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ENVIRONMENTAL MANAGEMENT PROGRAMME:

PROPOSED SEARCHER SEISMIC RECONNAISSANCE

PASA REFERENCE: 12/1/048

DOCUMENT DETAILS

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Searcher Seismic Reconnaissance

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REVISION AND AMENDMENTS

REVISION DATE:	REV #	DESCRIPTION
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Table of Contents

List of Figures

List of Tables

Appendices

Abbreviations

BPEO	:	Best Practicable Environmental Option
DFFE	:	Department of Forestry, Fisheries and Environment
DWS	:	Department of Water and Sanitation
EA	:	Environmental Authorisation
CBA	:	Critical Biodiversity Area
EAP	:	Environmental Assessment Practitioner
ECO	:	Environmental Control Officer
EO	:	Environmental Officer
EIA	:	Environmental Impact Assessment
EIMS	:	Environmental Impact Management Services (Pty) Ltd
EMF	:	Environmental Management Framework
EMPr	:	Environmental Management Programme Report
EPRP	:	Emergency Preparedness and Response Plan
ESA	:	Ecological Support Area
HSE	:	Health, Safety and Environment
I&AP	:	Interested and Affected Party
ISO	:	International Standards Organisation
MPRDA	:	Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)
NFA	:	National Forests Act (Act 84 of 1998)
NEMA	:	National Environmental Management Act (Act No. 107 of 1998)
NEMAQA	:	National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEMBA	:	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NEMWA	:	National Environmental Management: Waste Act (Act No. 59 of 2008)
NWA	:	National Water Act (Act No. 36 of 1998)
OHSA	:	Occupational Health and Safety Act (Act No. 85 of 1993)
SABS	:	South African Bureau of Standards
SANAS	:	South African National Accreditation System
SWMP	:	Storm Water Management Plan

1 INTRODUCTION

Searcher Geodata UK Ltd (the applicant / Searcher) undertook a seismic survey project during 2021 and during that project, an Environmental Management Programme (EMPr) was compiled and submitted to the competent authorities in support of the Reconnaissance Permit 12/1/038. The Orange Basin 2D Seismic Survey (Petroleum Agency South Africa (PASA) Ref: 12/1/038)) was a multiclient 2D programme off western South Africa which was terminated prior to completion as a result of the outcome of a legal challenge related to the validity of the exploration permit issued by PASA. Ultimately the Reconnaissance Permit expired with only a small part of the 2D survey taking place. Only about 21% (~2 025 km) full-fold line being recorded from the planned 9 635 km programme when the vessel became subject to an interim court interdict and ceased operations within South African waters. In 2022, Searcher then proposed to undertake a 3D seismic survey further offshore and over a smaller area offshore of the west coast of South Africa. Searcher required an Environmental Authorization (EA) to meet with the new legislation under the amended National environmental Management Act (Act No. 107 of 1998 NEMA) EIA Regulations, 2014, including the required stakeholder consultation to undertake the seismic surveys as part of Reconnaissance Permit 12/1/043. An EA was issued to Searcher by the Department of Mineral resources and Energy (DMRE) on the 20th of December 2022 (ref: 12/1/043). Due to the prolonged appeal phase, viable acquisition windows and vessel availability, Searcher was only able to undertake the 3D seismic surveys as part of the 12/1/043 Reconnaissance Permit and EA between January and April 2024. Subsequently, Searcher was not able to complete the full extents of the intended survey during the 2023-2024 survey season.

Since a Reconnaissance Permit is only valid for 1 year, the 12/1/043 permit will expire on the 10 November 2024. **Searcher has consequently applied for and received a new Reconnaissance Permit for the same previously approved activity over the same area (12/1/048)**. A new EA is required for Searcher to continue under the new 12/1/048 Reconnaissance Permit application. Although the current EA application relates to a new Reconnaissance Permit application by Searcher and not a renewal of the previous permission, it is for the same activity over the same area. Subsequently, Environmental Impact Management Services (Pty) Ltd (EIMS) has been appointed as Independent Environmental Assessment Practitioners to undertake the EA Process for the Proposed Searcher Exploration Activities located offshore extending from approximately 256km offshore of St Helena Bay to 220 km offshore of Hondeklip Bay, off the West Coast of South Africa. EIMS has been appointed to prepare and submit an application for EA as per the requirements of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended, promulgated under the National Environmental Management Act (Act No. 107 of 1998- NEMA) and the requirements of the Minerals and Petroleum Resources Development Act (Act No. 28 of 2002 – MPRDA).

The Reconnaissance Permit area of interest for the proposed 3D seismic survey is approximately 30 000 km^2 in extent. However, an area of approximately 7 800 km^2 (largely in the northern section) was surveyed[1] during the 2023-2024 survey season and will be excluded from Full Power Source[2] data acquisition during the proposed second survey period. The previously proposed and approved survey method will be followed which includes a single survey vessel equipped with seismic sources and streamers being used for the survey. The survey vessel will be supported by a minimum of one escort vessel. It is currently envisaged that the survey lines will remain mainly in the NE-SW or SE-NW orientation. The 3D survey will take in the order of 127 days including downtime and is proposed to be undertaken during the survey period (late December – May) but will likely commence in first quarter of 2025 and may extend into 2026. It must be noted that if any acquisition is to be undertaken in late December, then this must definitely be undertaken with a Passive Acoustic Monitoring (PAM) and preferably starting in the north and moving southwards.

The Environmental Management Programme (EMPr) has been compiled to meet the requirements for an EIA and as stipulated in the EIA Regulations, 2014. The competent authority for this application will be the Department of Mineral Resources and Energy (DMRE).

An EMPr is an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts during the applicable phases of a development or activity are prevented, and that the positive benefits

[1] 7 800km^2 survey area where viable full fold data has been acquired (excludes non active vessel manoeuvring, line turns, run in/outs).
[2] Full Power Source: Where the source array is at full power (excludes non active vessel manoeuvring, line turns and soft starts).

of the projects are enhanced. This EMPr has been compiled as a guideline for the mitigation and management measures to be implemented to avoid, reduce and minimise potential environmental impacts arising out of the project.

2 SCOPE OF THIS DOCUMENT

The purpose of the EMPr is to give effect to precautionary measures, which are to be put in place for controlling the activities that take place during the project. The EMPr also provides guidance to assist in ensuring compliance with relevant national legislative and regulatory requirements.

It should be kept in mind, however, that the EMPr is a working document that should be updated on a regular basis, as and when necessary. Formal risk identification forms an integral part of EMPr management and assists with prioritizing and focusing the control of risks. The EMPr thus supports this on-going proactive mitigation and the duty of care to the environment. The EMPr shall therefore allow for risk minimization, rather than just ensuring legal compliance. The purpose of this EMPr is thus also to allow the user to make minor amendments to ensure continual revision and improvement of risk mitigation through the continual re-assessment of risks associated with the activity.

3 DOCUMENT STRUCTURE

Table 1: EMPr Structure

Appendix 4 Reference	Description	Section in EMPr
Appendix 4(1)(1)(a)	Details of – (i) The EAP who prepared the EMPr; and (ii) The expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 4 Appendix A
Appendix 4(1)(1)(b)	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.	Section 5
Appendix 4(1)(1)(c)	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 6
Appendix 4(1)(1)(d)	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 though the environmental impact assessment process for all phases of the development including – (i) Planning and design; (ii) Pre-construction activities; (iii) Construction activities; (iv) rehabilitation of the environment after construction and in the case of a closure activity, closure; and (v) Where relevant, operation activities;	Section 13
Appendix 4(1)(1)(f)	A description of proposed impact management actions, identifying the manner in which the impact management contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to – (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) Comply with any prescribed environmental management standards or practices; and (iii) Comply with any applicable provisions of the act regarding closure, where applicable.	Section 13

Appendix 4 Reference	Description	Section in EMPr
Appendix 4(1)(1)(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 13
Appendix 4(1)(1)(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 13
Appendix 4(1)(1)(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	Section 13
Appendix 4(1)(1)(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 13
Appendix 4(1)(1)(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 13
Appendix 4(1)(1)(l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 13
Appendix 4(1)(1)(m)	An environmental awareness plan describing the manner in which – (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment.	Section 11
Appendix 4(1)(1)(n)	Any specific information that may be required by the competent authority.	N/A

4 REQUIREMENTS OF AN EAP

In terms of Regulation 13 of the EIA Regulations, 2014, an independent EAP, must be appointed by the applicant to manage the application. EIMS has been appointed by the Applicant as the EAP and is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations and Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

1) Objective and independent;
2) Has expertise in conducting EIA's;
3) Comply with the NEMA, the Regulations and all other applicable legislation;
4) Takes into account all relevant factors relating to the application; and
5) Provides full disclosure to the applicant and the relevant environmental authority.

The Curriculum Vitae (indicating the experience with environmental impact assessment and relevant application processes) of the consultants that were involved in the EMPr process, and the compilation of this report are attached as **Appendix A**.

4.1 Details of the EAP

EIMS was appointed by the Applicant as the EAP to compile this report. The contact details of the EIMS consultants who compiled the report are as follows:

Table 2: EAP Details

Item	Detail
Name of Practitioner	Mr John von Mayer (Project Manager)
Name of Practitioner	Mr Vukosi Mabunda (EAP)
Tel No.:	+27 11 789 7170
E-mail:	searcher@eims.co.za

4.2 Expertise of the EAP

EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS has in excess of 30 years' experience in conducting EIA's. Please refer to the EIMS website (www.eims.co.za) for further details of expertise and experience.

This EMPr was compiled by Mr. Vukosi Mabunda. Vukosi Mabunda is a current Geographic Information Systems (GIS) Specialist and Environmental Assessment Practitioner with 6 years' working experience. He is one of the few dual registered professionals with the South African Council for Natural Scientific Professions (SACNASP) as a Professional Geospatial Scientist and Professional Environmental Scientist (Reg. #134178). He is also a Registered Environmental Assessment Practitioner (EAP) with the Environmental Assessment Practitioners Association of South Africa (EAPASA Reg. #2019/867). Vukosi has dual professional background in Geographic and Environmental Sciences having academic qualifications which focused on these disciplines as well as relevant work experience. Vukosi has experience in various environmental assessment projects ranging from Environmental Screening, Basic Assessments, Section 102 Amendments and Scoping & Environmental Impact Assessments processes. In addition, Vukosi has undertaken Water Use Authorisations applications through both the General Authorisation and Water Use Authorisation processes. The Curriculum Vitae of the EAP responsible for the compilation of this Report is included in **Appendix A**.

It must be noted that this report is an updated version of the EIMS 1518 EMPr – Searcher Seismic Reconnaissance compiled by Mr John von Mayer and assisted by Mr Liam Whitlow and Mr GP Kriel in 2022 (EIMS, 2022). The current report was compiled by Vukosi Mabunda with the assistance of Mr John von Mayer. John von Mayer is a senior consultant at EIMS and has been involved in numerous significant projects the past 15 years. He has experience in

Project Management, small to large scale Environmental Impact Assessments, Environmental Auditing, Water Use Licensing, and Public Participation. He is a Registered Professional Natural Scientist (400336/11) with the South African Council Natural and Scientific Professions (SACNASP) as well as a registered EAPASA Environmental Practitioner (2019/1247). The CV's of EAPs involved in this report are attached in **Appendix A**.

5 PROJECT DESCRIPTION

As previously indicated in **Section 1**, Searcher recently undertook 3D seismic survey offshore of the west coast of South Africa as part of the approved reconnaissance permit 12/1/043. The survey commenced in January 2024 and ceased in April 2024 (survey window). Searcher was not able to complete the intended survey during the 2023-2024 survey season due to the viable acquisition windows and vessel availability. Since a Reconnaissance Permit can only be valid for 1 year, the 12/1/043 permit will expire on the 10 November 2024. **Searcher has consequently applied for and received a new Reconnaissance Permit to undertake the same activity over the same area (12/1/048)**. Subsequently, this section provides an overview of the proposed previously approved activity.

Seismic survey programmes comprise of data acquisition in either two-dimensional (2D) and/or three-dimensional (3D) scales, depending on information requirements. 2D surveys are typically applied to obtain regional data from widely spaced survey grids and provide a vertical profile through the subsurface, highlighting geophysical, geological information and features along the seismic line. Infill surveys on closer grids subsequently provide more detail over specific areas of interest. In contrast, 3D seismic surveys are conducted on a very tight survey grid spacing in specific target areas, often identified during 2D applications, providing a cube image of the subsurface geology within the survey volume. The current proposed seismic survey as discussed in this report is a 3D seismic survey and does not include any provision for exploration drilling.

During seismic surveys, low frequency sound pulses are generated by an acoustic instrument towed behind a survey vessel, just below the sea surface. The sounds are directed towards the seabed and the seismic signal is reflected by the geological interfaces below the seafloor. The reflected signals are received by an array of receivers or sets of hydrophones towed behind the vessel in a single streamer (2D) or in multiple streamers (3D) and are fed back to the recording instruments on board. The spacing between the hydrophone groups is commonly 25 m or shorter, depending on the purpose of the seismic survey. Each group contains many hydrophones, spaced less than 1 m apart. The hydrophone streamers must be towed at constant depth (6 – 10 m), with flotation usually achieved by filling the cables with solid filled gel or flexible polymer foam, so that they are neutrally buoyant. To compensate for minor adjustments, Automatic Cable Levellers, or "birds" are used. The ends of the hydrophone streamers are marked with tail buoys, to warn shipping about the presence of the cable in the water. The tail buoys also act as a platform for surface positioning systems so that the cable locations can be accurately monitored. Refer to **Figure 1** and **Figure 2** for a representation of the proposed activity.

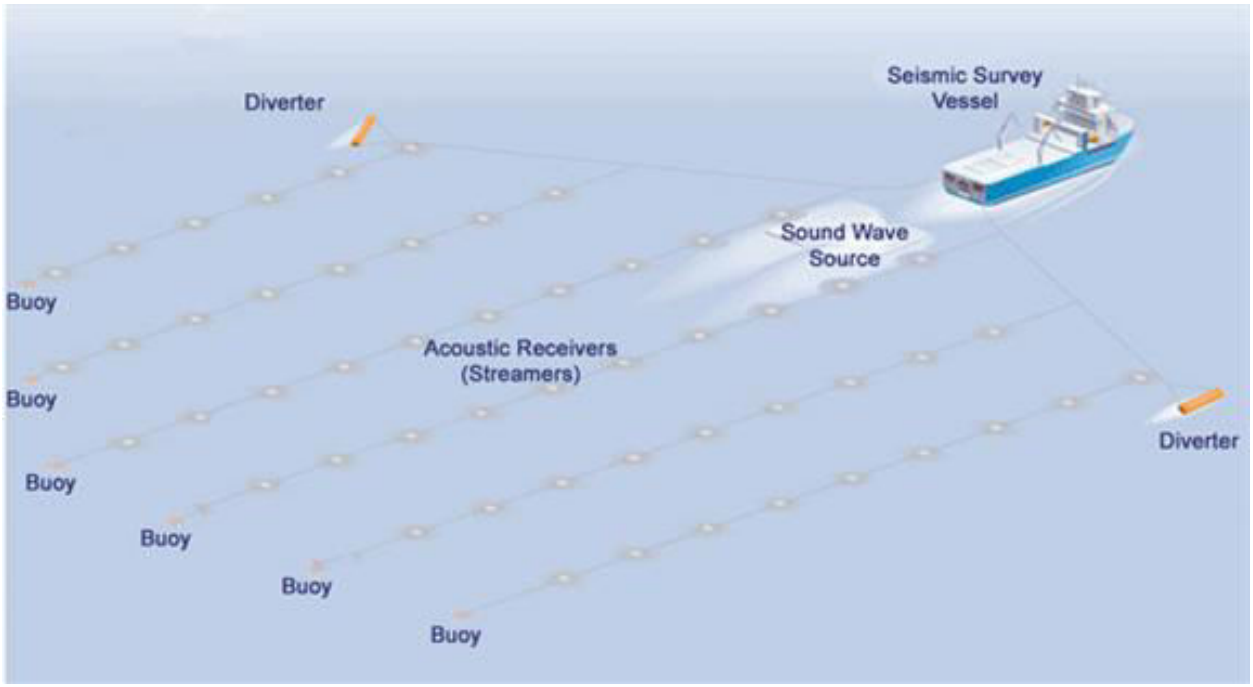

Figure 1: Example of seismic survey vessel and associated equipment (FishSAFE, 2021).

