



TRANS ATLANTIC
DIAMONDS

BASIC ASSESSMENT PROCESS FOR THE PROPOSED PROSPECTING IN SEA CONCESSION AREA 14A BY TRANS ATLANTIC DIAMONDS (PTY) LTD

Part B: Environmental Management Programme



December 2021



BASIC ASSESSMENT PROCESS FOR THE PROPOSED PROSPECTING IN SEA CONCESSION AREA 14A BY TRANS ATLANTIC DIAMONDS (PTY) LTD

Appendix A: Environmental Management Programme

DECEMBER 2021

Report prepared for:

Trans Atlantic Diamonds (Pty) Ltd
Office 1603 Portside
4 Bree Street
Cape Town, Western Cape, 8001



TRANS ATLANTIC
DIAMONDS

Report Prepared by:

Anchor Environmental (Pty) Ltd
8 Steenberg House, Silverwood Close, Tokai, South Africa
www.anchorenvironmental.co.za



Authors: Cheruscha Swart, Safiyya Sedick, Kenneth Hutchings and Barry Clark

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mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL

MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

1 GENERAL INFORMATION

1.1 Prospecting Right Applicant

| | |
|--------------------------------------|--|
| Name of the Applicant: | Trans Atlantic Diamonds (Pty) Ltd |
| Responsible Person | Anthony Peter |
| Contact number | 021 418 1587 |
| Fax number: | n/a |
| Physical address: | Office 1603 Portside, 4 Bree Street, Cape Town, Western Cape, 8001 |
| Postal address: | Office 1603 Portside, 4 Bree Street, Cape Town, Western Cape, 8001 |
| Email address: | anthony@transatlanticdiamonds.com |
| File reference number SAMRAD: | WC30/5/1/1/2/10385PR |

1.2 Important notice

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if, among others, the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application for Environmental Authorisation must (a) be prepared in a format that may be determined by the Competent Authority and (b) in terms of section 17 (1) (c) of the same regulation, the competent Authority must check whether the application has taken into account the minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings, as set out below, and ensure that the report is not cluttered with uninterpreted information and that it unambiguously represents the interpretation of the applicant.

1.3 Objective of the Basic Assessment Process

The objective of the basic assessment process is, through a consultative process, to –

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives,
- (d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on the these aspects, to determine:
 - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be managed, avoided or mitigated;
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and (iii) identify residual risks that need to be managed and monitored.

1.4 Objectives of the Basic Assessment Report:

The main objectives of the BAR are as follows:

- Assess the significance of the identified impacts for the proposed prospecting activities on the environment
- Provide sufficient information to strategically plan the prospecting activities to mitigate social, economic, heritage, environmental and other impacts.
- Provide a management plan that is effective and practical for implementation.
- Anticipate the risks and impacts of the prospecting activities through environmental monitoring and inspections.
- Create an adaptive framework for management of impacts such that unplanned events or incidents can be effectively controlled or minimised.
- The impact management plan and associated mitigation measures will be developed in adherence to international (such as UNCLOS), national and regional legal standards such as those implemented by designated authorities which include the DMRE, NEMA, and EIA regulations and guidelines.
- Through the development of the EMP, measures will be developed to avoid environmental, social and other risks and impacts, and to provide mitigation where possible. This will then be

included in the EMPr to be retained by the Environmental Control Officer (or such designated authority) who can oversee and report on the impact monitoring and mitigation measures.

- Provides the stakeholders with an opportunity to provide questions and comments on the proposed project.

PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1.5 Contact Person and correspondence address

1.5.1 Details of the EAP

| | |
|---------------------------------|--|
| Name of The Practitioner | Dr Kenneth Hutchings |
| Contact number: | 021 701 3420 |
| Fax number: | 021 701 5280 |
| Physical Address | Suite 8, Steenberg House, Silverwood Close, Steenberg Estate, Tokai, 7945 |
| Postal address: | Suite 8, Steenberg House, Silverwood Close, Steenberg Estate, Tokai, 7945 |
| Email address: | ken@anchorenvironmental.co.za |

1.5.2 Expertise of the EAP.

Kenneth Hutchings holds a doctoral degree (Ph.D.) in Zoology (fish taxonomy, life history, ecology and management), a Masters (M.Sc.) degree in Zoology (fisheries management), Honours degree in Marine Biology, and a Bachelor of Science degree in Zoology, Environmental and Geographical Science. Dr Hutchings is also a SACNASP registered scientist, Research Associate at the University of Cape Town and Associate Technical Consultant for the Marine Stewardship Council. Qualifications and registrations will be included as appendices to this report. See Appendix 1 for more details. The CVs of the additional contributing consultants are also included as part of Appendix 1.

1.5.3 Summary of the EAP's past experience.

(In carrying out the Environmental Impact Assessment Procedure)

Dr Hutchings has more than 25 years of research and consulting experience in several disciplinary fields, with his main areas of expertise including Marine and Fisheries Research. He has been the principal consultant on several Specialist studies, Risk and Environmental Assessments and Strategic Environmental Assessments, many of which formed part of EIAs and BAs. These projects ranged from sand mining operations, to shallow water offshore explorations, to desalination plants and upgrades to port. Clients, amongst many others, include NWJ Environmental, Golder Mozambique/Sasol Petroleum Mozambique Exploration Limitada, SE Solutions (Pty) Ltd, South32 Aluminium SA Limited, Transnet National Ports Authority and Tronox Namaqua Sands. For the past five years, Dr Hutchings has been the Environmental Assessment Practitioner (EAP) and supervisory EAP for several EIAs and BAs. Projects include the development of a Greenhouse Farm on the West Coast by Drylands Farms;

the development of an aquaculture farm near Kleinzee in the Northern Cape for Diamond Coast Aquaculture; the development of an abalone ranch in the NC 3 concession area in the Northern Cape by Port Nolloth Sea farms Ranching; and the establishment of a sea-based aquaculture development zone (ADZ) in Algoa Bay by the Department of Forestry, Fisheries and the Environment (DFFE) (previously Department of Agriculture, Forestry and Fisheries (DAFF)). The majority of Ken's work forms part of the integrated environmental management field. Ken has been the author and co-author of dozens of peer reviewed papers, reports and management plans, many of which has informed management decisions.

1.6 Content of the Environmental Management Programme

The 2014 EIA Regulations (as amended in 2017) prescribe the required content of an EMPr. These requirements, and the sections of this EMPr in which they are addressed, are summarised in Table 1

Table 1 Content of the EMPr as prescribed by the 2014 EIA Regulations.

| GN 326 | Item |
|----------|---|
| (a)(i) | Details of the EAP who prepared the EMPr |
| (a)(ii) | Expertise of that EAP to prepare an EMPr, including a curriculum vitae (company profile enclosed) |
| (b) | A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description; |
| (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; |
| (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 through the environmental impact assessment process for all phases of the development including- |
| (d)(i) | Planning and design |
| (d)(ii) | Operational activities |
| (d)(iv) | Rehabilitation of the environment after construction and where applicable post closure; and |
| (e) | A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to — |
| (e)(i) | Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; |
| (e)(ii) | Comply with any prescribed environmental management standards or practices; |
| (e)(iii) | Comply with any applicable provisions of the Act regarding closure, where applicable; and |
| (e)(iv) | Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable; |
| (f) | The method of monitoring the implementation of the impact management actions contemplated in paragraph (f); |
| (g) | The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f); |
| (h) | An indication of the persons who will be responsible for the implementation of the impact management actions; |
| (i) | The time periods within which the impact management actions contemplated in paragraph (f) must be implemented; |

| GN 326 | Item |
|---------------|--|
| (j) | The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f) |
| (k) | A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations; |
| (l) | An environmental awareness plan describing the manner in which- |
| (l)(i) | The applicant intends to inform his or her employees of any environmental risk which may result from their work; and |
| (l)(ii) | Risks must be dealt with in order to avoid pollution or the degradation of the environment; |
| (m) | Any specific information that may be required by the competent authority. |

2 INTRODUCTION

Trans Atlantic Diamonds (Pty) Ltd (The Applicant) is a licensed rough diamond dealer that has operated since October 1986. They act as an independent, online rough diamond sales channel which connects both buyers and sellers, while providing a sales solution for producers, small artisanal miners and suppliers. With over thirty years of diamond industry experience, they are well recognised within the trade, and have pioneered tender and auction services across the globe. Should prospecting reveal an economically viable resource and the project successfully proceed to resource extraction, all diamonds mined in the 14A concession area will be offered to the South African Diamond & Precious Metal Regulator (SADPMR) and will be put to tender on the Diamond Exchange and Export Centre, which is part of the SADPMR, with the intention of local beneficiation.

Trans Atlantic Diamonds (Pty) Ltd has applied for the right to prospect diamonds, gemstones, heavy and industrial minerals, as well as ferrous, base and precious metals in sea Concession Area 14A. This is an inshore concession area that extends from just south of Groothoekbaai to just north of Doringbaai, and is approximately 7 km south of Strandfontein on the West Coast of South Africa.

The prospecting activity triggers a number of Listed Activities in the Environmental Impact Assessment Regulations, 2014 (as amended), promulgated in terms of the National Environmental Management Act (Act No. 107 of 1998). The Applicant is therefore required to apply for Environmental Authorization (EA), in addition to prospecting rights, from the competent authority, i.e., the Department of Mineral Resources and Energy (DMRE), to commence with the activity. To apply for EA, a Basic Assessment of the proposed activity and its potential impacts, along with a Public Participation Process, must be conducted. These findings then need to be submitted as a Basic Assessment Report (BAR), along with an Environmental Management Programme (EMPr), to the DMRE and to the public for review and comment.

The Applicant has appointed Anchor Environmental Consultants (Pty) Ltd (Anchor) as the independent Environmental Assessment Practitioner to assist with applying for prospecting rights, Environmental Authorisation and conducting a Basic Assessment and Public Participation Process.

This document, if approved by the DMRE, represents the binding EMPr for the full cycle of the prospecting rights activities at the management level. The management and mitigation measures identified during the BA process apply to the following phases of prospecting:

- The Planning and Design Phase: These measures are applicable to the planning and design of the prospecting activities. Note, however, that no environmental impacts are associated with the planning phase. All mitigation measures are listed in this section have the purpose to minimise impacts during the operational and decommissioning phase.
- The Operational Phase: These measures are applicable during the long-term operation of the prospecting rights activities.
- The Decommissioning Phase: These mitigation measures are applicable during the decommissioning phase and refer to a reduction in prospecting activities (>90%).

The measures listed for the various phases are either:

- **Essential:** Mitigation measures which must be implemented and are non-negotiable; or
- **Best practice:** Recommended to comply with best practice, with adoption dependent on the proponent's risk profile and commitment to adhere to best practice, and which must be

shown to have been considered and sound reasons provided by the proponent if not implemented. *These measures have been italicised for ease of reference.*

Note that the EMPr will be submitted to the DMRE for approval along with the BAR. If an Environmental Authorisation is issued by the DMRE, this document may need to be updated to ensure that all relevant conditions of authorisation are adequately captured. It is also recommended that the EMPr is reviewed regularly and, where necessary, amended and submitted to the DMRE for acceptance.

2.1 Description of the Aspects of the Activity.

Trans Atlantic Diamonds (Pty) Ltd is proposing to prospect within Sea Concession area 14A using both non-invasive and invasive sampling activities, none of which require infrastructure. As the activity is located offshore and comprises prospecting only, no land-based infrastructure will be required. Prospecting will be conducted using a dedicated survey vessel such as the IMD SA survey vessel DP Star or the Explorer.

