

ENVIRONMENTAL AUDIT REPORT OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR EXPLORATION IN AREA 2, EAST COAST, SOUTH AFRICA

Gamtoos, Algoa, and Transkei basins (ER 12/3/276)

Prepared for: Impact Africa Limited

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EXECUTIVE SUMMARY

The overall findings of this SLR Consulting Audit of the 2014 Environmental Management Programme (EMPr), which was prepared by Environmental Impact Management Services (Pty) Ltd (EIMS) are that the mitigation measures adequately provide for the avoidance, management and reduction of potential negative impacts from exploration activities. The quantified EMPr mitigation adequacy scores are:

- 97% of the measures are considered “adequate”;
- 2% of the measures are considered “adequate with recommendations” and need slight text modifications in order to align with GIIP; and
- 1% of the measures are considered irrelevant/not applicable.

The original EMPr (EIMS, 2014) was prepared for Silver Wave Energy PTE Ltd (hereinafter referred to as “**Silver Wave**”) as part of their application for an Exploration Right for Area 2 off the East Coast of South Africa. Silver Wave obtained an Exploration Right and environmental approval of the EMPr for the following exploration activities:

- Two dimensional (2D) seismic;
- Three dimensional (3D) seismic; and
- Airborne geophysical data acquisition (high-resolution gravity gradiometry, gravity and magnetic).

Silver Wave did not undertake any exploration activities during the period that it held the Exploration Right. On 14th May 2021 Silver Wave transferred a 90% interest and operatorship to Impact Africa Limited (“**Impact**”).

SLR Consulting (Africa) Proprietary Limited has been appointed by Impact to undertake an independent environmental audit of the 2014 EMPr as part of its due diligence in taking over the operatorship and PASA EMPr approval of Area 2.

This audit is being undertaken as a requirement of Section 34, Section 54 and Appendix 7 of the EIA Regulations 2014 (as amended in 2017). The aim of the audit according to Section 34(2)(b)(ii) of the EIA Regulations 2014 (as amended in 2017), is to evaluate “*the ability of the measures contained in the EMPr, ... to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity*”.

The audit has evaluated the following:

- Extent to which the avoidance, management and mitigation measures provided for in the EMPr achieve the objectives and outcomes of the EMPr;
- Assessment of any new impacts and risks as a result of undertaking the activities presented in the EMPr;
- Effectiveness of the EMPr;
- Shortcomings in the EMPr; and
- Need for changes to the avoidance, management and mitigation measures provided for in the EMPr.

The adequacy of mitigation measures in the 2014 EMPr to provide for the avoidance, management and mitigation of environmental impacts were evaluated against Good International Industry Practice (GIIP). The identification of new impacts and risks, evaluation of shortcomings, effectiveness and changes required to the EMPr was undertaken by analysing the audit findings and applying professional judgement.

The overall audit findings showed that the 2014 EMPr is largely aligned with GIIP with some minor updates required to ensure full alignment. In addition to the minor updates, it is also recommended that the content of the 2014 EMPr be restructured to make it user friendly for Seismic (Geophysical) Contractors. These recommended updates are not considered to be major amendments of the EMPr that would change any of the outcomes or objectives of the EMPr. A full EMPr Amendment as per Section 33 of the EIA Regulations 2014 (as amended in 2017) is not deemed necessary.

Table 1 presents a summary of the environmental audit findings with reference to Section 34 and Appendix 7 of the EIA Regulations 2014 (as amended in 2017). Overall, the audit concluded that the EMPr is largely aligned with GIIP; however, some minor updates are required for the Report to be in full alignment.

Table 1: EMPr Audit Findings

Environmental Audit Report content requirements according to Appendix 7(2) of the EIA Regulations 2014 (as amended 2017)		Key Audit Findings
Appendix 7(2a)	Report on extent to which the avoidance, management and mitigation measures provided for in the EMPr achieve the objectives and outcomes of the EMPr.	The results of the audit are: 97% of the measures are “adequate”; 2% of the measures are “adequate with recommendations” (slight modifications required to align it to GIIP); 1% of the measures are irrelevant/not applicable.
Appendix 7(2b)	Identify and assess any new impacts and risks as a result of undertaking the activities.	No new impacts or risks were identified by the audit.
Appendix 7(2c)	Evaluate the effectiveness of the EMPr.	The audit found that the EMPr presented an adequate assessment of the potential impacts from the proposed exploration activities. The audit proposed some changes to the EMPr measures to fully align them with GIIP.
Appendix 7(2d)	Identify shortcomings in the EMPr.	No shortcomings were identified by the audit.

Environmental Audit Report content requirements according to Appendix 7(2) of the EIA Regulations 2014 (as amended 2017)		Key Audit Findings
Appendix 7(2e)	Identify the need for changes to the avoidance, management and mitigation measures provided for in the EMPr.	The audit recommends minor changes to the EMPr measures so as to be in alignment with GIIP. These changes include utilising PAM 24 hours a day and implementing a 60-minute pre-shoot watch in order to allow for the detection of deep-diving species.

The overall conclusion of this audit is that the 2014 EMPr Management and Mitigation Plan, should be updated to reflect the changes in industry practice.

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ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
2D	Two Dimensional. In two-dimensional (2D) marine seismic surveying both the sound source and the sound detectors (geophones) are moved along a straight line. The same line contains recording cables and geophones as well as source points. The resultant product can be thought of as a vertical sonic cross-section of the subsurface beneath the survey line.
3D	Three Dimensional. In three-dimensional (3D) marine seismic surveying the sound detectors (numbering up to a thousand or more) are spread out over an area and the sound source is moved from location to location through the area. 3D seismic programs are generally a uniform and evenly spaced grid of lines. Receiver lines containing the recording devices (geophones) usually, but not always, run in a direction perpendicular or diagonal to the source lines. The resultant product can be thought of as a cube of common depth point stacked reflections.
DFFE	Department of Forestry, Fisheries and the Environment
EA	Environmental Authorisation
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme Report
FLO	Fisheries Liaison Officer
GIIP	Good International Industry Practice
IAGC	International Association for Geophysical Contractors
IFC	International Finance Corporation
I&APs	Interested and Affected Parties
JNCC	Joint Nature Conservation Committee
MMO	Marine Mammal Observer
MPRDA	Mineral and Petroleum Resources Development Act (No. 28 of 2002)
NEMA	National Environmental Management Act (No. 107 of 1998), as amended
PAM	Passive Acoustic Monitoring
PASA	Petroleum Agency South Africa
SAMSA	South African Maritime Safety Authority
SAN	South African Navy
SBP	Sub Bottom Profiler

Acronym / Abbreviation	Definition
SEP	Stakeholder Engagement Plan
SPI	Shot Point Interval
PS	Performance Standards

1. INTRODUCTION

1.1 SCOPE AND PURPOSE OF THE REPORT

This Environmental Audit Report has been compiled in compliance with Section 54 (A)(2) of the Environmental Impact Assessment (EIA) regulations, 2014 (as amended), promulgated under the National Environmental Management Act, 1998 (act No. 107 of 1998; NEMA). This independent audit was conducted for Impact Africa Limited (hereafter referred to as “Impact”). This document presents the audit findings of the approved Environmental Management Programme Report (EMPr) authorised by the Petroleum Agency South Africa (PASA) on 17 July 2014 (Ref. 12/3/1/276/2/2/1). The EMPr was submitted as part of an application for an Exploration Right for Area 2 (PASA Ref. 12/3/276) off the East Coast of South Africa (see Figure 1-1).