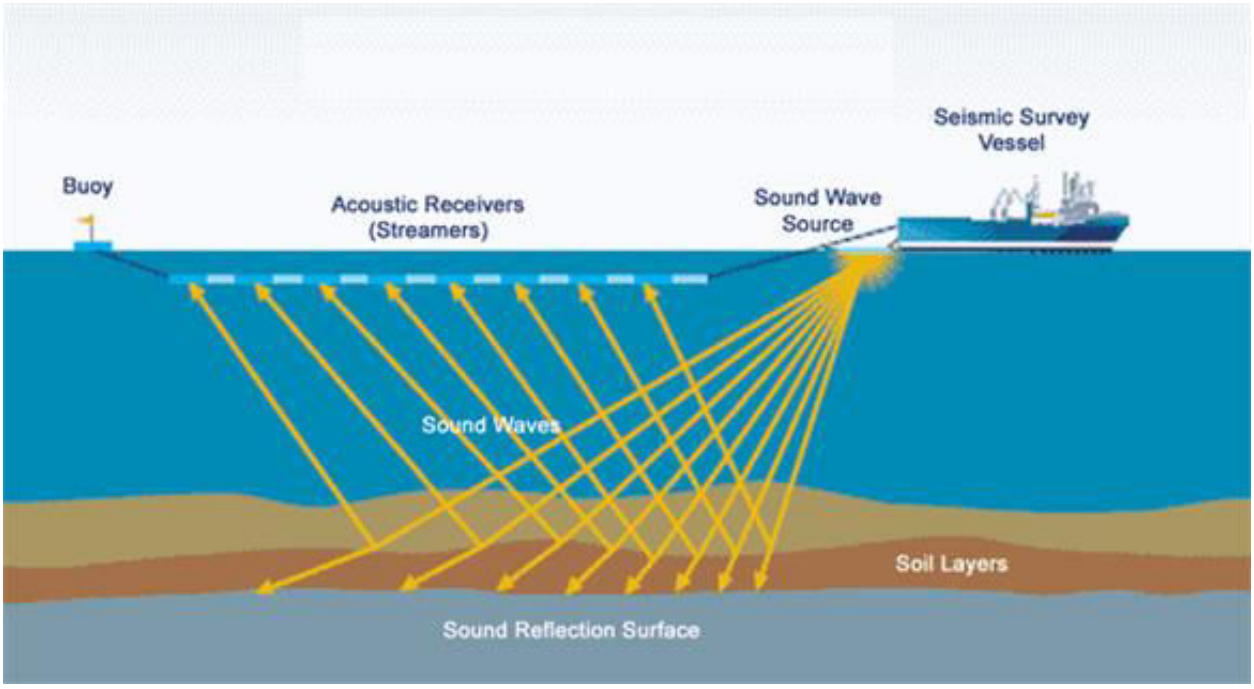

Figure 2: Example demonstration of seismic survey activities (FishSAFE, 2021).

While acquiring the seismic data, the survey vessel would travel along transects of a prescribed grid within the survey area that have been chosen to cross any known or suspected geological structure in the area. The vessel typically travels at a speed of between four and six knots (i.e. 2 to 3 metres per second / 7.2 to 10.8 kilometres per hour) while surveying.

The proposed survey would involve a seismic sound source and multiple hydrophone streamers (up to 12), which would be up to 12 000 m long and 2 000 m wide. The streamers would be towed at a depth of 6-25 m below the

surface and would not be visible, except for the tail-buoy at the terminal end of the cable. The array has an operating pressure of 2 000 pounds per square inch. The sound source would be towed behind the vessel at a depth of between 5 – 10 m below the surface. As the survey vessel would be restricted in manoeuvrability, other vessels should remain clear of it and therefore a support vessel usually assists in the operation of keeping other vessels at a safe distance.

Each triggering of a sound source is termed a seismic pulse, and these are discharged at intervals of 6 - 37.5 seconds (depending on water depth and other environmental characteristics). Each seismic pulse is usually only between 5 and 30 milliseconds in duration, and despite peak levels within each pulse being high, the total energy delivered into the water is low. Seismic sources have most of their energy in the 5-300 Hz frequency range, with the optimal frequency required for deep penetration seismic work being 50-80 Hz.

Sound levels from individual sound sources used today in the seismic industry range from 200 to 232 dB re 1 µPa at 1 m, for small to large individual seismic sources, respectively. For sound source arrays, sound levels range from 235 dB re 1 µPa at 1 m for a small array (500 cubic inches) to 260 dB re 1 µPa at 1 m for large arrays (7 900 cubic inches). The majority of the produced energy is below 250 Hz, with 90% of the energy between 70 to 140 Hz, although pulses do contain some higher frequencies up to 16 kHz. It must be noted, however, that the sound level specifications for sound source arrays refer to sound levels in the vertical direction directly beneath the sound source array, generally near its centre, with nominal sound levels in the horizontal direction being ~10-20 dB lower.

6 SITE DESCRIPTION AND SENSITIVE AREAS

The proposed project area is located between approximately 256 km offshore of St Helena Bay, extending north along the western coastline to approximately 220 km offshore of Hondeklip Bay covering the Northern Cape Ultra Deep, Mid Orange Basin and Various Blocks offshore exploration areas. The area of interest for the proposed 3D seismic survey is approximately 30 000 km^2 in extent. The survey exclusion zone represents an area of ~7 803km^2 which was surveyed during the 2023-2024 window and will not form part of the new survey area as indicated in **Figure 3**.

The proposed 3D survey area falls into the Southeast Atlantic Deep Ocean Ecoregions. Although there is a lack of knowledge of the community structure and diversity of benthic macrofauna off the shelf edge, the South Atlantic bathyal and abyssal unconsolidated habitat types have been rated as 'Least Threatened', reflecting the great extent of these habitats in the South African Exclusive Economic Zone (EEZ). Only sections along the shelf edge and in the Cape Canyon are rated as 'Vulnerable' and 'Endangered'. Geological features of note in and adjacent to the proposed survey area are Child's Bank, Tripp Seamount, two canyons, the Cape Canyon and Cape Valley also occur to the south of the Reconnaissance Permit Area. Features such as banks and seamounts often host deepwater corals and boast an enrichment of bottom-associated communities relative to the otherwise low-profile, homogenous seabed habitats.

There are six offshore Marine Protected Areas (MPAs) in the general project area, but none fall within the Reconnaissance Permit Area. The proposed 3D survey area lies well offshore of these MPAs. Although there is no overlap of the 3D survey area with Ecologically and Biologically Significant Areas (EBSAs), critical biodiversity areas (CBAs) within the Reconnaissance Permit and 3D survey areas include both CBA1 (irreplaceable) and CBA2 (natural areas selected to meet biodiversity targets) as indicated in **Figure 4**. No no-go areas were identified.

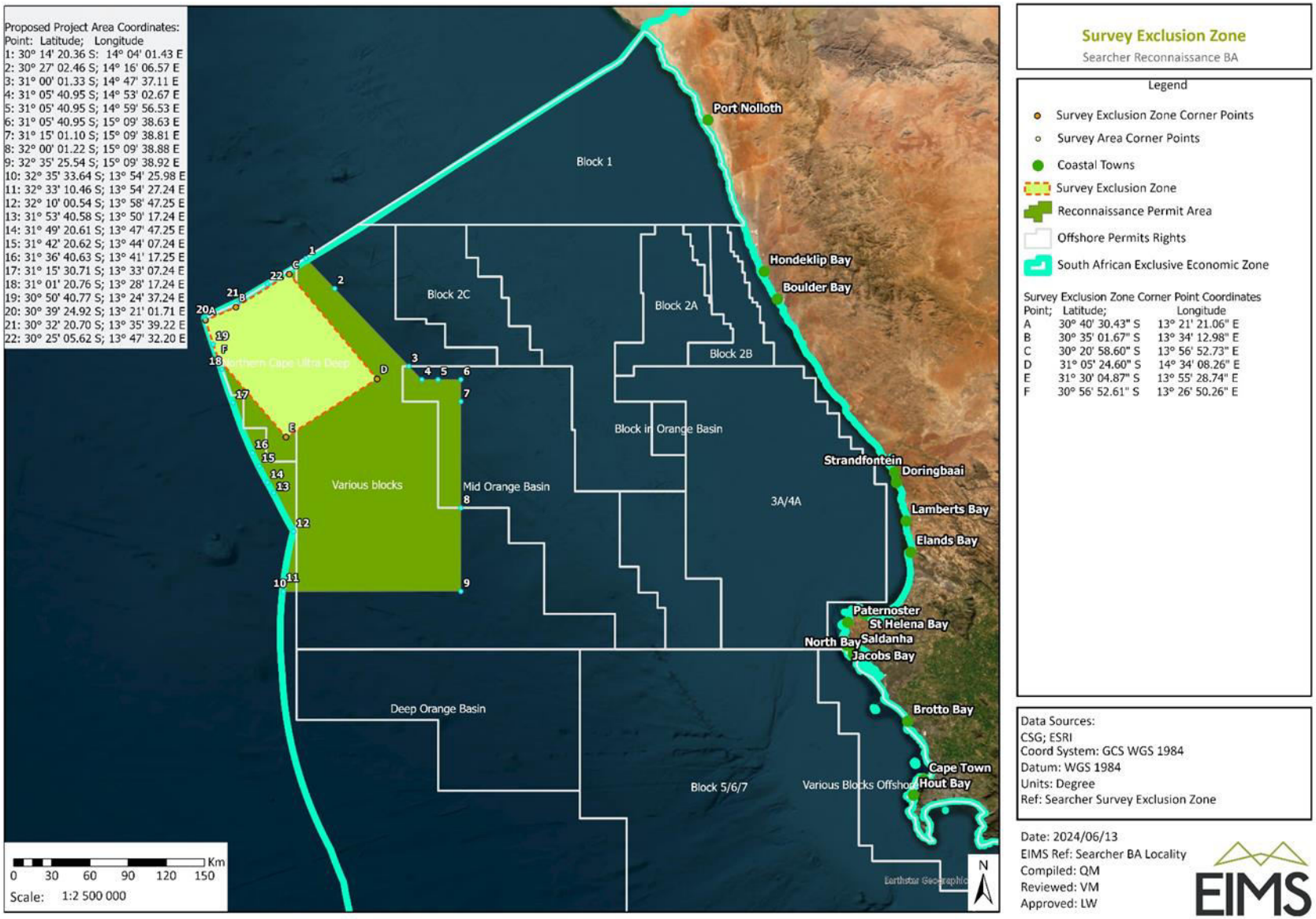

Figure 3: Site Locality Map showing the proposed 3D Seismic exploration survey area.

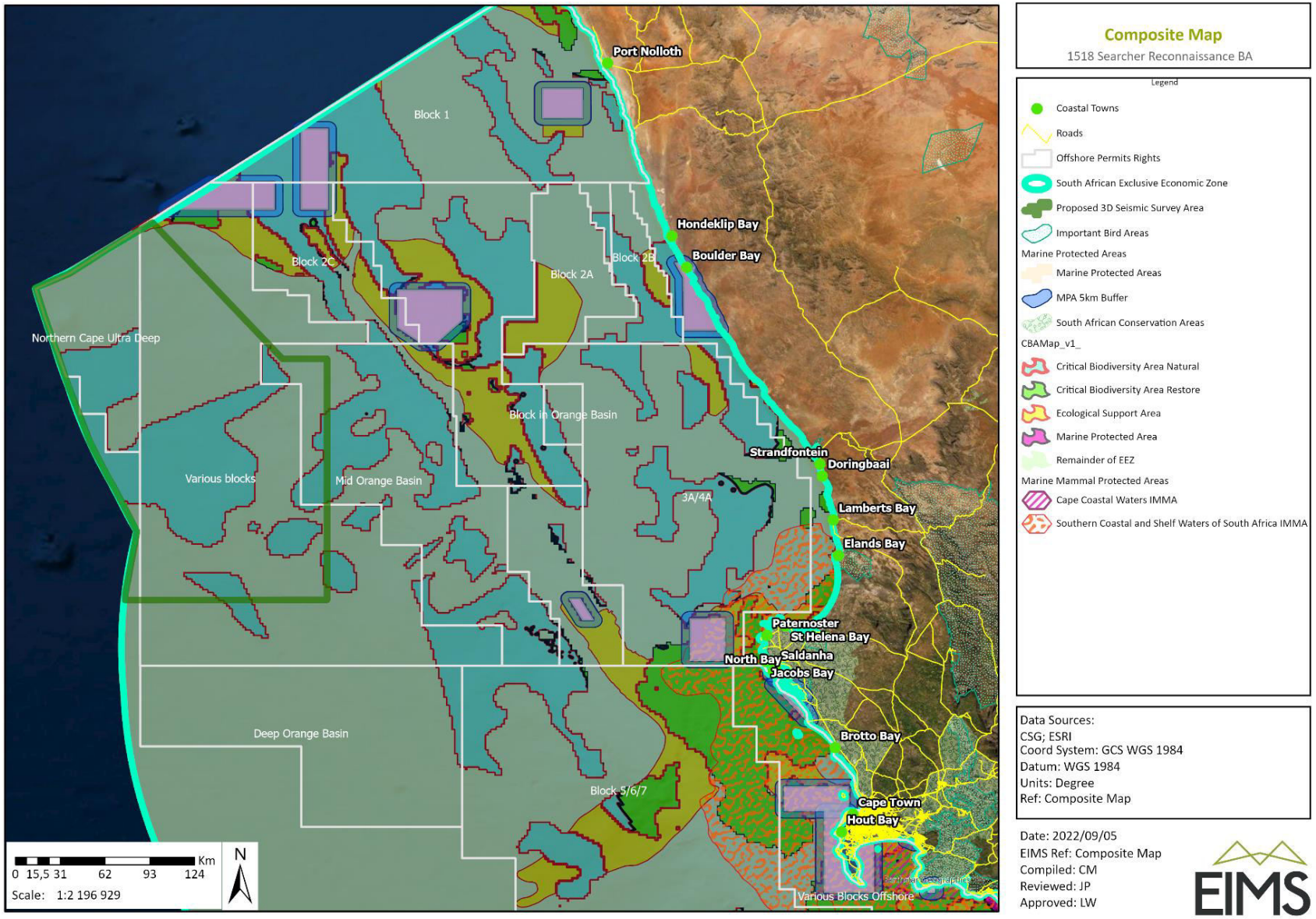

Figure 4: Site sensitivity map showing sensitivities within the exploration area.

6.1 Potential Impacts Identified

Potential impacts associated with the proposed activity have been identified and addressed in the EMPr and are summarised in the table below:

Table 3: Potential Impacts identified in Basic Assessment Report

#	Impact	Phase
1	Impacts of seismic noise on mysticetes and odontocetes	Operation
2	Impacts of seismic noise on seals	Operation
3	Impacts of seismic noise on turtles	Operation
4	Impacts of seismic noise on diving seabirds	Operation
5	Impacts of seismic noise to pelagic fish	Operation
6	Impacts of seismic noise to marine invertebrates	Operation
7	Impacts of seismic noise to plankton and ichthyoplankton	Operation
8	Disturbance and behavioural changes on seabirds, seals, turtles and cetaceans due to vessel noise	Operation
9	Disturbance and behavioural changes on seabirds, seals, turtles and cetaceans due to noise of support aircraft	Operation
10	Disturbance and behavioural changes on pelagic fauna due to vessel lighting	Operation
11	Impacts of marine biodiversity through the introduction of non-native species in ballast water and on ship hulls	Operation
12	Impacts of vessel discharges on marine fauna	Operation
13	Impacts to turtles and cetaceans due to ship strikes, collision and entanglement with towed equipment	Operation
14	Impacts to benthic and pelagic fauna due to accidental loss of equipment to the seabed or the water column	Operation
15	Impacts of an operational spill or collision on marine fauna	Operation
16	Exclusion from fishing grounds	Operation
17	Impact of sound on catch rates	Operation
18	Loss of Equipment	Operation
19	Accidental Release of diesel / oil	Operation
20	Impacts on cultural heritage	Operation
21	Impacts on livelihoods	Operation
22	Impacts on sense and spirit of place	Operation

#	Impact	Phase
23	Impacts on social licence to operate	Operation
24	Community expectations	Operation
25	Social unrest	Operation
26	Uncertainty	Operation
27	Concerns about cumulative impacts	Operation
28	Further marginalization of vulnerable groups	Operation
29	Stakeholder Fatigue (public engagements)	Pre-operation, Operation and Post-operation

7 ENVIRONMENTAL MANAGEMENT APPROACH

The compilation of an EMPr for an activity which is likely to result in significant environmental impacts is typically compiled at the culmination of a thorough investigation into the receiving environment and the identification and assessment of likely environmental impacts (i.e. EIA). This EMPr forms part of an EIA process. This EMPr aims to comply with the requirement of Appendix 4 of the EIA Regulations, 2014. These requirements are systematically addressed in the subsequent sections of this report. The primary objectives of the EMPr are as follows:

- To promote sustainability and describe an action programme to mitigate negative impacts as far as possible;
- To be a practical document that sets out both the goals and actions required in mitigation. Though the term "mitigation" can be broad in definition, it means in this context to "allay, moderate, palliate, temper or intensify." Mitigation of a negative impact means that its effect is reduced. Mitigation of a positive impact means that its effect is increased or optimised; and
- To indicate responsibilities for the implementation of these action items within the EMPr.