They are proposing to prospect for precious metals (gold, silver and platinum), gemstones (alluvial diamonds, sapphires and garnets), ferrous and base metals such as rare earths (monasite mineral), black sand minerals (titanium minerals e.g. ilmenite and rutile), zirconium ore (zircon) and iron ore (magnetite) within Sea Concession area 14A.

The proposed prospecting programme will take place during spring and/or summer and when weather conditions are suitable, and seas are calm. It is anticipated to be completed within five (5) years. Sampling will be conducted in four phases and include a combination of non-invasive and invasive activities to detect the presence of paleo-beach deposits, which are known from other concessions to contain diamondiferous gravels. Prospecting operations are expected to occur sporadically over the entire extent of the concession area. The non-invasive activities will include geophysical exploration (acoustic survey), data acquisition and analysis, while the invasive activities will include physical sampling (collection of core, drill and grab samples).

Non-invasive sampling activities will include the following:

- Desktop study;
- Geophysical survey and seafloor mapping;
- Data acquisition and synthesis;
- Geological modelling; and
- Feasibility study.

Invasive sampling activities will include:

- Core sampling using either a Vibracore, Gravity core or Sonic core;
- Drilling with a specialised drilling tool; and
- Van Veen grab sampling.

The four sampling phases will include:

- **Phase 1:**

- a) Desktop Study
- b) Geophysical Exploration
- **Phase 2:**
 - a) Van Veen grab sampling
 - b) Core sampling
- **Phase 3:**
 - a) Drill sampling
- **Phase 4:**
 - a) Feasibility study and resource estimation

2.1.1 Non-invasive sampling:

Phase 1

a) Desktop Study:

A comprehensive literature review will be undertaken to investigate the depositional environments, sediment stratigraphy and geological units of the area. Data will be obtained from a variety of sources including previous explorations in neighbouring concession areas, published papers, data from field surveys, databases, etc. This review will allow the applicant to identify target sites that are likely to contain diamonds within the concession area. It will also enable the applicant to identify potential challenges and the best means to address these challenges with a view to minimising environmental impacts and costs. This will allow for a more efficient and effective prospecting sampling programme.

b) Geophysical Exploration

Geophysical surveying will be undertaken to collect high-resolution acoustic and multibeam echosounder data along lines 50 m to 200 m apart, throughout the concession area. Surveys will be conducted using a dedicated survey vessel such as the IMD SA survey vessel DP Star or the Explorer. The vessel will have a hull-mounted multibeam echo sounder (MBES) and a Topas sub-bottom profiler systems that are designed to collect high-resolution acoustic data. As these devices are hull mounted, no physical or environmentally destructive impacts are anticipated for this sampling method. Potential noise or sound impacts on biota will, however, be considered. The acoustic equipment will be similar to that typically used in diamond prospecting i.e. hull-based transducers that generate sound waves at frequencies of 70-455 kHz. Information obtained during this survey will be used to inform the appropriate drilling method that must be implemented.

The IMD SA survey vessel DP Star is regularly used for similar survey work along the west coast of southern Africa. This type of survey typically does not require the vessel to tow any cables, however, it will be “restricted in its ability to manoeuvre” during the survey due to the operational nature of this work. Concession 14A will be surveyed from the western boundary (1 km from the highwater mark) to not shallower than 15 m water depth for the sake of vessel safety. Survey lines for 14A amount to a total distance of approximately 120 km. The survey speed of the DP Star is typically 100 km/day, which would equate to approximately two day's work. It has been proposed that

survey work will be conducted over a one-week window period during suitable calm sea and weather conditions (probably late summer-autumn 2022). The area shallower than 15 m is expected to be surveyed by use of a small vessel equipped with a simplified array of acoustic survey equipment. The bathymetry of 14A will be modelled using processed acoustic survey data before sampling can take place. It is estimated that this will take approximately one month.

The use of this geophysical survey equipment allows the operator to produce a digital terrain model of the seafloor. The MBES provides depth sounding information on either side of the vessel's track across a swath width of approximately two times the water depth, while the Topas sub-bottom profiler generates profiles up to 60 m beneath the seafloor, thereby giving a cross section view of the sediment layers. The source sound level of the MBES is variable but will be a maximum of 221 dB re 1 μ Pa @ 1m, with a frequency range of between 200 and 400 kHz. The Topas sub-bottom profiler uses shallow (35 to 45 kHz) and medium penetration (1 to 10 kHz) "Chirp" acoustic pulses. This equipment has a variable power output and can therefore have the power ramped up in accordance with survey requirements and be contained within acceptable environmental noise levels. As such, it is also capable of "soft starts". The use of a magnetometer to detect magnetic signatures will also be required.

2.1.2 Invasive Sampling activities:

Sampling will be undertaken in targeted areas identified through the analysis of the acoustic survey data. Three potential methods of collecting geophysical samples from the seabed are being considered.

Phase 2:

a) Van Veen grab sampling

This is a popular method used to collect sediment samples for biological, environmental and geotechnical studies. It usually comprises a clamshell bucket made of stainless steel that collects sediment from the seafloor. A Van Veen grab with a sampling capacity of approximately 50 kg will be used to collect baseline environmental data on sediment and benthic macrofauna at 20-50 sites. The grab can penetrate to depths of 20 to 50 cm and collects surficial sediment samples that will be subjected to subsampling. Those for biological analyses will be stored in formalin or ethanol whereafter they will be sent for biological analysis, while the geotechnical subsamples will be frozen and sent to a laboratory to test for shear strength, grain size composition, etc. Samples for biological will be analysed to identify benthic macrofauna (small animals such as worms, mussels, and crustaceans) and to determine the geological units of the seafloor. The grab samples will disturb a total surface area of 5 square meters (m²) while the total volume of samples that will be collected will be 1.5 cubic meters (m³). Results from this survey will be used to describe and to assess change in macrofaunal communities in the area during and after prospecting and mining.

b) Coring

Geotechnical samples will be collected at 100-200 sites using either vibracoring, gravity coring or sonic coring. A core is used to penetrate the seafloor to collect sediment samples. These samples are analysed to determine the sea floor geology (types of material present, i.e. sand, gravel and/ or rock and the hardness of the rock), topography (trenches or elevations) and sediment stratigraphy (how sand and rock are layered). This information is then used to engineer the drilling tool (for phase three of the prospecting activities – see below) and the future mining vessel.

Geotechnical sampling is also used for resource evaluation, i.e. determining whether there are materials that can be mined in the area and whether it will be economically viable. The type of coring will depend on the geological formations of the seafloor. The sonic core is an advanced form of drilling that employs high-frequency, resonant energy generated inside the Sonic head to advance a core barrel or casing into subsurface formations, i.e. can penetrate some subsurface rock, whilst gravity and vibracoring can only sample unconsolidated material. The diameter of core samples will be approximately 10 cm, the corers will penetrate to depths of 3–8 m. Material collected by the cores will be brought to the surface for analysis. The volume per core is estimated at 0.024 m³. Core samples do not require onboard processing (i.e. no sediment spill in the ocean) as all material collected will remain intact within core tubes which will be analysed on land. The core samples will be collected from a purpose-built survey vessel with equipment sourced from IMD SA and/or Underwater Mining Solutions. It is estimated that an initial 100 core samples will be required at a sampling rate of approximately ten cores per day which would amount to a total of ten days work. Sampling work will be restricted between the western boundary of the concession and not shallower than 20 m water depth. The exact sampling sites will be informed by the information acquired during the geophysical surveying and the recommendations from the environmental impact assessment (marine ecology specialist study). The core samples will disturb a total surface area of 1.57 m², while the total volume of samples that will be collected by the cores will be 4.71 m³.

Phase 3

a) Drilling

In addition to the above, prospective targets will be analysed by a uniquely designed drill tool that can dredge gravel from the seabed. Material will be processed onboard by a processing plant and tailings will be discarded overboard, thereby causing sediment plumes, in this instance as a near-shore deposit. The discard material is reported to consist mostly of sand that has a minimal suspension time. Pending the final tool design, the drill bit footprint is estimated to be between 3 and 5 m² diameter. The expected average hole depth will be 3 m, although the drill is designed to drill up to 12 m into the seabed if required. Sample volumes are anticipated to be in the range of 9 to 15 m³ per sample. This does not constitute bulk sampling in terms of the Mineral and Petroleum Resources Development Act, Act 28 of 2002 (pers comms DMRE), however, as the material is for prospecting purposes only, not commercial gain, nor are large sections of the seafloor being dredged out. An estimated total of 300 samples spaced at roughly 300 m apart from north to south will be required during Phase 2 (reconnaissance sampling). A sampling rate of ten samples per day would equate to a period of approximately, one month (this does not consider weather delays). It is expected that Phase 3 (resource development phase) may require a greater density of samples (arranged in a 25 m to 50 m sampling grid).

The information acquired will be used for understanding the seafloor topography, resource evaluation and to determine if diamond mining within concession area 14A is economically viable. Information will also be used to inform the construction of the mining vessel and to identify areas for mining.

Phase 4:

a) Feasibility study and resource estimation

Should Phases 1, 2 and 3 yield positive results and the targeted features be identified, a feasibility study will be conducted to assess the likely magnitude of the resource and the economic viability of mining in the proposed prospecting area. This will be a desktop study and will consider the data collected as part of the prospecting activities. The outcome of this will be a Feasibility Study Report. The report will include data on the seafloor topography, sediment stratigraphy and geological units; distribution of potentially mineralised deposits; an evaluation of the drill samples; resource evaluation of areas that are mineralised; an estimate of the extent and size of the resource present; results and recommendations for future mining operations, and recommendations on mining vessel design and construction.

2.2 Composite Map: Location and environmental sensitivities in Concession 14A

The following section includes maps showing the location of Concession Area 14A, the environmental sensitivities, areas that should be avoided and buffers.

