Annex F

Environmental Management Programme (EMPr)

Exploration Drilling within Block ER236, off the East Coast of South Africa

Final Environmental Management Programme Report

December 2018

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Exploration Drilling within Block ER236, off the East Coast of South Africa

Eni

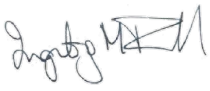
Final Environmental Management Programme Report

December 2018

Compiled by: Vicky Stevens and Lindsey Bungartz

For and on behalf of Environmental Resources Management

Approved by: Ingeborg McNicoll

Signed: 

Position: Senior Partner

Date: 13 December 2018

Acronyms and Abbreviations

°	Degrees
%	Percent
BOP	Blowout Preventer
ALARP	As low as reasonably practicable
AOI	Area of Influence
Cd	Cadmium
CSIR	Council for Scientific and Industrial Research
CV	Curriculum Vitae
DAFF	Department of Agriculture, Forestry and Fishery
DEA	Department of Environmental Affairs
DPS	Dynamic Positioning System
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
ERM	Environmental Management Resources
ERP	Emergency Response Plan
ft	Feet
Hg	Mercury
HSE	Health Safety & Environment
HydroSAN	South African Navy Hydrographic Office
IDZ	Industrial Development Zone
IFC	International Finance Corporation
IMO	International Maritime Organization
IOPP	International Oil Pollution Prevention
JNCC	Joint Nature Conservation Committee
Km	Kilometer
m	Meter
MARPOL	International Convention for the Prevention of Pollution by Ships
Mg/L	milligram per litre
Mg/kg	milligrams per kilogram
MPAs	Marine Protected Areas
MPRDA	Mineral and Petroleum Resources Development Amendment
MPRDAA	Mineral and Petroleum Resources Development Amendment Act
MSDS	Material Safety Data Sheets
NADF	Non-aqueous drilling fluid
NAF	Non-aqueous fluids
NOx	Oxides of Nitrogen
ODS	Oxide dispersion strengthened
OSCP	Oil Spill Contingency Plan
OSRL	Oil Spill Response Limited
PASA	Petroleum Agency South Africa
PPE	Personal Protective Equipment
PSV	Platform Supply Vessel
ROV	Remote Operated Vehicle
SAHRA	South African Heritage Resource Agency
SAMSA	South African Maritime Safety Authority
SAN	South African Navy
SASAR	South African Search and Rescue
SO_x	Sulphur oxide
SOPEP	Shipboard Oil Pollution Emergency Plan
SWIS	Subsea Well Intervention Services
VSP	Vertical Seismic Profile
WBF	Water Based Fluid
WBM	Water Based Mud

WCCP	Well Control Contingency Plan
WMP	Waste Management Plan

CONTENTS

1 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

1.1 INTRODUCTION

The aim of the Environmental Management Programme (EMPr) is to provide a set of guidelines and actions aimed at addressing potential environmental risks and impacts associated with the mobilisation, drilling and demobilisation of the project, and will be included in contract documentation between the Company and its contractors. The EMPr also provides assurance to regulators and stakeholders that their requirements with respect to environmental and socio-economic performance will be met, and provides a framework for compliance auditing and inspection programs. It becomes a legally binding document on the Environmental Authorisation of the project.

1.2 OBJECTIVES

The objectives of the EMPr are to:

- Fulfil the requirements of South African EIA legislation and international Conventions;
- Be consistent with oil and gas industry good practices and Eni South Africa's technical guidelines/standards;
- Outline the appropriate avoidance and/or mitigation options to potential impacts, to minimise impacts, after first establishing whether impacts cannot be avoided;
- Provide an implementation mechanism for mitigation measures and commitments identified in the EIA Report;
- Establish a monitoring programme and record-keeping protocol against which Eni South Africa and its contractor's/sub-contractor's performance can be measured and to allow for corrective actions or improvements to be implemented when needed; and
- Provide protocols for dealing with unforeseen circumstances such as unplanned events or ineffective mitigation measures.

1.3 CONTENTS OF AN EMPR

An EMPr needs to fulfil the requirements listed in section 24N of the Act of Environmental Impact Assessment (EIA) Regulations of 2014 (as amended).

Table 1.1 Contents of an EMPr

Legislated Content	Section in this Report
In detail, an EMPr needs to provide the following information:	
• The Environmental Assessment Practitioner (EAP) who prepared the EMPr; and	*Section 1.4*
• The expertise of that EAP to prepare an EMPr, including a curriculum vitae;	*Annex A*
• A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	*Section 1.5*
• A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	*Section 1.5*
• A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including:	*Section 1.6*
○ Planning and design;	
○ Pre-construction activities;	
○ Construction activities;	
○ Rehabilitation of the environment after construction and where applicable post closure; and	
○ Where relevant, operation activities;	
• A description of proposed impact management actions, identifying the manner in which the impact management outcomes will be achieved, and must, where applicable, include actions to:	*Table 1.8*
○ Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
○ Comply with any prescribed environmental management standards or practices;	
○ Comply with any applicable provisions of the Act regarding closure, where applicable; and	
○ Comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;	
○ The method of monitoring the implementation of the impact management actions identified;	
○ The frequency of monitoring the implementation of the impact management actions identified;	
○ An indication of the persons who will be responsible for the implementation of the impact management actions;	
○ The time periods within which the impact management actions must be implemented;	
○ The mechanism for monitoring compliance with the impact management actions identified;	
○ A programme for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	
• An environmental awareness plan describing the manner in which—	*Section 1.7.1*
○ The applicant intends to inform his or her employees of any environmental risk which may result from their work; and	
○ Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
• Any specific information that may be required by the competent authority.	*Section 1.7, to 1.12*

1.4 *DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER*

ERM was appointed by Eni as the Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment process and application for environmental authorisation for the proposed offshore drilling project.

ERM and the specialists appointed by ERM have no financial ties to nor are they a subsidiary, legally or financially, of Eni. Remuneration for the services by Eni in relation to the EIA Report (including the EMPr) is not linked to approval by any decision-making authority and ERM has no secondary or downstream interest in the development.

ERM is a global environmental consulting organisation employing over 5,000 specialists in over 150 offices in more than 40 countries. In South Africa, ERM Southern Africa employs over 150 environmental consultants out of offices in Johannesburg, Durban and Cape Town.

The contact details of the EAP for the application are presented in *Box 1.1* below.

Box 1.1 Contact Details of the EAP

Environmental Resources Management Southern Africa (Pty) Ltd.
Postnet Suite 90
Private Bag X12
Tokai
7966

Vicky Stevens
1st Floor | Great Westerford | 240 Main Road | Rondebosch | 7700
Cape Town | South Africa
T +27 21 681 5400 | F +27 21 686 0736
E eni.exploration.eia@erm.com

The CV and details of the Independent Environmental Practitioner are presented in *Annex A*.

The core EIA team members and specialists involved in this EIA process are listed in *Table 1.2* below.