This EMPr shall be deemed to have contractual standing on the basis that its contents and specifically objectives are a detailed expansion of the environmental risks and consequent requirements of the EA (if, and when issued). Where relevant the Applicant is responsible for delegating responsibility for compliance to designated parties (internal or external). Such delegation must be legally binding to the extent relevant.

The objectives and targets in this EMPr are further guided by the NEMA, and specifically by the EIA Regulations, 2014. Thus, the underlying principles of sustainable development are the ultimate objectives and target of this report. The EMPr has included measures to ensure the development activity complies with the following principles, as instilled in the NEMA, amongst others:

i. That the disturbance of ecosystems and loss of biological diversity are minimised and remedied;

ii. That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;

iii. That waste is avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner;

iv. That a risk-averse and cautious approach is applied, which considers the limits of current knowledge about the consequences of decisions and actions; and

v. That negative impacts on the environment and on people's environmental rights be anticipated, prevented and remedied.

7.1 Environmental Management Principles

NEMA establishes a general framework for environmental law, in part by prescribing national environmental management principles that must be applied when making decisions that may have a significant impact on the environment. These principles are briefly summarised below:

7.1.1 Holistic Principle

The Holistic principle, as defined by NEMA (Section 2(4) (b)) requires that environmental management must be integrated, acknowledging that all elements of the environment are linked and inter-related and it must take into account the effect of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option (defined below in Section 7.1.2). Holistic evaluation does not mean that a project must be looked at as a whole. It rather means that it must be accepted that there is an all-inclusive whole into which a project is introduced. If the indications are that the project could have major adverse effects, the project must be reconsidered and where appropriate, re-planned or relocated to avoid an adverse impact or to ensure a beneficial impact.

7.1.2 Best Practicable Environmental Option

When it is necessary to undertake any action with environmental impacts, the different options that could be considered for the purpose must be identified and defined. The Best Practicable Environmental Option (BPEO) is defined in NEMA as "the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term." Other guidelines typically used for environmental management in terms of other legislation include: BPM which is the Best Practicable Means and BAT which is the Best Available Technology.

7.1.3 Sustainable Development

The concept of sustainable development was introduced in the 1980's with the aim to ensure that the use of natural resources is such that our present needs are provided without compromising the ability of future generations to meet their own needs. The constitution of South Africa is built around the fact that everyone has the right to have the environment protected through reasonable legislative and other measures that secure ecologically sustainable development. The National Environmental Principles included in the NEMA require development to be socially, environmentally and economically sustainable.

7.1.4 Preventative Principles

The preventative principle is fundamental to sustainable development and requires that the disturbance to ecosystems and the pollution, degradation of the environment and negative impacts on the environment be avoided, or, where they cannot be altogether avoided, are minimised and remedied.

7.1.5 The Precautionary Principle

The precautionary principle requires that where there is uncertainty, based on available information, that an impact will be harmful to the environment, it is assumed, as a matter of precaution, that the said impact will be harmful to the environment until such time that it can be proven otherwise. The precautionary principle requires that decisions by the private sector, governments, institutions and individuals need to allow for and recognise conditions of uncertainty, particularly with respect to the possible environmental consequences of those decisions. In South Africa, the DWS (then DWAF) adopted a BPEO guideline in 1991 for water quality management and in 1994 in the Minimum Requirements document for waste management.

In terms of DWAF Minimum Requirements for the Handling and Disposal of Hazardous Waste, 1994, the precautionary principle is defined as, "Where a risk is unknown; the assumption of the worst-case situation and the making of provision for such a situation." Here the precautionary principle assumes that a waste or an identified contaminant of a waste is "both highly hazardous and toxic until proven otherwise."

In the context of the EIA process in South Africa, the precautionary principle also translates to a requirement to provide sound, scientifically based, information that is sufficient to provide the decision-making authority with

reasonable grounds to understand the potential impacts on the environment, the extent thereof and how impacts could be mitigated. If such information is not adequate for this purpose, the relevant authority cannot be satisfied as is required and then the authority should require that further information be collected and provided.

7.1.6 Duty of Care and Cradle to Grave Principle

In terms of the NEMA Section 28, “Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.”

By way of example, the principle of “duty of care” in terms of waste management emphasises the responsibility to make sure that waste is correctly stored and correctly transported, as it passes through the chain of custody to final point of disposal. This means that waste must always be stored safely and securely. The company removing and disposing of waste also holds the responsibility to hold the relevant licenses, and that waste is transported alongside the necessary paperwork.

“Cradle to Grave” refers to the responsibility a company takes for the entire life cycle of a product, service or program, from design to disposal or termination. In terms of the DWAF Minimum Requirements for the Handling and Disposal of Hazardous Waste, 1994, “any person who generates, transports, treats or disposes of waste must ensure that there is no unauthorised transfer or escape of waste from his control. Such a person must retain documentation describing both the waste and any related transactions. In this way, he retains responsibility for the waste generated or handled.” This places responsibility for a waste on the Generator and is supported by the "Cradle to Grave" principle, according to which a "manifest" accompanies each load of Hazardous Waste until it is responsibly and legally disposed. This manifest is transferred from one transporter to the next along with the load, should more than one transporter be involved. Once the waste is properly disposed of at a suitable, permitted facility, a copy of the manifest must be returned to the point of origin.” Duty of Care offers one strategy to implement sustainable development.

7.1.7 Polluter Pays Principle

The "polluter pays principle" holds that the person or organisation causing pollution is liable for any costs involved in cleaning it up or rehabilitating its effects. It is noted that the polluter will not always necessarily be the generator, as it is possible for responsibility for the safe handling, treatment or disposal of waste to pass from one competent contracting party to another. The polluter may therefore not be the generator but could be a disposal site operator or a transporter. Through the 'duty of care' principle, however, the generator will always be one of the parties held accountable for the pollution caused by the waste. Accordingly, the generator must be able to prove that the transferral of management of the waste was a responsible action. The polluter pays principle acceding to NEMA dictates that “the cost of remedying pollution, environmental degradation and consequent adverse effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.”

7.2 Duty of Care Responsibilities

Section 28 of the NEMA makes provision for duty of care, and remediation of environmental damage. The binding principles are described below:

1. Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.

   (1A) Subsection (1) also applies to a significant pollution or degradation that-

   a) occurred before the commencement of this Act;

b) arises or is likely to arise at a different time from the actual activity that caused the contamination; or

c) arises through an act or activity of a person that results in a change to pre-existing contamination.

2. Without limiting the generality of the duty in subsection (1), the persons on whom subsection (1) imposes an obligation to take reasonable measures, include an owner of land or premises, a person in control of land or premises or a person who has a right to use the land or premises on which or in which-

   a) any activity or process is or was performed or undertaken; or

   b) any other situation exists, which causes, has caused or is likely to cause significant pollution or degradation of the environment.

3. The measures required in terms of subsection (1) may include measures to-

   a) investigate, assess and evaluate the impact on the environment;

   b) inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment;

   c) cease, modify or control any act, activity or process causing the pollution or degradation;

   d) contain or prevent the movement of pollutants or the cause of degradation;

   e) eliminate any source of the pollution or degradation; or

   f) remedy the effects of the pollution or degradation.

7.3 Failure to Comply with Environmental Considerations

Within the provisions of the relevant environmental legislation, there are a number of penalties for non-compliance or offences. Below a few extracts are presented for information purposes, however these must not be read in isolation and the reader is reminded that there are other Acts, or sections of Acts, that may be applicable to the relevant project:

- NEMA Section 49B(1): A person convicted of an offence in terms of section 49A(1)(a), (b), (c), (d), (e), (f) or (g) is liable to a fine not exceeding R10 million or to imprisonment for a period not exceeding 10 years, or to both such fine or such imprisonment- this includes commencing with a listed activity without an EA or the non-compliance with conditions of any EA and associated EMPr;
- NEMA Section 49B(2): A person convicted of an offence in terms of section 49A(1)(i), (j) or (k) is liable to a fine not exceeding R5 million or to imprisonment for a period not exceeding 5 years, and in the case of a second or subsequent conviction to a fine not exceeding R10 million or to imprisonment for a period not exceeding 10 years, and in both instances to both such fine and such imprisonment;
- NEMA Section 49B(3): A person convicted of an offence in terms of section 49A(1)(h), (l), (m), (n), (o) or (p) is liable to a fine or to imprisonment for a period not exceeding one year, or to both a fine and such imprisonment;
- NWA Section 151 (1c): No person may fail to comply with any condition attached to a permitted water use under this Act;
- NWA Section 151 (2): Any person who contravenes any provision of subsection (1) is guilty of an offence and liable, on the first conviction, to a fine or imprisonment for a period not exceeding five years, or to both a fine and such imprisonment and, in the case of a second or subsequent conviction, to a fine or imprisonment for a period not exceeding ten years or to both a fine and such imprisonment;
- NEM:BA Section 102 (1): A person convicted of an offence in terms of section 101 is liable to a fine not exceeding R10 million, or an imprisonment for a period not exceeding ten years, or to both such a fine and such imprisonment;

- NEM:WA Section 68 (1): A person convicted of an offence referred to in section 67(1)(b), (c), (d), (e), (f), (i), (j), (k) or (l) or section 67(2)(a), (b), (c), (d) or (e) is liable to a fine not exceeding R5 000 000 or to imprisonment for a period not exceeding five years, or to both a fine and such imprisonment, in addition to any other penalty or award that may be imposed or made in terms of the National Environmental Management Act;
- NEM:WA Section 68 (2): A person convicted of an offence referred to in section 67(1)(b), (c), (d), (e), (f), (i), (j), (k) or (l) or section 67(2)(a), (b), (c), (d) or (e) is liable to a fine not exceeding R5 000 000 or to imprisonment for a period not exceeding five years, or to both a fine and such imprisonment, in addition to any other penalty or award that may be imposed or made in terms of the National Environmental Management Act;
- NEM:WA Section 68 (3): Any person convicted of an offence referred to in section 67(1)(m) is liable to a fine or to imprisonment for a period not exceeding six months or to both a fine and such imprisonment;
- NEM:WA Section 68 (4): A person who is convicted of an offence in terms of this Act and who persists after conviction in the act or omission that constituted the offence commits a continuing offence and is liable on conviction to a fine not exceeding R1 000 or to imprisonment for a period not exceeding 20 days, or to both such fine and such imprisonment, in respect of each day that person persists with that act or omission;

It is recommended that a procedure for non-compliances (i.e. incentives or disincentives for conformance and non-conformance with the EMPr requirements) must be employed to ensure that the EMPr is adequately implemented. The system to be used must be determined before the project commences, included in the tender documents and contracts, and made clear to all project workers. The system may include that the independent Environmental Control Officer (ECO) can be authorized to impose spot fines on the Contractor and/or his subcontractors for any of the defined transgressions. Such fines should be issued in addition to any remedial costs incurred as a result of non-compliance with the environmental specifications and or legal obligations.

8 ROLES AND RESPONSIBILITIES

The applicant will be responsible for ensuring overall compliance with the provisions of the EMPr. Implementation is the key to the success of the EMPr. In order to ensure that the EMPr and its mitigation measures are implemented, roles and responsibilities need to be clearly defined and documented prior to commencement. This section serves as a guide on which party is normally responsible for certain tasks. Specific roles are designated in the specific environmental management and mitigation requirements in this EMPr.

8.1 The Project Applicant/Proponent

The applicant is the principal party (Proponent) of the project. For the purposes of this project it is understood that the Applicant role is fulfilled by the Searcher. The legal accountability for correct implementation of the relevant requirements of the EA and EMPr falls primarily upon the applicant and must therefore be built into all contractor's contractual agreements. The applicant's role typically includes:

- Provide for all necessary supervision during the execution of the project including appointment of key personnel to act on his/her behalf during the project (e.g.: Project Manager). The key personnel will be tasked with ensuring that the various contractors/developers comply with the necessary provisions of the EA and EMPr;
- Ensure that the various contractors and applicable sub-contractors appoint a suitably qualified, competent Environmental Officer (EO) that will be responsible for among others, ensuring daily compliance with the EMPr and EA throughout the execution of the relevant project components;
- Appoint a suitably qualified, competent independent Environmental Compliance Officer (ECO) who will undertake periodic audits on the various contractors works and produce relevant ECO reports;
- Appoint at least 2 suitably qualified MMOs to monitor marine fauna for the duration of the survey;

- Appoint an independent and suitably qualified PAM operator to monitor marine fauna for the duration of the survey;
- Appoint a suitably qualified FLO to facilitate communications between the seismic and fishing vessels for the duration of the survey;
- Notify the relevant competent authority of changes in the development resulting in significant environmental impacts;
- Assess the various contractor's environmental performance during the survey, in consultation with the ECO;
- Ensure compliance with regulations;
- To implement the projects as per the approved project plan;
- To ensure that implementation is conducted in an environmentally acceptable manner;
- To comply with special conditions as stipulated by surrounding landowners during the negotiation process (if any);
- To inform and educate all employees about the environmental risks associated with the different activities that should be avoided during the survey process and lessen significant impacts to the environment; and
- Ensure MMOs and PAM operators are briefed on the area-specific sensitivities and on the seismic survey planning (including roles and responsibilities, and lines of communication).

Seabird, turtle and marine mammal incidence data and seismic source output data arising from surveys should be made available on request to the Marine Mammal Institute, the Department of Forestry, Fisheries and the Environment (DFFE), and the Petroleum Agency South Africa (PASA) for analyses of survey impacts in local waters. Therefore, ultimately, the Applicant is responsible for the development and implementation of the EMPr and, where relevant, ensuring that the conditions in the EA are satisfied. Where survey activities are contracted out (e.g. to Contractors and Subcontractors), the liability associated with non-compliance still rests with the Applicant (unless otherwise agreed upon between the authorities, the Applicant and the contracting parties). The Applicant (and not the Contractor) is therefore responsible for liaising directly with the relevant authorities with respect to the preparation and implementation of the EMPr and meeting authorisation conditions.

8.2 The Project Manager

During the development, it is envisaged that there may be a number of contractors and sub-contractors undertaking various activities on the project. The Project Manager would oversee all contractors and sub-contractors from a project management point of view. The roles of the Project Manager typically include the following:

- The Project Manager acts on behalf of the Applicant regarding the administration of contracts to sub-contractors, etc.;
- Provides and/or approves scheduling, aspects of co-ordination and estimating;
- Ensures implementation of the project plan within cost, time and quality constraints;
- Ensures that implementation of EMPr is executed as planned; and
- Keeps the asset owner informed of progress made during the life cycle of the project.

8.3 The Environmental Compliance Officer

The ECO is appointed by the Applicant and should be independent from the Applicant and the Contractors / Operators. The ECO should have appropriate training and/or experience in the implementation of environmental management specifications. The ECO must preferably have a tertiary qualification in an Environmental Management or appropriate field. The ECO provides feedback to the Project Manager regarding all environmental matters. The ECO's key role is auditing the implementation of the EMPr. For the purposes of

implementing the conditions contained herein, the Applicant should appoint the ECO well before the start of survey activities. The ECO will be responsible for the auditing function as well as the clarification of environmental conditions contained in this EMPr to anyone working on the site. The ECO does not necessarily have to be onboard the survey vessel, provided that relevant information is provided by the MMO / PAM.

The ECO roles include:

- Recommendations for review and update of the EMPr;
- Liaison between the Applicant, Contractors, authorities and other lead stakeholders on high importance environmental concerns;
- Ensures that correct shape files have been uploaded into the vessel navigation systems to support effective implementation of spatial controls
- Review the site induction training to ensure environmental issues receive adequate attention and important site-specific issues are included;
- Conduct environmental audits of the site/contractors including relevant documentation on a monthly basis;
- Validating the regular site inspection reports, which are to be prepared by the relevant contractor's EO or Lead MMO/PAM (who will be tasked with the onsite responsibilities of the ECO);
- Maintain a record of all non-conformances and incidents to ensure that measures are put in place to remedy such;
- Maintain a public consultation register in which all complaints are recorded, as well as action taken; and
- Verification that all environmental monitoring programmes (sampling, measuring, recording etc. when specified) are carried out according to protocols and schedules.

It is important to note that where opportunity for interpretation occurs within the conditions of this EMPr, the interpretation of the ECO will take preference.