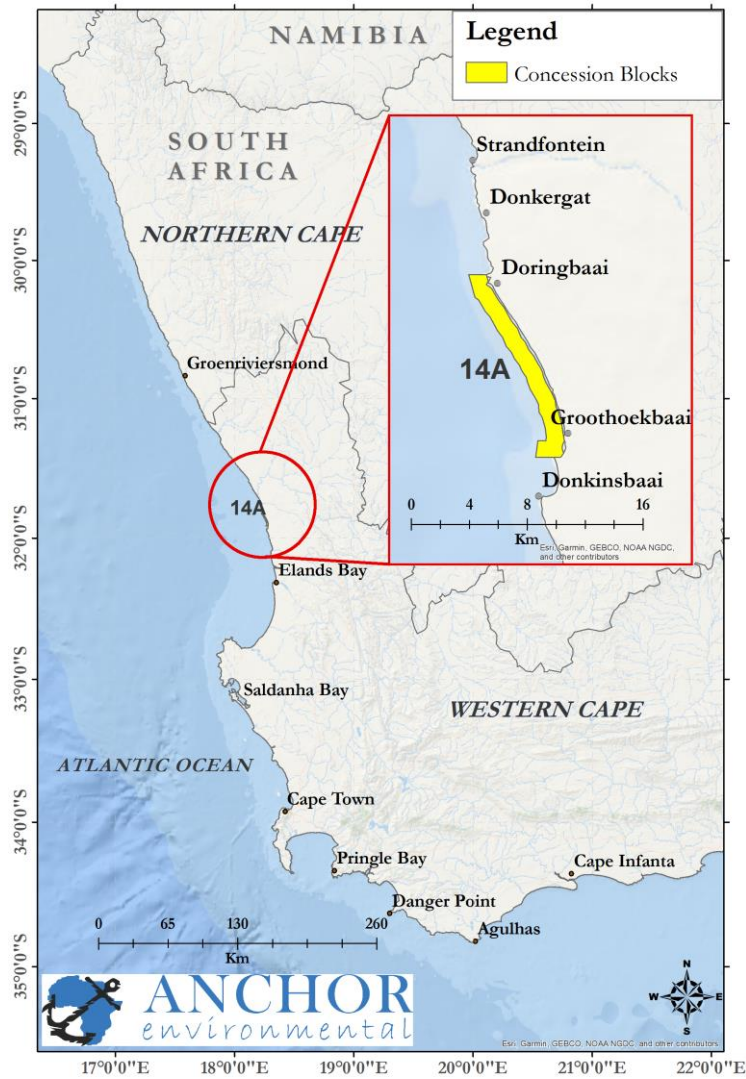


Figure 1 The location of Concession Area 14A along the West Coast

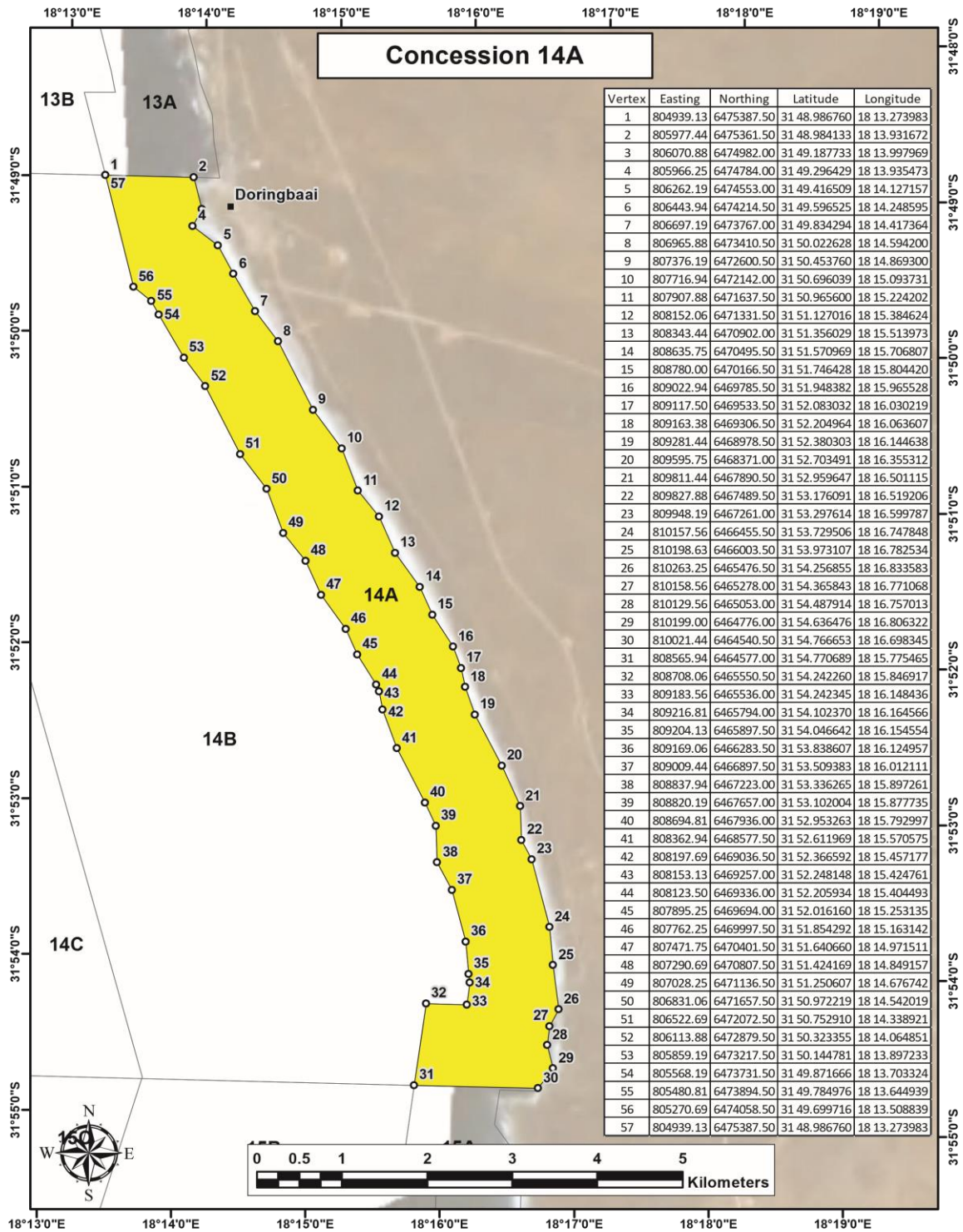


Figure 2 Coordinates and boundaries of Concession Area 14A along the West Coast.

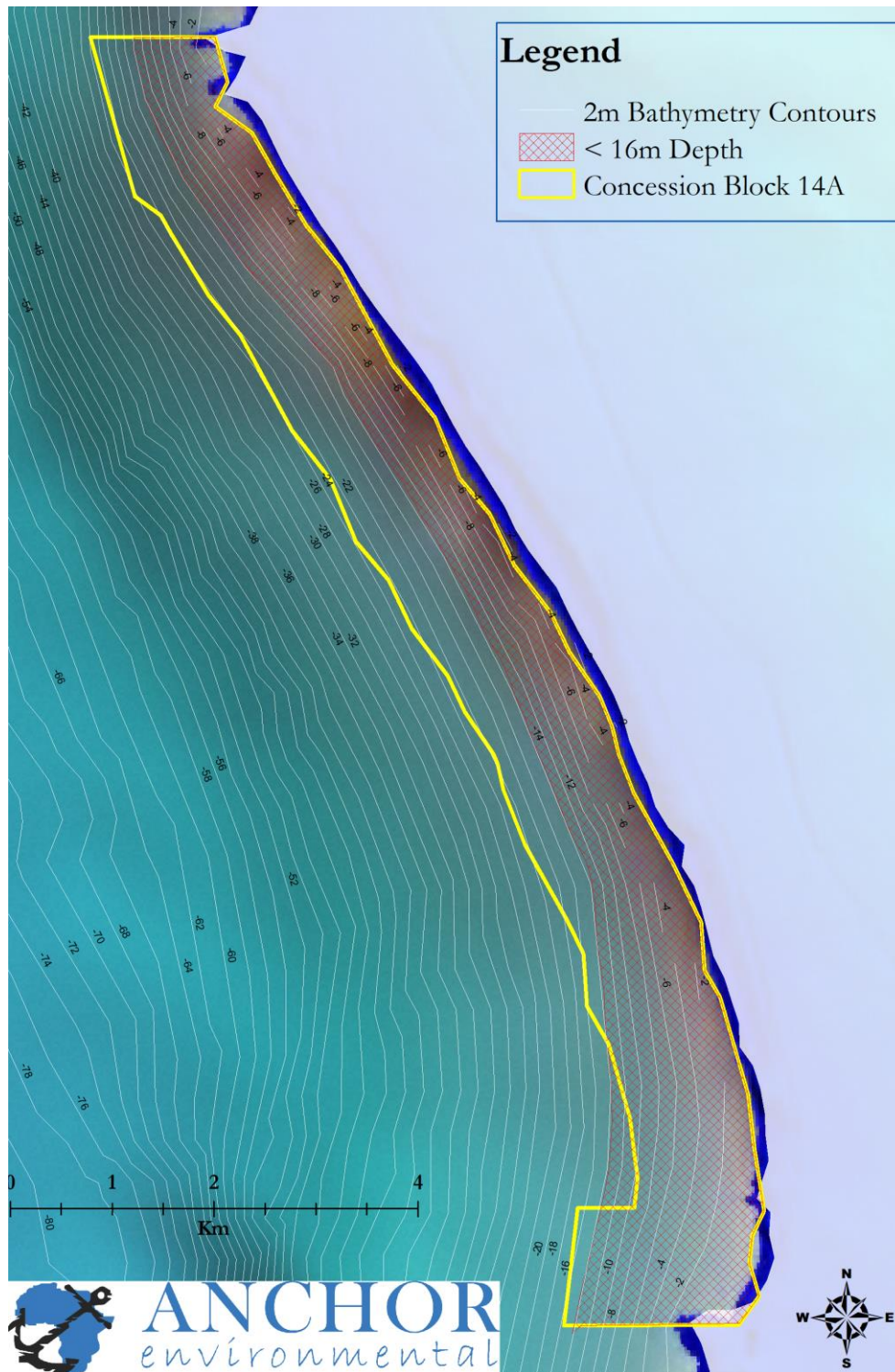


Figure 3 Sea concession 14A off the Western Cape Coast with bathymetry (at 2 m intervals). The red hatched area indicates that portion of 14A that is shallower than 16 m and will not be surveyed by the geophysical survey vessel. A small craft vessel equipped with a simpler array of geophysical survey equipment is expected to survey these shallow areas.

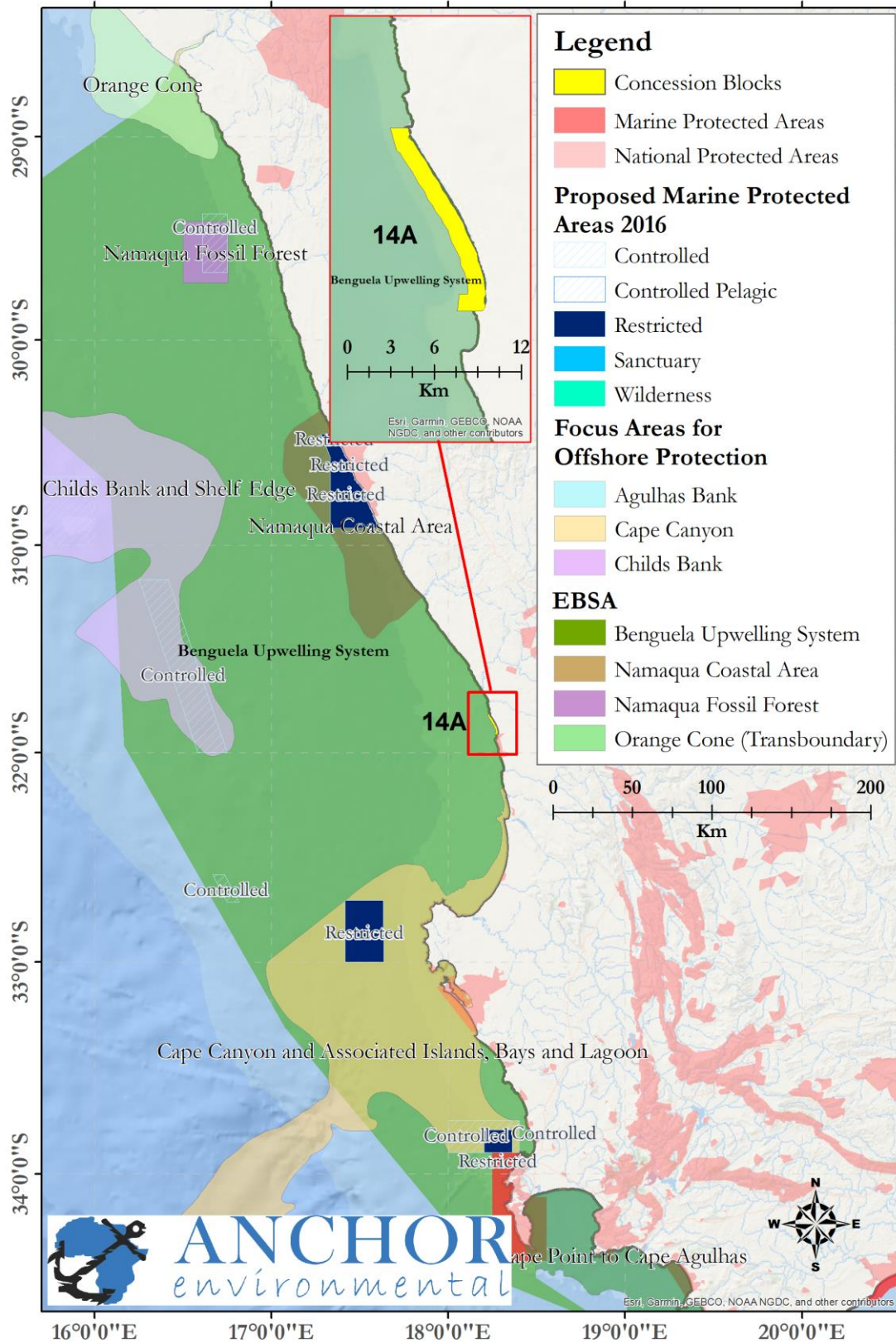


Figure 4 Marine protected Areas and Ecological, Biologically Significant Areas and location of concession area 14A. Source: <https://bgis.sanbi.org/>.