Table 1.2 The EIA Team

Name	Organisation	Role	Qualifications, Experience
Ingeborg McNicoll	ERM	Project Director	BSc (Hons) Marine Biology. 35 years' experience
Vicky Stevens	ERM	Project Manager and EAP	MSc (oceanography), 12 years' experience
Lindsey Bungartz	ERM	Social and Stakeholder Engagement Specialist	BSocSc (Hons), 10 years' experience
Dr Andrea Pulfrich	Pisces Environmental Services (Pty) Ltd	Marine Ecology Specialist	PhD (Fisheries Biology), 20 years' experience
Dr David Japp	Capricorn Marine Environmental (Pty) Ltd (CapMarine)	Fisheries Specialists	MSc (Ichthyology and Fisheries Science), 30 years' experience
Ms Sarah Wilkinson			BSc (Hons) Oceanography and Botany, University of Cape Town, 14 years' experience
Dr John Gribble	ACO Associates CC	Maritime Heritage Specialist	BA (Hons), MA Archaeology, 20 years' experience
Michael J. Fichera	ERM	Oil Spill and Drill cuttings modelling Specialist	B.S. in Civil Engineering and an M.E. in Environmental Engineering, 25 years' experience
Mr Stephen Luger	PRDW	Modelling Peer Reviewer	MSc Engineering, 24 years' experience

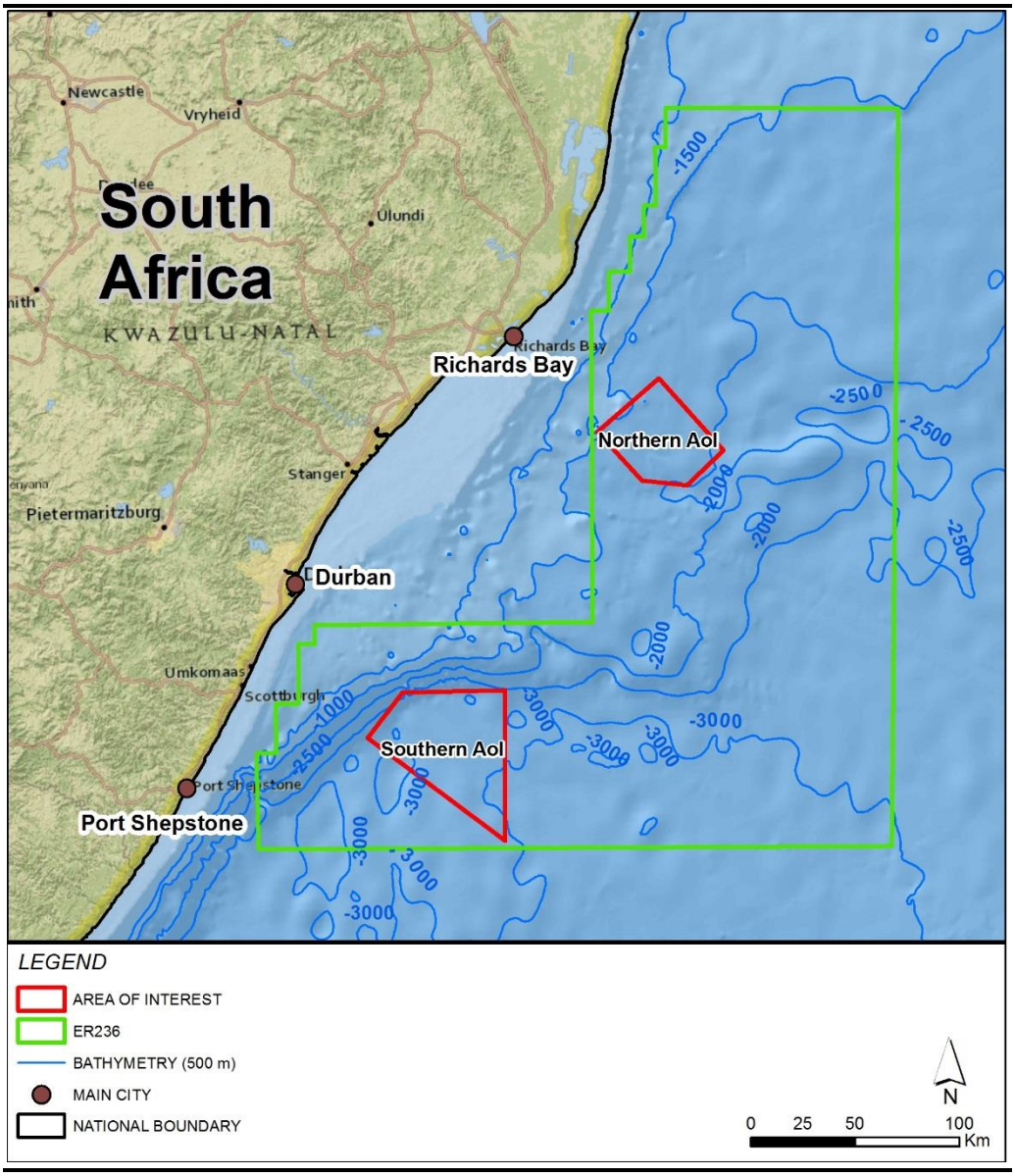
1.5 SITE AND PROJECT DESCRIPTION

Eni South Africa BV (Eni), and Sasol Africa Limited (Sasol) hold an Exploration Right off the East Coast of South Africa. Eni South Africa and Sasol are considering the possibility of conducting an exploration drilling programme in Block ER236 (12/3/236) to assess the commercial viability of the hydrocarbon reservoir for future development.

Eni South Africa proposes to drill up to six wells inside Block ER236 (*Figure 1.1*), within two areas of interest, to establish the quantity and potential flow rate of any hydrocarbon present.

The drilling of the first exploration well is planned for some time between November 2019 and March 2020, dependent on drillship availability, amongst a number of other planning requirements. The drilling of one well is expected to take in the order of 71 days to complete. The time sequence and the number of additional exploration and appraisal wells will be dependent on the results of the first exploration well.

Figure 1.1 Project Location – Offshore South Africa



Source: ERM, 2018

The drilling of the northern and the southern areas of interest will be undertaken as two separate campaigns, which consist of:

- Up to four wells (two exploration and two appraisal wells) in the northern area of interest, which is located, at its closest point, approximately 62 km from shore, in water depths ranging between 1,500 m and 2,100 m;

- Up to two wells (one exploration and one appraisal well) in the southern area of interest, which is located, at its closest point, approximately 65 km from shore, in water depths ranging between 2,600 m and 3,000 m.

- The expected drilling depth will be between approximately 3,800 m and 4,100 m from the sea surface, through the seabed, to the target depth in the northern area, while around 5,100 m for the southern area.

- Well testing may be conducted on the appraisal wells if they present potential commercial quantities of hydrocarbon.

The co-ordinates of the Block ER236 and the drilling areas of interest are provided in tables below.

Table 1.3 Coordinates of the Block ER236 (WGS84 UTM Zone 36S)

Point	Latitude	Longitude
A	27°48'30"S	32°52'0"E
B	27°48'30"S	34°0'0"E
C	31°0'0"S	34°0'0"E
D	31°0'0"S	30°49'0"E
E	30°35'0"S	30°49'0"E
F	30°35'0"S	30°55'0"E
G	30°22'24,6"S	30°55'0"E
H	30°22'24,72"S	31°2'0"E
I	30°7'0"S	31°2'0"E
L	30°2'0"S	32°30'0"E
M	28°41'18"S	32°30'0"E
N	28°41'18"S	32°35'20"E
O	28°31'4"S	32°35'20"E
P	28°31'4"S	32°41'30"E
Q	28°21'59"S	32°41'30"E
R	28°21'59"S	32°45'40"E
S	28°13'51"S	32°45'40"E
T	28°13'51"S	32°49'0"E
U	27°58'47"S	32°49'0"E
V	27°58'47"S	32°52'0"E

Table 1.4 Co-ordinates of the Northern Drilling Area of Interest (WGS84 UTM Zone 36S)

Point	Latitude	Longitude
A	29° 12' 33,341"S	32° 31' 46.013"E
B	28° 58' 47.34"S	32° 49' 32.73"E
C	29°17'28.529"S	33°8'58.59"E
D	29°26'34.962"S	32°58'11.965"E
E	29°25'22.117"S	32°44'46.372"E

Table 1.5 Co-ordinates of the Southern Drilling Area of Interest (WGS84 UTM Zone 36S)

Point	Latitude	Longitude
A	30°19' 39.588"E	32° 3' 48.518"E
B	30°58' 35.904"E	32° 3' 25.921"E
C	30°31' 35.022"E	31° 22' 26.396"E
D	30°19' 49.794"E	31° 33' 7.656"E

1.5.1 Project Components and Activities

Main project components include the following:

- Deep Water Drillship: due to water depth in each area of interest, it is anticipated that exploratory drilling will be conducted using a deep water drillship. The deep water drillship will be kept in position using a dynamic positioning system (DPS) which allows for minimal subsea disturbance due to its ability to operate without moorings. A significant benefit to using a drillship is the ease of mobility as it is a self-propelled vessel with the flexibility to move from location to location without the need of transport vessels;

- Exclusion Zone: During the drilling operations, there will be a temporary 500 m safety zone around the drillship, which will be enforced by a standby vessel. The safety zone will be described in a Notice to Mariners as a navigational warning. The purpose of the safety zone is to prevent a vessel collision with the drillship during operations. Under the Marine Traffic Act, 1981 (No. 2 of 1981), an "exploration platform" or "exploration vessel" used in prospecting for or mining of any substance falls under the definition of an "offshore installation" and as such it is protected by a 500 m safety zone.

