
	Monta company exploration destroys all the fish species in the sea dead or damaged all Sunda-Gas must also prevent this so as not to get a severe impact.	SGBU is employing industry best practice controls and mitigation measures to prevent a well blow out. It is noted that the condensate dispersion that occurred on the Montara drilling project was much larger than is predicted for the Chuditch-2 well.

Name and Organisation	Question	Response
Fonciano da Costa de Jesus GIS-East Timor	What is the impact of climate change on marine resources?	Refer to section 7 of the EIS
	You can consult with people who study climate change to find out the problem.	Refer to section 17 of the EIS
Petronela Jariu DIT-Petroleum	What challenges has Sunda-Gas faced so far?	In relation to the Environment, none thus far as we haven't drilled or conducted any testing
Sandra Pereira DIT-Petroleum	Perforation of the foal (reservoir?) is a very high-risk what does Sunda-Gas do when this drilling has its greatest impact or risk to the sea?	Refer to section 4.3.3 and 4.3.4 of the EIS
Gilberto ANLA.IP	Have you done an environmental study or not?	A detailed Environmental Baseline Survey (EBS) was conducted in February 2025 at the Chuditch 2 well site by Sunda Gas. The EBS looked at water quality, sediment, benthic habitat and Infauna.
	When the mitigation plan for these problems is already in place or not?	An Environmental Management Plan and Oil Spill Contingency Plan are developed

Appendix: 10 HSE Policy

Health Safety & Environment Policy

SUNDA ENERGY

Sunda Energy are committed to:

- Eliminating, mitigating and managing hazards and risks that could cause accidents, injuries, illnesses, property damage or an environmental impact.
- Supporting personnel to meet their health, safety and environmental responsibilities.
- Ensuring all decisions consider short and long term economic, environmental, safety and community impacts.

Sunda Energy demonstrate this commitment by

- Integrating Health, Safety and Environment (HSE) management into all business plans and operations. We will clearly define accountabilities and communicate our operating principles effectively.
- Ensuring that systems and processes are developed and implemented to identify, assess, control, and review HSE risks in all operations. Additionally, processes will be defined to investigate, learn from, and manage incidents effectively.
- Ensuring that appropriately trained, qualified and competent personnel are provided to manage, maintain, and implement systems and controls to manage hazards and risk in all operations of the business.
- Ensuring that effective communication channels are established to provide staff with relevant information on HSE issues and, conduct all structured meetings so that pertinent HSE learnings or information can be shared as appropriate with the meeting group, fostering involvement and stimulating discussion on HSE matters.
- Regularly measuring, monitoring, and reviewing HSE performance as part of our management review process, ensuring records are maintained and results are reported to senior management, relevant authorities, and other stakeholders as required.
- Ensuring that established procedures for the procurement or provision of Goods and operation of Services, incorporate HSE requirements in alignment with the Company management principles and standards.
- Ensuring that timely treatment and active rehabilitation for personnel who suffer work-related injuries or illnesses. In case of an environmental incident, we will take necessary steps to minimize its impact. We will also learn from these events to enhance our health, safety, and environmental practices.
- Ensuring that we take all viable opportunities to reduce waste and green house gas emissions, conserve energy and repurpose or recycle materials.

Andy Butler
Chief Executive Officer, Sunda Energy Plc
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