According to Section 54(A)(2) of the EIA Regulations 2014 (as amended), where a right or permit has been issued in terms of the Mineral and Petroleum Resources Development Act (MPRDA), 2002 (Act 28 of 2002), for: a) prospecting or exploration of a mineral or petroleum resources; or b) the extraction and primary processing of a mineral or petroleum resource; and the associated Environmental Management Programme (EMPr) is still in effect after 8 December 2014, the requirements contained in Part 3 of Chapter 5 of the EIA Regulations apply to such EMPr. This means that an Environmental Audit Report must be submitted to the Petroleum Agency of South Africa (PASA), as the competent authority.

In compliance with Section 34(2)(a) of the EIA Regulations, 2014 (as amended), SLR Consulting (South Africa) (Pty) Ltd (herein referred to as “SLR”) has been appointed by Impact as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Audit.

1.2 PROJECT BACKGROUND

Silver Wave was the sole holder of an Exploration Right for a large area between Cape St Francis and Port Edward (ER 12/3/276) (“**Exploration Right**”), off the East Coast of South Africa (see Figure 1-1). The initial period of the Exploration Right was granted for a period between 4 August 2015 and 3 August 2018. On 24 March 2021, Silver Wave was granted the first renewal of the Exploration Right. On 14 May 2021, Silver Wave transferred a 90% participating interest and operatorship in the Exploration Right to Impact.

The Exploration Right area is collectively referred to as Area 2. Prior to the March 2021 renewal, 50% of the block was relinquished and now comprises delineated Licence Blocks 3230, 3329 and portions of Blocks 3229, 3231, 3232, 3328, 3330, 3331, 3437, 3428, 3429, 3430, 3525, 3536 and 3527. It covers an area of approximately 78,708 km² (see Figure 1-2).

At its closest point to the coast, Area 2 is located approximately 75 km from Port St Johns, approximately 80 km from East London and approximately 100 km from Cape St Francis (see Figure 1-2). Water depths in the area are in excess of 3 000 m.

To support the Exploration Right application, an EMPr was compiled by Environmental Impact Management Services (Pty) Ltd (EIMS) covering two- (2D) and three-dimensional (3D) seismic surveys and airborne geophysical acquisition (consisting of high-resolution gravity gradiometry, gravity and magnetic data acquisition). The EMPr was approved by PASA in terms of the MPRDA on 17 July 2014. To date, no exploration activities have been undertaken in Area 2.

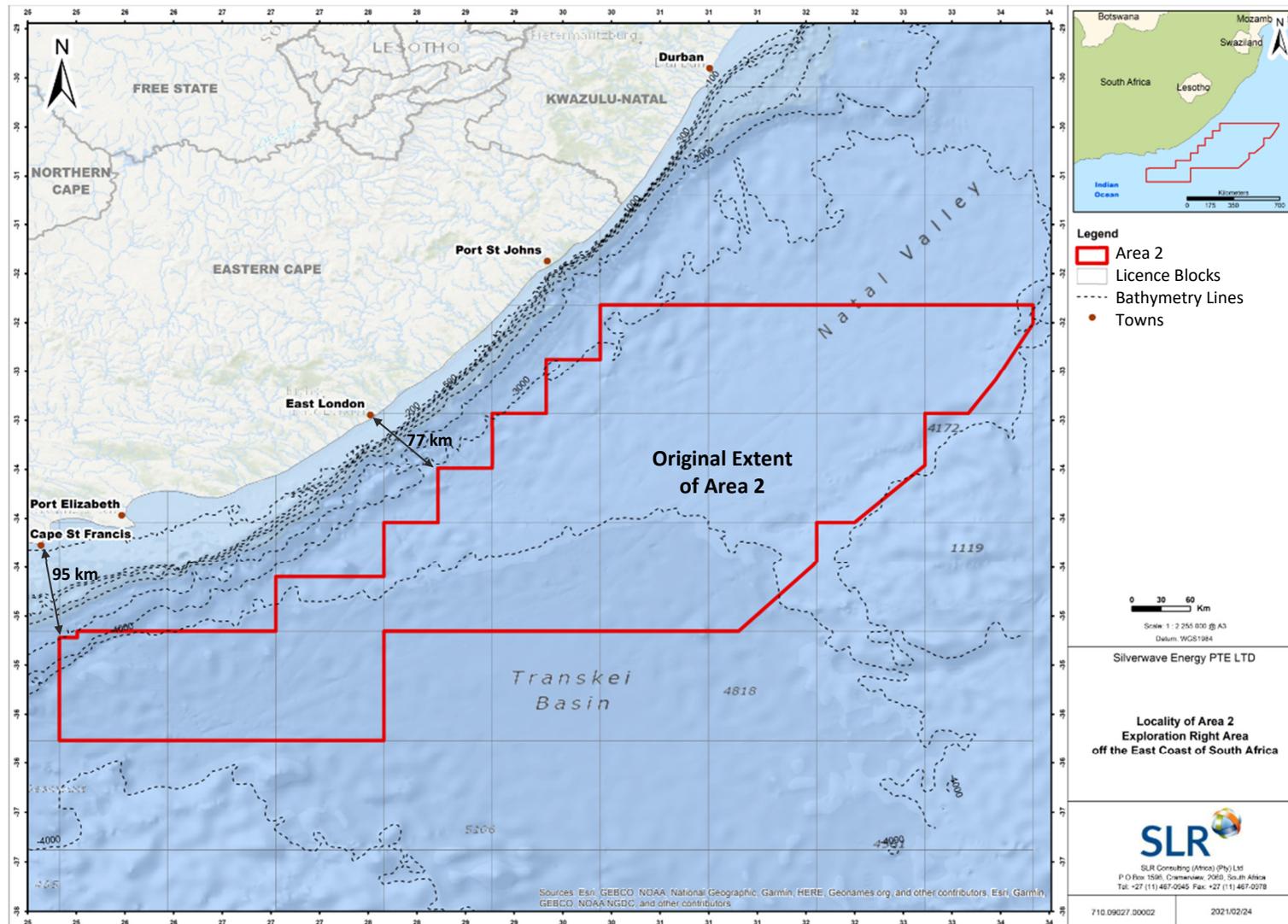


Figure 1-1: Original extent of Area 2 off the East Coast of South Africa – western point approximately 120 km south-west of Port Elizabeth (Gqberha) and north-western t corner 75 km south-east of Port St. Johns.