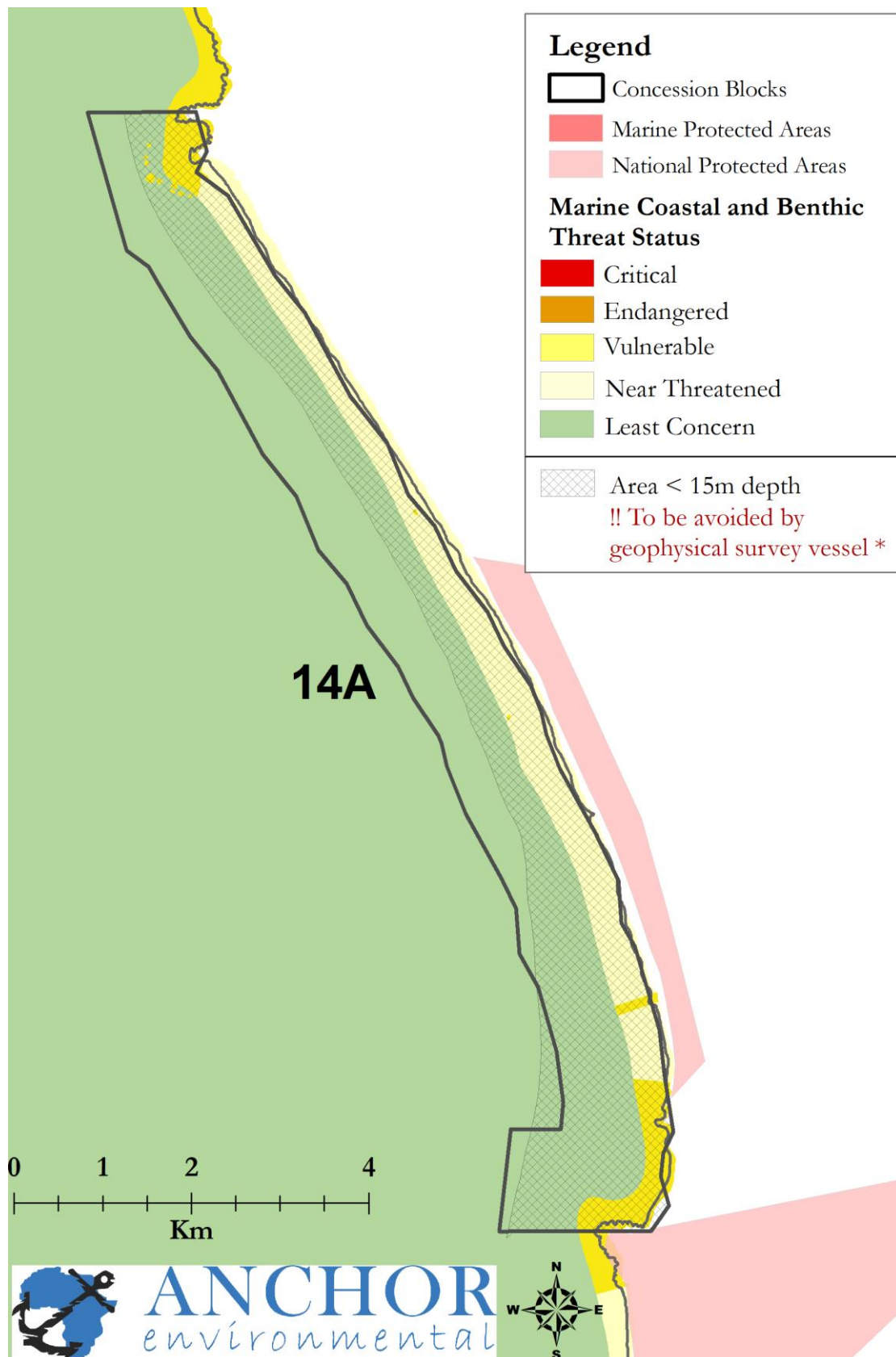


Figure 5 SANBI Ecosystem Threat Status and location of concession area 14A. Source: <https://bgis.sanbi.org/>.

2.3 Project Phasing

2.3.1 Planning and design Phase

The planning and design phase of the development refers to the actual planning and design of the operational phase. This refers to the desktop literature study, literature review and stakeholder consultation that will inform the prospecting activities taking place within the operational phase. A comprehensive literature review will be undertaken to investigate the depositional environments, sediment stratigraphy and geological units in the area. This will include an assessment of whether diamonds and other resources are likely to occur within the prospecting area. Data will be obtained from a variety of sources including previous explorations in neighbouring concession areas, published papers, data from field surveys, databases, etc. This review will allow the applicant to identify target prospecting sites within the concession area. It will also enable the applicant to identify potential challenges and means to address these challenges to reduce environmental impacts and costs. This will allow for a more efficient and effective prospecting sampling programme.

2.3.2 Operational Phase

The operational phase of the development will commence once a thorough due diligence has been conducted regarding the activities scheduled to take place during this phase. This refers to geophysical surveys, drilling/ coring of the seabed and extracting sediment samples using a Van Veen grab.

The purpose of the geophysical survey during the prospecting operation is to collect high-resolution underwater signals and multibeam echosounder data. The acoustic device will be hull mounted and therefore the impacts of a towed device will not need to be considered. This activity will allow the identification and mapping of features and various rock formations and sedimentary types within the concession area. Based on the geological formation of the seafloor in concession area 14 (A), as revealed by the geophysical survey, an appropriate sampling method will be identified.

Drilling will be conducted for the collection of geophysical samples of the seabed. Three potential methods of drilling are being considered. The type of drilling will depend on the geological formations of the seafloor. Sonic coring is an advanced form of drilling which employs the use of high frequency, resonant energy generated inside the sonic head. This allows a core barrel or casing to advance into subsurface formations. It can thus penetrate some subsurface rock and is used in locations with large amounts of rock that cannot be penetrated by gravity cores or vibracores. Gravity coring and Vibracoring can only sample unconsolidated material. The core samples will be collected from a purpose-built survey vessel with equipment sourced from IMD SA and Underwater Mining Solutions.

Grab sampling is a popular method used to collect sediment samples for biological, environmental and geotechnical studies. It usually comprises a clamshell bucket made of stainless steel that “grabs” or collects subsurface sediments. Sediments are usually collected up to a depth of 20 to 50 cm. The sediment samples are sub-sampled and those for biological analyses then stored in formalin or ethanol whereafter they are sent for biological analysis. The geotechnical samples are also frozen and sent to a laboratory to test for shear strength, composition, etc.

2.3.3 Decommissioning Phase

Decommissioning refers to the process of removing the operating assets of the project after completion of the operational phase and activities.

3 IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

Based on the professional experience of the environmental assessment practitioner, The National Web based Environmental Screening Tool, legal requirements, the nature of the proposed activity, and the nature of the receiving environment, the following key environmental issues – potential negative impacts and potential benefits were identified:

- Marine Ecology – potential alteration of the marine ecology due to geophysical surveys and the collection of sediment by means of grab and core.
- Heritage – potential impact on underwater heritage resources, notably wrecks, fossils and associated artefacts.
- Social and economic – potential socio-economic benefits to the wider community in the form of job creation, skills development, increased investment and growth. Negative impacts due to user conflict (local fisherman; recreational fishing). The local fishing industry could also be affected if it overlaps with productive fishing grounds.

Specialist studies were conducted where expert input was provided on the potential impacts to the marine environment and fishing industry as well as heritage and socio-economic impacts by the proposed prospecting activities. The marine specialist study is included in Appendix 3 of the Final Basic Assessment Report (BAR). Anchor also appointed ACO Associates CC to conduct a desktop Maritime and Underwater Cultural Heritage (MUCH) study as requested by the South African Heritage Resource Association (SAHRA). The heritage specialist study has been included in Appendix 4. A desktop-based socio-economic study was conducted and has been included in Appendix 5. The findings of these specialist reports and all other relevant information have been integrated into the Final Basic Assessment Report (BAR) and used to inform the Environmental Management Programme (EMPr). A summary of the potential impacts of the proposed development are presented below. All the impacts are systematically described and assessed, and mitigation measures are proposed. These mitigation measures should diminish perceived negative impacts and or enhance potential benefits. Potential impacts are denoted by first listing the phase of the development (i.e. Planning & Design Phase = PP; Operation Phase = OP; Decommissioning Phase = DP) followed by the impact category:

- Marine Ecology = ME
- UMH = Underwater and Maritime Heritage Resources
- Socio-Economy, Fisheries, and other Users= SE

Impacts are numbered consecutively and separately for the distinct phases (i.e., Planning & Design Phase, Operation Phase and Decommissioning Phase). Positive impacts are noted as such in parenthesis after the description of the impact. The following colour scheme is used to indicate significance of impacts:

| Negative | Positive |
|---------------|---------------|
| VERY HIGH | VERY HIGH |
| HIGH | HIGH |
| MEDIUM | MEDIUM |
| LOW | LOW |
| VERY LOW | VERY LOW |
| INSIGNIFICANT | INSIGNIFICANT |

3.1 Planning and Design Phase

The Planning and design phase is not associated with any environmental impacts.

3.2 Operational Phase

Table 2 Summary of potential impacts associated with the operational phase of the proposed prospecting activities before and after mitigation; where N/A refers to impacts where no mitigation is deemed necessary.

| Impact | Description | Significance – Without mitigation | Significance – With mitigation |
|--------|---|-----------------------------------|--------------------------------|
| ME | Underwater noise generated by geophysical surveys on invertebrates | VERY LOW | INSIGNIFICANT |
| | Underwater noise generated by geophysical surveys on fish | VERY LOW | INSIGNIFICANT |
| | Underwater noise generated by geophysical surveys on marine mammals | MEDIUM | LOW |
| | Underwater noise generated by geophysical surveys on seabirds | LOW | VERY LOW |
| | Underwater noise generated by geophysical surveys on turtles | INSIGNIFICANT | N/A |
| | Marine megafauna collisions with survey vessels | VERY LOW | INSIGNIFICANT |
| | Offshore based seabed sampling and tailings disposal | LOW | N/A |
| | Fine sediment plumes | VERY LOW | N/A |
| | Waste discharge during vessel operations | VERY LOW | INSIGNIFICANT |

| Impact | Description | Significance – Without mitigation | Significance – With mitigation |
|--------|--|-----------------------------------|--------------------------------|
| SE | Shipping Traffic | INSIGNIFICANT | N/A |
| | Inshore net fishers' group | VERY LOW | INSIGNIFICANT |
| | Small scale fisheries group | VERY LOW | INSIGNIFICANT |
| | West Coast Rock Lobster Fisheries | VERY LOW | INSIGNIFICANT |
| | Small pelagic purse seine | VERY LOW | INSIGNIFICANT |
| | Doring Bay Abalone aquaculture facility | VERY LOW | INSIGNIFICANT |
| | Local socio-economic performance (positive) | INSIGNIFICANT | N/A |
| | Regional socio-economic performance (positive) | LOW (positive) | N/A |
| UMH | Impacts on Submerged Prehistoric Heritage Resources: Core/drill/ grab sampling | VERY LOW | VERY LOW (positive) |
| | Impacts on Maritime Archaeological Resources: Core/drill/ grab sampling | N/A | N/A |
| | Impacts on Paleontological Resources: Core/drill/ grab sampling | VERY LOW | VERY LOW (positive) |

3.2.1 Impacts of geophysical surveys on marine fauna

3.2.1.1 Impacts of underwater noise generated by geophysical surveys on invertebrates

The proposed geophysical survey is expected to have an impact on the invertebrate communities existing within the shallow waters of the proposed concession area. Impacts may include changes in physiological behaviour and alterations to invertebrate biology such as persistent damage to the statocysts (sensory organ) and righting reflex particularly in rock lobsters.