8.4 Marine Mammal Observer

Independent Marine Mammal Observer (MMO) is required on board at all times. As a minimum, at least one MMO must be on watch during all daylight hours for the pre-acquisition observations and while the acoustic source is active. The duties of the MMO would be to:

- Give effective briefings to crew members, and establish clear lines of communication and procedures for onboard operations;
- Record seismic source activities, including sound levels, "soft-start" procedures and pre-start regimes;
- Observe and record responses of marine fauna to seismic source from optimum vantage points, including seabird, turtle, seal and cetacean incidence and behaviour and any mortality or injuries of marine fauna as a result of the seismic survey. Data captured should include species identification, position (latitude/longitude), distance/bearing from the vessel, swimming speed and direction (if applicable) and any obvious changes in behaviour (e.g. startle responses or changes in surfacing/diving frequencies, breathing patterns) as a result of the seismic activities. Both the identification and the behaviour of the animals must be recorded accurately along with current seismic sound levels. Any attraction of predatory seabirds, large pelagic fish or cetaceans (by mass disorientation or stunning of fish as a result of seismic survey activities) and incidents of feeding behaviour among the hydrophone streamers should also be recorded;
- Record sightings of any injured or dead protected species (marine mammals, large pelagic fish (e.g. sharks), seabirds and sea turtles) should be recorded, regardless of whether the injury or death was caused by the seismic vessel itself. If the injury or death was caused by a collision with the seismic vessel, the date and location (latitude/longitude) of the strike, and the species identification or a description of the animal should be recorded and included as part of the daily report;

- Record meteorological conditions at the beginning and end of the observation period, and whenever the weather conditions change significantly;
- Request the delay of start-up or temporary termination of the seismic survey or adjusting of seismic source, as appropriate. It is important that MMO decisions on the termination of seismic source is made confidently and expediently, and following dialogue between the observers on duty at the time. A log of all termination decisions must be kept (for inclusion in both daily and "close-out" reports);
- Use a recording spreadsheet in order to record all the above observations and decisions; and
- Prepare daily reports of all observations, to be forwarded to the necessary authorities as required, in order to ensure compliance with the mitigation measures.

8.5 Passive Acoustic Monitoring Operator

An independent Passive Acoustic Monitoring (PAM) Operator is required on board at all times. As a minimum, at least one PAM must be on watch at all times while the acoustic source is active. The duties of the PAM operator would be to:

- Provide effective regular briefings to crew members, and establish clear lines of communication and procedures for onboard operations;
- Ensure that the hydrophone cable is optimally placed, deployed and tested for acoustic detections of marine mammals;
- Confirm that there is no marine mammal activity within 500 m of the seismic source array prior to commencing with the "soft-start" procedures;
- Record species identification, position (latitude/longitude), distance and bearing from the vessel and acoustic source, where possible;
- Record general environmental conditions;
- Record seismic source activities, including sound levels, "soft-start" procedures and pre-start regimes;
- Request the delay of start-up and temporary termination of the seismic survey, as appropriate;

8.6 Fisheries Liaison Officer

An Independent Fisheries Liaison Officer (FLO) must be appointed to undertake the following:

- Facilitate communication with maritime vessels;
- Report daily on vessel activity;
- Respond and advise on action to be taken in the event of encountering fishing gear; and
- Report daily on the survey vessel's potential impacts on marine fauna.

8.7 The Contractor/ Operator

The contractor / operator is usually a third party appointed by the applicant/project manager to undertake the actual survey acquisition. For the purposes of this section, any contractor (regardless of who appointed them) is referred to as the "contractor".

The relevant contractors are answerable to the Project Manager and ECO for all environmental issues associated with the project. Contractor performance will, amongst others, be assessed on health, safety and environmental management criteria. The principal contractor/s, any other contractors and sub-contractors will be required to comply with the provisions contained herein, and accordingly, the EMPr and its provisions must form part of any contractual arrangements between the applicant and contractors, and contractors and their sub-contractors, etc. The contractor must comply with EMPr and ensure that all his employees and sub-contractors appointed by him/her are familiar with the EMPr. The legal accountability for correct implementation of the relevant requirements of the EA and EMPr must be contractually bound to the appointed contractor.

The Contractors roles include (but not limited to):

- Provide all necessary supervision during the execution of the project;
- Adhere to the instruction of the onsite EO or Lead MMO/PAM (who will be tasked with the onsite responsibilities of the EO) and provide any relevant data to evidence daily compliance with the EMPr, EA during the acquisition phase;
- Adhere to the instructions of the MMO and PAM operators with regards to seismic source soft start procedures and possible temporary termination of activities if indicated by marine fauna observations;
- To implement the project as per the approved project plan;
- To ensure that implementation is conducted in an environmentally acceptable manner;
- To fulfil all obligations as per the agreed contract; and
- Ensure that the Contractors staff and employees have received the appropriate environmental awareness training prior to commencing survey activities.

8.8 The Contractor/ Operator Onsite Environmental Officer

The Principal Contractor / Operator shall appoint an onsite Environmental Officer (EO), who is responsible for implementation of the EMPr. The Contractor / Operator must ensure that the Contractor's EO is suitably qualified and competent to perform the necessary tasks and is appointed at a level such that she / he can interact effectively with other Contractors / Operators, labourers, the ECO and the public (if necessary). The Contractor's / Operator's EO ensures that all sub-contractors working under the Contractor / Operator and sub-contractors abide by the requirements of the EMPr. The appointment of additional EO and/or sub-contractors EO's is at the ECO's discretion. The costs related to the implementation of the EMPr will be the responsibility of the relevant Contractor / Operator.

The Contractor's / Operator's EO roles will include:

- Preparing activity based Environmental Method Statements where applicable and where required by the ECO;
- Review the contractors safe work procedures/risk assessments/induction training/DSTI's (daily safe task instruction) during the survey and include information relating to the relevant environmental risks and appropriate mitigation measures;
- Support the ECO in monitoring by maintaining a permanent presence on board the survey vessel;
- Establishing and maintaining an environmental incident register;
- Taking required corrective action within specified time frame in respect of non-conformances and environmental incidents;
- Assist in finding environmentally acceptable solutions to problems;
- Attendance at HSE meetings, toolbox talks and induction programmes (where relevant);
- Complete a daily diary with the purpose of recording environmental issues and corrective measures on a daily basis;
- Report any complaints to the ECO to be captured in the Consultation register;
- Liaise with the project teams on issues related to implementation of, and compliance with the EMPr; and
- Ensure adequate and compliant waste management.

For the purposes of this project, the role of EO can be fulfilled by the Lead MMO / PAM. If this is the case, then the roles must be clearly indicated in the Lead MMO's / PAM's appointment letter.

8.9 The Authorities

The authorities that should be involved include the Administrative Authority (DFFE) and the Competent Authorities (DMRE). The authorities may be required to perform the following roles:

- Review Monitoring and Audit reports, if required;
- Review whether there is compliance by the Applicant and Contractor with the terms of the EMPr and permit/license conditions. Whenever necessary, the authorities should assist the Applicant in understanding and meeting the specified requirements; and
- The authorities may perform random controls to check compliance. In case of persistent non-compliance, the Applicant will be required to provide an action plan with corrective measures, and have it approved by the authorities.

9 ENVIRONMENTAL MANAGEMENT SYSTEM

The purpose of this EMPr is to ensure that the environment is properly considered during the design, mobilisation, operations, and completion of the survey activities, and that negative impacts are minimised or prevented, and positive impacts enhanced. At the same time the EMPr should provide a logical extension of the EIA, specialist studies, or any other technical planning and assessment documentation, to ensure that recommendations are implemented, and that the project does not deviate from the environmental profile that formed the basis of the assessment.

9.1 Document Control

A formal document control system should be established. The document control system must provide for the following requirements;

- Documents are approved for adequacy prior to use;
- Review and update documents as necessary and re-approve documents;
- Ensure that changes and the current version status of documents are identified;
- Ensure that relevant versions of applicable documents are available at points of use;
- Ensure that documents remain legible and readily identifiable;
- Ensure that documents of external origin necessary for the EMPr are identified and their distribution controlled; and
- Prevent unintended use of obsolete documents and apply suitable identification to them if they are retained for any purpose.

The responsibility for establishing a suitable document control system rests with the Project Manager.

9.2 Record Keeping

It is essential that an official procedure for control of records be developed to ensure records required to demonstrate conformity to environmental standards are maintained. The Applicant, or the Project Manager (if assigned) is therefore required to develop and maintain a procedure for the identification, storage, protection, retrieval, retention and disposal of records as part of the EMPr. Records must be legible, identifiable and traceable.

9.3 Auditing and Reporting Procedures

Reporting procedures must be developed at the start of the project, for conveying information from the compliance monitoring activities and to ensure that management is able to take rapid corrective action should certain thresholds be exceeded. Different reporting procedures may include:

- Inspections;

- Accidents and emergencies;
- Measuring performance indicators and interpreting and acting on the indicators;
- Records of monitoring activities to test the effectiveness of mitigation measures and impact controls, as well as for compliance auditing purposes; and
- Training programmes and evidence of appropriate levels/amount of skills/capacities created.

All monitoring and auditing must be accompanied by applicable records and evidence (e.g. delivery slips, photographic records, etc.). All reports must be retained and made available for inspection by the ECO, the Applicant and /or the Relevant Competent Authorities. All reports shall be signed by the relevant parties to ensure accountability. The Applicant must use the audit report findings to continually ensure that environmental protection measures are working effectively through a system of self-checking. The EMPr should be viewed as a dynamic document aimed at continual environmental performance improvement.

The following auditing and reporting shall be required throughout the survey:

- Daily Environmental Diary: These reports must be prepared by the contractors' EO and must aim to monitor and report on day-to-day activities so as to ensure compliance with the relevant authorisations, licences and permits, the approved EMPr, and environmental method statements;
- Monthly Compliance Reports (EO): These reports must be prepared by the contractors' EO and must aim to provide a concise monthly performance report, including copies of relevant documents (e.g. waste manifests, incident registers, consultation registers, etc);
- Monthly Audit Reports: The ECO must compile monthly compliance reports (audits) which are to be submitted to the Applicant for review and correction of non-compliance issues. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified. Depending on the outcome of the authorisation processes it may be a requirement to submit these to the relevant authorities.

9.4 Responding to Non-Compliances

Non-compliance will be identified and managed through the following four key activities including:

- Inspections of the survey vessel and activities related to the survey;
- Monitoring of selected environmental quality variables (where relevant);
- Audits of the survey activities and relevant documentation; and
- Reporting on a monthly basis.

An environmental non-conformance and incident register must be prepared and maintained by the ECO throughout the 3D seismic survey in order to track and monitor environmental concerns, incidents, and non-conformances. The register must include details of date, location (coordinates), description of the NC or Incident, applicable environmental commitment/standard, corrective action taken, adequacy of corrective action, date rectified, etc.

Non-compliance with the EMPr or any other environmental legislation, specifications or standards shall be recorded by the ECO in the non-conformance register. This register shall be maintained by the ECO and will be sent to the Applicant and Contractor on a regular basis (monthly), and the Applicant shall ensure that the responsible party takes the necessary corrective actions. Non-conformances may only be closed out in the register by the ECO upon confirmation that adequate corrective action has been taken and/or documented proof provided. The register should be utilised to measure overall environmental performance.

9.5 Environmental Incidences

For the purposes of this project, an environmental incident can be divided into three levels, i.e. major, medium and minor. All Major and Medium environmental incidents shall be recorded in the ECO's non-conformance and incident register. Minor incidents shall be recorded by the contractor, and by the Applicant in their own incident register. Definitions of environmental incidents are provided in **Table 4**.

Table 4: Description of incidents and non-conformances for the purpose of the project

Non-Conformance	Any deviation from work standards, practices, procedures, regulations, management system performance etc. that could either directly or indirectly lead to injury or illness, damage to the workplace or oceanic environment, legal transgression or a combination of these.
Major Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in widespread, long-term, irreversible significant negative impact on the oceanic environment and/or has a high risk of legal liability. A major environmental incident usually results in a significant pollution and may entail risk of public danger. Major environmental incidents usually remain an irreversible impact even with the involvement of long-term external intervention i.e. expertise, best available technology, remedial actions, excessive financial cost etc. Major environmental incidents must be reported to the authorities. The ECO shall make the final decision as to whether a particular incident should be classified as a Major incident.
Medium Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in widespread or localised, short term, reversible significant negative impact on the oceanic environment and/or has a risk of legal liability. A medium environmental incident may be reported to the authorities, can result in significant pollution or may entail risk of public danger. The impact of medium environmental incidents should be reversible within a short to medium term with or without intervention. The ECO shall make the final decision as to whether a particular incident should be classified as a Medium incident.
Minor Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, where the oceanic environmental impact is negligible immediately after occurrence and/or once-off intervention on the day of occurrence.

The following incident reporting procedures shall apply to this project:

- All environmental incidents shall be reported to Contractor's onsite EO or Lead MMO / PAM, and shall be recorded in the contractors' respective incident registers. The Contractor's EO or Lead MMO / PAM shall immediately notify the ECO.
- The ECO shall record the incident in the non-conformance and incident register and advise on the appropriate measures and timeframes for corrective action;
- An incident report shall be completed by the relevant party responsible for the incident for all medium and major incidents and the report shall be submitted to the Project Manager and ECO within 5 calendar days of the incident;
- The ECO shall investigate all incidents and identify any required actions to prevent a recurrence of such incidents; and
- In the event of an emergency incident (unexpected sudden occurrence), including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed, the Applicant shall notify the relevant authorities in accordance with Section 30(3) of the NEMA. The Applicant shall engage the ECO who shall assess all major incidents and shall advise the Applicant when any such incident must be reported to the authorities as per the above requirement.

9.6 Application of the Mitigation Hierarchy

A key component of the EIA process is to explore practical ways of avoiding and where not possible to reducing potentially significant impacts of the proposed seismic acquisition activities. The mitigation measures put forward are aimed at preventing, minimising or managing significant negative impacts to as low as reasonably practicable (ALARP). The mitigation measures are established through the consideration of legal requirements, project standards, best practice industry standards and specialist inputs.

The mitigation hierarchy, as specified in International Finance Corporation (IFC) Performance Standard 1, is based on a hierarchy of decisions and measures aimed at ensuring that wherever possible potential impacts are mitigated at source rather than mitigated through restoration after the impact has occurred. Any remaining significant residual impacts are then highlighted and additional actions are proposed. With few exceptions, however, identified impacts were of low significance with very low or zero potential for further mitigation. In such cases the appropriate project Standards will be used and additional best management practices are proposed.

The operator will ensure that the proposed seismic survey is undertaken in a manner consistent with good international industry practice and Best Available Techniques (BAT), and in compliance with the applicable requirements in the MPRDA regulations.

The operator will ensure that the proposed seismic survey is undertaken in a manner consistent with good international industry practice and in compliance with the applicable requirements in MARPOL 73/78, as summarised below.

- The discharge of biodegradable wastes from vessels is regulated by MARPOL 73/78 Annex V, which stipulates that:
    - No disposal to occur within 3 nautical miles (± 5.5 km) of the coast.
    - Disposal between 3 nautical miles (± 5.5 km) and 12 nautical miles (± 22 km) needs to be comminuted to particle sizes smaller than 25 mm.
    - Disposal overboard without macerating can occur greater than 12 nautical miles from the coast when the vessel is sailing.
- Discharges of oily water (deck drainage, bilge and mud pit wash residue) to the marine environment are regulated by MARPOL 73/78 Annex I, which stipulates that vessels must have:
    - A Shipboard Oil Pollution Emergency Plan (SOPEP).
    - A valid International Oil Pollution Prevention Certificate, as required by vessel class.
    - 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 in water concentration must be less than 15 ppm prior to discharge overboard.
    - Oil residue holding tanks.
    - Oil discharge monitoring and control system.
- Sewage and grey water discharges from vessels are regulated by MARPOL 73/78 Annex IV, which specifies the following:
    - Vessels must have a valid International Sewage Pollution Prevention Certificate.
    - Vessels must have an onboard sewage treatment plant providing primary settling, chlorination and dechlorination before discharge of treated effluent.
    - The discharge depth is variable, depending upon the draught of the seismic vessel / support vessel at the time, but will be in accordance with MARPOL 73/78 Annex IV.
    - Discharge of sewage beyond 12 nm requires no treatment. However, sewage effluent must not produce visible floating solids in, nor cause the discolouration of, the surrounding water.

- Sewage must be comminuted and disinfected for discharges between 3 nautical miles (± 6 km) and 12 nautical miles (± 22 km) from the coast. This will require an onboard sewage treatment plant or a sewage comminuting and disinfecting system.
- Disposal of sewage originating from holding tanks must be discharged at a moderate rate while the ship is proceeding on route at a speed not less than 4 knots.

- Sewage will be treated using a marine sanitation device to produce an effluent with:
  - A biological oxygen demand (BOD) of <25 mg/l (if the treatment plant was installed after 1/1/2010) or <50 mg/l (if installed before this date).
  - Minimal residual chlorine concentration of 1.0 mg/l.
  - No visible floating solids or oil and grease.