- Shore base: an onshore logistics base will be located in either the Richards Bay or Durban, on an existing brownfield site (previously developed land) within the Port or the Industrial Development Zone (IDZ). A final decision will be undertaken after a logistic survey is conducted in the identified areas.

- Supply and standby vessels: for the duration of the drilling operation, the drillship will be supported by Platform Supply Vessels (PSVs), which are general purpose vessels designed to carry a variety of equipment and cargo. These vessels will supply the drillship three to four times a week with drilling muds, cement and equipment such as casing, drill pipe and tubing. They will also remove waste that must be appropriately disposed of on land. The number of PSVs has not yet been defined (it is anticipated that there will be two or three).

- Personnel: all shore based personnel will reside locally. The majority of onshore staff employed will be local if an existing locally based logistics company is evaluated as suitable for operational logistics support and follow up. The drillship will accommodate around 150-200 personnel. The number of personnel on the supply vessels will vary based on vessel size and the types of activities they support. All workers will be provided with health and safety training and Personal Protective Equipment (PPE) suitable for the types of activities.

- Crew transfer: transportation of personnel to and from the drillship will most likely be provided by helicopter operations from Richards Bay or Durban. The drillship will accommodate around 200 personnel. Crews will generally work in 12 hour shifts in 2 to 4 weeks cycles. Crew changes will be staggered, and in combination with ad hoc personnel requirements. Thus helicopter operations to and from the drillship will occur on an almost daily basis. The helicopter crew will generally work in 10 hour shifts in 2 to 4 week cycles and in accordance with Eni's Aviation Manual.

- Infrastructure and services:

    - *Freshwater*: the project will require seawater and some limited industrial water for making the water based drilling muds for the tophole sections of the well and for rig cleaning. This industrial water will be transported from shore. The drinking (potable) water for the drillship will be provided either by reverse osmosis system or by bottled water;
    - *Fuel:* the drillship and supply vessels will use marine diesel during transit, standby and drilling operations; and
    - *Food Supplies and Local Services:* a catering company will provide food and beverages to the offshore vessels. Food selection, quantities, and sourcing will be undertaken with support from the shore base.

Project activities associated with drilling include the following phases:

- Mobilisation of the supply vessels to Richards Bay or Durban, ;

- Operation of the shore-based facilities for handling support services needed by the drillship;

- Drilling of a well (and subsequent 5 additional wells depending on the results of this initial well);

- Well execution (side track, logging, completion) options;

- Well testing for appraisal option;

- Well abandonment (Plug and Abandonment "decommissioning"); and

- Demobilisation of the drillship, vessel and local logistics base.

All activities will be conducted by Eni in conformity with recognised industry international best practice.

1.6 POTENTIAL IMPACTS ASSESSED

Table 1.6 Potential Impacts from Planned Activities

No.	Issue	Impact	Pre-mitigation Significance Rating	Post mitigation Significance Rating
1	**Key Impacts Identified from Planned Activities**			
1.1	Climate change	Burning of hydrocarbons from vessels and during well testing (if confirmed) for appraisal wells.	**Negligible**	**Negligible**
1.2	Seawater and sediment quality degradation /contamination and impacts on marine fauna	Wastewater discharges from the drillship, supply and support vessels	**Negligible**	**Negligible**
		Physical disturbance to the seabed, sediments and benthic fauna from pre-drilling Remote Operated Vehicle (ROV) surveys	**Negligible**	**Negligible**
		Physical disturbance to the seabed, sediments and benthic fauna from drilling operations	**Negligible**	**Negligible**
		Impact of disposal of muds and cuttings at the seabed on benthic fauna	**Moderate**	**Minor**
		Impact of disposal of muds and cuttings at the seabed on deep water corals (sessile fauna)	**Moderate**	**Minor**
		Physical disturbance to the seabed, sediments and benthic fauna from cement disposal	**Negligible**	**Negligible**
		WBM biochemical impacts related to drill cuttings, adhered residual WBM and WBM muds on marine fauna present in the water column	**Negligible**	**Negligible**
		NADF biochemical impacts related to drill cuttings and adhered residual NADF muds on marine fauna present in the water column	**Minor**	**Negligible**
		Disturbance of marine fauna by the masking of biologically relevant sounds by underwater noise associated with drilling operations	**Minor**	**Minor**
		Avoidance behaviour of marine fauna due to disturbance by underwater noise associated with drilling operations	**Negligible**	**Negligible**
		Impacts of helicopter noise associated with drilling on marine fauna	**Moderate**	**Minor**
		Impact of light from project vessels on marine fauna	**Negligible**	**Negligible**
1.4	Disturbance to fishing (commercial and subsistence)	Impacts related to restricted access to fishing grounds	**Minor**	**Minor**
1.5	Abandonment of wellhead(s) on seafloor	Impacts of the presence of the wellhead after abandonment on other marine activities	**Negligible**	**Negligible**
1.6	No-Go alternative	Impact of the No-Go alternative	**Moderate (-ve)**	**Moderate (+ve)**

No.	Issue	Impact	Pre-mitigation Si gnificance Rating	Post mitigation Significance Rating
2	**Additional Relevant Impacts Identified through Stakeholder Engagement during Scoping**			
2.1	Maritime Heritage	Exploration drilling	**Negligible**	**Negligible**
2.2	Local employment / income generation	Employment of labour and allocation of jobs Training / capacity building of local people	**Negligible**	**Negligible**

Table 1.7 Potential Risks of Unplanned Activities and their Risk Significance ratings

No.	Issue	Impact	Post -Mitigation Significance Rating
1	**Unplanned Activities**		
1.1	Risk significance of oil spills on marine and coastal habitats and species	Hydrocarbon spill from a vessel collision (ie loss of diesel) on marine and coastal habitats and species (Invertebrates, pelagic fish and larvae, and for marine mammals and turtles)	**Minor (ALARP)**
1.2		Hydrocarbon spill from a vessel collision on marine and coastal habitats and species (seabirds)	**Moderate (ALARP)**
1.3		Oil spill due to blowout surface risk to invertebrates, fish, marine mammals and turtles (including species inside MPAs)	**Minor (ALARP)**
1.4		Oil spill due to blowout surface risk to marine and coastal habitats and species (seabirds)	**Moderate (ALARP)**
1.5		Oil spill due to blowout - sub-surface risk to invertebrates, fish, marine mammals and turtles (including species inside MPAs)	**Minor (ALARP)**
1.6		Oil spill due to blowout -sub-surface risk to seabirds	**Minor (ALARP)**
1.7		Loss of drilling fluids and cuttings due to riser disconnect on marine and coastal habitats and species (Invertebrates, pelagic fish and larvae, and for marine mammals and turtles)	**Minor (ALARP)**
1.8		Loss of drilling fluids and cuttings due to emergency riser disconnect on seabirds	**Moderate (ALARP)**
1.9		Loss of drilling fluids and cuttings due to emergency riser disconnect on invertebrates, fish, marine mammals and turtles (including species inside MPAs)	**Minor (ALARP)**
1.10	Risk significance of oil spills on marine and coastal based livelihoods	Oil spill due to blowout or diesel spill on tourism	**Moderate (ALARP)**
1.11		Oil spill due to blowout or diesel spill on small-scale and subsistence fisheries	**Moderate (ALARP)**
1.12		Oil spill due to blowout or diesel spill on recreational fisheries	**Minor (ALARP)**
1.13		Oil spill due to blowout or diesel spill on commercial fisheries	**Minor (ALARP)**
1.14		Vessel collision on workforce health and safety	**Minor (ALARP)**

No.	Issue	Impact	Post -Mitigation Significance Rating
1.15	Accidental vessel on vessel collision on community and workforce health and safety	Vessel collision on community health and safety	**Moderate (ALARP)**

1.7 IMPLEMENTATION OF EMPR

The EMPr details the mitigation measures, which must be implemented during the development of the proposed project and assigns responsibilities for specific tasks. Eni shall ensure that a copy of the approved EMPr and associated approvals are supplied to the Drilling Contractor and a copy is kept on board the drillship and support vessels during the operations.