Impact Assessment

The potential for negative impacts due to the proposed geophysical surveys on rock lobster feeding, reproduction and survival do exist. These impacts would, however, be at the local scale for a short duration and the overall impact is assessed to be **INSIGNIFICANT** with mitigation.

Recommended Essential Mitigation Measures:

- Avoid important rock lobster fishing grounds, including reefs.
- Conduct surveys outside of rock lobster fishing season.

3.2.1.2 Impacts of underwater noise generated by geophysical surveys on fish

The perceived impacts of the proposed geophysical activities on fish communities have not been quantified to date. Prolonged or powerful underwater noise may result in changes to migration patterns, spawning grounds and recruitment stocks. However, the majority of fish are highly mobile and able to avoid underwater noise at levels that may cause serious injury.

Impact Assessment

Concession area 14A is in shallow water and reef areas within the concession provide habitat for the important fishery species, the Cape Bream *Pachymetopon blochii*. Cape Bream are largely resident on reef systems and may not move away from the sound source during surveying. Due to the limited extent and short duration of the planned surveys, the overall impact of the geophysical surveys on fish was assessed to be **VERY LOW** and can be reduced to **INSIGNIFICANT** with the implementation of mitigation measures.

Recommended Essential Mitigation Measures:

- Appoint a Fisheries Liaison Officer (FLO) to report daily on fishing and survey activities and areas to allow for effective avoidance or minimization of potential impacts on the local fishing communities.
- Avoid important fishing grounds (reefs) and fishing seasons.

3.2.1.3 Impacts of underwater noise generated by geophysical surveys on marine mammals

The underwater noise generated by the sampling instruments (Section 2.1) could potentially impact the marine mammals that frequent the concession area. Impacts may include a reduction in foraging efficiency, reproductive potential, social cohesion, and ability to detect predators.

Impact Assessment

The proposed geophysical method and sampling tools to be used during the survey are outlined in the methods section of the Final BAR dated December 2021 (section 5.5). Of these, the Topas sub-bottom profiler system uses shallow (35-45 kHz) and medium penetration (1-10 kHz) sound pulses to map the sediment horizon. This could present a risk to Heaviside's, Dusky and other dolphins and marine mammals that fall into the category of mid-frequency cetaceans. It is also highly likely that seals may be encountered within the concession area as their general foraging area covers the continental shelf up to 120m depth, well outside of the proposed prospecting area. Seals do, however, show a high tolerance to underwater noise and generally display avoidance behaviour in response to underwater noise. It is likely that seals would only suffer significant injury if they were diving directly below the vessel near the sound source. The likelihood of this occurring is considered low.

Based on the above, impacts to marine mammals were assessed to be of **MEDIUM** risk with the possibility of reducing it to **LOW** risk with the implementation of mitigation measures.

Recommended Essential Mitigation Measures:

- A designated onboard Marine Mammal and Seabird Observer (MMSO) should be appointed to ensure compliance with mitigation measures during geophysical surveying.
- The MMSO must conduct pre-survey visual scans of at least 15 minutes for the presence of cetaceans around the survey vessel prior to the initiation of any acoustic impulses.
- “Soft starts” should be carried out for equipment with source levels greater than 210 dB re 1 μ Pa at 1 m over a period of 20 minutes to give adequate time for marine mammals to leave the vicinity. Where this is not possible, the equipment should be turned on and off over a 20-minute period to act as a warning signal and allow cetaceans to move away from the sound source.
- Terminate the survey if any marine mammals show affected behaviour within 500 m of the survey vessel or equipment until the mammal has vacated the area.
- Avoid planning geophysical surveys during the movement of migratory cetaceans (particularly baleen whales) from their southern feeding grounds into low latitude waters (beginning of June to end of November) and ensure that migration paths are not blocked by sonar operations.
- A passive acoustic monitoring (PAM) system should be used during survey activity to detect cetaceans that could be at risk, especially during the months of June and November.

3.2.1.4 Impacts of underwater noise generated by geophysical surveys on seabirds

Impacts of the underwater noise generated by the proposed geophysical survey on seabirds, particularly diving seabirds, may be indirect. Perceived impacts on seabirds, whether resting on the water surface or diving, are limited by the complexity of trophic pathways in the marine environment and include injury to their physiology, behavioural avoidance, and indirect impact on prey species.

Impact Assessment

This impact is largely dependent on the diet of the bird species concerned and the effect of geophysical surveys on its prey species. As a result of the continuous nature of the intermittent survey pulses, diving birds such as the African penguin would be expected to hear the sound pulses from a distance where levels would not induce mortality or injury and avoid approaching the source area. Some seabirds have been known to avoid feeding areas within 50 km of the geophysical surveys.

Other seabirds found close inshore that may be impacted include the Cape Cormorant and various terns and gull species. Pelagic seabirds such as albatross, petrels and shearwaters are most likely to be encountered in offshore waters, however, there is a possibility that vagrants may occur within Concession 14A. The overall impact is assessed to be of **LOW** risk and with the implementation of mitigation can be reduced to **VERY LOW**.

Recommended Essential Mitigation Measures:

- A designated onboard Marine Mammal and Seabird Observer (MMSO) to ensure compliance with mitigation measures during geophysical surveying.
- MMSO to conduct pre-survey visual scans of at least 15 minutes for the presence of feeding seabirds in the survey area.
- If spotted wait until all marine life (seabirds, seals, cetaceans and turtles) have cleared an area of 500 m radius of the centre of the sound source before resuming with the geophysical survey (initiate soft start procedure when resuming geophysical survey).

- Terminate the survey, if any seabirds show affected behaviour within 500 m of the survey vessel or equipment, until they have vacated the area.
- Record incidences of encounters with marine life (seabirds, turtles, seals, fish) their behaviour and response to geophysical survey activity.
- Suspend operations if any obvious mortalities or injuries to marine life are observed.

3.2.1.5 Impacts of underwater noise generated by geophysical surveys on turtles

Impacts of underwater noise on turtles may be considerable especially as their hearing sensitivity overlaps with the higher frequencies generated by the geophysical equipment. This may result in physiological injury that may lead to boat strikes and entanglement in towed geophysical equipment.

Impact Assessment

Turtles may only detect geophysical survey equipment at close range (< 10 m, possibly linked to visual rather than auditory cues) or are not sufficiently mobile to move away from approaching survey vessels (particularly if basking). Initiation of a sound source at full power in the immediate vicinity of a swimming or basking turtle could therefore result in physiological injury. Injured turtles are less mobile than other large marine fauna and are vulnerable to both boat strikes and entanglement with geosurvey towed equipment. Most importantly, turtles are restricted to offshore pelagic waters off the west coast of South Africa and are unlikely to be encountered in Concession 14A, however, the possibility does exist that vagrant individual might be encountered. Further to this, most incidents involve foraging turtles or turtles diving in an escape response becoming trapped by towed survey equipment which is not in the scope of works for the proposed geophysical survey in Concession 14A. The overall impact is therefore assessed to be **INSIGNIFICANT** with no mitigation required

Mitigation

As the geophysical survey will involve hull mounted equipment, no mitigation is necessary.

3.2.2 Impacts of survey vessels

3.2.2.1 Marine megafauna collisions with survey vessels

An increase in ship traffic through any area frequented by megafauna such as whales and turtles may result in collisions or entanglement of marine mammals with survey vessels and towed instruments, respectively.

Impact Assessment

There is a low risk of survey vessel collisions with marine megafauna such as whales and turtles that are susceptible to “ship strikes”. The potential for collision between cetaceans and other megafauna and the survey vessel, or entanglement in the deployed sampling equipment is directly proportional to the vessel speed and the abundance and behaviour and cetaceans in the area during the surveys. The 14A concession area is part of the natural range of several species of marine mammals including large whales such as humpback and southern right whales, but it is not considered an important aggregation site or migration route. The number of marine fauna expected to be encountered during

the limited time that the survey vessel is active is therefore expected to be very low and the intensity of the impact is considered high for the individual affected animal and medium for the population as a whole. The potential impact of marine megafauna collision with the survey vessel or entanglement in sampling equipment is assessed to be of **VERY LOW** significance and with the implementation of mitigation measures is reduced to **INSIGNIFICANT**.

Recommended Essential Mitigation Measures:

- Appoint a designated onboard Marine Mammal and Seabird Observer (MMSO) and vessel operator to ensure compliance with mitigation measures during geophysical surveying and keep watch for marine megafauna in the path of the vessel during geophysical surveying.
- The MMSO should conduct pre-survey visual scans of at least 15 minutes for the presence of feeding seabirds in the survey area.
- Avoid planning geophysical surveys during the movement of migratory cetaceans (particularly baleen whales) from their southern feeding grounds into low latitude waters (beginning of June to end of November) and ensure that migration paths are not blocked by sonar operations.
- If spotted wait until all marine life (seabirds, seals, cetaceans and turtles) have cleared an area of 500 m radius of the centre of the sound source before resuming with the geophysical survey (initiate soft start procedure when resuming geophysical survey).
- Vessel transit speed to not exceed 12 knots (22 km/hr), except within 25 km of the coast where it should be kept to less than 10 knots (18 km/hr) as well as when sensitive marine fauna are present in the vicinity.
- Record incidences of encounters with marine life (seabirds, turtles, seals, fish) their behaviour and response to geophysical survey activity.

3.2.3 Offshore based seabed sampling and tailings disposal

Material will be processed onboard by a processing plant and tailings will be discarded overboard, thereby causing sediment plumes, in this instance as a near-shore deposit. Impacts from sampling are likely to result in localised removal of benthic organisms and their habitat within the footprint of the sampling tool, which due to the relatively small size of the various coring tools, is expected to be virtually negligible. However, the impacts from drill sampling are expected to be more extensive. These impacts include direct habitat loss and smothering of the benthos adjacent to sampling sites associated with localised tailings discard

Impact Assessment

It is generally accepted that inshore disturbed area require a shorter period of time to recover than those in deeper water further offshore. Important drivers of inshore habitat recovery are related to the exposure to dynamic physical processes such as wave action and sediment refill from river mouths (Biccard *et al.* 2020b). Hence, recovery times greatly increase with depth and distance from sources of sedimentation.

The overall consequence of this impact is considered of **LOW** significance. No direct mitigation is considered necessary for localised smothering of the benthos (tailings disposal). However, it is

possible to implement careful planning and management of potential discharges to ensure that tailings are not discarded onto sensitive reef habitat (Penney *et al.* 2007; Pulfrich 2017).

Recommended Essential Mitigation Measures:

No essential mitigation measures have been identified.

Best Practice:

- Planning and management of potential discharges to ensure that tailings are not discarded onto potentially sensitive habitats and reefs.