The project will also comply with industry best practices with regard to waste management, including:

- Waste management will follow key principles: Avoidance of Waste Generation, adopting the Waste Management Hierarchy (reduce, reuse, recycle, recover, residue disposal), and use of Best Available Technology (BAT).
- An inventory will be established of all the potential waste generated, clarifying its classification (hazardous, non-hazardous or inert) and quantity, as well as identifying the adequate treatment and disposal methods.
- Waste collection and temporary storage shall be designed to minimise the risk of escape to the environment (for example by particulates, infiltration, runoff or odours).
- On-site waste storage should be limited in time and volume.
- Dedicated, clearly labelled, containers (bins, skips, etc.) will be provided in quantities adapted to anticipated waste streams and removal frequency.

Detailed mitigation measures for seismic surveys in other parts of the world are provided by Weir et al. (2006), Compton et al. (2007) and US Department of Interior (2007). Many of the international guidelines presented in these documents are extremely conservative as they are designed for areas experiencing repeated, high intensity surveys and harbouring particularly sensitive species, or species with high conservation status. A number of countries have more recently updated their guidelines, most of which are based on the JNCC (2010, 2017) recommendations but adapted for specific areas of operation. A review and comparison of these is provided in MaMa CoCo SEA (2015). The guidelines currently applied to seismic surveying in South African waters are those proposed in the Generic EMPr (CCA & CMS 2001). These have been updated as necessary to include salient points from recognised international guidelines, particularly the JNCC (2010, 2017) Guidelines and the 2013 New Zealand Code of Conduct for seismic operations.

10 REVIEW AND REVISION OF THE EMPR

It is important to note that this EMPr is made legally binding on the Applicant through the EA and the approval of the EMPr by the decision-making authority. It is important to consider that the EMPr is a dynamic document which may require such alteration and /or amendment as the project evolves. Conditions under which the EMPr would require revision include:

- Changes in legislation;
- Occurrence of unanticipated impacts or impacts of greater intensity, extent and significance than predicted;
- Inadequate mitigation measures (i.e. where environmental performance does not meet the required level despite the implementation of the mitigation measure);
- Secondary impacts occur as a result of the mitigation measures; and
- Instances where the implementation of the specified management, as a result of changes in circumstances, may become impractical or unreasonable to implement.

The Applicant in consultation with the ECO should be responsible for ensuring that the registration and updating of all relevant EMPr documentation is carried out. It shall be the responsibility of the Applicant, in consultation with the ECO, to ensure that all personnel are performing according to the requirements of the document control procedure, and to initiate the revision of controlled documents, when required by changes in process or operations.

The ECO must undertake a risk assessment of any proposed changes to the EMPr. This risk assessment must be included in the applicable monthly audit report, and where applicable supported by the necessary proof of public consultation. It is important to note that if alterations and/or amendments are required these may only be affected with written approval from the competent authority and in accordance with the relevant legal processes.

11 ENVIRONMENTAL AWARENESS PLAN AND TRAINING

Training and environmental awareness is an integral part of a complete EMPr. The overall aim of the training will be to ensure that all site staff are informed of their relevant requirements and obligations pertaining to the relevant authorisations, licences, permits and the approved EMPr and protection of the environment.

The applicant and contractor must ensure that all relevant employees are trained and capable of carrying out their duties in an environmentally responsible and compliant manner and are capable of complying with the relevant environmental requirements. To obtain buy-in from staff, individual employees need to be involved in:

- Identifying the relevant risk;
- Understanding the nature of risks;
- Devising risk controls; and
- Given incentive to implement the controls in terms of legal obligations.

The Applicant shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. All training must be formally recorded, and attendance registers retained. The environmental training should, as a minimum, include the following:

- General background and definition of the oceanic environment;
- The importance of compliance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- Compliance with mitigation measures proposed for sensitive marine fauna;
- Their roles and responsibilities in achieving compliance with the environmental policy and procedures and with the requirement of the applicant's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences (legal and/or other) of departure from specified operating procedures including fines (where applicable);
- The mitigation measures required to be implemented when carrying out their work activities; and
- All operational risks must be identified, and processes established to mitigate such risk, proactively. Thus, the applicant needs to inform the employees of any environmental risks that may result from their work, and how these risks must be dealt with in order to avoid pollution and/or degradation of the oceanic environment.

The specific requirements for environmental training during the survey include:

- Environmental Induction Training: All workers must receive induction training which shall be presented by the Contractors HSE Manager Representatives. The induction training must include an environmental management component which will be prepared by the Contractor's onsite EO or Lead MMO / PAM and presented where possible by the Contractor's onsite EO or Lead MMO / PAM. The

training material must include general environmental awareness with an overview of the approved EMPr and applicable authorisations, licences and permits. Health and safety expectations including communication and reporting to key personnel, including incidents and during emergencies, should also be outlined. The Induction Training Material must be reviewed and approved by the ECO;

- Weekly Environmental Toolbox Talks will be prepared by the Contractor's onsite EO or Lead MMO / PAM to cover a range of environmental topics and must be presented to relevant staff during applicable times during the seismic survey process (e.g. at the start of a day or activity). The aim of these toolbox talks will be to inform employees of general environmental requirements pertaining to specific activities, as well as specific EMPr and EA requirements and obligations. The ECO shall review environmental toolbox talks on a periodic basis to ensure the material is relevant and appropriate;
- Informal training of all seismic survey staff is also required on an on-going basis through informal discussions, on-site supervision and through facilitation of day to day activities. Such training must be given or otherwise facilitated by the Contractor's onsite EO or Lead MMO / PAM; and
- The Contractor's onsite EO or Lead MMO / PAM must review all safe work procedures/risk assessments/DSTI's (daily safe task instruction) from the safety department and include the relevant environmental risks and appropriate mitigation measures where necessary. Since the above procedures are specific to the applicable activity being undertaken, the inclusion of environmental measures aims to ensure each activity is undertaken in an environmentally responsible manner.

12 EMERGENCY RESPONSE PLAN

The Applicant must identify potential emergencies and develop procedures for preventing and responding to them. There are several options for dealing with high priority impacts and risks, as the paradigm has two components, probability and consequence. The design of control measures rests on understanding the cause and effect. Best practise is to intervene with the ultimate factors where feasible, rather than treat the outcomes. Emergency response therefore has the option of reducing probability or reducing the consequence while reducing the probability is the preferred option. Below are some common emergency preparedness approaches:

- Threat consequence if a risk eventuates, when the risk becomes an issue;
- Combine reducing the probability and treating the consequence;
- Offset environmental losses by investing in other assets;
- Not manage some of the risks because there are too many; and
- Make provision to manage residual impacts or issues that arise because of shortcomings in risk identification and rating, avoidance and mitigation or because a rare event has occurred.

Residual impacts are those impacts that despite reducing the probability and consequence might still occur. In these cases, parties will have to be compensated, pollution cleaned up and damage to the environment remediated.

The Applicant shall be required to develop and implement an Emergency Preparedness and Response Plan prior to commencing work. The Applicant must ensure that the Emergency Preparedness and Response Plan makes provision for environmental emergencies, including, but not limited to:

- Fire Prevention;
- Fire Emergency Response;
- Spill prevention;
- Spill Response;
- Accidents to employees; and
- Use of hazardous substances and materials, etc.

The Applicant and Contractor must ensure that lists of all emergency telephone numbers/contact persons (including fire control) are kept up to date and that all numbers and names are posted at relevant locations throughout the seismic survey phase.

12.1 Spill Response Procedure

The Contractor must ensure that all employees, staff and labourers are informed and instructed regarding implementation of spill prevention measures and spill response procedures. In the event of a spill, the following general requirements shall apply, and the detailed spill procedure must cater for these requirements:

- Immediately reporting of spills by all employees and/or visitors to the relevant supervisor and EO (this requirement must be including in induction training);
- Take immediate action to contain or stop the spill where it is safe to do so;
- Contain the spill and prevent its further spread;
- Dispose of any contaminated materials according to appropriate waste disposal procedure. Note: Waste from spills of hazardous materials shall be disposed of as hazardous waste at a suitably licensed onshore waste disposal facility;
- The Contractor's onsite EO or Lead MMO / PAM shall record details of the spill in their respective incident registers;
- Photographic evidence shall be obtained of the spill clean-up.

In the case of large spills, the services of a specialist spill response agency shall be required, who shall advise on appropriate clean-up procedures and follow-up monitoring (if required). The incident procedures as defined in Section 9.5 shall also apply.

The Applicant must also, (as per Section 30 of the NEMA) notify the Director-General (DWS, Competent Authority, DEFF), South African Police Services, Provincial Environmental Authority, the Local Municipality, and any persons whose health may be affected of the nature of an incident including:

- Any risks posed to public health, safety and property;
- Toxicity of the substance or by products released by the incident; and
- Any step taken to avoid or minimise the effects of the incident on public health and the environment.

12.2 Measures to Control or Remedy any Causes of Pollution or Degradation

The broad measures to control or remedy any causes of pollution or environmental degradation as a result of the proposed activities taking place on the project are provided below:

- Ensure that the environmentally sensitive areas are adequately understood by the ship's Captain throughout the survey;
- Contain potential pollutants and contaminants (where possible) at source;
- Handling of potential pollutants and contaminants (where possible) must be conducted in controlled areas;
- Ensure the timeous clean-up of any spills;
- Implement a waste management system for all waste streams present; and
- Investigate any third party claims of pollution or contamination as a result of the project activities.

13 MANAGEMENT AND MITIGATION

Table 5: Technical or Management Options

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
13.1 Legal Compliance							
A	The Applicant shall identify and comply with all relevant national, provincial and local legislation, including associated regulations and bylaws and shall establish and maintain procedures to keep track of, document and ensure compliance with environmental legislative changes.	Planning Operation	Prior to operation and ongoing	Applicant	ECO (Monthly)	Ensure compliance with relevant legislation.	Up to date legal register. (Legal register) (ECO Monthly Audit)
B	Should there be changes in legislation and/or regulations the Applicant shall take the necessary actions to incorporate such changes and to pass these requirements on to the Contractors.	Planning Operation	Prior to operation and ongoing	Applicant ECO	ECO (Monthly)	Ensure compliance with relevant legislation / Confirmation that requirements in terms of updated legislation are passed onto the contractors.	(Contractors contractual agreements) (ECO Monthly Audit)
13.2 Appointment of ECO/MMO/PAM/FLO							
A	The Applicant shall appoint a suitably qualified ECO who shall be independent from the Applicant and the Contractor / Operator. The ECO must preferably have a tertiary qualification in Environmental Management or appropriate environmental science field. The ECO should have appropriate qualification and experience in the implementation of environmental management specifications. For the purposes of implementing the conditions contained in this EMPr. The Applicant shall provide the ECO with the necessary support to ensure that the environmental aspects relating to the project are adhered to. The appointment of the ECO shall remain in force until all obligations of this EMPr have been met (e.g. including any relevant rehabilitation phase).	Planning Operation	Prior to operation	Applicant	Applicant (once off prior to operations)	Appoint ECO to ensure monitoring of successful implementation of the EMPr.	Confirmation that ECO has been appointed and is suitably qualified to perform the duties contained in this EMPr. (ECO appointment and CV)
B	Qualified, independent MMOs are required on board at all times. As a minimum, one must be on watch during daylight hours while the acoustic source is active.	Planning Operation	Prior to operation	Applicant	Applicant (once off prior to operations)	Appoint MMO to ensure monitoring of successful implementation of the EMPr.	Confirmation that MMO has been appointed and is suitably qualified to perform the duties contained in this EMPr. (MMO appointment and CV)
C	Qualified, independent PAM Operators are required on board at all times. As a minimum one must be on watch while the acoustic source is active.	Planning Operation	Prior to operation	Applicant	Applicant (once off prior to operations)	Appoint PAM to ensure monitoring of successful	Confirmation that PAM has been appointed and is suitably qualified to perform the duties contained in this EMPr.

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
						implementation of the EMPr.	(PAM appointment and CV)
D	The Applicant shall appoint an independent FLO who must have experience in the liaising with the fishing operations and communities.	Planning Operation	Prior to operation	Applicant	Applicant (once off prior to operations)	Appoint FLO to ensure monitoring of successful implementation of the EMPr.	Confirmation that FLO has been appointed and is suitably qualified to perform the duties contained in this EMPr. (FLO appointment and CV)
E	The Applicant is responsible for the maintenance, update and review of the EMPr. The ECO shall include any recommendations for proposed amendments/alterations of the EMPr to the Applicant who shall engage the competent authority, to the extent required, with regards to such changes.	Planning Operation	As required	Applicant ECO	ECO (Monthly) Applicant (as and when necessary)	Ensure EMPr is reviewed and updated where necessary to ensure adequate mitigation for all impacts associated with the project.	Audit results and recommendations (ECO Monthly Audit)
13.3	Appointment of Contractors						
A	The EMPr must be made binding on the contractor/s and should be included in tender documentation and contracts. The costs related to the implementation of the EMPr during survey activities must be provided for in the contract.	Planning Operation	Prior to operation	Applicant Contractors	ECO (Once-off at the start of individual contractor's work)	Ensure that the contractor is in possession of the EMPr and that they understand their obligations thereto.	Confirmation that contractor has received EMPr, and that EMPr has been made contractually binding. (Contractual agreements) (ECO Monthly Audit)
B	All contractors and sub-contractors must have a copy of this EMPr on site and should be briefed by the onsite **EO or the Lead MMO / PAM (who will be tasked with the onsite responsibilities of the EO)** with regards to the use and implementation of the EMPr.	Planning Operation	Prior to Operation and Ongoing	Contractor	ECO (Monthly) Applicant (once off per contractor)	Ensure all contractors are aware of EMPr requirements.	Confirmation that contractors have received training relating to EMPr implementation. (Training records) (ECO Monthly Audit)
C	The Contractor shall appoint a dedicated Contractor's onsite **EO or the Lead MMO / PAM (who will be tasked with the onsite responsibilities of the EO)** who is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the onshore ECO and the public. The Contractor's onsite EO or the Lead MMO / PAM (who will be tasked with the onsite responsibilities of the EO) shall be appointed prior to the onset of the seismic survey.	Planning	Prior to Operation and Ongoing	Contractor	ECO (Once-off)	Ensure a suitably qualified onsite EO or Lead MMO / PAM is present on site to oversee day to day activities and ensure successful implementation of EMPr during the seismic survey.	Confirmation that onsite EO or Lead MMO / PAM has been appointed and is suitably qualified to perform the necessary duties contained in this EMPr. (ECO Monthly Audit)
D	The Contractor shall ensure that all sub-contractors working under them abide by the requirements of the EMPr through the inclusion of the EMPr and applicable environmental requirements in contractual agreements for all sub-contractors.	Operation	Ongoing	Contractor	EO (Weekly) ECO (Monthly)	Ensure that the contractor implements all the mitigation measures as described in the EMPr.	Signed declaration of understanding by contractors (Onsite EO weekly checklist) (ECO Monthly Audit Report)

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
13.4 Health and Safety							
A	The Applicant through the Project Manager shall ensure: • That reasonable measures are taken to ensure the safety of all site staff; • Provide appropriate Personal Protective Equipment (PPE) where required; • Compliance with the Occupational Health and Safety Act (Act No. 85 of 1993) and associated regulations; • That all accidents and incidents are recorded and reported to the Project Manager and ECO; and • The Applicant and Contractor must ensure that he/she has the contact details of the nearest emergency rooms (hospitals), of both private and public hospitals.	Operation	Ongoing	Project Manager Contractor	Safety Department	Ensure compliance with legal provisions of OHSA.	(safety reports) (safety audits)
13.5 Emergency Response / Disaster Management Planning							
A	Develop and implement an Emergency Preparedness and Response Plan (EPRP) for implementation during the seismic survey. This should be revised periodically as the various phases of the seismic survey work takes place.	Planning Operation	Prior to Operation and Ongoing	Contractor	ECO (Once-off)	Ensure emergency preparedness and response systems in place.	Verification that EPRP is in place. (ECO Audit) (EPRP) (Incident Reports)
13.6 Socio-Economic Considerations							
A	Searcher should follow the community engagement protocol that is based on the San Code of Research Ethics. This was conducted in 2024 consultation with the affected communities and includes a communication strategy and grievance mechanism.	Planning Operation	Prior to Operation and Ongoing	Applicant/ Project manager	ECO (Monthly)	Ensure that socio-economic considerations are considered and implemented where necessary	Consultation in alignment with the community engagement protocol. (Consultation register)
B	Searcher should continue to implement the community engagement protocol that were was developed in 2023/24 and continue to consult with communities on potential ways in which to make a positive contribution to the communities.	Planning Operation	Prior to Operation and Ongoing	Applicant/ Project manager	ECO (Monthly)	Ensure that socio-economic considerations are considered and implemented where necessary	Consultation Register (ECO Monthly Audit)
C	A representative from Searcher should consult with the traditional leadership of the affected communities to establish what their understanding of meaningful consultation is and how communities should be consulted in future. This will assist with readjusting the relationship between Searcher and the traditional communities. Given the socio-political environment, opposition to the project and associated non-technical risks, further meaningful engagement with the leadership and communities are critical from a social perspective.	Planning Operation	Prior to Operation and Ongoing	Applicant/ Project manager	ECO (Monthly)	Ensure that socio-economic considerations are considered and implemented where necessary	Consultation Register and workshops (ECO Monthly Audit)