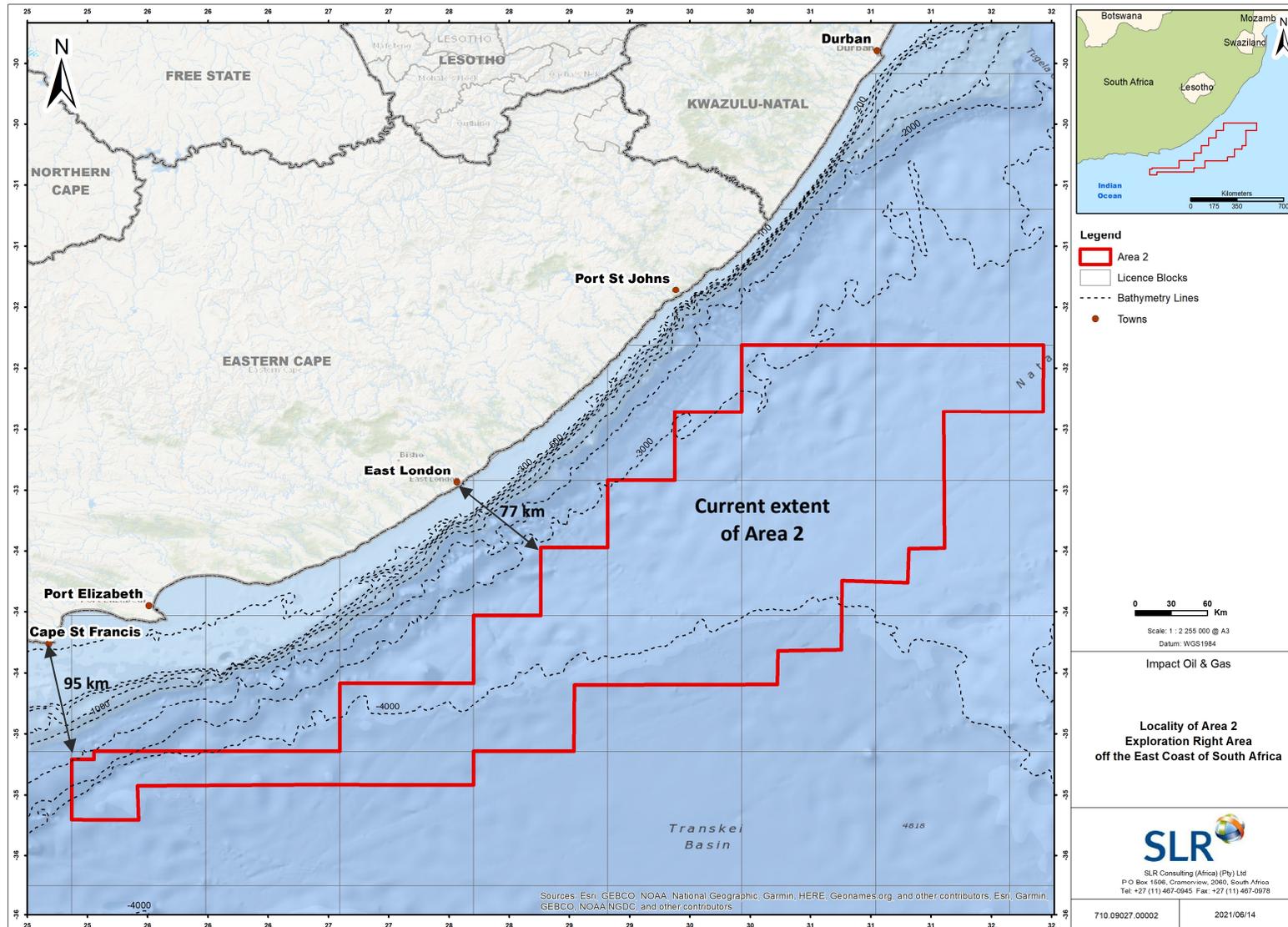


Figure 1-2: Current extent of Area 2 after relinquishment of the deeper offshore portion of the licence area.

1.3 AUDIT REPORT REGULATORY REQUIREMENTS

Appendix 7 of the EIA Regulations, 2014 (as amended), specifies the content of an Environmental Audit report and requires the following aspects to be considered:

- Report on the level of compliance with the conditions of the EMPr.
- Report on the extent to which the avoidance, management and mitigation measures provided for in the EMPr achieve the objectives and outcomes of the EMPr.
- Identify and assess any new impacts and risks as a result of undertaking the activity.
- Evaluate the effectiveness of the EMPr.
- Report on any changes to the mitigation measures / actions contained in the EMPr

The contents of the Environmental Audit Report as required by Appendix 7(3) of the EIA Regulations 2014 are set out in Table 1-1.

Table 1-1: Regulatory requirements of the Structure and Content of the Environmental Audit Report

Appendix 7(3) Section Number	Contents	Audit Report Section
3 (1)	An environmental audit report prepared in terms of these Regulations must contain—	
3(1)(a)	details of the—	
3(1)(a)(ii)	independent person who prepared the environmental audit report; and	Section 2.1.1
3(1)(a)(ii)	expertise of the independent person that compiled the environmental audit report;	Section 2.1.1
3(1)(b)	a declaration that the independent auditor is independent in a form as may be specified by the competent authority;	Section 2.1
3(1)(c)	an indication of the scope of, and the purpose for which, the environmental audit report was prepared;	Section 1.3
3(1)(d)	a description of the methodology adopted in preparing the environmental audit report;	Section 2
3(1)(e)	an indication of the ability of the EMPr, and where applicable, the closure plan to—	
3(1)(e)(i)	sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity on an on-going basis	Section 3
3(1)(e)(ii)	sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the closure of the facility; and	
3(1)(e)(iii)	ensure compliance with the provisions of environmental authorisation, EMPr, and where applicable, the closure plan.	
3(1)(f)	a description of any assumptions made, and any uncertainties or gaps in knowledge	Section 2.4
3(1)(g)	a description of any consultation process that was undertaken during the course of carrying out the environmental audit report	N/A

Appendix 7(3) Section Number	Contents	Audit Report Section
3(1)(h)	a summary and copies of any comments that were received during any consultation process; and	N/A
3(1)(i)	any other information requested by the competent authority.	N/A

2. METHODOLOGY

2.1 AUDIT TEAM

SLR has been appointed as the independent environmental consultants to undertake the Environmental Audit Report of the EMPr for Area 2. The details of the project team that were involved in the preparation of the Environmental Audit Report are provided in Table 2-1.

SLR has no vested interest in the Project other than fair payment for consulting services rendered.