3.2.4 Impact of fine sediment plumes on pelagic habitat

During the sampling process, sedimentary material that has been brought to the surface will be processed onboard and unwanted material (tailings) will be discarded overboard, thereby causing sediment plumes. These plumes can affect light penetration through the water column and can adversely affect phytoplankton productivity in the water column. Suspended sediment plumes can also develop either near the seabed, or in mid-water due to the dynamic collapse and diffusion of the sediment jet following the discharge. In addition to reduced phytoplankton productivity, suspended sediments may also affect the biological responses of consumers (hatching success, larval survival and foraging behaviour) provided they contain inorganic particles.

Impact Assessment

Suspended sediment concentrations generated at the point of discharge, the extent and area over which plumes disperse, and their duration, depend largely on the proportions of silts, muds and clays in the mined sediments, as well as the sea-surface conditions during disposal. The finer sediments discharged at the surface generate a plume in the upper water column, which is dispersed away from the vessel by prevailing currents, diluting rapidly to background levels at increasing distances from the vessel. Sampling activities in 14A will not be contiguous. This will result in a delay in time while the seabed tool is transferred to the new sampling site before additional sediment is released overboard with the next sample.

Although, these plumes differ in intensity and timing from natural background conditions, marine communities in the Benguela region are well adapted to such events as they are frequently exposed to naturally elevated suspended-sediment levels. This is particularly true for shallow inshore waters, like 14A, where sediment is suspended because of wave action. Studies conducted on dredge-mining operations have recorded that water-column turbidity return to natural background levels within a few hours after dredging has ceased.

The volumes of sediment that are expected to be collected and processed in this project are relatively small, and the overall impact is considered to be of **VERY LOW** significance. The impacts on the environment are expected to be insignificant and without any measurable cumulative impact.

Mitigation

No direct mitigation is feasible as tailings disposal is an integral part of this mining method.

3.2.5 Waste discharge during vessel operations

Water quality in the vicinity of exploration, sampling and associated support vessels may be impaired by various forms of waste discharged into the marine environment. The impacts on marine life depend on the properties of the waste discharged and may include toxic spills such as in the case of hydrocarbons, entanglement in debris and ingestion of small pieces of plastic.

Impact Assessment

Vessel operators may experience accidental spills from operational machinery, which could include hydrocarbons such as hydraulic fluids, diesel, oils and/or hazardous substances. Spills of this nature are highly toxic and unless carefully managed, may pollute nearshore and coastal environments as well as damage and potentially destroy marine organisms (wreckage of a vessel). Cumulative impacts are unlikely due to the low likelihood of major accidents such as collision or wreckage.

Volumes of sewage that are likely to be discharged from the survey vessel are considered to be small, of low intensity and limited to the area of prospecting over a short period. Similarly, galley waste would be limited to the duration of the sampling survey and would also be of a small volume and low intensity. Solid waste such as litter would be stored on board and transported onshore for disposal on land and would thus have no impact on the marine environment.

Detergents used for washing exposed marine deck spaces are discharged overboard. The toxicity of detergents varies greatly depending on their composition, but low-toxicity, biodegradable detergents should preferably be used. Those used on work deck spaces would be collected with the deck drainage and treated as such.

Electricity on exploration, sampling and associated support vessels is typically provided by diesel-powered engines and generators, which are cooled by pumping water through a set of heat exchangers. The cooling water is then discharged overboard. Other equipment is cooled through a closed loop system, which may use chlorine as a disinfectant. Such water would be tested prior to discharge and would comply with relevant Water Quality Guidelines.

Based on the relatively small volumes of waste that can be expected, the potential impact of operational discharges from prospecting on the marine environment are of **VERY LOW** significance. With the implementation of the stipulated mitigation measures this can be reduced to **INSIGNIFICANT**.

Recommend Mitigation Measures (Pulfrich 2015):

- Inform & empower all staff about sensitive marine species & suitable disposal of waste;
- Ensure compliance with relevant MARPOL standards;
- Develop a waste management plan using waste hierarchy;
- A Shipboard Oil Pollution Emergency Plan (SOPEP) must be prepared for all vessels and should be in place at all times during operations;
- Deck drainage should be routed to a separate drainage system (oily water catchment system) for treatment to ensure compliance with MARPOL (15 ppm);
- All process areas should be bunded to ensure drainage water flows into the closed drainage system;

- Drip trays should be used to collect run-off from equipment that is not contained within bunded areas and the contents routed to the closed drainage system;
- Low-toxicity biodegradable detergents should be used in the cleaning of all deck spillages;
- All hydraulic systems should be adequately maintained and hydraulic hoses should be frequently inspected; and
- Spill management training and awareness should be provided to crew members of the need for thorough cleaning-up of any spillages immediately after they occur in order to minimise the volume of contaminants washing off decks.

3.2.6 Potential impacts on the socio-economy, fisheries and other users

Doringbaai is a small coastal village where marine resource use, particularly small-scale commercial (including interim relief rights holders), rock lobster and line fishing are critical livelihood activities that play an important role in ensuring food security for the community. The entire concession area is well within the daily travel range of the small, outboard motor-powered boats used by small scale fishers operating from Doringbaai and the depth range of the concession area (5-30 m) includes the most frequently fished depths for the main target species in the area (west coast rock lobster and Cape seabream). The proposed prospecting activities may potentially have an impact on the fishing industry.

3.2.6.1 Impacts on Fisheries

1) Traditional Linefish sector

The presence of the survey vessel and proposed activities could potentially affect important fishing grounds

Impact Assessment

The line fisheries along the west coast (Line fish management Zone A - Orange River to Cape Infanta) target the nomadic coastal migrant species, snoek (*Thyrsites atun*), which also contributed the most in terms of catch weight in the commercial line fisheries (total landings of up to 5 800 tonnes). Snoek, has prominent nursery grounds just north of the Cape Columbine, and spawns offshore from the Agulhas banks, relying on the Benguela current to transport eggs and larvae further north along the west coast. Snoek season extends between May and September with total annual catches ranging between 1 063 and 7 872 tonnes over the period 1985 to 2018.

When snoek is less abundant, the hottentot seabream (*Pachymetopon blochi*) is harvested. Hottentot species is primarily found between Port Nolloth and Cape Agulhas in depths between the littoral zone to some 55 m depth, while spawning occurs year-round, reaching greatest stock densities in summer and winter. Total annual seabream catches are much lower than snoek over the period 1985 and 2018 ranging between 79 and 953 t with 215 t landed in 2018.

The reported catch data from the commercial linefish sector shows a direct overlap with Concession Area 14A, although only a small proportion of the annual average reported national catch is made in this area.

2) Small Pelagic Purse seine fisheries

The presence of the survey vessel and proposed activities could potentially impact important fishing grounds

Impact Assessment

The small pelagic purse-seine fishery operates between the Orange River and East London mostly in nearshore waters (within 10 km of the coast). The 14A Concession Area does overlap with identified priority fishing areas for anchovy and with part of the sardine directed fishing ground. A quantitative spatial analysis using commercial catch return data (all small pelagic species combined) for the period 2006-2011 suggests that Concession Area 14A itself does not constitute an area where a substantial proportion of the average annual purse seine catch is made.

Despite the importance of partially overlapping reporting grid blocks to the small pelagic fishery that account for an average annual catch in the region of 3 300 tonnes, a relatively small proportion of the average annual catch over this period ~300 tonnes which is <0.05% of the national total, was made within Concession Area 14A itself (assuming uniform distribution of catches within a survey block and area-based allocation of catch to the concession area 14A, which is a conservative approach given the shallow water depths of <10m throughout much of the concession area that would preclude the deployment of large purse sein nets). Furthermore, the target species are pelagic, and their distribution is variable, so the fishery group is unlikely to be significantly negatively affected by small temporary closures/exclusion zones around survey vessels and geotechnical survey sites.

3) West Coast Rock Lobster sector

The West Coast Rock Lobster (WCRL) fishery is divided into two sectors which include near-shore and offshore fisheries, operating in a water depth less than 30 m and to depths greater than 100 m, respectively. The presence of the survey vessel and proposed activities could potentially affect important harvesting grounds

Impact Assessment

The commercial sector for nearshore WCRL fishery has 823 right holders (according to the IDGP 2013 report), and 653 registered vessels, using hoop nets deployed from “bakkies” (rowing boats) (CapMarine 2021; DEFF 2020). The WCRL fisheries is managed by Total Allowable Catch (TAC) according to four sub-sectors (i.e., commercial offshore, commercial nearshore, small-scale and recreational fisheries). The latest TAC allocated to the subsistence (interim relief measure) fishing and small-scale fishing sector (offshore) for the 2020/2021 period were 131.03t and 108.97 t, respectively.

WCRL fisheries is the considered one of the most important fisheries in terms of market value (R500 million per annum) and employment, with approximately 4 200 people employed in this fishery along the west coast. Both the subsistence/near-shore and small scale offshore WCR L sectors are at risk of being directly impacted by the proposed prospecting activities in Concession Area 14A. Physical and underwater noise disturbance during the prospecting activities may disturb the benthic environment impacting the near shore WCRL fisheries sector, including recreational fishers and subsistence fishers that operate primarily in the summer.

WCRL catches, particularly within the proposed prospecting activity area and its vicinity, has been experiencing a decreasing CPUE for both hoop-net and trap-net fishing since 2012. Additionally, somatic growth trends have decreased considerably over the period 1967 to 2019. Potential impacts resulting from the proposed prospecting activity could further reduce CPUE and stagnate population recovery. Similar to line fishing, west coast rock lobster fishing constitutes an important economic activity for residents of Doringbaai, where few other livelihood options exist. The allocation of TAC by right holder residential address shows that approximately 1% (3 tonnes) of the national near shore allocation (~300 tonnes) is held by right holders who reside in Doringbaai.

The catches from these sectors made within the concession area 14A are all of limited significance as a proportion of the national total catch. However, for local small-scale fisherman impacts such as the temporary exclusion of fishing vessels from the concession area during geophysical survey and sampling/prospecting activities are more significant.

The proposed prospecting activities will, however, be of short duration and at a local scale. The potential negative impacts of the proposed prospecting on the various fishing sectors were therefore assessed to be of **VERY LOW** significance. The impacts can be reduced to **INSIGNIFICANT** with effective implementation of mitigation.

Recommended Essential Mitigation Measures:

- Appoint a fisheries liaison officer (FLO) to facilitate communication with fishing communities in Doringbaai and neighbouring towns. The FLO should report daily on vessel activity and respond and advise on action to be taken in the event of encountering fishing gear in the survey area.
- Prior to survey commencement, the following key stakeholders should be consulted and informed of the proposed survey activity (including navigational co-ordinates of the survey area, timing and duration of proposed activities) and the likely implications thereof:
 - Fishing industry / associations:
 - SA Marine Linefish Management Association (SAMLMA);
 - South African Pelagic Fishing Industry Association (SAPFIA)
 - West Coast Rock Lobster Association; and
 - Local fishing communities in Doringbaai
 - Other associations and organs of state
 - DFFE;
 - SAMSA;
 - South African Navy Hydrographic office; and
 - Overlapping and neighbouring right holders.
- These stakeholders should again be notified at the completion of surveying when the survey vessel(s) is/are off location. The operator must request, in writing, that the South African Navy Hydrographic office release Radio Navigation Warnings and Notices to Mariners throughout the survey periods. The Notice to Mariners should give notice of (1) the co-ordinates of the proposed survey area, (2) an indication of the proposed timeframes of surveys and day-to-day location of the survey vessel(s), and (3) an indication of the required safety zone(s) and the proposed safe operational limits of the survey vessel. These Notices to Mariners should be distributed timeously to fishing companies and directly onto vessels where possible

- Important rock lobster and other fishing grounds must be identified in consultation with local stakeholders so that effective and mutually acceptable mitigation measures can be implemented during prospecting activities
- These fishing grounds and fishing seasons should be avoided.
- Surveys should therefore be undertaken when fishing effort is lower (preferably out of fishing seasons).
- “Soft starts” of at least 20 minutes should be implemented.
- Planning and management of potential discharges must be undertaken to ensure that tailings are not discarded onto potentially sensitive habitats.