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	13.7 Heritage/ Palaeontological Features						
A	Re-assess post-project the potential effects on the identified communities and their intangible cultural heritage. This will require consideration of the socio- economic baseline developed during the previous survey and this environmental impact process. Based on the outcomes, provide resources and support to enhance the mitigation capacity of communities intangible cultural heritage by fostering dialogue, mutual understanding and reconciliation between and within communities.	Planning Closure	During Operation	Applicant/ Project manager in consultation with specialist	EO – once off	Re-assess post project, the effects on the identified communities and their intangible cultural heritage. Enhance mitigation capacity of intangible cultural heritage	Safeguarding measures or plans in place post survey.
B	Survey positioning data and/or any resulting information that could aid in discovering offshore heritage resources, such as shipwrecks, will be shared with the South African Heritage Resources Agency (SAHRA).	Operation	During survey	Applicant & Contractor	EO (Monthly)	No impact on or destruction of significant heritage resources	Reporting of heritage / palaeontological finds to the SAHRA.
	13.8 Air Quality						
A	Maintain all diesel motors and generators in good working order. Properly tune and maintain all engines, motors, generators and all auxiliary power to contain the minimum of soot and unburned diesel.	Operation	Ongoing	Applicant & Contractor	ECO (Weekly)	Ensure that no excessive air quality impacts are perceived	Visual confirmation of compliance with EMPr conditions. (Onsite EO weekly checklist) (ECO Monthly Audit)
	13.9 Noise Nuisance						
A	In the unlikely event that aircraft are utilised for crew changes or medivac: • Plan support aircraft flight path to avoid sensitive and protected areas and ensure no flying occurs over coastal seal colonies and seabird nesting areas • Avoid extensive low-altitude coastal flights by ensuring that the flight path is perpendicular to the coast, as far as possible. • Brief all pilots on the ecological risks associated with flying at a low level along the coast or above marine mammals.	Planning Operation	Prior to Operation and Ongoing	Applicant Contractor	EO (Weekly) ECO (Monthly)	Ensure that noise levels are controlled within acceptable limits. No complaints relating to noise.	Confirmation that noise levels are within acceptable limits and relevant notifications undertaken. (Onsite EO weekly checklist) (ECO Monthly Audit) (Consultation register)
	13.10 Impacts of Seismic Surveys on Marine Fauna						
A	All initiation of seismic source acquisition be carried out as “soft-starts” of at least 20 minutes duration.	Operation	During Operation	Contractor	EO (Weekly) ECO (Monthly)	Utilisation of soft starts at initiation.	Confirmation soft starts at initiation. (EO weekly checklist) (ECO Monthly Audit)
B	Implement a dedicated MMO and PAM pre-acquisition watch of at least 60 minutes (to accommodate deep-diving species in water depths greater than 200 m).	Operation	During Operation	Contractor	EO (Weekly) ECO (Monthly)	Utilisation of soft starts at initiation.	Confirmation soft starts at initiation. (Onsite EO weekly checklist) (ECO Monthly Audit)

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
C	• Implement a "soft-start" procedure of a minimum of 20 minutes' duration on initiation of the seismic source if: ○ **during daylight** hours it is confirmed: • visually by the MMO during the pre-shoot watch (60 minutes) that there are no penguins or feeding aggregations of diving seabirds, slow swimming large pelagic fish, turtles, seals or cetaceans within 500 m of the seismic source, and • by PAM technology that there are no vocalising cetaceans detected in the 500 m mitigation zone. ○ **during times of poor visibility or darkness** it is confirmed by PAM technology that no vocalising cetaceans are present in the 500 m mitigation zone during the pre-shoot watch (60 minutes).	Operation	During Operation	Contractor	EO (Weekly) ECO (Monthly)	Utilisation of soft starts at initiation.	Confirmation soft starts at initiation. (Onsite EO weekly checklist) (ECO Monthly Audit)
D	Delay "soft-starts" if penguins or feeding aggregations of diving seabirds, slow swimming large pelagic fish, turtles, seals or cetaceans are observed within the mitigation zone. • A 'soft-start' should not begin until 30 minutes after cetaceans depart the 500 m mitigation zone or 30 minutes after they are last seen or acoustically detected by PAM in the mitigation zone. • In the case of penguins, diving seabirds, slow swimming large pelagic fish and turtles, delay the 'soft-start' until animals are outside the 500 m mitigation zone. • In the case of fur seals, which may occur commonly around the vessel, delay 'soft-starts' for at least 10 minutes until it has been confirmed that the mitigation zone is clear of all seal activity. However, if after a period of 10 mins seals are still observed within 500 m of the airgun, the normal 'soft-start' procedure should be allowed to commence for at least a 20-minute duration. Seal activity should be carefully monitored during 'soft-starts' to determine if they display any obvious negative responses to the airgun and gear or if there are any signs of injury or mortality as a direct result of the seismic activities. • If visual confirmation is not possible implement a seismic pause of 4 minutes.	Operation	During Operation	Contractor MMO	MMO (ongoing) ECO (Monthly)	Visual scanning of seabirds.	Confirmation recording of diving seabirds, turtles, seals and cetaceans visual scanning. (MMO Reports) (ECO Monthly Audit)
E	When arriving at the survey area for the first time, survey activities should, as far as possible, only commence during daylight hours with good visibility and wind speeds below Beaufort 3. However, if this is not possible due to prolonged periods of high wind speed, poor visibility (e.g. thick fog) or unforeseen technical issue which results in a night-time start, the initial acoustic source activation (including gun tests) may only be undertaken if the normal 60-minute PAM pre-watch and 'soft-start' procedures have been followed.	Operation	During Operation	Contractor	EO (Weekly) ECO (Monthly)	Utilisation of soft starts at initiation.	Confirmation soft starts at initiation. (Onsite EO weekly checklist) (ECO Monthly Audit)

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
F	If line changes are expected to take **longer** than 40 minutes: • Terminate airgun firing at the end of the survey line and implement a pre-shoot search (60 minutes) and 'soft-start' procedure (20 minutes) when approaching the next survey line. • If line turn is shorter than 80 minutes (i.e. shorter than a 60-minute pre-shoot watch and 20-minute 'soft-start' combined), the pre-shoot watch can commence before the end of the previous survey line.	Operation	During Operation	Contractor	EO (Weekly) ECO (Monthly)	Utilisation of soft starts after breaks.	Confirmation soft starts after breaks. (Onsite EO weekly checklist) (ECO Monthly Audit)
G	If line changes are expected to take **less** than 40 minutes, airgun firing can continue during the line change if: • The power is reduced to 180 cubic inches (or as close as is practically feasible) at standard pressure. Airgun volumes of less than 180 cubic inches can continue to fire at their operational volume and pressure; • The Shot Point Interval (SPI) is increased to provide a longer duration between shots, with the SPI not to exceed 5 minutes; and • The power is increased and the SPI is decreased in uniform stages during the final 10 minutes of the line change (or geophone repositioning), prior to data collection re-commencing (i.e. a form of mini soft start). • Normal MMO and PAM observations continue during this period when reduced power airgun is active.	Operation	During Operation	Contractor	EO (Weekly) ECO (Monthly)	Utilisation of soft starts after breaks.	Confirmation soft starts after breaks. (Onsite EO weekly checklist) (ECO Monthly Audit)
H	An area of radius of 500 m from the centre of the seismic source array be scanned (visually during the day) 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 for a period of 10 minutes. If after a period of 10 minutes seals are still within 500 m of the seismic sources, the normal "soft start" procedure should be allowed to commence for at least a 20-minutes duration. Their activity should be carefully monitored during "soft-starts" to determine if they display any obvious negative responses to the seismic sources and gear or if there are any signs of injury or mortality as a direct result of the seismic activities.	Operation	During Operation	Contractor MMO	MMO (ongoing) ECO (Monthly)	Visual scanning of seabirds.	Confirmation recording of seabird visual scanning. (MMO Reports) (ECO Monthly Audit)
I	Terminate seismic source on observation of any obvious mortality or injuries to cetaceans, turtles, seals or mass mortalities of squid and fish (specifically large shoals of tuna or surface shoaling small pelagic species such as sardine, anchovy and mackerel) when estimated by the MMO to be as a direct result of the survey.	Operation	During Operation	Contractor MMO	MMO (ongoing) ECO (Monthly)	Recording of mass mortality as a result of survey activities. Ceasing of survey activities.	Confirmation recording of mortality as a result of survey activities. (MMO Reports) (ECO Monthly Audit)
J	Plan seismic surveys to avoid most sensitive periods within the survey area for some marine fauna from early June to early December, notably: • Movement of migratory cetaceans (particularly baleen whales) from their southern feeding grounds into low latitude waters	Planning Mobilisation	Pre-Survey Planning	Contractor	MMO (ongoing) ECO (Monthly)	Surveys planned according to the movement of mammals.	Confirmation recording of surveys in line with the movement of mammals. (MMO Reports) (ECO Monthly Audit)

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	• Aggregation of migratory cetaceans on the summer feeding grounds between St Helena Bay and Dassen Island from late October to late December						
K	Plan survey, as far as possible, so that the first commencement of seismic source sounding in a new area (including seismic source tests) are undertaken during daylight hours.	Planning Mobilisation	Pre-Survey Planning	Contractor	MMO (ongoing) ECO (Monthly)	Surveys commence during daylight hours.	Confirmation recording of surveys commencement during daylight hours. (MMO Reports) (ECO Monthly Audit)
L	Prohibit seismic source use (including seismic source tests) outside of the Reconnaissance Permit Area. Although a seismic vessel and its gear may transit, including passing through a declared Marine Protected Area, acoustic sources (seismic sources) must not be operational during this transit.	Planning Mobilisation	Pre-Survey Planning	Contractor	MMO (ongoing) ECO (Monthly)	No seismic source operational during transit	Confirmation no survey equipment in use during transit. Survey logs. (MMO Reports) (ECO Monthly Audit)
M	A buffer of at least 5 km is recommended around MPAs.	Planning Mobilisation	Pre-Survey Planning	Contractor	MMO (ongoing) ECO (Monthly)	No surveys undertaken in MPAs or within 5 km from MPAs.	Confirmation no survey equipment in use within MPAs. Survey logs. (MMO Reports) (ECO Monthly Audit)
N	When arriving at the survey area for the first time, survey activities should, as far as possible, only commence during daylight hours with good visibility and wind speeds below Beaufort 3. However, if this is not possible due to prolonged periods of high wind speeds, poor visibility (e.g. thick fog) or unforeseen technical issue which results in a night-time start, the initial acoustic source activation (including seismic source tests) may only be undertaken if the normal 60-minute PAM pre-watch and "soft-start" procedures have been followed.	Operation: Pre-Start Observations	During Operation	Contractor MMO PAM Operator	MMO (ongoing) PAM Operator (ongoing) ECO (Monthly)	New location arrival procedure followed.	Confirmation of following of new location arrival procedure. Survey logs. (MMO Reports) (PAM Reports) (ECO Monthly Audit)
O	In the unlikely event that multiple surveys would take place at the same time within the same survey area then during seismic source pulses, each survey vessel must be at least 40 kilometres from any other survey vessel until sufficient objective evidence is obtained that a reduced buffer distance is acceptable.	Operation	During Operation	Contractor	EO (Weekly) ECO (Monthly	Negligible cumulative noise impacts	Confirmation: 40 km distance maintained between any other survey vessels while seismic source is active.
P	Report any collisions with large whales to the International Whaling Commission (IWC) database, which has been shown to be a valuable tool for identifying the species most affected, vessels involved in collisions, and correlations between vessel speed and collision risk. Should a cetacean become entangled in towed gear, contact the South African Whale Disentanglement Network (SAWDN) formed under the auspices of DEA to provide verbal specialist assistance in releasing entangled animals where necessary.	Operation	During Operation	Contractor	EO (Weekly) ECO (Monthly	Any large whale collisions reported to IWC. SAWDN contacted for assistance should cetacean become entangled.	Confirmation reporting to IWC and contacting SAWDN. (MMO Reports) (ECO Monthly Audit)
13.11 Line Turns and Breaks in Acquisition							
A	• If line changes are expected to take less than 40 minutes, seismic acquisition can continue during the line change if:	Operation	During Operation	Contractor	EO (Weekly) ECO (Monthly)	Utilisation of soft starts.	Confirmation soft starts (Onsite EO weekly checklist)

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	○ The power is reduced to 180 cubic inches (or as close as is practically feasible) at standard pressure. Seismic source volumes of less than 180 cubic inches can continue to discharge at their operational volume and pressure; ○ The Seismic Pulse Interval (SPI) is increased to provide a longer duration between pulses, with the SPI not to exceed 5 minutes; and ○ The power is increased and the SPI is decreased in uniform stages during the final 10 minutes of the line change (or geophone repositioning), prior to data collection re-commencing (i.e. a form of mini soft start). ○ Normal MMO and PAM observations continue during this period when reduced power seismic source is active.						(ECO Monthly Audit)
B	• If after breaks in seismic acquisition, the seismic source can be restarted within 5 minutes, no soft-start is required and acquisition can recommence at the same power level provided no marine mammals have been observed or detected in the mitigation zone during the break-down period. • For all breaks in seismic source of longer than 5 minutes, but less than 20 minutes, implement a "soft-start" of similar duration, assuming there is continuous observation by the MMO and PAM operator during the break. • For all breaks in seismic source of 20 minutes or longer, implement a 60-minute pre-acquisition watch and 20-minute "soft-start" procedure prior to the survey operation continuing. • For planned breaks, ensure that there is good communication between the seismic contractor and MMO and PAM operators in order for all parties to be aware of these breaks and that early commencement of pre-watch periods can be implemented to limit delays.	Operation	During Operation	Contractor	EO (Weekly) ECO (Monthly)	Utilisation of soft starts.	Confirmation soft starts (Onsite EO weekly checklist) (ECO Monthly Audit)
C	• If line changes are expected to take longer than 40 minutes: • Terminate seismic source at the end of the survey line and implement a pre-acquisition search (60 minutes) and "soft-start" procedure (20 minutes) when approaching the next survey line. • If line turn is shorter than 80 minutes (i.e. shorter than a 60-minute pre-acquisition watch and 20-minute "soft-start" combined), the pre-acquisition watch can commence before the end of the previous survey line.	Operation	During Operation	Contractor	EO (Weekly) ECO (Monthly)	Utilisation of soft starts.	Confirmation soft starts (Onsite EO weekly checklist) (ECO Monthly Audit)

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
13.12 Shut-downs							
A	• Seismic source should be terminated on observation of penguins or feeding aggregations of diving seabirds, turtles, slow swimming large pelagic fish (including whale sharks, basking sharks, and manta rays [and devil rays-Namibia only]), seals and cetaceans within the 500 m mitigation zone If PAM detects the presence of very high frequency cetaceans (Heaviside's dolphins, pygmy sperm whale and dwarf sperm whale) within 1 000 m of the sound source, seismic source should be terminated. • Terminate source for cetaceans until such time as there has been a 30-minute delay from the time the animal was last sighted within the mitigation zone before the commencement of the normal soft start procedure. For specific species of turtles, penguins, feeding aggregations of diving seabirds and slow swimming large pelagic fish, terminate source until such time as the animals are outside of the 500 m mitigation zone (seismic "pause", no soft-start required). If visual confirmation is not possible implement a seismic pause of 4 minutes.	Operation	During Operation	Contractor MMO PAM Operator	MMO (ongoing) ECO (Monthly)	Visual scanning and termination of activities.	Confirmation recording of visual scanning. Termination of activities. (MMO Reports) (ECO Monthly Audit)
B	Seismic source should be terminated on observation of any obvious mortality or injuries to cetaceans, turtles, seals or mass mortalities of invertebrate and fish species (specifically large shoals of tuna or surface slow swimming small pelagic species such as sardine, anchovy and mackerel) as a direct result of the survey. Such mortalities would be of particular concern where a) commercially important species are involved, or b) mortality events attract higher order predator and scavenger species into the seismic area during the survey, thus subjecting them to acoustic impulses.	Operation	During Operation	Contractor MMO PAM Operator	MMO (ongoing) ECO (Monthly)	Visual scanning and termination of activities.	Confirmation recording of visual scanning. Termination of activities. (MMO Reports) (ECO Monthly Audit)
C	Seismic source should also be terminated when obvious changes to turtle, seal or cetacean behaviours are observed from the survey vessel, or turtles and cetaceans (not seals) are observed within 500 m of operating seismic sources or appear to be approaching active seismic sources (particularly if the MMO has lost sight of the approaching animal prior to it entering the mitigation zone). 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, that frequencies of seismic sound energy lies below best hearing frequencies (certain toothed cetaceans and seals), or that animals have become trapped within the area filled with sound through diving behaviour.	Operation	During Operation	Contractor MMO PAM Operator	MMO (ongoing) ECO (Monthly)	Visual scanning and termination of activities.	Confirmation recording of visual scanning. Termination of activities. (MMO Reports) (ECO Monthly Audit)
D	Although a seismic vessel and its gear may transit, including passing through a declared Marine Protected Area, acoustic sources (seismic sources) must not be operational during this transit	Planning Mobilisation	Pre-Survey Planning	Contractor	MMO (ongoing) ECO (Monthly)	No surveys seismic source operational during transit	Confirmation no survey equipment in use during transit. Survey logs. (MMO Reports)