The EMPr is applicable to all work activities during the planning, operations and decommissioning phases of the proposed activities. As per section 102 of the Mineral and Petroleum Resources Development Amendment Act, 2008 (No. 49 of 2008) (MPRDAA) may not be amended or varied without the written consent of the Minister.

The EMPr should be fully integrated into Eni's Health, Safety and Environment (HSE) procedures to promote:

- Ownership of the plan at the highest level;
- Appropriate resource allocation for implementation of the EMPr; and
- Effective execution of the EMPr.

The ultimate responsibility for the project's environmental performance lies with Eni, specifically the Managing Director, project Managers and HSE Managers. This will involve ensuring that the HSE requirements are applied and that all requirements are met by contractors and subcontractors engaged in work; including monitoring the performance of its contractors as well as the overall project. Environmental commitments will be incorporated into operational procedures, working practices and overall management procedures. Eni South Africa will be required to track and steward implementation of the EMPr.

1.7.1 *Environmental Awareness Training*

Eni will identify, plan, monitor and record training needs for personnel whose work may have a significant adverse impact upon the environment. Eni recognises that it is important that employees at all levels are aware of Eni's HSE policy, potential impacts of their activities, and roles and responsibilities in achieving conformance with the policy and procedures. The personnel with responsibilities in specific environmental practices will be adequately trained to ensure effective implementation of the work instructions and procedures for which they have responsibilities. This training will include awareness and competency with respect to:

- General awareness relating to exploration well drilling activities, including environmental and social impacts that could potentially arise from project activities;

- Legal requirements in relation to environmental performance;

- Necessity of conforming to the requirements of the EMPr, including reporting requirements (ie such as incident reporting);

- Activity-specific training (ie waste management practices); and

- Roles and responsibilities to achieve compliance, including change management and emergency response.

Training would take cognisance of the level of education, designation and language preferences of the personnel. Eni would also require that each of the appointed contractors institute training programmes for its personnel. Each contractor will be responsible for site Health Safety & Environment (HSE) awareness training for personnel working on the project and for identification of any additional training requirements to maintain required competency levels. The contractor training programme will be subject to approval by Eni and it will be audited to ensure that:

- Training programs are adequate;
- All personnel requiring training have been trained; and
- Competency is being verified.

1.8 SPECIFIC MANAGEMENT PLANS

1.8.1 Emergency Response Plan

An Emergency Response Plan (ERP) is a requirement of the International Finance Corporation (IFC) Performance Standards and EHS Guidelines. This plan will include each stage of the project lifecycle (mobilisation, drilling and demobilisation) and commensurate with the potential risks and impacts identified in the EIA Report.

The objective of the ERP is to be prepared to respond to accidental and emergency situations in a manner appropriate to the operational risks, and to prevent their potential negative consequences.

1.8.2 Oil Spill Contingency Plan

A project specific Oil Spill Contingency Plan (OSCP) will be developed by Eni. This plan will be developed in terms of the nationally adopted Incident Management System for spills and the National OSCP. This plan would instruct employees as to the correct response procedures for any unlikely oil spill that may occur during the exploration drilling operation. This plan of intervention, providing contacts lists and mobilization procedures will be drafted prior to the commencement of drilling activities.

Eni will specifically develop its own Oiled Wildlife Response Plan (OWRP) according to the National Oiled Wildlife Preparedness & Response Plan (NOWCP) as part of it's OSCP.

All employees who are affected by the plan would be trained before commencement of drilling and at least one exercise would be held during drilling to confirm preparedness of people and equipment.

The oil spill contingency plan should include or address, but not be limited to, the following:

- Alert procedure;
- Initial / immediate actions;
- Oil Spill Response Options / Strategies;
- Oiled Wildlife Response Plan;
- Roles and responsibilities (including Emergency Directory);
- Response Actions;
- Response termination procedure;
- Oil Spill Modelling Report;
- Oil Spill Risk Assessment (environmental sensitivities and priorities for protection);
- Oil Spill Response Equipment Inventory;
- Response technical guidelines and limitations;
- Response equipment and maintenance / Inspection plan;
- Facilities (including specification) and products (including MSDS manual); and
- Drills and training.

The OSCP shall be reviewed and approved by the South African Maritime Safety Authority (SAMSA) prior to start of drilling. On approval SAMSA will issue a Pollution Safety Certificate. Eni shall provide copies of the plan and the approved Pollution Safety Certificate from SAMSA to the Petroleum Agency of South Africa, and the Department of Environmental Affairs.

1.8.3 Waste Management Plan

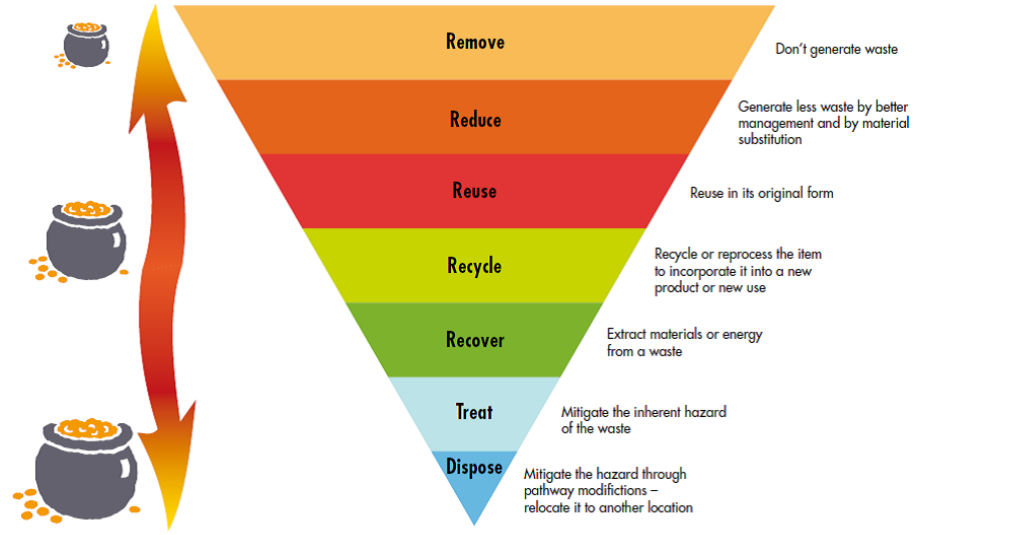
A Waste Management Plan (WMP) will be developed before the start of the drilling activities start for implementation during the project activities. The WMP establishes the procedures adopted for the management of waste to be generated during the course of conducting offshore and onshore operations (drilling, vessels trips, and onshore support facilities). It covers collection, storage, treatment, transport, disposal, discharge, reporting and data management. The WMP will comply with applicable International Conventions for the Prevention of Pollution at Sea from Ships (MARPOL 73/78).[1]

[1] It is the understanding of ERM that a Waste Management Licence is not required.