Table 2-1: Details of the Project Team

GENERAL				
Organisation	SLR Consulting (South Africa) (Pty) Ltd			
Physical Address	5 th Floor, Letterstedt House, Newlands on Main Cnr Main and Campground Roads, Newlands, 7700			
Tel No.	+27 21 461 1118			
FULL NAME	QUALIFICATIONS	PROFESSIONAL REGISTRATIONS	EXPERIENCES (YEARS)	TASKS AND ROLES
Nigel Rossouw	M.Sc (Env. & Geogr. Science), University of the Western Cape	IAIA/SA Member	25	Project Lead. Lead Auditor. Technical Review. Quality Assurance and Quality Control
Eloise Costandius	M.Sc (Ecol. Assessment), University of Stellenbosch	Pr.Sci.Nat, IAIA/SA Member	16	Auditor. Report Author

2.1.1 Expertise of the Project Team

Nigel Rossouw is a Principal Environmental Consultant at SLR. Nigel is an environmental professional with over 25 years of experience in the corporate, project implementation and consulting environments. Nigel worked for eight years in Shell where he gained an in-depth experience of the energy sector working across the Upstream and Mid-stream lines of business providing environmental and social advise to a portfolio of large energy ventures and projects in the Africa, Middle East and Asia Pacific regions. His areas of experience covers: Environmental and Social Impact Assessment, Strategic Environmental Assessment, Options Analysis, Environmental and Social Planning and Management, Environmental and Social Due Diligence, Monitoring and Auditing, Training and Capacity Building Nigel has been involved in the feasibility and project implementation stages on some of the largest infrastructure and Oil & Gas projects in Southern Africa.

Eloise Costandius has worked as an environmental assessment practitioner since 2005 and has been involved in numerous projects covering a range of environmental disciplines, including Basic Assessments, Environmental Impact Assessments, Auditing and Environmental Management Programmes. She has gained experience in a

wide range of projects relating to oil and gas exploration, infrastructure projects (e.g. roads) and industrial developments. She is registered as a Professional Natural Scientist with SACNASP.

2.2 ENVIRONMENTAL AUDIT METHODOLOGY

2.2.1 Audit Process

The audit approach was guided by the requirements of the ISO 19011:2018 Guidelines for Auditing Management Systems. Figure 2 illustrates the structured and systematic step-wise approach of the audit. The audit scope was based on Section 34 and Appendix 7(2) of the EIA Regulations which defines the five key objectives set out in Section 1.3 of this report.

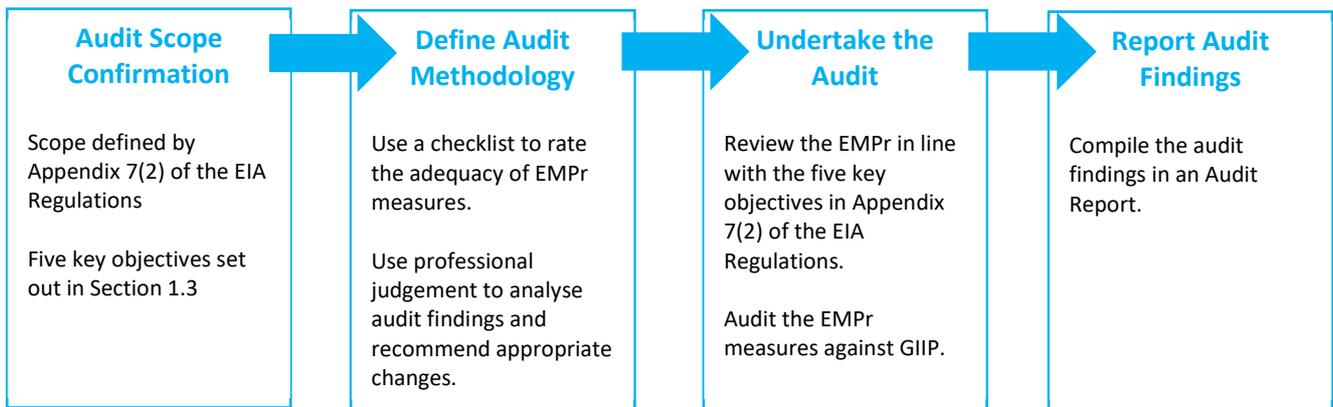


Figure 2-1: Overview of the step-wise approach of the audit

2.2.2 Good International Industry Practice

The mitigation measures set out in Chapter 8 of the EMPr (EIMS, 2014) were analysed against the requirements of the EIA Regulations. The specific requirements of the EIA Regulations are that EMPrs need to provide avoidance, management and mitigation of potential impacts. The efficacy of the measures was analysed against Good International Industry Practice (GIIP).

In South Africa, the practice for offshore seismic operations has been to adopt the “*JNCC Guidelines for minimising the risk of injury to marine mammals*”. JNCC is the Joint Nature Conservation Committee, a public body that advises the UK Government on UK-wide and international nature conservation. JNCC developed guidelines in 1995 to minimise acoustic disturbance of marine mammals by oil and gas industry seismic surveys. These national UK guidelines have subsequently become the standard, or basis, of international mitigation measures for noise pollution during seismic surveys. At the time the EMPr was prepared JNCC Guidelines, 2010 was the current version and provided guidance on seismic surveys only. In 2017 JNCC published further guidance covering geophysical surveys, which includes multibeam echo sounder (MBES) and sub-bottom profiler (SBP). The audit reviewed the EMPr measures and assessed its adequacy against the 2017 Guidelines from JNCC, where applicable. It should be noted that the 2017 Guidelines did not supersede the 2010 Guidelines, but instead provided additional recommendations. Both the JNCC 2010 and 2017 Guidelines are relevant sources.

International industry guidelines and standards that also form part of the GIIP include:

- IOGP and IPIECA (2020) Environmental management in the upstream oil and gas industry., Report 254.
- IOGP (2009) Managing Health, Safety and Environment in a geophysical contract (report No. 432/)
- OGP (2009) Guidelines for Waste Management. Report 413.
- IAGC (2013) Environmental Manual for Worldwide Geophysical Operations.
- IAGC (1996) Guidelines for Health, Safety and Environment (HSE) Auditing in the Geophysical Industry. Report 245.
- IOGP (2007) Environmental-Social-Health Risk and Impact Management Process. Report 389.
- IOGP and IAGC (2017) Seismic Surveys & Marine Mammals. Joint IOGP/IAGC position paper. Report 576.
- IOGP (2017) Recommended monitoring and mitigation measures for cetaceans during marine seismic survey geophysical operations. Report 579.

2.2.3 Documents Reviewed

The Environmental Audit Report has been informed by a desktop review of the following documentation:

- EIMS, 28 March 2014. Environmental Management Programme for Silver Wave (EIMS Ref. 1004 (276)).
- CapFish SA (Pty) Ltd, March 2014. Proposed Oil and Gas Exploration Activities in TCP 56, Offshore of the Eastern Cape, South Africa. Impacts on the Fishing Industry Specialist Report.
- Pisces Environmental Services (Pty) Ltd, February 2014. Proposed Oil and Gas Exploration Activities in TCP 56, off the Eastern Cape, South Africa. Marine Faunal Assessment.
- PASA, 17 July 2014. Approval of an EMPr in terms of the Requirements of the MPRDA.

2.2.4 Audit Assessment

The measures listed in Chapter 8 of the EMPr were evaluated and assessed for their ability to provide adequate avoidance, management and mitigation of potential impacts in relation to GIIP. The adequacy criteria used is set out in Table 2-1.