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
							(ECO Monthly Audit)
13.13 Key Equipment							
A	Key Equipment to be used: • All seismic vessels must be fitted with Passive Acoustic Monitoring (PAM) technology, which detects animals through their vocalisations. The PAM technology must have enough bandwidth to be sensitive to the whole frequency range of sensitive marine life expected in the area. • The use of PAM 24-h a day must be implemented to detect deep diving species. • Ensure the PAM streamer is fitted with at least four hydrophones, of which two are HF and two LF, to allow directional detection of cetaceans. • Ensure the PAM hydrophone streamer is towed in such a way that the interference of vessel noise is minimised. • Ensure spare PAM hydrophone streamers (e.g. 4 heavy tow cables and 6 hydrophone cables) are readily available in the event that PAM breaks down, in order to ensure timeous redeployment • Define and enforce the use of the lowest practicable seismic source volume for production. Design arrays to maximise downward propagation, minimise horizontal propagation and minimise high frequencies in seismic source pulses (have this verified by independent evaluators.); • Ensure the ramp-up noise volumes do not exceed the production volume. • Limit horizontal sound propagation by adopting suitable array configurations and pulse synchronization and eliminating unnecessary high frequencies. • Prohibit seismic source use (including seismic source tests) outside of the area of operation (which includes line turns undertaken outside the licence area). • The operator must provide a display screen for the acoustic source operations. All information relating to the activation of the acoustic source and the power output levels must be readily available to support the observers in real time via the display screen and to ensure that operational capacity is not exceeded. • 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'.	Planning Mobilisation Operation	Mobilisation and Operation	Contractor PAM Operator	PAM Operator (ongoing) ECO (Monthly)	Adequate equipment is in place and used as per the requirements and specifications.	Confirmation Of PAM Operations (PAM Operator Reports, ECO Reports). Use of lowest volume seismic sources, turtle friendly buoys, operation within approved area, use of solid streamers.

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	• Ensure that solid streamers rather than fluid-filled streamers are used to avoid leaks. • Ensuring that loads are lifted using the correct lifting procedure and within the maximum lifting capacity of crane system. • Minimise the lifting path between vessels • Undertake frequent checks to ensure items and equipment are stored and secured safely on board each vessel. • In the event that equipment is lost during the operational stage, assess safety and metocean conditions before performing any retrieval operations. Establishing a hazards database listing the type of gear left on the seabed and/or in the Reconnaissance Permit Area with the dates of abandonment/loss and locations, and where applicable, the dates of retrieval. Notify SAN Hydrographer of any hazards left on the seabed or floating in the water column, and request that they send out a Notice to Mariners with this information. • Use low toxicity dispersants cautiously and only with the permission of DFFE. • Ensure adequate resources are provided to collect and transport oiled birds to a cleaning station. • Notify SANHO of any hazards left on the seabed or floating in the water column, and request that they send out a Notice to Mariners with this information.						
13.14 PAM Malfunctions							
A	• If the PAM system malfunctions or becomes damaged **during night-time operations or periods of low visibility**, continue operations for 30 minutes without PAM if no marine mammals were detected by PAM in the mitigation zones in the previous 2 hours, while the PAM operator diagnoses the issue. If after 30 minutes the diagnosis indicates that the PAM gear must be repaired to solve the problem, reduce power to 180 cubic inches. The reduced seismic source may continue for 30 minutes while PAM is being repaired, the last 10-minute of which is a 10-minute ramp up to full power (mini "soft-start"). If the PAM repair will take longer than 60 minutes, stop surveying until such time as a functional PAM system can be redeployed and tested. • If the PAM system breaks down **during daylight hours** operations may continue for 20 minutes without PAM while the PAM operator diagnoses the issue. If the diagnosis indicates that the PAM gear must be repaired to solve the problem, operations may continue for an additional 2 hours without PAM monitoring as long as:	Operation	Operation	Contractor PAM Operator MMO	PAM Operator (ongoing) ECO (Monthly)	Ceasing activities during PAM Malfunctions. PAM equipment investigation and repair.	Ceasing activities during PAM Malfunction. PAM equipment investigation and repair. (PAM Operator Reports, ECO Reports).

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	○ No marine mammals were detected solely by PAM in the mitigation zones in the previous 2 hours; ○ Two MMOs maintain watch at all times during operations when PAM is not operational; ○ The time and location in which operations began without an active PAM system is recorded.						
13.15 Seismic source Testing							
A	For seismic source testing the following should apply: • Maintain a pre-acquisition watch of 60-minutes before any instances of seismic source testing. If only a single lowest power seismic source is tested, the pre-acquisition watch period can be reduced to 30 minutes.	Operation	Operation	Contractor	PAM Operator (ongoing) ECO (Monthly)	Adequate testing is in place and conducted as per the requirements and specifications.	Testing in line with the requirements (PAM Operator Reports, ECO Reports).
B	• Implement a "soft-start" procedure if testing multiple seismic sources. ○ The "soft-start" should be carried out over a time period proportional to the number of seismic sources being tested and not exceed 20 minutes; seismic sources should be tested in order of increasing volume; ○ If testing all seismic sources at the same time, a 20 minute "soft-start" is required; ○ If testing a single lowest power seismic source a "soft-start" is not required.	Operation	Operation	Contractor	PAM Operator (ongoing) ECO (Monthly)	Adequate testing is in place and conducted as per the requirements and specifications.	Testing in line with the requirements (PAM Operator Reports, ECO Reports).
13.16 Waste Management							
A	• The discharge of biodegradable wastes from vessels is regulated by MARPOL 73/78 Annex V, which stipulates that: ○ No disposal to occur within 3 nautical miles (± 5.5 km) of the coast. ○ Disposal between 3 nautical miles (± 5.5 km) and 12 nautical miles (± 22 km) needs to be comminuted to particle sizes smaller than 25 mm. ○ Disposal overboard without macerating can occur greater than 12 nautical miles from the coast when the vessel is sailing.	Operation	During Operation	Contractor ECO	ECO (ongoing)	Proper waste management in line with the required EMPr and regulations.	Recording of waste types and quantities (waste register and records)
B	• Discharges of oily water (deck drainage, bilge and mud pit wash residue) to the marine environment are regulated by MARPOL 73/78 Annex I, which stipulates that vessels must have: ○ A Shipboard Oil Pollution Emergency Plan (SOPEP). ○ A valid International Oil Pollution Prevention Certificate, as required by vessel class.	Operation	During Operation	Contractor ECO	ECO (ongoing)	Proper waste management in line with the required EMPr and regulations.	Recording of waste types and quantities (waste register and records)

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	○ 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 in water concentration must be less than 15 ppm prior to discharge overboard. ○ Oil residue holding tanks. ○ Oil discharge monitoring and control system.						
C	• Sewage and grey water discharges from vessels are regulated by MARPOL 73/78 Annex IV, which specifies the following: ○ Vessels must have a valid International Sewage Pollution Prevention Certificate. ○ Vessels must have an onboard sewage treatment plant providing primary settling, chlorination and dechlorination before discharge of treated effluent. ○ The discharge depth is variable, depending upon the draught of the seismic vessel / support vessel at the time, but will be in accordance with MARPOL 73/78 Annex IV. ○ Discharge of sewage beyond 12 nm requires no treatment. However, sewage effluent must not produce visible floating solids in, nor cause the discolouration of, the surrounding water. ○ Sewage must be comminuted and disinfected for discharges between 3 nautical miles (± 6 km) and 12 nautical miles (± 22 km) from the coast. This will require an onboard sewage treatment plant or a sewage comminuting and disinfecting system. ○ Disposal of sewage originating from holding tanks must be discharged at a moderate rate while the ship is proceeding on route at a speed not less than 4 knots.	Operation	During Operation	Contractor ECO	ECO (ongoing)	Proper waste management in line with the required EMPr and regulations.	Recording of waste types and quantities (waste register and records)
D	• Sewage will be treated using a marine sanitation device to produce an effluent with: ○ A biological oxygen demand (BOD) of <25 mg/l (if the treatment plant was installed after 1/1/2010) or <50 mg/l (if installed before this date). ○ Minimal residual chlorine concentration of 1.0 mg/l. ○ No visible floating solids or oil and grease.	Operation	During Operation	Contractor ECO	ECO (ongoing)	Proper waste management in line with the required EMPr and regulations.	Recording of waste types and quantities (waste register and records)
E	• The project will also comply with industry best practices with regard to waste management, including: ○ Waste management will follow key principles: Avoidance of Waste Generation, adopting the Waste Management Hierarchy (reduce, reuse, recycle, recover, residue disposal), and use of Best Available Technology (BAT).	Operation	During Operation	Contractor ECO	ECO (ongoing)	Proper waste management in line with the required EMPr and regulations.	Recording of waste types and quantities (waste register and records)

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	○ An inventory will be established of all the potential waste generated, clarifying its classification (hazardous, non-hazardous or inert) and quantity, as well as identifying the adequate treatment and disposal methods. ○ Waste collection and temporary storage shall be designed to minimise the risk of escape to the environment (for example by particulates, infiltration, runoff or odours). ○ On-site waste storage should be limited in time and volume. ○ Dedicated, clearly labelled, containers (bins, skips, etc.) will be provided in quantities adapted to anticipated waste streams and removal frequency.						
F	• Avoid the unnecessary discharge of ballast water. • Use filtration procedures during loading in order to avoid the uptake of potentially harmful aquatic organisms, pathogens and sediment that may contain such organisms. • Ensure that routine cleaning of ballast tanks to remove sediments is carried out, where practicable, in mid-ocean or under controlled arrangements in port or dry dock, in accordance with the provisions of the ship's Ballast Water Management Plan. • Ensure all infrastructure (e.g. arrays, streamers, tail buoys etc) that has been used in other regions is thoroughly cleaned prior to deployment.	Operation	During Operation	Contractor ECO	ECO (ongoing)	Proper waste management in line with the required EMPr and regulations.	Recording of waste types and quantities (waste register and records)
13.17 Vessel and Aircraft Operations							
A	Ensure vessel transit speed between the survey area and port is a maximum of 12 knots (22 km/hr), except in the MPAs where it is reduced further to 10 knots (18 km/hr).	Operation	During Operation	Contractor ECO	ECO (ongoing)	Ensure vessel speed limits are adhered to	Confirmation of flights undertaken in accordance with the requirements (ECO Reports, ship logs)
B	In the unlikely event that aircraft are utilised for crew changes or medivac: • Pre-plan flight paths to ensure that no flying occurs over seabird and seal colonies and offshore islands by at least 1 852 m (i.e. 1 nm); • Avoid extensive low-altitude coastal flights by ensuring that the flight path is perpendicular to the coast, as far as possible • The flight path between the onshore logistics base and seismic vessel should be perpendicular to the coast; • Brief all pilots on the ecological risks associated with flying at a low level along the coast or above marine mammals.	Operation	During Operation	Contractor ECO	ECO (ongoing)	Adequate flight planning in line with the requirements of the EMPr and legislation.	Confirmation of flights undertaken in accordance with the requirements (ECO Reports, Flight plans).
C	• The lighting on the seismic vessel and support vessels should be reduced to a minimum compatible with safe operations whenever and wherever possible. Light sources should, if possible and	Operation	During Operation	Contractor ECO	ECO (ongoing)	Adequate lighting and vessel planning, operation and maintenance in line with	Confirmation of lighting and vessel planning, operation and maintenance undertaken in accordance with the

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	consistent with safe working practices, be positioned in places where emissions to the surrounding environment can be minimised. • Keep disorientated, but otherwise unharmed, seabirds in dark containers for subsequent release during daylight hours. Ringed/banded birds should be reported to the appropriate ringing/banding scheme (details are provided on the ring. • Avoid the unnecessary discharge of ballast water. • Use filtration procedures during loading in order to avoid the uptake of potentially harmful aquatic organisms, pathogens and sediment that may contain such organisms. • Ensure all infrastructure (e.g. arrays, streamers, tail buoys etc.) that has been used in other regions is thoroughly cleaned prior to deployment. • Implement a waste management system that addresses all wastes generated at the various sites, shore-based and marine. This should include: o Separation of wastes at source; o 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. • Use a low-toxicity biodegradable detergent for the cleaning of all deck spillages. • The vessel operators should keep a constant watch for marine mammals and turtles in the path of the vessel. Keep watch for marine mammals behind the vessel when tension is lost on the towed equipment and either retrieve or regain tension on towed gear as rapidly as possible. • In the event that equipment is lost during the operational stage, assess safety and metocean conditions before performing any retrieval operations. • Ensure that routine cleaning of ballast tanks to remove sediments is carried out, where practicable, in mid-ocean or under controlled arrangements in port or dry dock, in accordance with the provisions of the ship's Ballast Water Management Plan. • Prepare and implement a Shipboard Oil Pollution Emergency Plan and adopt the South African Marine Pollution Contingency Plan, which sets out national policies, principles and arrangements for the management of emergencies including oil pollution in the marine					the requirements of the EMPr and legislation.	requirements (ECO Reports, maintenance plans, OM Manuals).

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	environment. (The vessel will also have a valid Oil Pollution Prevention Certificate) • As far as possible, and whenever the sea state permits, attempt to control and contain any spill at sea with suitable recovery techniques to reduce the spatial and temporal impact of the spill. • Ensure offshore bunkering is not undertaken in the following circumstances: o Wind force and sea state conditions of ≥6 on the Beaufort Wind Scale; o During any workboat or mobilisation boat operations; o During helicopter operations; o During the transfer of in-sea equipment; and o At night or times of low visibility.						
13.18 Fisheries							
A	• At least 3 weeks prior to the commencement of seismic survey activities, key stakeholders should be consulted and informed of the proposed seismic survey programme (including navigational co-ordinates of location, timing and duration of proposed activities) and the likely implications thereof (specifically the exclusion and safety zone around the seismic vessel): o Fishing industry associations: SA Tuna Association; SA Tuna Longline Association and Fresh Tuna Exporters Association. o Other key stakeholders: SAN Hydrographer, South African Maritime Safety Association, Ports Authority and the DFFE Vessel Monitoring, Control and Surveillance Unit in Cape Town. • These stakeholders should again be notified at the completion of the project when the survey and support vessels are off location.	Planning Operation	Three weeks prior to operation	Contractor FLO	FLO (pre- and post operations) ECO	Notification of stakeholders.	Confirmation of notification of stakeholders.
B	• Request, in writing, the SAN Hydrographer to broadcast a navigational warning via Navigational Telex (Navtext) and Cape Town radio for the duration of the seismic survey activity. • Distribute a Notice to Mariners prior to the commencement of the seismic survey operations. The Notice to Mariners should give notice of (1) the co-ordinates of the survey area, (2) an indication of the proposed survey timeframes, (3) the dimensions of the towed gear array and dimensions of the safety zone around the seismic vessel, and (4) provide details on the movements of support vessels servicing the project. This Notice to Mariners should be distributed timeously to fishing companies and directly onto vessels where possible.	Planning Operation	During Operation	Contractor FLO	FLO (pre- and post operations) ECO	Navigational Telex (Navtext) and Cape Town radio broadcast.	Navigational Telex (Navtext) and Cape Town radio broadcast.
C	For the duration of the survey, circulate a daily survey schedule (look-ahead), via email, to key fishing associations.	Operation	During operation	Contractor	ECO (monthly)	Vessels indication in place.	Notification to fishing associations

Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
D	An experienced Fisheries Liaison Officer (FLO) should be placed on board the seismic or guard vessel to facilitate communications with fishing vessels in the vicinity of the seismic survey areas.	Operation	During operation	Contractor	ECO (monthly)	Vessels indication in place.	Adequate indication in place.
E	The lighting on the seismic and support vessels should be managed to ensure that they are sufficiently illuminated to be visible to fishing vessels, as well as ensure that it is reduced to a minimum compatible with safe operations.	Operation	During Operation	Contractor FLO	FLO (pre- and post operations) ECO	Adequate lighting in place	Adequate lighting in place
F	Notify any fishing vessels at a radar range of 12 nm from the seismic vessel via radio regarding the safety requirements around the seismic vessel.	Operation	During Operation	Contractor FLO	FLO (pre- and post operations) ECO	Notification of fishing vessels.	Notification of fishing vessels.
G	Implement a grievance mechanism in case of disruption to fishing or navigation.	Operation	During Operation	Contractor FLO	FLO (pre- and post operations) ECO	Grievance mechanism	Grievance mechanism. (Complaints register)

14 APPENDICES

Appendix A: EAP DETAILS

APPENDIX: A.1

MAIN EAP / REPORT COMPILER

CURRICULUM VITAE

Name:	Mr. Vukosi Glen Mabunda
Nationality:	South African
Date of Birth:	08 July 1994
Profession:	Environmental Assessment Practitioner and GIS Specialist
Professional Qualification/ Training:	Master of Science in Geography, University of Johannesburg, 2021
	BSc Honours: Geography, University of Johannesburg, 2017
	BSc: Life & Environmental Sciences, University of Johannesburg, 2016
	ISO 14001:2015 - Environmental Management Systems (EMS), Alison, 2022
	ISO 9001:2015 QMS Execution and Auditing Techniques, Alison, 2022
	Introductory EIA Report Writing, IAIA-SA, 2020
Professional Registrations:	Registered Professional Natural Scientist (SACNSP- #134178) – Environmental Sciences
	Registered Professional Natural Scientist (SACNSP- #134178) – Geospatial Sciences
	Registered Environmental Assessment Practitioner (EAPASA- #2019/867)
Professional Memberships:	International Association for Impact Assessment (SA) - Membership Number: 6985
	Geo-Information Society of South Africa - Membership Number: HSXC-6048
	Society of South African Geographers - Membership Number: 36/21
	Geo-Information Society of South Africa (GISSA) - Membership Number: HSXC-6048
Current Employer:	Environmental Impact Management Services (Pty) Ltd

KEY EXPERIENCE

Vukosi Mabunda is a current Geographic Information Systems (GIS) Specialist and Environmental Assessment Practitioner with 6 years' working experience. He is one of the few dual registered professionals with the South African Council for Natural Scientific Professions (SACNASP) as a Professional Geospatial Scientist and Professional Environmental Scientist. He is also a registered Environmental Assessment Practitioner (EAP) with the Environmental Assessment Practitioners Association of South Africa (EAPASA). Vukosi has dual professional background in Geographic and Environmental Sciences having academic qualifications which focused on these disciplines as well as relevant work experience. Vukosi has experience in various environmental assessment projects ranging from Environmental Screening, Basic Assessments, Section 102 Amendments and Scoping & Environmental Impact Assessments processes. In addition, Vukosi has undertaken Water Use Authorisations applications through both the General Authorisation and Water Use Authorisation processes.

EMPLOYMENT HISTORY

Duration	Employer, Country	Position
August 2023 to Present	Environmental Impact Management Services (Pty) Ltd	Environmental Assessment Practitioner & GIS Specialist
May 2019 to August 2023	GA Environment (Pty) Ltd	GIS Specialist and Environmental Assessment Practitioner
January 2018 to April 2019	City of Johannesburg Metropolitan Municipality, South Africa	Environmental GIS Intern

PROJECTS EXPERIENCE

Period: August 2023 - Current	Organisation: EIMS	Position: Environmental Assessment Practitioner & GIS Specialist
Key Projects/Assignments	a. <u>Environmental & GIS Consultant: Responsible for the following aspects:</u> • Environmental Authorisations & Water Use Authorisations; • Quality control and assurance; • Client management; • Project Management; and • Capacity Building and Training. b. <u>Project Experience:</u> • Scoping and EIA for Glencore Lydenburg Smelter Solar PV, Mpumalanga (in progress). • Scoping and EIA for Harmony Brand A Tailings Storage Facility, Free State (in progress). • Scoping and EIA for Nuvest Recovery Solutions Chemical Plant in Meyerton, Gauteng Province (Final EIR Submitted). • Part II EA Amendment for Motuoane Hennenman Exploration Project, Free State (in progress). • Environmental Registration (Standard) for Zibulo 132kV Overhead Powerlines Projects, Mpumalanga (Registration Issued). • General Authorisation for Glencore Lydenburg Smelter Solar PV, Mpumalanga (in progress). • ECO for JRA Klipfontein View Roads and Stormwater Upgrades, Gauteng. • ECO for Eskom Lulamisa – Dalkeith 88kV Powerline Rebuild, Gauteng.	

Period: May 2019 – August 2023	Organisation: GA Environment	Position: Environmental Assessment Practitioner & GIS Specialist
Key Projects/Assignments	a. Environmental & GIS Consultant: Responsible for the following aspects: • Environmental Authorisations & Water Use Authorisations; • Quality control and assurance; • Client management; • Project Management; and • Capacity Building and Training. b. Project Experience: i. Scoping and EIA Projects: • The Proposed Lower Coerney Balancing Dam, Eastern Cape Province (EA Issued). • Scoping and EIA for the Proposed Ennerdale Extension 9 Mixed-Use Development. Gauteng Province (EA Issued). ii. Basic Assessment Projects: • SANRAL R101 Section 8 Bela Bela to Modimolle Road Upgrade Project, Limpopo Province (EA Issued). • The Proposed Harmony Gold Slurry and Return Water Pipeline from TGT 2 Tailings Storage Facility to Freddie's 9 TSF, Free State Province (EA Issued). • The Proposed Development of a Fender Maintenance Workshop and Storage Area in The Port of Saldanha, Western Cape Province (EA Issued). • Eskom Azaadville 4km 400kV Deviation Powerline, Eskom Westrand Strengthening Phase II (EA Issued) • The Proposed Construction of an Eskom 66kV Deviation from the Existing Knobel-Gilead Distribution Powerline (EA Issued). • The Proposed Housing Development Agency Ennerdale Extension 2 Housing Project, Gauteng Province (Application withdrawn after Final Submission). iii. Water Use Authorisation Projects: • SANRAL R101 Section 8 Bela Bela to Modimolle Road Upgrade Project, Limpopo Province (GA Issued). • The Proposed Harmony Gold Slurry and Return Water Pipeline from TGT 2 Tailings Storage Facility to Freddie's 9 TSF, Free State Province (WUL Issued). The Proposed Lower Coerney Balancing Dam, Eastern Cape Province (Application withdrawn after submission)	

iv. ECO Projects:

- Provision of Environmental Compliance Monitoring Services for the Eskom Normandie-Kemp 88kV Powerline Project, Mpumalanga Province.
- Provision of Environmental Compliance Monitoring Services for Transnet in and around the Port of Saldanha, Saldanha Bay Municipality.
- Development of COEGA Development Corporation Phase 1 of the Wild Coast Special Economic Zone, Eastern Cape Province.
- Provision of Environmental Compliance Monitoring Services for the City of Ekurhuleni Human Settlements Vosloorus High Density Housing Development Project, Gauteng Province.

v. Environmental Screening/Sensitivity Assessments & NEMA Queries:

- Detailed Environmental Screening for the Proposed Balwin Greater Thaba Eco Village, Gauteng Province.
- Environmental Screening Reports for various sites under the Rapid Land Release Programme: Packages A – F, Gauteng Province.
- Environmental Screening Reports for the Proposed Upgrading of Informal Settlements Programme in West Rand and Sedibeng Municipality, Gauteng Province.
- Environmental Screening Reports for the Proposed Upgrade of Internal Roads Northern Areas (Mabopane and Garankuwa), Gauteng Province.
- NEMA Query for the Proposed Upgrade of R61 Baziya Community Road as Part of the SANRAL R61 Road Upgrade Project, Eastern Cape Province.
- NEMA Query for the Proposed Rhodesfield Mixed Land Use Development, Gauteng Province.

vi. GIS Projects and Tasks:

- City of Ekurhuleni Land Use Survey, Gauteng Province.
- Locality, Sensitivity and Master Layout Mappings, all projects above (excluding ECO) and the following:
    - Proposed Extension of NECSA Pipe Storage Facility
    - Eskom Nuwekloof and Witzenberg Battery Storage Projects
    - Proposed Foskor-Merensky 400kV Power Line Project
    - Blyde River Canyon Universal Access EMPr Project
    - Mangaung Metropolitan Municipality Integrated Public Transport Network
    - Moloto Road EIA - SANRAL R573 (K139) project
    - The Proposed SANRAL PWV 2 Project

LANGUAGE CAPABILITY

Language	Speak	Read	Write
English	Excellent	Excellent	Excellent
XiTsonga	Excellent	Fair	Fair
IsiZulu	Good	Fair	Fair

DECLARATION

I confirm that the above information contained in the CV is an accurate description of my experience and qualifications at the time of signature.

_____ 01 June 2024

Signature of Staff Member Date

Environmental Assessment Practitioners Association of South Africa

Registration No. 2019/867

Herewith certifies that

Vukosi Glen Mabunda

is registered as an

Environmental Assessment Practitioner

Registered in accordance with the prescribed criteria of Regulation 15. (1) of the Section 24H Registration Authority Regulations (Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Effective: 01 March 2024

Expires: 28 February 2025

Chairperson

Registrar

SAQA
SOUTH AFRICAN QUALIFICATIONS AUTHORITY

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Vukosi Glen Mabunda

Registration Number: 134178

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)
Geospatial Science (Professional Natural Scientist)

Effective **3 March 2021** Expires **31 March 2025**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

APPENDIX: A.2

SECODARY EAP / REPORT REVIEWER

CURRICULUM VITAE

Name:	John Paul von Mayer
Nationality:	South African
Date of Birth:	24 September 1984
Profession:	Environmental Scientist
Professional Qualification/ Training:	BSc Honours Environmental Science; University of the Witwatersrand, 2007
	BSc Environmental Science; University of the Witwatersrand, 2006
	Certificate in Environmental Law, Rhodes University, 2011
Professional Membership/ Registrations:	Registered Professional Natural Scientist (SACNSP- #400336/11) EAPASA Registered Environmental Assessment Practitioner (2019/1247)
Current Employer:	Environmental Impact Management Services (Pty) Ltd.

KEY EXPERIENCE

Mr John von Mayer is a senior consultant at EIMS and has been involved in numerous significant projects the past 14 years. He has experience in Project Management, small to large scale Environmental Impact Assessments, Environmental Auditing, Water Use Licensing, and Public Participation. He is a Registered Professional Natural Scientist (400336/11) with the South African Council Natural and Scientific Professions (SACNASP) as well as a registered EAPASA Environmental Practitioner (2019/1247) His key experience includes:

- Experience with identification and assessment of environmental impacts.
- Experience in environmental compliance and monitoring.
- Knowledge of environmental legislation and policies, planning process and regulatory frameworks.
- Knowledge and experience of public participation process.
- Strong competencies in the assessment of renewable energy and mining projects.
- Project management.

CAREER SUMMARY

Period: November 2016 - Present:	Organisation: EIMS	Position: Senior Environmental Assessment Practitioner
Key Projects/Assignments	Senior EAP: Responsible for managing various projects. Main responsibilities include: • Compilation of EIA reports	

	• Environmental audits and compliance reporting • Compilation of Environmental Management Plans • Various licensing and permitting applications Currently involved in a number of ongoing projects, EIAs, etc. Selected Project Experience: • Update of Environmental Management Plans for three of Harmony's Freestate Gold Mining Operations. • Eloff Phase 3 Coal Mine EIA. • Vlakvarkfontein Coal Mine Extension EIA and WULA. • EA application for Searcher 3D Seismic Survey Reconnaissance project off the West Coast of South Africa. • Droogvallei Coal Mine Water Use Licence Application. • Elandsfontein mine extension EIA and WULA near Delmas Mpumalanga Province. • Proxa Eastern Basin Treatment Plant Audit. • Harmony Mispah and Kareerand Pipelines EA and WULAs for various Harmony mines throughout Free-State • External Environmental Compliance Audits for various Eskom power stations (Matimba, Medupi, Kusile etc). • Updates to Manungu Mine Rehabilitation Strategy and Implementation Plan • Amendment of Environmental Authorization for Harmony Gold Mining Kalgold operations • EMPr amendment for Harmony Moab mine • Environmental Compliance Audit for the Amakhala Emoyeni Wind Farm. • Environmental Compliance Audit for various coal mines including Canyon Coal's Hokhana Coal Mine. • Tetra4 EA / EMPr / WUL compliance audits for Cluster 1 exploration activities. • Harmony Valley Tailings Storage Facility EIA and WULA near Welkom. • Various EIAs for Glencore Solar PV facilities at Wonderkop smelter, Lydenburg smelter and Rhovan vanadium mine. • EMPr Performance assessment audits at various Harmony Free-State operations • Various other permitting and licensing applications.

Period: June 2008 – June 2012 and October 2014 – November 2016	Organisation: Savannah Environmental	Position: Senior Environmental Assessment Practitioner
Key Projects/Assignments	Project Manager and Environmental Assessment Practitioner for the following: • Environmental Impact Assessment for the Hopefield Wind Energy Facility, Western Cape Province • Environmental Impact Assessment for a Wind Energy Facility near Cookhouse, Eastern Cape Province • Basic Assessment for Cookhouse II Wind Energy Facility expansion project, Eastern Cape Province • Provision of Environmental Consulting Services for the Implementation and Compliance Monitoring of the Cookhouse Wind Energy Facility • Environmental Post Construction Audits for Wind Monitoring Masts near Cookhouse and Oyster Bay • Environmental Impact Assessments for the Amakhala Emoyeni Wind Energy Facilities near Bedford, Eastern Cape Province • Environmental Impact Assessments and Environmental Management Plans for Wind Energy Facilities near Indwe and Sterkstroom, Eastern Cape Province • Environmental Impact Assessment and Management Plan for Happy Valley Wind Energy Facility near Humansdorp, Eastern Cape Province • Environmental Impact Assessment and Management Plan for Deep River Wind Energy Facility near Humansdorp, Eastern Cape Province • Environmental Impact Assessment and Management Plan for 200km of Eskom Transmission Lines in Limpopo Province: Mokopane Integration Project • Environmental Impact Assessment and Management Plan for Tsitsikamma Community Wind Energy Facility in the Eastern Cape Province • Integrated Environmental Impact Assessment and Management Plan for Tshivhaso Coal Fired power Plant near Lephalale • Environmental Audits and Compliance Monitoring for Eskom Duvha Mine Water Recovery Project (client: Eskom) • Completed Regional Siting Assessments for proposed Wind Energy Facilities on the West Coast (client: Investec) • Numerous Basic Assessments including: Qoboshane Road and Access Bridge Project, Various 132kV power line projects throughout the country, Wastewater treatment facility for Harmony's Doornkop Mine, Camco PV project at Thaba Eco Lodge. • Legal Review and Licenses Audit for Eskom Generation, Duvha Power Station.	

	• Legal Review and License Audit for Eskom Generation, Hendrina Power Station. • External WUL and NEMA Performance Assessment for the Hakhano Colliery in Middelburg. • Annual Environmental Compliance, Equator Principles, IFC Performance Standards and World Bank EHS Guidelines Auditing for the construction of the 138MW Amakhala Emoyeni Project 1 Wind Energy Facility near Bedford, Eastern Cape Province.	
June 2012 – October 2014: Senior Environmental Scientist;	**Organisation: Mills and Otten**	**Position: Environmental Scientist**
Key Projects/Assignments	Environmental Scientist at Mills and Otten. Worked on the following projects: • Phase 1 and Phase 2 contamination assessments for BP,BP RM, Engen and Total SA at various filling stations and fuel installations throughout the country. • Remediation monitoring and Remediation Action Plans for various filling stations in Johannesburg for BP RM and Total SA. • Various Waste and Water Use License Applications	

LANGUAGE CAPABILITY

Language	Speak	Read	Write
English	Excellent	Excellent	Excellent
Afrikaans	Average	Good	Average

DECLARATION

I confirm that the above information contained in the CV is an accurate description of my experience and qualifications and that, at the time of signature.

_____ 08/06/2024_____

Signature of Staff Member Date

Environmental Assessment Practitioners Association of South Africa

Registration No. 2019/1247

Herewith certifies that

John von Mayer

is registered as an

Environmental Assessment Practitioner

Registered in accordance with the prescribed criteria of Regulation 15. (1) of the Section 24H Registration Authority Regulations (Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Effective: 01 March 2024

Expires: 28 February 2025

Chairperson

Registrar

SAQA
SOUTH AFRICAN QUALIFICATIONS AUTHORITY

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

John Paul von Mayer

Registration Number: 400336/11

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)

Effective **31 August 2011** Expires **31 March 2025**

Chairperson

Chief Executive Officer

To verify this certificate scan this code