Best Practice mitigation measures:

- Prior to survey commencement, key stakeholders (see below) should be consulted and informed of the proposed survey activity and the likely implications thereof
- Inform & empower all staff about sensitive marine species & suitable disposal of waste.

3.2.6.2 Impact on Aquaculture

The proposed prospecting activities may have an impact on aquaculture, especially the Doring Bay Abalone aquaculture facility. A potential impact resulting from the proposed drill activity that may impact the aquaculture facility is the generation of fine sediment plumes and increased turbidity, degrading water quality.

Impact Assessment

The Doring Bay Abalone (DBA) aquaculture facility was established in 2014 and uses seawater intake for the successful operation of the aquaculture facility. Currently, the facility has one sea water intake point and could require two in the future for its continued effective operation. It is essential that intake seawater conditions such as good water quality and a water temperature between 16 °C and 18 °C is maintained at the aquaculture facility for the optimal growth of abalone (*Haliotis midae*), and DBA economic returns.

The generation of sediment plumes during prospecting activity are likely to effect water quality in concession area 14A in a localised and temporary manner. Fine sediment plumes can become trapped in the surf zone or carried alongshore with coastal processes such as rip currents, extreme wave action, and wind driven currents, transporting plumes along the coast. Due to the local and temporary nature of the proposed prospecting, the potential impact of the proposed prospecting activity on DBA’s operational success is **VERY LOW** and can be reduced to **INSIGNIFICANT** after mitigation measures are applied.

Recommended Essential Mitigation Measures:

- Avoid prospecting activity surrounding the seawater intake points.
- Ensure compliance with relevant MARPOL standards.
- Develop a waste management plan using waste hierarchy.
- A Shipboard Oil Pollution Emergency Plan (SOPEP) must be prepared for all vessels and should be in place at all times during operations.

- Deck drainage should be routed to a separate drainage system (oily water catchment system) for treatment to ensure compliance with MARPOL (15 ppm).
 - All process areas should be bunded to ensure drainage water flows into the closed drainage system.
 - Drip trays should be used to collect run-off from equipment that is not contained within bunded areas and the contents routed to the closed drainage system.
 - Low-toxicity biodegradable detergents should be used in the cleaning of all deck spillages.
 - All hydraulic systems should be adequately maintained and hydraulic hoses should be frequently inspected.
 - Spill management training and awareness should be provided to crew members of the need for thorough cleaning-up of any spillages immediately after they occur in order to minimise the volume of contaminants washing off decks.
- Monitor water-quality surrounding the sediment plumes.

3.2.6.3 Impact on local and regional economic performance

The proposed prospecting activity may hold potential benefits in terms of socio-economic performance at the local and regional scale. Benefits could include community support, job creation and Broad based Black Economic Empowerment.

Impact Assessment

Mining is economically important as it can create broad scale employment opportunities and boost the national and local economy. Previous offshore diamond mining operations in Doringbaai did not however, employ many local community members which leads to poor community support. The potential impact on the socio-economic performance is likely to be insignificant on a local scale (i.e., in Doringbaai community). Conversely, investment from Trans Atlantic Diamonds in South Africa will have a greater positive impact on the regional economy.

Mitigation

No mitigation measures are necessary but listed below are several recommendations for best practice.

Good Practice:

Trans Atlantic Diamonds should aim to incorporate codes of good practice on Broad Based Black Economic Empowerment issued under the section 9 of the Broad Based Black Economic Empowerment Act, Act 53 of 2003, as amended by Act 46 of 2013. Therefore, the following resource support aims is recommended:

- At least 25% cost of sales excluding labour cost and depreciation must be procured from local producers or local suppliers in SA.
- Job creation – 50% of jobs created are for persons of colour provided that the number of such employees since the immediate prior verified B-BBEE measurements is maintained. Employment opportunities that could be fulfilled:
 - Employment of local security companies.
 - Employment allocated to port duties

- If feasible, employment of local small-scale fishers vessels as support vessels during survey operations.
- Employment of local or national Geologists, a vessel manager, captain, crew members, scientists etc.
- At least 25% transformation of raw material or beneficiation which includes local manufacturing, production and/or assembly, and/or packaging, or at least 85% of labour cost paid to South African employees by service industry organizations
- prospecting equipment can be sourced within South Africa or neighbouring communities.
- investigate if support for operational activities can be provided by local Doringbaai services for; e.g. Refueling, general supplies, and possible equipment repair)
- Skills transfer – Training opportunities:
 - Environmental officers
 - Health and Safety Officers
 - Marine Mammal Observers (MMO's) and Passive Acoustic Monitoring (PAM) operators
 - general crew/ deck member
 - Commercial divers to help with surveys

3.2.6.4 Potential interference with commercial shipping traffic

The majority of shipping traffic is located on the outer edge of the continental shelf, which is well offshore of the outer edge of Concession Area 14a. The inshore traffic of the continental shelf along the West Coast is largely comprised of fishing and mining vessels, especially between Kleinsee and Oranjemund. Thus, there is unlikely to be much interaction between vessels involved with prospecting in Area 14a and other vessels. The impact on shipping traffic is considered to be localised, of low intensity in the short-term. The significance of this impact is therefore assessed to be **INSIGNIFICANT** with and without mitigation.

3.2.7 Impact on Underwater Cultural Heritage

3.2.7.1 Impacts of core sampling on submerged prehistoric heritage resources

The proposed prospecting activities could disturb submerged prehistoric heritage resources such as hominid teeth, fossilised footprints, and shell middens.

Impact Assessment

Historically, large parts (as much as 80,000 km² in extent) of the continental shelf were exposed as dry land. This exposed continental shelf was populated by terrestrial fauna, flora and our human ancestors. No studies of the submerged prehistory of the West Coast have been conducted to date, although the archaeological evidence for a hominin presence along the coast is abundant, especially from the early, middle and later stone ages. Any areas of South Africa's current seabed shallower than -120 m thus has the potential to have been used by our ancestors and to preserve the archaeological evidence of that use. As such, Concession 14A which extends from just inshore of the coastline to 1 km offshore with a maximum depth range of 30 m, could potentially hold such prehistoric evidence.

The overall significance of the impact is considered to be **VERY LOW**.

Recommended Essential Mitigation Measures:

- Core sample sections containing alluvial material, especially where organic remains are present, should be retained and subject to paleoenvironmental assessment.
- Coarser fraction (i.e., gravel and stone) samples of sorted seabed sediment should be retained and assessed by an archaeologist for the presence of lithic material

3.2.7.2 Impacts of core sampling on maritime archaeological resources

Potential and unidentified historical shipwrecks may be disturbed by the proposed prospecting activities.

Impact Assessment

At least 89 shipwrecks have been reported between the Orange and Berg Rivers (As per the SAHRA Maritime and Underwater Cultural Heritage database), but only one is known to have occurred within Concession Area 14A, i.e. the *Girl Devon*. Approximately 4.6 km north of the northern most boundary of this concession, a second shipwreck, *Elizabeth*, is known to be present

Very little information is currently available for either of these wrecks or their exact locations. Records do, however, indicate that *Girl Devon* sank off Doringbaai in January 1971 with the loss of 19 lives, while the *Elizabeth* sank at Mietjie Frans se Baai, north of Doringbaai in either late 1817 or early 1818. It is therefore possible that either of these wrecks might be present within the concession area. Although the wreck of *Girl Devon* is currently not old enough to be protected by the NHRA, it should still be reported to the authorities if it is discovered. Likewise, any shipwreck discovered should be reported as although it is unlikely, there is still a possibility that unknown and/ or unrecorded wrecks are present within or close to Concession Area 14A.

The likelihood of encountering a shipwreck is very small and highly unlikely that any impact may arise from prospecting activities on maritime resources, and they are **SCOPED OUT** of this impact assessment.

Mitigation

No mitigation necessary

3.2.7.3 Impacts of core sampling on Palaeontological Resources

Sampling activities for the proposed prospecting could potentially disturb valuable palaeontological resources such as marine shell fossils and phosphorite nodules.

Impact Assessment

This concession area is on the inner continental shelf. Here the Pre-Cretaceous bedrock drops relatively steeply down towards the sea. The inner-shelf bedrock is expected to comprise primarily of highly deformed, metasedimentary schists, quartzites and limestones of the Gifberg Group. The sediment distribution is sparse and mostly affected by the topography of the bedrock, with mini-basins

of sediments interspersed by bedrock high outcrops. The southern portion is expected to comprise minor outliers of basal Table Mountain Group conglomerates, shales and sandstones. In the north, older crustal basement gneisses are present. The oldest preserved deposits are found beneath the latest Quaternary basal gravels, in deeper, local bedrock depressions and palaeochannels in the Precambrian bedrock.

Millions of years of upwelling, sea level oscillations, ice ages, erosion and interglacial deepening led to the production of a wide range of multiphase phosphorite nodules, phosphatic shell casts of various ages and preservation of bones and teeth of sharks and other fishes, the skulls of extinct whale species and the occasional remains of land animals. The specimens and fossils are regularly discovered during trawling, scientific sampling and dredging, prospecting and mining. These specimens are often donated to scientific institutions and provide an invaluable contribution to the palaeontological knowledge and potential of the continental shelf. The marine shell fossils are predominantly species typical of that expected on the West Coast Shelf, although extralimital species are also common. Indeed, extra-limitals have been found during diamond sampling/mining off northern Namaqualand and can be expected to be more abundant further south such as in Concession Area 14A.

The overall significance of the impact is assessed to be **VERY LOW**.

Recommended Essential Mitigation Measures:

- Any fossils found during the processing of cores must have the details of context recorded, must be kept for identification by an appropriate specialist and, if significant, be deposited in an appropriate institution.
- The possible detailed study and dating of a set of cores, possibly as a B.Sc. Honours or M.Sc. project should be considered.

3.2.8 No-Go Alternative

Both positive and negative impacts are related to not continuing with the prospecting activities. These include lost opportunities in terms of collecting baseline environmental data, determining the presence of offshore mining resources and socio-economic benefits.

Impacts Assessment

The impacts related to lost opportunity to collect scientific data and thereby benefitting the wider scientific community and maximising the use of South Africa's economic resources are all considered to be of **LOW** significance. The positive implications of the no-go option, on the other hand, is that there would be no effects on the biophysical environment in the proposed area. This was also assessed to be of **LOW** significance considering the lost opportunity in terms of scientific data and economic opportunities.

3.2.9 Impact assessment summary

A summary of the potential impacts associated with the proposed prospecting activities and no-go alternative are presented in Table 3 below.

Potential impacts of the proposed sampling activities on marine and fisheries are of medium to short term duration and would be restricted to the immediate vicinity of the proposed sampling area. The potential impacts to marine fauna associated with the sampling activities are considered to **INSIGNIFICANT** to **LOW** after mitigation.

Impacts associated with shipping activities are of short term and restricted to the sampling survey area. The potential impacts of the sampling vessel on shipping activity within the concession area would be **INSIGNIFICANT** after mitigation.

It is highly unlikely that underwater cultural heritage would be disturbed during the proposed prospecting activity and the possibility of encountering a shipwreck in the concession area is very low. However, should cultural heritage material be disturbed during the prospecting activities the impact would be at the national level and would be of high intensity and of high significance. With the implementation of mitigation measures this could greatly be avoided and should sampling activities be halted in the unlikely event that cultural activity be encountered, the impact is regarded as **INSIGNIFICANT**.