Table 2-2: Adequacy Criteria

Adequacy Rating	Definition
Adequate (A)	Mitigation measure considered adequate to provide avoidance, management and mitigation of potential impacts and is aligned with GIIP.
Adequate with Recommendations (AR)	Mitigation measure considered adequate to provide avoidance, management and mitigation with recommendations for modifications to meet GIIP.
Inadequate (I)	Measure is not considered adequate to provide avoidance, management and mitigation of potential impacts. Additional measures are required to meet GIIP.

2.3 ASSUMPTIONS AND LIMITATIONS

The following assumption and limitations have been made in respect of the audit findings:

- All project information relevant to the audit has been provided by Impact.
- Information provided by Impact is correct and valid at the time of the audit.
- The EMPr and supporting specialist studies (i.e. the Marine Fauna and Fisheries studies) constitute the full body of records/evidence that contain all the mitigation measures.
- The footprint and nature of the seismic activities described in the 2014 Audit Report is broadly similar to that being planned by Impact.

3. AUDIT FINDINGS

3.1 ADEQUACY OF MEASURES OF THE EMPr TO PROVIDE FOR AVOIDANCE, MANAGEMENT AND MITIGATION OF ENVIRONMENTAL IMPACTS

The overall findings of this Audit of the EMPr are that the mitigation measures adequately provide for the avoidance, management and reduction of potential negative impacts from exploration activities. The quantified EMPr mitigation adequacy scores are:

- 97% of the measures are considered “adequate”;
- 2% of the measures are considered “adequate with recommendations” and need slight text modifications in order to align with GIIP; and
- 1% of the measures are considered irrelevant/not applicable.

The measures that are deemed Adequate with Recommendations on the adequacy rating criteria in Table 2-2 are presented in Table 3-1.

Measures deemed to be adequate are presented in Appendix A. Recommendations for minor changes that would not affect the adequacy ratings are also provided in Appendix A.

Changes from the original 2014 EMPr are indicated in red.

Table 3-1: Material Audit Findings.

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Material Audit Findings
Noise impacts on cetaceans	All survey vessels must be fitted with Passive Acoustic Monitoring (PAM) technology, which detects animals through their vocalisations. As the survey is taking place in waters up to 1,000 m depth where sperm whales are likely to be encountered, the use of PAM 24-h a day is highly recommended. As a minimum, PAM technology must be used during the 30-minute pre-watch period and when surveying at night or during adverse weather conditions and thick fog. The hydrophone streamer must be towed behind the airgun array to minimise the interference of vessel noise, and be fitted with two hydrophones to allow directional detection of cetaceans.	AR	It has become the industry standard in South Africa that PAM be used 24h a day in deep water areas. It is suggested to update the wording to include it as a full mitigation measure and not just a “highly recommended” one.	Measure to be updated to state: All survey vessels must be fitted with Passive Acoustic Monitoring (PAM) technology, which detects animals through their vocalisations. As the survey is taking place in waters up to 1,000 m depth where sperm whales are likely to be encountered, PAM is to be used 24h a day. As a minimum, PAM technology must be used during the 30-minute pre-watch period and when surveying at night or during adverse weather conditions and thick fog. The hydrophone streamer must be towed behind the airgun array to minimise the interference of vessel noise, and be fitted with two hydrophones to allow directional detection of cetaceans.
	Prior to the commencement of “soft starts” an area of 500-m radius around the survey vessel (exclusion zone) must be scanned (visually and using PAM technology) for the presence of diving seabirds, turtles, seals and cetaceans. There must be a dedicated pre-shoot watch of at least 30 minutes for cetaceans. “Soft starts” should be delayed until such time as this area is clear of cetaceans, and should not begin until 30 minutes after the animals depart the 500 m exclusion zone or 30 minutes after they are last seen.	AR	JNCC states that pre-watch period should be 60 minutes in water depths greater than 200 m. This allows for detection of deep diving species which are known to dive for longer than 30 minutes. It is recommended that the pre-watch period be extended. It was also found that the marine specialist study by Pulfrich included a 60-minute recommendation which was not carried across into the EMPr.	Measure to be updated to state: Prior to the commencement of “soft starts” an area of 500-m radius around the survey vessel (exclusion zone) must be scanned (visually and using PAM technology) for the presence of diving seabirds, turtles, seals and cetaceans. There must be a dedicated pre-shoot watch of at least 60 minutes for cetaceans, so that deep or long diving species can be detected. “Soft starts” should be delayed until such time as this area is clear of cetaceans, and should not begin until 30 minutes after the animals depart the 500 m exclusion zone or 30 minutes after they are last seen.

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Material Audit Findings
	<p>The Applicant and FLO must establish a direct line of communication with operators and proposed trap areas of the south coast rock lobster trap. If possible the survey should be planned to coincide with the month of October, when there is the lowest activity in the fishery</p>	<p>Irrelevant / Not Applicable</p>	<p>The scientific consensus is that no seismic surveying should be allowed during the whale migration and breeding periods from June to end of November. The mitigation measure of “shooting seismic in October” appears in the EMPr, but is not a mitigation option identified in the Fisheries Assessment Study. It is thus proposed to exclude the reference to survey timing where it relates to south coast rock lobster. This exclusion is further supported by the fact that Area 2 does not overlap with the south coast rock lobster fishing grounds. This measure is deemed to be irrelevant to exploration activities in Area 2 and thus not applicable.</p>	<p>Measure to be updated as follows:</p> <p>The Applicant and FLO must establish a direct line of communication with operators and proposed trap areas of the south coast rock lobster trap. If possible the survey should be planned to coincide with the month of October, when there is the lowest activity in the fishery</p> <p>Identify active vessels and set up ongoing communications with operators for the duration of the survey.</p>

3.2 IDENTIFICATION AND ASSESSMENT OF ANY NEW IMPACTS AND RISKS

No new impacts or risks have been identified by the audit. All impacts identified in the EMPr are considered appropriate, considering the description of the proposed activities and baseline conditions presented in the EMPr.

3.3 EVALUATION OF THE EFFECTIVENESS OF THE EMPr

SLR is of the opinion that the EMPr provided an assessment of all potential impacts normally associated with seismic and airborne gravity gradiometer surveys in the South African offshore. The EMPr is considered effective in identifying and assessing impacts related to exploration activities. Although not all mitigation measures are considered to fully align with GIIP and some minor text updates are recommended for some measures, this does not affect the overall conclusions of the EMPr.

It should be noted that since compilation of the EMPr in 2014, some additional industry recognised mitigation measures have become part of the accepted standard measures for seismic surveys in South African waters, for example, the need to implement 24-hour PAM in water depths of more than 200 m.