The following are key recommended measures for the Waste Management Plan Development:

- Waste will be dealt by Eni South Africa in accordance with the waste hierarchy presented in *Figure 1.2* below;
- Suitably approved and fully licensed companies providing waste treatment and disposal services will be selected by review and evaluation in line with international good practice;
- Waste tracking procedures will be defined in the WMP to provide traceability from source of generation to end point; and
- Non-hazardous waste will be segregated and recycled where possible.

Figure 1.2 ***Waste Hierarchy***



Source: Eni Technical Guideline, AMTE-TG-010, 2015

1.9 *INSURANCE*

There will be adequate protection and indemnity insurance cover for oil pollution incidents. Eni retains worldwide third-party liability insurance coverage, which is designed to hedge part of the liabilities associated with damage to third parties, loss of value to the Group's assets related to unfavourable events and in connection with environmental clean-up and remediation. Tier 1 Oil spill equipment is already available on the drillship drilling site (off-shore) to respond immediately to unlikely spill events. Furthermore, Eni has service agreements in place for equipment and personnel to be mobilized from onshore to the spill event in short time within 48 hours. For instance part of Equipment and dispersants are held already available in Saldanha Bay.

Further equipment will be available on board of stand-by vessels and in the logistic base close to operations with short lead times to access and execute response strategies.

1.10 ENVIRONMENTAL MANAGEMENT PROGRAMME COMMITMENTS REGISTER

This section details the specific management commitments to be implemented to prevent, minimise or manage significant negative impacts and optimise and maximise any potential benefits of the project. These commitments are presented for the three project phases; planning, operations and decommissioning phases.

This EMPr Commitments Register (*Table 1.8)* is structured in the following manner so that the mitigation measures have a clear and logical context within which they are designed, implemented, monitored and evaluated:

- Activities;
- Objective;
- Mitigation /Management and Enhancement Commitments;
- Responsibility;
- Timing / Frequency; and
- Requirement for the Close Out Report.

Table 1.8 EMPr Commitments Register

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
A)Planning Phase						
1.	Drilling timing/ scheduling	Drill in a favourable fair weather period to reduce impacts in the unlikely event of a blow-out	Since the probability of shoreline oiling in the unlikely event of a blow-out is significantly influenced by the season in which drilling is undertaken, it is recommended that drilling be undertaken during the summer months.	Eni	Prior to commencement of operation	Confirm drilling period and justify timing
2.	Preparation of subsidiary plans	Preparation for any emergency that could result in an environmental impact	The following plans should be prepared and in place: • A project-specific OSCP approved by SAMSA. • Eni to provide copies of the approved plan and the Pollution Safety Certificate from SAMSA to PASA and the Department of Environmental Affairs (DEA). • Shipboard Oil Pollution Emergency Plan (SOPEP) for drillship and support vessels as required by MARPOL 73/78. • Emergency Response Plan (ERP) • South African Search and Rescue (SASAR) Manual. • Waste Management Plan (*WMP*). • Ballast Water Management Plan. In addition to the above, ensure that: • Drillship has Pollution Safety Certificate(s) issued by the South African Maritime Safety Authority (SAMSA). • There is adequate protection and indemnity insurance cover for oil pollution incidents. • There is a record of the drillships and support vessels' seaworthiness certificate and/or classification stamp. • The wellheads and BOP are designed to allow for capping system installation. • Eni should have a contract in place with contractors specialized in Well Emergency (capping system, killing and relief well during Blow Out) response and oil spill response (e.g. Oil Spill Company Limited (OSRL) and	Eni and Drilling Contractor	Prior to commencement of operation	Confirm compliance and justify any omissions

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
			Wild Well Control) for the duration of the exploration drilling programme.			
3.	Stakeholder consultation and notification	PASA and DEA notification	Compile the specific details of each drilling operation into a Drilling Notification document and submit to PASA and DEA. The notification should provide, inter alia, the details on the following: • Drilling programme (timing, co-ordinates and duration). • Contractor details. • Drillship and support vessel specifications (including relevant certification and insurance). • Oil Spill Contingency Plan (OSCP). • Emergency Response Plan (ERP).	Eni	30 days prior to commencement of operations or as required by PASA and / or DEA	Confirm that notification was sent to PASA and DEA

		Stakeholder notification	Develop a stakeholder management plan for drilling operations. This plan should include:
			• Notification of relevant government departments and other key stakeholders of the proposed drilling programme (including navigational co-ordinates of well location, timing and duration of proposed activities) and the likely implications thereof (specifically the 500 m exclusion zone and the movement of support vessels). Stakeholders include:
			  • Fishing industry / associations:
			  • South African Tuna Association.
			  • SAMSA.
			  • South African Navy (SAN) Hydrographic office.
			  • Department of Agriculture, Forestry and Fisheries (DAFF),
			  • Transnet National Ports Authority (ports of Richards Bay and / or Durban).
			  • Adjacent prospecting / exploration and mining / production right holders.
			• Distribution of a Notice to Mariners prior to the commencement of the drilling operations to inform them of drilling activities, including timing and
				Eni	30 days prior to commencement of operations	Provide copies of all correspondence

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
			location thereof. • Any dispute arising with adjacent prospecting / exploration right holders should be referred to the Department of Mineral Resources and / or PASA for resolution.			
4.	Financial provision		Ensure that financial provision is in place to execute the requirements of the EMPr. Financial provision is to be approved by PASA.	Eni	Prior to commencement of operations	Confirm that financial provision for EMPr has been put in place
5.	Permits / exemptions	Compliance with legislative requirements	• If necessary, apply to the South African Heritage Resource Agency (SAHRA) for permission to disturb any cultural heritage material (e.g. shipwrecks) older than 60 years. • Comply with any requirements specified by SAHRA.	Eni	Prior to commencement of operations or when identified	Provide copy of permit / exemption
6.	Pre-Drilling Survey	Ensure that well positions will not affect obstacles / installations and sensitive habitats on the seabed	• Use a Remotely Operated Vehicle (ROV) to survey the seafloor prior to drilling in order to confirm the presence or absence of any significant topographic features, vulnerable habitats and / or species (e.g. cold-water corals, sponges) and cultural heritage material (e.g. wrecks) in the area. • Implementation of procedures for ROVs that stipulate that the ROV does not land or rest on the seabed as part of normal ROV operations. • Review ROV footage of pre-drilling surveys to identify potential vulnerable habitats within 500 m of the drill site. • Relocate drill site more than 500 m from any identified vulnerable habitats.	Eni/ Drilling/ support vessel contractors	Prior to commencement of operations or when identified	• Copy of permit from SAHRA (if required) • Provide photographic evidence of the seabed condition from ROV coverage

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
7.	Pre-Drilling Survey	Protect Shipwrecks	• Review any pre-drill remote sensing data collected to ground-truth seabed conditions to establish whether any shipwrecks are present on the seabed. • Should these reviews of the ROV data identify wreck material at or near the location of a proposed drill site, micro-siting of the well location and the possible implementation of a drilling activity exclusion zone around the archaeological feature should be sufficient to mitigate the risks to the site. • A chance find procedure must be developed for the project and should any shipwreck material that was not identified by the measures set out above be encountered during the exploration drilling process.	Eni/ Drilling/ support vessel contractors	Prior to commencement of operations or when identified	• Copy of permit from SAHRA (if required) • Provide photographic evidence of the seabed condition from ROV coverage
B) Operational Phase						
General Vessel Operations						
8.	Use of drilling and supply vessels during all phases	Minimise impact to air quality by complying with MARPOL 73/78 Annex VI, Regulations for the Prevention of Air Pollution from ships	• Compliance to MARPOL 73/78 Annex VI regulations regarding the reduction of SOx, NOx, ODS, VOC and emissions from shipboard incineration. • Compliance to MARPOL 73/78, IMO certification and classification of the hazardous area according to EN 60047-10 for incineration of non hazardous domestic solid waste (paper, carton, wood etc.) on the drillship • All diesel motors and generators will undergo routine inspections and receive adequate maintenance to minimise soot and unburnt diesel released to the atmosphere. • Leak detection and repair programmes will be implemented for valves, flanges, fittings, seals, etc. • Use of a low sulphur fuel for project vessels, if available.	Drilling/ support vessel contractors	Throughout vessel operations	Provide a summary of the vessel log book records

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
9.		Minimise impact to marine water quality by complying with MARPOL 73/78 requirements (Annex I - Regulation for the Prevention of Pollution by Oil; Annex IV - Regulation for Prevention of Sewage from ships; Annex V - Prevention of Pollution by Garbage from Ship).	• Storage of chemical, fuels and oil in bunded areas on board the vessels to contain leaks and spills. • Oil spill response equipment present on board of drillship and vessels. • Compliance with MARPOL 73/78 standards for all facilities and vessels and equipment with wastewater treatment unit for the treatment of domestic wastewater. • Compliance with national and international requirements of wastewater treatment and disposal. • Discharge of all the wastewater effluents from drillship and vessels only after treatment. Equipment of vessels with oil/water separators to treat drainage and bilge water in compliance with MARPOL 73/78 Annex I requirements, that is to a level lower than 15 ppm oil content in water.	Drilling/ support vessel contractors	Throughout vessel operations	• Confirm compliance and justify any omissions • Provide summary of waste record book / schedule and receipts • Report occurrence of minor oil spills and destination of wastes
			Implement a waste management system in accordance with Eni's Waste Management Guidelines that addresses all wastes generated at the various sites, shore-based and marine.	Drilling/ support vessel contractors/ Eni	Prior to mobilisation	
			Route all deck and machinery drainage to: • Equipment for the control of oil discharge from machinery space bilges and oil fuel tanks, e.g. oil separating/filtering equipment and oil content meter. • Oil residue holding tanks. • Oil discharge monitoring and control system	Drilling/ support vessel contractors	Prior to mobilisation	
10.	Use of drilling and supply vessels during all phases	Minimise impact to marine water quality by complying with MARPOL 73/78 requirements (Annex I - Regulation for the Prevention of Pollution by Oil; Annex IV - Regulation for Prevention of Sewage	The following certificates shall be in place: • A valid International Sewage Pollution Prevention Certificate, as required by vessel class. • International Oil Pollution Prevention (IOPP) Certificate, as required by vessel class.	Drilling/ support vessel contractors	Throughout vessel operations	Confirm compliance and justify any omissions
			Discharge food wastes after they have been passed through a comminuter or grinder, and when the drillship is located more than 3 nautical miles (± 5.5 km) from land.	Drilling/ support vessel contractors	Throughout vessel operations	Provide summary of Garbage Record Book

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
		from ships; Annex V - Prevention of Pollution by Garbage from Ship).				
		Control the spread of non-native invasive species to vulnerable ecosystems	All ships that carry ballast water must de- and re-ballast in adherence with the International Maritime Organization (IMO) guidelines and standards governing discharge of ballast waters at sea.	Drilling/ support vessel contractors	During ballast water discharge, throughout vessel operations	Provide Ballast Water Record Book logs.
11.	Use of drilling and supply vessels during all phases	Protect marine fauna, migratory birds and seabirds by managing noise from the drillship and supply vessels transit	Vessels shall undergo a regular maintenance regime to reduce noise.	Drilling/ support vessel contractors	Throughout vessel operations	Provide a summary of the vessel maintenance records
12.	Use of drilling and supply vessels during all phases	Protect marine fauna, migratory birds and seabirds by managing illumination of the drillship and supply vessels	• Adopt use of lights compatible with safe operations whenever and, wherever possible, reduction of the intensity and emissions to the surrounding environment. • Keep disorientated, but otherwise unharmed, seabirds in dark containers for subsequent release during daylight hours. Injured birds should be returned to shore where feasible to allow for treatment. Ringed/banded birds should be reported to the appropriate ringing/banding scheme (details are provided on the ring)	Drilling/ support vessel contractors	Throughout vessel operations	Provide a summary of the vessel log book records
13.	Use of drilling and supply vessels during all phases	Protect marine fauna and coastal tourism by effective containment of oil, chemicals and fluids	• Implement refuelling procedures for bunkering. • Use dry break couplings. • Regularly inspect refuelling hoses. • Conduct oil spill response exercises. • Ensure all workers are trained to recognise and report incidents and emergencies. • Select chemicals to ensure low impact to aquatic organism in case of accidental overboard disposal.	Eni and Drilling/ support vessel contractors	Throughout vessel operations	• Record of all spills (Spill Record Book), including spill reports, emergency exercise

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
			• Bund and drain hydrocarbon and chemical storage areas to a closed loop system. • Ensure all drainage water passes through an oily water analyser maintained and calibrated (<15 mg/L oil in water) prior to overboard discharge. • Inspect and maintain all chemical / fuel containers including the vessels fuel tanks and mud tanks. • In the case of a small spill implement the SOPEP. • In case of a large spill activate the OSCP and onshore emergency team			reports, audit reports • Incident log • Records of staff training
14.	Use of drilling and supply vessels during all phases	Protect marine fauna and coastal tourism by effective containment of oil, chemicals and fluids	• Categorise the likely different quantities of oil spills in the OSCP and agree with the relevant authorities how each categories of spills need to be reported and responded to. • Develop an Oiled Wildlife Response Plan (OWRP) according to National Oiled Wildlife Preparedness & Response Plan (NOWCP). as an Annex to the OSCP Information that should be supplied when reporting a spill includes: • The type and circumstances of incident, ship type, port of registry, nearest agent representing the ships company. • Geographic location of the incident, distance offshore and extent of spill. • Prevailing weather conditions, sea state in affected area (wind direction and speed, weather and swell). • Persons and authorities already informed of the spill.	Eni and Drilling/ support vessel contractors	In event of spill	• Record of all spills (Spill Record Book), including spill reports, emergency exercise reports, audit reports • Incident log

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
			• Control and contain the spill at sea (e.g. booms installation), as far as possible and whenever the sea state permits, using suitable recovery techniques to reduce the spatial and temporal impact of the spill. • Use low toxicity dispersants except within 5 nautical miles offshore or in depths < 30 m to reduce concentrations below most acute toxicity thresholds. • Provide adequate resources to collect, transport and treat oiled animals (e.g. birds or sea turtles) to a cleaning station in compliance with National Oiled Wildlife Preparedness & Response Plan (NOWCP)	Drilling/ support vessel contractors	In event of spill	• Record of all spills (Spill Record Book), including spill reports. emergency exercise reports. audit reports • Incident log
15.		Protect marine fauna from accidental collision	• Use anti-collision monitoring equipment and procedures on the drillship and supply vessels. • Report any cases of collision or observation of any strandings to the South African Stranding Network	Eni and Drilling/ support vessel contractors	Throughout vessel operations	• Incident log
C) Drilling Phase						
16.	Operation of drillship at drill site	Ensure navigational safety	• Implementation of the stakeholder management plan for drilling operations	Eni	30 days prior to commencement of operations	Provide copies of all correspondence with stakeholders
17.	Operation of drillship at drill site	Ensure navigational safety	• Prevent collisions by ensuring that the drillship and support vessels display correct signals by day and lights by night (including twilight), by visual radar watch and standby vessel(s). • Manage the lighting on the drillship and support vessels to ensure that it is sufficiently illuminated to be visible to fishing vessels and compatible with safe operations. • Maintain standard vessel watch procedures. • Enforce the 500 m safety/exclusion zone around the drillship. • A support vessel, equipped with appropriate radar and communications, is kept on 24-hour standby. • Use flares or fog horn where necessary.	Drilling/ support vessel contractors	Throughout operation	Provide records of any incidents and interaction with other vessels