3.4 IDENTIFICATION OF SHORTCOMINGS OF THE EMPr

Although all potential impacts were assessed and largely appropriate mitigation measures provided, the EMPr was compiled prior to publishing of the latest EIA Regulations, 2014 (as amended in 2017). The latest Regulations included specific requirements for the contents of an EMPr (Appendix 4 of the EIA Regulations, 2014). These requirements specifically address the need to specify outcomes and objectives of mitigation measures. Chapter 8 of the EMPr should ideally be re-structured so that the mitigation measures are aligned with defined outcomes and objectives. This recommendation would, however, not be considered an EMPr amendment as contemplated in Section 35 of the EIA Regulations, 2014 (as amended in 2017).

3.5 IDENTIFICATION OF THE NEED FOR CHANGES TO THE EMPr

The audit has determined that while the EMPr measures are largely considered to align with GIIP, there are instances where some EMPr measures do not meet the latest guidelines or GIIP. Table 3-1 presents the recommended changes to the EMPr measures to fully align the EMPr with GIIP. Changes to the EMPr need only to be restricted to Chapter 8 of the EMPr.

As stated in Section 3.4 above, it is also recommended that the EMPr structure be updated to include reference to mitigation outcomes and objectives. In order to make the EMPr table a more user-friendly document for seismic contractors to use, it is also recommended to restructure the table in order to address the different phases and monitoring requirements in one table as well as consolidate mitigation measures and monitoring requirements in order to reduce repetition.

3.6 ADDITIONAL OPERATIONAL ACTIONS

In addition to the changes identified in Table 3-1, it is advised that the following action be implemented by Impact.

- Establish an Issues and Response procedure, which should be defined in a Stakeholder Engagement Plan (SEP). The process should align with the guidance presented in the International Finance Corporation (IFC) Performance Standard (PS) 1 and the IPIECA Manual on “community grievance mechanisms in the oil and gas industry” (IPIECA, 2015).

4. CONCLUSION AND RECOMMENDATIONS

The audit found that the EMPr is broadly aligned with GIIP and with the exception of a few measures provides adequate avoidance, management and mitigation of potential impacts. The audit has not identified any new impacts or risks. The EMPr presents a comprehensive assessment of the potential impacts from the proposed exploration activities. Overall, the EMPr is considered effective in identifying and assessing the impacts. The audit has not identified any major shortcoming in the EMPr.

It is recommended that an updated EMPr be prepared. There is no need for changes to any of the Chapters in the EMPr, except for the Chapter 8. These recommended changes would not require an EMPr Amendment process as contemplated in Section 35 of the EIA Regulations, 2014 (as amended in 2017), as the proposed changes would not lead to a change in the overall EMPr outcomes and objectives.



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(Reviewer)

APPENDIX A: NON-MATERIAL AUDIT FINDINGS

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
Planning and Preparation Phase				
Interference with existing users	The applicant, through the Fisheries Liaison Officer (FLO), must notify other users of the plan to commence pre-survey aerial activities.	A	These planning measures all only related to the proposed aerial survey activities prior to seismic surveys.	
	Plan flight paths to avoid coastline and protected areas	A		
Noise Nuisance	Plan flight path to avoid sensitive and protected areas	A		
Operation Phase				
Interference with existing uses	<p>The Applicant must notify key stakeholders of the navigational co-ordinates of the seismic survey and keep them updated on the seismic survey programme. The notification must also invite interested and affected parties (I&APs) to be included on the daily report distribution list (only those included on the daily notification database will receive further notification during the survey). The following stakeholders must be notified:</p> <ul style="list-style-type: none"> Fishing industry and associations; Overlapping and neighbouring users with delineated boundaries in the oil / gas and mining industries; South African Navy Hydrographic Office; 	A	<p>No timeframes are given for notification of key stakeholders.</p> <p>Government Department names have changed since compilation of the EMPr. DAFF and DEA:BOC are to be updated.</p>	<p>Measure to be updated to state:</p> <p>The Operator must notify key stakeholders of the planned seismic survey at least 30 days prior to survey commencement. Key stakeholders are to be notified of the navigational co-ordinates of the seismic survey and kept updated on the seismic survey programme.</p> <p>DAFF is to be updated to the Department of Forestry, Fisheries and the Environment (DFFE)</p> <p>DEA:BOC is to be updated to DFFE: Oceans and Coasts (DFFE:O&C).</p>

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
	<ul style="list-style-type: none"> Government departments with jurisdiction over marine activities, particularly DAFF, DEA:BOC and PASA; SAMSA and local Port Captains; and General I&APs. 			
	<p>The applicant must request, in writing, the SAN Hydrographic Office to release Radio Navigation Warnings and Notices to Mariners throughout the seismic survey period. The Notice to Mariners should give notice of the seismic survey co-ordinates, the 500 m safety zone around the seismic vessel, the timing of the seismic survey, and the day-to-day location of the seismic vessel.</p>	A		
	<p>Through normal communication channels, Radio Navigation Warnings and Notices to Mariners, keep key stakeholders updated on the seismic survey programme.</p>	A		
	<p>Keep constant watch for approaching vessels during the survey and warn by radio and standby vessel, if required.</p>	A	<p>No vessel warning distance is specified. It is suggested to include a distance of 12 nm from the survey vessel as a limit within which passing vessels are to be contacted by radio.</p>	<p>Measure to be updated to state: Keep constant watch for approaching vessels during the survey and warn all vessels that approach within 12 nm of the survey vessel by radio and standby vessel, if required.</p>
	<p>Take steps to share information and co-operate with other marine users and resource managers in the marine environment generally, to their mutual benefit.</p>	A		
<p>Atmospheric Emissions</p>	<p>Maintain all diesel motors and generators in good working order. Properly tune and maintain all engines,</p>	A		

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
	motors, generators and all auxiliary power to contain the minimum of soot and unburned diesel.			
Waste Disposal	The Applicant must comply with all legal requirements for waste management and pollution control and employ "good housekeeping" and monitoring practices.	A		
	Deck drainage must be collected in oily water separator systems. Weather decks are to be kept free of spillage	A		
	Galley waste is to be disposed of overboard only after macerating to less than 25 mm according to MARPOL standard if the vessel is more than 3 nautical miles from the nearest land. Disposal overboard without macerating is only to occur if the vessel is more than 12 nautical miles from land.	A		
	Medical waste must be sealed in aseptic containers for appropriate disposal onshore.	A		
	Any discharged water must meet the MARPOL 73/78 standards.	A		
	In the event of a deck spillage biodegradable detergents with low-toxicity must be used.	A		
	Spill management awareness training for crew members must be undertaken.	A		
	Hydraulic systems must be regularly maintained and inspected.	A		
	A waste minimisation strategy must be designed and implemented.	A		