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
			• Co-operate with other legitimate users of the sea to minimise disruption to other marine activities.			
18.	Operation of drillship at drill site and transit of supply vessels to and from port	Minimise impact to water quality by complying with the requirements of MARPOL 73/78 standards (Annex I - Regulation for the Prevention of Pollution by Oil; Annex IV - Regulation for Prevention of Sewage from ships; Annex V - Prevention of Pollution by Garbage from Ship).	• Separation of wastes at source. • Recycling and re-use of wastes where possible. • Treatment of wastes at source (maceration of food wastes, compaction, incineration, treatment of sewage and oily water separation). • Implement leak detection and repair programmes for valves, flanges, fittings, seals, etc.	Drilling/ support vessel contractors	Throughout operation	• Confirm compliance and justify any omissions • Provide summary of waste record book / schedule and receipts • Report occurrence of minor oil spills and destination of wastes
19.	Operation of drillship at drill site and transit of supply vessels to and from port	Appropriate waste management	• Segregate, classify and store all hazardous waste in suitable receptacles on board in order to ensure the safe containment and transportation of waste. • Provide a specific waste management storage and segregation area at the onshore logistics base. • Dispose of hazardous waste at a facility that is appropriately licensed and accredited • Incineration of non-hazardous waste (paper, wood, carton) using a certified burner.	Drilling/ support vessel contractors/Eni	Throughout operation	

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
20.	Operation of helicopters	Conserve and ensure the protection of marine and coastal fauna	• The National Environmental Management: Protected Areas Act (2003) stipulate that the minimum over-flight height over nature reserves, national parks and world heritage sites is 762 m (2,500 ft). • The Marine Living Resources Act (1998) prohibits aircraft to approach within 300 m of a whale. Therefore, except for when the aircraft lands on or takes off from the drillship and logistics base, the flight altitude would be >300 m. • The operation of helicopters and fixed-wing aircraft is governed by the Civil Aviation Act (No. 13 of 2009) and associated regulations.	Eni Logistics Manager and Helicopter contractor	All flights to/from drillship	• Submit copy of set flight path (including altitude) • Report deviations from set flight paths
		Conserve and ensure the protection of marine and coastal fauna	• Pre-plan flight paths to ensure that no flying occurs over IBAs; • Avoid extensive low-altitude coastal flights (<914 m and within 2 km of the shore). • Maintain an altitude of at least 914 m within Marine Protected Areas; • Comply fully with aviation and authority guidelines and rules; and • Brief all pilots on the ecological risks associated with flying at a low level along the coast or above marine mammals.			
		Community/ Occupational Health and Safety	• Compliance with Eni's H&S Standards. • Flights to be prohibited in bad weather.			
21.	Spudding	Protect sensitive seabed habitats	Adjust the well location to avoid spudding on or in close proximity to potential vulnerable habitats (identified in pre-drilling ROV surveys).	Eni / Drilling contractor	Prior to spudding	• Provide photographic evidence of the seabed condition from ROV coverage

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
22.	Well drilling	Protect sensitive seabed habitats	• Careful selection of fluid additives taking into account their concentration, toxicity, bioavailability and bioaccumulation potential. Use only low-toxicity and partially biodegradable additives. • Use high efficiency solids control equipment to reduce the need for fluid change out and minimise the amount of residual fluid on drilled cuttings. • Regular maintenance of the onboard solids control package. • Use high efficiency solids control equipment to reduce the need for fluid change out and minimise the amount of residual fluid on drilled cuttings. • Minimize residual NADF adhered to cuttings using dedicated efficient equipment (e.g. drier) • Drilling fluids to be discharged to sea (including residual material on drilled cuttings) must be subject to tests for meet discharge standards. • If drilled cuttings or mud tests demonstrate concentrations/contaminations higher than discharge limits, collect cuttings in skips and mud on board of drilling ship for delivery to shorebase and land waste treatment facilities • At the end of operations shore to base any residual volume of NADF mud for recycle/reuse or to land waste treatment facilities	Eni/ Drilling contractor	Prior to drilling, throughout drilling, after drilling	• Provide material safety data sheet (MSDS) sheets for chemicals used • Provide volumes of muds, cuttings and cement disposed • Provide photographic evidence of the seabed condition from ROV coverage
			• Minimise excess cement during the initial riserless drilling stage by monitoring (by ROV) for discharges during cementing. • Use only low-toxicity and partially biodegradable cement additives.		Prior to cementing	

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
23.	Well drilling	Minimise impact to marine water quality and sensitive species	• Eni's specifications for discharge of WBM includes: o Discharge of cuttings via a caisson in >15 m depth. o Discharge of cuttings only in water >30 m depth. o Hg: max 1 mg/kg dry weight in stock barite. o Cd: max 3 mg/kg dry weight in stock barite. o Maximum chloride contraction must be less the four time the ambient concentration of fresh or brackish receiving water. o Ship-to-shore otherwise. • Eni's specifications for discharge of NADF retained on drill cuttings includes: o Discharge of cuttings via a caisson in >15 m depth. o Discharge of cuttings only in water >30 m depth. o Organic Phase Drilling Fluid concentration: maximum residual non aqueous phase drilling fluid (NAF) 5% (C16-C18 internal olefins) or 9.4% (C12-C14 ester or C8 esters) on wet cuttings. o Hg: max 1 mg/kg dry weight in stock barite. o Cd: max 3 mg/kg dry weight in stock barite. o Ship-to-shore otherwise.	Drilling contractor	Throughout drilling, after drilling	Provide volumes of muds, cuttings and cement disposed

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
24.	Vertical Seismic Profiling (VSP)	Protect offshore marine fauna	Apply JNCC Guidelines for minimising the risk of injury to marine mammals from geophysical surveys • Undertake a 30-minute pre-start scan (prior to soft-starts) within the 3 km radius observation zone in order to confirm there is no cetacean activity within 500 m of the source. • Implement a "soft-start" procedure of a minimum of 20 minutes' duration when initiating the VSP acoustic source. • The "soft-start" procedure may only commence if no cetaceans have been sighted within the shut- down zone (ie a 500 m horizontal radius from the VSP acoustic source) during the pre- start-up visual scan. • Maintain visual observations within the 500 m shut-down zone continuously to identify if there are any cetaceans present. • Shut down the acoustic source if a cetacean is sighted within 500 m shut-down zone until such time as the animal has moved to a point more than 500 m from the source.	Eni/Drilling contractor	During VSP	Provide records of number of species observed (including abnormal behaviours)
25.	Placement of wellhead on seafloor	Minimise risk of the introduction of non-indigenous invasive marine species	• Ensure all infrastructure (e.g. wellheads, BOPs and guide bases) that has been used in other regions is thoroughly cleaned before use in South Africa. • Avoid presence and spread out of invasive species by the implementation of the ballast water management plan	Contractor	Prior to mobilisation	Confirm compliance and justify any omissions
26.	Well Drilling	Protect marine fauna and coastal tourism by effective containment of oil, chemicals and fluids	• Fully inspect the BOPs on the drillship in accordance with the American Petroleum Industries recommended practices (or equivalent) prior to drilling. • Utilize biodegradable hydraulic control fluid for BOP test • All responsible personnel must be adequately trained in both accident prevention and immediate response. • Implement monitoring and management measures in accordance with normal well control practise to assist in the detection and control of uncontrolled releases.	Eni/Drilling contractor	Prior to and during drilling	Provide relevant certification and / or evidence of BOP inspection and application of risk control system