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
	Onboard solid waste must be in secure storage.	A		
	Solid and hazardous waste disposal must be carried out in accordance with appropriate laws and ordinances through cooperation with the relevant local authority.	A		
	Used oil must be returned to a port with a registered facility for processing or disposal.	A		
	Drilling unit and supply vessels must comply with international agreed standards regulated under MARPOL.	A	“Drilling unit” is used instead of “seismic vessel”.	Measure to be updated to state: Seismic Drilling unit and supply vessels must comply with international agreed standards regulated under MARPOL.
	The Applicant must use approved sewage treatment plants that meet the MARPOL standard requirements.	A		
	Waste disposal contractor is to dispose of waste returned to port at a licensed landfill site.	A	It is suggested to include reference to the keeping of Waste Disposal Certificates.	Measure to be updated to state: Waste disposal contractor is to dispose of waste returned to port at a licensed landfill site. Records of all Waste Disposal Certificates are to be kept.
Noise Nuisance	Helicopter flight paths must be pre-planned in order to ensure that bird colonies, coastal reserves, and marine islands are avoided.	A		
	Extensive coastal flights must be avoided.	A		
	Aircraft may not approach within 300 m of cetaceans in terms of the Marine Living Resources Act, 1998 without a permit.	A		

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
	The operator must comply with the Seabirds and Seals Protection Act, 1973, which prohibits the wilful disturbance of seals on the coast or offshore islands.	A		
	The contractor must comply fully with aviation guidelines and rules.	A		
	All pilots must be briefed on the ecological risks associated with flying at a low level parallel to the coast.	A		
Disturbance, damage, or destruction of potential heritage features	If any cultural or heritage feature is discovered or unearthed during the survey the applicant or ECO must notify SAHRA and MUCH and follow any directions received.	A		
Water contamination and pollution	No discharge of any oil whatsoever is permitted within 50 nautical miles of the coast.	A		
	The applicant must obtain written permission from the Minister in the event that transfer of oil at sea is required within the economic zone (i.e. 200 miles from the coast).	A		
	The applicant must submit an application in terms of Regulation 14 to the Principal Officer at the port nearest to where any such transfer is to take place.	A		
	The applicant must inform the South African Maritime Safety Authority (SAMSA) of the location, supplier and timing, of the transfer 5 days prior to refuelling at sea.	A		

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
	In the event of an oil spill the Applicant must notify the relevant authorities immediately. The Applicant must clean the spill through the use of approved deep sea oil spill cleanup techniques. These include containment with berms, mechanical recovery using skimmers and separators, or the use of chemical dispersants and microbes. The Applicant must notify the relevant marine wildlife rescue agencies to implement a suitable remediation strategy.	A		
Impact of Aerial Surveys on Marine Fauna	Flight paths must be pre-planned to ensure that no flying occurs over coastal reserves, bird colonies or IBAs	A		
	Extensive coastal flights (parallel to the coast within 1 nautical mile of the shore) should be avoided, particularly during the movement of migratory cetaceans (particularly baleen whales) from their southern feeding grounds into low latitude waters (June to November). As no seasonal patterns of abundance are known for odontocetes occupying the Exploration Area, a precautionary approach to avoiding impacts throughout the year is recommended.	A		
	Aircraft must maintain a minimum altitude of at least 300 m above sea level at all times	A	The <i>Regulations for the Management of Boat Based Whale Watching and Protection of Turtles</i> (2009), S3(1)(g) specify that: “if in charge of a vessel or aircraft, approach closer than 300 metres to any whale or fail to proceed to a distance of 300	Aircraft shall not approach closer than 300 metres to any whale.

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
			metres if a whale surfaces closer than 300 metres from the vessel or aircraft”	
	Aircraft may not approach to within 300 m of whales in terms of the Marine Living Resources Act, 1998. As this may be both impractical and impossible, an exemption permit must be applied for through the Department of Environmental Affairs and Tourism.	A	It is suggested that the new Organ of State name be used.	Measure to be updated to include DFFE instead of DEAT.
	The contractor must comply fully with aviation and authority guidelines and rules.	A		
	All pilots must be briefed on ecological risks associated with flying at a low level parallel to the coast.	A		
Impacts on Plankton	No direct mitigation measures for potential impacts on plankton and fish egg and larval stages are feasible or deemed necessary.	A		
Impacts on Invertebrates	No mitigation measures for potential impacts on marine invertebrates and their larvae are feasible or deemed necessary.	A		
Impacts on Fish	Implement a “soft-start” procedure of a minimum of 30 minutes’ duration when initiating seismic surveying, to allow fish to move out of the survey area and thus avoid potential physiological injury as a result of seismic noise. The Marine Mammal Observer (MMO) must monitor the soft-start procedure.	A	The industry standard is for the “soft-start” to be of a 20 minute duration. From recommendations made by the specialist (Andrea Pulfrich) in her latest assessments, 20 minutes should suffice for fish species.	Measure to be updated to be updated as follows: Implement a “soft-start” procedure of a minimum of 20 minutes’ duration when initiation seismic surveying, ...

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
	Airgun firing must be terminated if mass mortalities of fish as a direct result of survey activities are observed.	A		
	During line changes low level warning airgun discharges must be fired at regular intervals in order to keep fish shoals away from the survey operation while the vessel is repositioned.	A		
	Maintain the firing of low-power guns during line turns that encroach within a 5 nautical mile radius of the 6-Mile, 12-Mile and 72-Mile Banks. On lines beyond that the low power guns can be stopped during turns, but the normal start-up procedure should nonetheless be maintained.	A		
Impacts on Diving Seabirds	All initiation of airgun firing must be carried out as “soft-starts” of at least 30 minutes duration.	A	The industry standard is for the “soft-start” to be of a 20 minute duration. From recommendations made by the specialist (Andrea Pulfrich) in her latest assessments, 20 minutes should suffice for fish species.	Measure to be updated to state: All initiation of airgun firing must be carried out as “soft-starts” of at least 20 minutes duration.
	An area of radius of 500 m must be scanned by an independent observer for the presence of diving seabirds prior to the commencement of “soft starts” and that soft starts be delayed until such time as this area is clear of seabirds.	A		
	Maintain the firing of low-power guns during line turns that encroach within a 5 nautical mile radius of the 6-Mile, 12-Mile and 72-Mile Banks. On lines beyond that the low power guns can be stopped during turns, but	A		

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
	the normal start-up procedure should nonetheless be maintained.			
	Seabird incidence and behaviour must be recorded by an onboard Independent Observer. Any obvious mortality or injuries to seabirds as a direct result of the survey must result in temporary termination of operations.	A		
	Any attraction of predatory seabirds (by mass disorientation or stunning of fish as a result of seismic survey activities) and incidents of feeding behaviour among the hydrophone streamers must be recorded by an onboard Independent Observer.	A		
	Seabird incidence data and seismic source output data arising from surveys must be made available on request to the Marine Mammal Institute, Department of Agriculture, Fisheries and Forestry, and the Petroleum Agency of South Africa for analyses of survey impacts in local waters.	A	It is suggested to use the new name for the Organ of State	DFFE to be used instead of DAFF
Impacts on Turtles	All initiation of airgun firing must be carried out as “soft-starts” of 30 minutes duration.	A	The industry standard is for the “soft-start” to be of a 20 minute duration. From recommendations made by the specialist (Andrea Pulfrich) in her latest assessments, 20 minutes should suffice for fish species.	Measure to be updated to state: All initiation of airgun firing must be carried out as “soft-starts” of at least 20 minutes duration.
	An area of radius of 500 m to be scanned by an independent observer for the presence of turtles prior to the commencement of “soft starts” and that soft	A		