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
			• Inspect and maintain all chemical / fuel containers including the vessels fuel tanks and mud tanks • Develop a Well Control Contingency Plan (WCCP) for each well.			
27.	Well Drilling	Protect marine fauna and coastal tourism by effective containment of oil, chemicals and fluids	• In the event of a spill, apply the OSCP and ERP • In the event of an oil spill that poses a risk of major harm to the environment immediately notify relevant authorities and emergency team. Information that should be supplied when reporting a spill includes: o The type and circumstances of incident, ship type, port of registry, nearest agent representing the ships company. o Geographic location of the incident, distance offshore and extent of spill. o Prevailing weather conditions, sea state in affected area (wind direction and speed, weather and swell). • Persons and authorities already informed of the spill. • Immediately activate and mobilize the OSCP ; containment and recovery tools, equipment and personnel (e.g skimmers, booms, dispersants sprays, capping system) • Monitor oil spill movements at sea surface (using metocean and oil spill modelling data) to predict possible coastline area to be impacted and organize emergency response team nearshore and along coastline	Eni and contractors (including support stand-by vessels)	In event of medium to large spill	• Record of all spills (Spill Record Book), including spill reports; emergency exercise reports; audit reports • Incident log
28.	Use and handling of hazardous materials	Minimise damage to the environment by implementing response procedures efficiently	• Provide MSDS to all personnel involved in management of materials prior of any mobilization or usage • Implement OSCP and ERP. • Induction and training (proper use, transfer procedures). • Implement ERP to deal with all chemical spills.	Eni Drilling/ support vessel contractor	In event of medium to large spill	
29.	Transport, Storage And Handling Of	Avoid human and environmental exposure to radio- active material	Comply with necessary regulations and licence requirements for the transport, storage and handling of radioactive devices.	Eni Drilling/ support vessel contractor	Throughout drilling operations	Provide copy of licence(s) and results from routine tests on

Ref no.	Activities	Objective	Mitigation /Management and Enhancement Commitments	Responsibility	Timing / Frequency	Requirement for Close Out Report
	Radioactive Devices					radioactive sources to determine leak levels
30.	Well testing	Minimise impact to air quality	• Selection of an efficient test flare burner head equipped with an appropriate combustion enhancement system to minimise incomplete combustion, black smoke, and hydrocarbon fallout to the sea. • Record volumes of hydrocarbons flared	Eni/Drilling contractor	During well testing operations	Provide records of hydrocarbons flared
31.	Dropped objects	Community/ Occupational Health and Safety	• Compliance with Eni's H&S Standards • Recover (wherever practicable) objects which are accidentally dropped into the sea.	Eni/Drilling contractor	Throughout drilling, after drilling	• Incident log
D) Demobilisation/Decommissioning Phase						
32.	Abandonment of wells	Isolate permeable and hydrocarbon bearing formations and avoid leakages	• Seal well by inserting cement plugs in the well bore at various levels according to good oilfield practice. • Test well integrity. • Final wellhead and seabed ROV survey after well(s) plug and abandonment ("decommissioning"). • The abandoned wellhead location must be surveyed and accurately charted with the HydroSAN office.	Eni/contractor	On completion of well drilling, after plug and abandonment ("decommissioning") operations	• Provide copies of correspondence with SAN Hydrographer
33.	Transit of drillship and supply vessels from drilling location	Ensure navigational safety	Inform all key stakeholders that the drillship and support vessels are off location.	Eni	Within four weeks after completion of drilling	Copies of notification documentation required
34.	Transit of drillship and supply vessels from drilling location		Dispose all waste retained onboard at a licensed waste site using a licensed waste disposal contractor.	Drilling/ support vessel contractors	When drillship / support vessels are in port	Waste receipt required from contractor

1.11 MONITORING

Monitoring will be conducted to ensure compliance with regulatory requirements and the performance objectives specified in the EMPr, as well as to evaluate the effectiveness of operational controls and mitigation measures.

The main objectives of the monitoring programme will be to:

- Gather, record and analyse data required for regulatory and EMPr purposes;
- Verify the predictions and conclusions made in the EIA;
- Identify changes in the environment and receptors;
- Produce information to evaluate environmental performance specified in the EMPr;
- Produce information about emergencies that require an immediate response;
- Obtain information on the actual and potential environmental impacts of exploration activities;
- Use monitoring results as a source of information and as grounds for decision making regarding the design of new mitigation measures; and
- Describe whether and to what extent discharges from exploration activities have had impacts on the marine environment.

Monitoring will include, but not limited to the following:

Table 1.9 Monitoring Activities

No.	Aspect	Criteria to be monitored	Timing/Frequency
1	Sensitive seabed structures and sediments quality	• Hard substrate and rocky outcrops • Type and quantity of benthic fauna • Granulometry, hydrocarbons, metals and heavy metals	Prior to drilling and once during campaign
2	Ballast water prior to arrival on location	• Volume discharged, treatment and location (compliance with International Convention for the Control and Management of Ships' Ballast Water and Sediments	Before/during first de-ballasting in country
3	Drilling fluids	• Volume on board • Volume used • Volume discharged • Toxicity, barite contamination, Organic Phase Drilling Fluid concentration	Daily during drilling operations

No.	Aspect	Criteria to be monitored	Timing / Frequency
		(NADF), chloride concentration (WBM-brine) • Update MSDS of chemicals and products on board of vessels	
4	Cement	• Volume used and excess of cement discharged overboard/at sea bottom during riserless operations • Monitor cement returns and terminate pumping if returns are observed on the seafloor	During cementing operations
5	Chemicals and hazardous materials	• Cement chemicals and additives • Volume stored • Volume consumed	Daily during drilling operations
6	Drill cuttings	• Volume discharged • Oil content in drill cuttings	Daily during drilling operations
7	Deck drainage /machinery space /bilge water	• Correct operation of oil separating/filtering equipment and oil content meter (compliance with MARPOL 73/78 standards, Annex I Regulation for the Prevention of Pollution by Oil)	Prior to drilling and once during campaign
8	Sewage discharge	• Correct operation of sewage treatment system (compliance with MARPOL 73/78 standards, Annex IV (Regulation for Prevention of Sewage from ships)	At start and once during campaign
9	Galley waste	• Type and volume discharged • Correct operation for discharge (compliance with MARPOL 73/78 standards, Annex V Regulation for Prevention of Pollution by Garbage from ships))	Daily during drilling operations
10	General waste	• Type and volume of waste generated • Type and volume transferred for onshore waste disposal facility • Compliance with waste Management Plan	Daily during drilling operations
11	Hazardous waste	• Volume of waste generated • Volume transferred for onshore disposal • Compliance with Waste Management Plan	Daily during drilling operations
12	Fuel usage	• Type and volume on board • Volume consumed	Daily during drilling operations
13	Accidental oil and chemical spills	• Type • Volume • Compliance with Shipboard Oil Spill Emergency Plan	Daily during drilling operations
14	Radioactive sources	• Correct containment and storage on board and during transportation	At start and once during campaign
15	Vertical Seismic Profiling	• Marine mammals observations and final report • Application of JNCC best practice	During pre-watch period and continuous during VSP
16	Well (flow) testing (if required)	• Volumes of hydrocarbon fluids	Daily during well testing operations
17	Dropped objects	• Establish a hazards database listing: o the type of gear left on the seabed o date of abandonment/loss o location; and	Daily during drilling operations

No.	Aspect	Criteria to be monitored	Timing / Frequency
		○ where applicable, the dates of retrieval	
18	Disruption/ interference to fishing/shipping	• Interactions with other vessels (via radio) • Number of grievances/incidents logged	Daily during drilling operations
19	Fauna interaction	• Bird and sea fauna incidents of injury/death • Stray land birds resting on drillship	Daily during drilling operations

1.12 AUDITING

Section 34 of the Environmental Impact Assessment Regulations (GNR R982/2014) stipulate that a holder of an environmental authorisation must, for the period during which the environmental authorisation and EMPr, and the closure plan, remain valid:

- Audit the compliance with the conditions of the environmental authorisation, the EMPr, and the closure plan; and

- Submit an environmental audit report to the relevant competent authority, ie Petroleum Agency of South Africa (PASA).

Section 34 of the regulations also stipulates that the environmental audit report must be prepared by an independent person with the relevant environmental auditing expertise and must be conducted and submitted to the relevant competent authority at intervals as indicated in the environmental authorisation. These intervals may not exceed 5 years.

An environmental audit report must contain all information set out in Appendix 7 of the Environmental Impact Assessment Regulations.

REFERENCES

Eni Technical Guideline, AMTE-TG-010, 2015
ERM, 2018