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
	starts be delayed until such time as this area is clear of turtles.			
	Daylight observations of the survey region must be carried out by onboard Independent Observers and incidence of turtles and their responses to seismic shooting should be recorded.	A		
	Seismic shooting must be terminated when obvious changes to turtle behaviour is observed from the survey vessel, or animals are observed within the immediate vicinity (within 500 m) of operating airguns and appear to be approaching firing airgun. If animals are observed between 500 m and 2 km radius, the acoustic source should immediately power down to low setting. The rationale for this is that animals at close distances (i.e. where physiological injury may occur) may be suffering from reduced hearing as a result of seismic sounds	A		
	Any obvious mortality or injuries to turtles as a direct result of the survey must result in temporary termination of operations.	A		
	Ensure that 'turtle-friendly' tail buoys are used by the survey contractor or that existing tail buoys are fitted with either exclusion or deflector 'turtle guards'	A		
	Turtle incidence data and seismic source output data arising from surveys must be made available on request to the Marine Mammal Institute, Department of Agriculture, Fisheries and Forestry, and the Petroleum Agency of South Africa for analyses of survey impacts in local waters.	A	It is suggested to use the new name for the Organ of State	DFFE to be used instead of DAFF

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
Impacts on Seals	All initiation of airgun firing must be carried out as “soft-starts” of at least 20 minutes duration.	A		
	An area of radius of 500 m be scanned by an independent observer for the presence of seals prior to the commencement of “soft starts” and that these be delayed until such time as this area is clear of seals. If after a period of 30 minutes seals are still within 500 m of the airguns, the normal “soft start” procedure must commence for at least a 20-minutes duration.	A		
	Daylight observations of the survey region must be carried out by onboard Marine Mammal Observers (MMOs) and incidence of seals and their responses to seismic shooting must be recorded.	A		
	Seismic shooting must be terminated when obvious negative changes to seal behaviour is observed from the survey vessel.	A		
	Any obvious mortality or injuries to seals as a direct result of the survey should be recorded	A		
Impacts on Cetaceans	Seismic surveys must be undertaken to avoid the key migration periods or winter breeding concentrations (particularly baleen whales, beginning of June to end of November), and ensure that migration paths are not blocked. In addition, avoid surveying during December when humpback whales may still be moving through the area on their return migrations.	A		
	As no seasonal patterns of abundance are known for odontocetes occupying the proposed study area, a	A		

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
	precautionary approach to avoiding impacts throughout the year is recommended.			
	Independent onboard MMOs and PAM operators must be appointed for the duration of the seismic survey. The MMOs and PAM operators must have experience in seabird, turtle and marine mammal identification and observation techniques.	A		
	The implementation of “soft-start” procedures of a minimum of 20-minutes’ duration on initiation of seismic surveying would mitigate any extent of physiological injury in most mobile vertebrate species as a result of seismic noise and is consequently considered a mandatory management measure for the implementation of the proposed seismic survey. This requires that the sound source be ramped from low to full power, thus allowing a flight response to outside the zone of injury or avoidance. This build up of power should occur in uniform stages to provide a constant increase in output. The rationale for the 20 minute “soft-start” period is based on the flight speeds of cetacean species. Where possible, “soft-starts” must be planned so that they commence within daylight hours.	A		
	All breaks in airgun firing of longer than 20 minutes must be followed by the 30-minute pre-shoot watch and a “soft-start” procedure of at least 20 minutes prior to the survey operation continuing. Breaks shorter than 20 minutes should be followed by a visual assessment for marine mammals within the 500 m	A		

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
	mitigation zone (not a 30 minute pre-shoot watch) and a “soft-start” of similar duration.			
	Seismic shooting must be terminated when obvious negative changes to cetacean behaviour is observed from the survey vessel, or animals are observed within the immediate vicinity (within 500 m) of operating airguns and appear to be approaching the firing airgun.	A		
	During night-time line changes low level warning airgun discharges must be fired at regular intervals in order to keep animals away from the survey operation while the vessel is repositioned for the next survey line.	A		
	The use of the lowest practicable airgun volume must be defined and enforced, and airgun use must be prohibited outside of the licence area.	A		
	All data recorded by MMOs must as a minimum form part of a survey close-out report. Furthermore, daily or weekly reports should be forwarded to the necessary authorities to ensure compliance with the mitigation measures.	A		
	Marine mammal incidence data and seismic source output data arising from surveys must be made available on request to the Marine Mammal Institute, Department of Agriculture, Fisheries and Forestry, and the Petroleum Agency of South Africa for analyses of survey impacts in local waters.	A		
Impact on Fisheries	Prior to the commencement of the survey, the fishing industry, DAFF (Branch: Fisheries) and other Interested and Affected Parties (I&APs) must be consulted and	A	No specific fishing associations are mentioned. It is recommended to include the	Measure to be updated to include the below list of fishing associations.

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
	informed of the pending activity and the likely implications for the large pelagic long-line fishery.		list of associations in order to cover all tasks in one recommendation.	<ul style="list-style-type: none"> • South African Deep-sea Trawling Industry Association (SADSTIA), • South East Coast Inshore Fishery Association (SECIFA), • Small Hake Quota Holders Association, • South African Tuna Longline Association, • Hake Longline Association, • South Coast Rock Lobster Association, • Shark Longline Association, • South African Marine Linefish Management Association (SAMLMA), • South African Squid Management Industry Association (SASMIA) and • Blue Continent Products.
	The survey vessel must be accompanied by at least one chase boat.	A		
	An experienced Fisheries Liaison Officer (FLO) must be deployed on board either the survey vessel or chase boat to facilitate communication with maritime vessels. In the case where an FLO is not deployed, the on-board Marine Mammal Observer (MMO) should be familiar with fisheries operational in the area.	A		
	The FLO must report daily on vessel activity and respond and advise on action to be taken in the event of encountering fishing gear and the survey vessel's potential impacts on marine fauna.	A		
	A daily electronic reporting routine must be set up to keep interested and affected parties informed of	A		

Identified Impact	Technical Management Option/Mitigation Measures	Adequacy Rating	Evaluation	Non-Material Audit Findings
	survey activity, fisheries interactions and environmental issues.			
	The Applicant and FLO must identify active small pelagic purse-seine vessels and set up ongoing communications with operators for the duration of the survey.	A		
	The Applicant and FLO must identify active demersal and mid-water trawl vessels and set up ongoing communications with operators for the duration of the survey.	A		
	The Applicant and FLO must identify active demersal long-line vessels and gear (marked at each end by a surface buoy) and set up ongoing communications with operators for the duration of the survey.	A		
	The Applicant and FLO must establish communications with the known pelagic long-line operators if drifting buoys with radar responders are sighted.	A		
Impact on Fisheries Research	The Applicant must involve the managers of the research survey programmes in the planning of the seismic survey in order to negotiate timing and avoid conflict.	A		

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