Potential socio-economic impacts were identified as temporary disturbance of marine resources, exclusion of fishing vessels from the concession area, degradation of water quality and an increase in local and regional economic performance. However, the impacts would be restricted to the duration of the proposed sampling activities and were assessed as **INSIGNIFICANT** after mitigation.

The implications of no-go alternative for the proposed prospecting activity are related to loss of scientific data and maximising South Africa's economic resources as well as the opportunity to establish viable diamond and gemstone resources. The impact is assessed as being of **LOW** significance with the positive implications being no biophysical impacts on the environment in the concession area.

Table 3 Summary of the associated potential impacts for the proposed prospecting activity and their significance

| Impact | Consequence | Probability | Significance | Status | Confidence |
|--|-------------|-------------|----------------------|--------|------------|
| Marine and fisheries impacts | | | | | |
| Impact 1: Underwater noise generated by sampling activities on invertebrates | Very low | Probable | VERY LOW | -ve | Medium |
| With mitigation | Very low | Improbable | INSIGNIFICANT | -ve | Medium |
| Impact 2: Underwater noise generated by sampling activities on fish | Very Low | Probable | VERY LOW | -ve | Medium |
| With mitigation | Very Low | Improbable | INSIGNIFICANT | -ve | Medium |
| Impact 3: Underwater noise generated by sampling activities on marine mammals | Medium | Probable | MEDIUM | -ve | High |
| With mitigation | Medium | Improbable | LOW | -ve | High |

| Impact | Consequence | Probability | Significance | Status | Confidence |
|--|----------------------------------|-------------|----------------------|--------|------------|
| Impact 4: Underwater noise generated by sampling activities on seabirds | Low | Probable | LOW | -ve | High |
| With mitigation | Low | Improbable | VERY LOW | -ve | High |
| Impact 5: Underwater noise generated by sampling activities on turtles | Very low | Improbable | INSIGNIFICANT | -ve | High |
| No mitigation | | | | | |
| Impact 6: Marine megafauna collisions with survey vessels | Low | Possible | VERY LOW | -ve | High |
| With mitigation | Very low | Improbable | INSIGNIFICANT | -ve | High |
| Impact 7: Offshore based seabed sampling and tailings disposal | Low | Definite | LOW | -ve | High |
| No mitigation | | | | | |
| Impact 8: Fine sediment plumes | Very low | Definite | VERY LOW | -ve | High |
| No mitigation | | | | | |
| Impact 9: Waste discharges during vessel operations | Very low | Probable | VERY LOW | -ve | High |
| With mitigation | Very low | Improbable | INSIGNIFICANT | -ve | High |
| Impact 10: Impact on fisheries | Very Low | Probable | VERY LOW | -ve | High |
| No mitigation (see best practice recommendations) | Very Low | Improbable | INSIGNIFICANT | -ve | High |
| Impact 11: Impacts on Submerged Prehistoric Heritage Resources | Low | Possible | VERY LOW | -ve | Low |
| With Mitigation | Low | Possible | VERY LOW | +ve | Low |
| Impact 12: Impacts on Maritime Archaeological Resources: Core Sampling | No impacts expected — scoped out | | | | |
| Impact 13: Impacts on Paleontological Resources – Core Sampling | Low | Possible | VERY LOW | -ve | Low |
| With Mitigation | Low | Possible | VERY LOW | +ve | Low |
| Impact on shipping activities | | | | | |
| Impact 14: Impacts on other vessels | Very low | Possible | INSIGNIFICANT | -ve | Low |
| No mitigation | | | | | |
| Socio-economic impacts | | | | | |
| Impact 15: Inshore net fishers group | Low | Definite | VERY LOW | -ve | High |
| With mitigation | Very low | Possible | INSIGNIFICANT | -ve | High |
| Impact 16: Small Scale fisheries | Low | Definite | VERY LOW | -ve | High |
| With mitigation | Low | Probable | INSIGNIFICANT | -ve | High |

| Impact | Consequence | Probability | Significance | Status | Confidence |
|---|-------------|-------------|----------------------|--------|------------|
| Impact 17: West Coast Rock Lobster Fisheries | Low | Definite | VERY LOW | -ve | High |
| With mitigation | Low | Probable | INSIGNIFICANT | -ve | High |
| Impact 18: Small Pelagic Purse Seine | Low | Definite | VERY LOW | -ve | High |
| With mitigation | Low | Probable | INSIGNIFICANT | -ve | High |
| Impact 19: Doring Bay Abalone aquaculture facility | Low | Definite | VERY LOW | -ve | High |
| With mitigation | Low | Probable | INSIGNIFICANT | -ve | Medium |
| Impact 20: Local socio-economic performance | Very Low | Possible | INSIGNIFICANT | +ve | Medium |
| No mitigation | | | | | |
| Impact 21: Regional socio-economic performance | Low | Definite | LOW | +ve | Medium |
| No mitigation | | | | | |
| No-go option | | | | | |
| Impact 22: No socio-economic benefits | Medium | Possible | LOW | -ve | Medium |
| No mitigation | | | | | |
| Impact 23: No impact on the environment | Low | Probable | LOW | +ve | Medium |
| No mitigation | | | | | |

3.3 Decommissioning Phase

The decommissioning phase is not associated with any environmental impacts.

4 IMPACT MANAGEMENT OBJECTIVES, OUTCOMES AND ACTIONS

Key outcomes are presented in this section and includes recommendations for mitigation measures that must be implemented should the environmental authorisation for the proposed prospecting activities be granted.

The nature, intensity and extent of any potential impacts that have been identified, including those issues identified by I&APs during the consultation process, have been carefully assessed and incorporated into the BAR and specifically into the EMPr. This information was used to inform management actions (an impact management plan) that will form part of the EMPr. The objectives of the impact management plan is to anticipate and avoid risks and impacts. Each prospecting activity will be considered, together with its potential impacts on the environment, fisheries, socio-economic, heritage and other resources. Through the development of the EMPr, measures have been developed to avoid environmental, social and other risks and impacts, and to provide mitigation where possible. This will then be included in the impact management plan to be retained by the Environmental Control Officer (or such designated authority) who can oversee and report on the impact monitoring and mitigation measures.

To ensure the implementation of the impact management plan, the outcomes will be measured through compliance monitoring, evaluations, routine inspections and independent audits which will also be defined in the EMPr.

Any cost incurred by a Government Department or Municipality due to non-compliance to any relevant environmental legislation by the applicant, will be charged to the developer/ applicant.

It is the applicant's duty to ensure that the EMPr is implemented and to appoint the appropriate individuals to implement the EMPr and adhere to relevant legislation.

The mitigation Hierarchy in terms of the Department of Environmental Affairs and Development Planning guideline should be followed and includes:

- In order of priority aim to avoid, minimise, or remedy disturbance of ecosystems and loss of biodiversity;
- Avoid degradation of the environment;
- Avoid jeopardizing ecosystem integrity;
- Pursue the best practicable environmental option by means of integrated environmental management;
- Protect the environment as the people's common heritage;
- Control and minimise environmental damage; and
- Pay specific attention to management and planning procedures pertaining to sensitive, vulnerable, highly dynamic, or stressed ecosystems.

4.1 Compliance with the EMPr and relevant legislation

The applicant is reminded of its "duty of care" prescribed in section 28 of the NEMA, 1998 which states that "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".

All the mitigation measures as proposed in the Final BAR, Environmental Management Programme and specialist studies must be implemented. The applicant should consider and adhere to all relevant laws, legislation, regulations, guidelines and plans (see Table 4). This list is not complete and should be updated regularly. All phases of the proposed prospecting project must comply with the Environmental Management Programme

Table 4 The most important legislation applicable to prospecting in Concession area 14A.

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED | HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT. |
|--|--|---|
| <p>Mineral and Petroleum Resources Development Act, 2002.</p> <p>In terms of this Act, a Prospecting Right must be obtained before any prospecting activities may commence</p> | <p>Throughout the entire prospecting process</p> | <p>The applicant must submit a prospecting right application in terms of Section 16 (1) of this Act, along with an application for Environmental Authorisation (EA) to the Regional Manager. The prospecting right application must be accepted within 14 days, provided that no other entity or person holds a Prospecting Right, Mining Right, Mining Permit or Retention Permit for the same land and mineral. Once the application is accepted, a Basic Assessment Process, including stakeholder consultation and reporting, must be conducted as per Chapter 5 of the National Environmental Management Act, 1998 (NEMA).</p> |
| <p>National Environmental Management Act, 1998.</p> <p>NEMA sets out a number of governing environmental principles that should be taken into account and applied by all organs of state when making decisions that significantly affect the environment. It provides the minimum requirements for the procedures for investigating, assessing and communicating the potential impacts of activities on the environment and society and for the granting of Environmental Authorisation for any activity. It requires that any activity should not only be environmentally sustainable, but economically and socially as well. The cultural, social, economical, psychological, developmental and physical needs of people should be considered along with the environment.</p> | <p>Throughout the entire prospecting process</p> | <p>A Basic Assessment Process will be conducted and the appropriate environmental authorisation obtained before commencing with any activities. Measures will be taken to ensure that the activity preserves and promotes the environmental and socioeconomic integrity of the area. Interested and Affected Parties (I&APs) will be consulted and informed about the proposed activities and their potential impacts (both positive and negative). Comments received from I&APs will be communicated to the authorities for consideration as part of the Basic Assessment Report.</p> |
| <p>Environmental Impact Assessment (EIA) Regulations, 2014 (as amended).</p> <p>The EIA regulations, 2014 (as amended) promulgated in term of Chapter 5 of NEMA controls certain listed activities. These activities are published as Listing Notice (LN) 1 in Government Notice (GN) No. R983 (as amended) as LN 2 in GN No.R 984 (as amended) and as LN 3 in GN No. R985 (as amended). These activities are prohibited until Environmental Authorisation (EA) has been granted by the competent authority. Activities triggered under LN 1 and 3 requires that a Basic Assessment be</p> | <p>Throughout the entire prospecting process</p> | <p>The proposed project triggers Listing Notice (LN) 1. A Basic Assessment Process will be undertaken and a Basic Assessment Report and stakeholder consultation report submitted as part of the application for EA. No activity will commence before EA has been granted by the Competent Authority.</p> |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED | HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT. |
|--|--|---|
| <p>conducted, while activities triggered under LN 2 requires that a Scoping and Environmental Impact Assessment Report be conducted.</p> <p>See the Department of Environmental Affairs and Development Planning. 2011. EIA guideline and Information document series: Information document on biodiversity offsets</p> | | |
| <p>National Environmental Management: Air quality Act, 2004.</p> <p>The offshore area of activity and the South African Exclusive Economic Zone (EEZ) does not fall within any municipal or provincial jurisdiction. There is thus a no formal means by which an application can be made for incineration from vessels in the offshore area. This activity is, however, permitted in terms of the International Convention for the prevention of pollution from ships, 1973/1978 (MARPOL) to which South Africa is a signatory.</p> | <p>Throughout the entire prospecting process</p> | <p>South Africa is a signatory of the International Convention for the prevention of pollution from ships, 1973/1978 (MARPOL). As such, all vessels have the responsibility to ensure that they prevent, minimise and mitigate potential pollution by vessels. To manage the potential impact of air pollution by vessels, all contractors and employees will be subjected to an environmental awareness campaign.</p> |
| <p>National Environmental Management: Waste Act, 2008.</p> | <p>Throughout the entire prospecting process</p> | <p>South Africa is a signatory</p> |
| <p>Convention for the prevention of pollution from ships, 1973/1978 (MARPOL).</p> | <p>Throughout the entire prospecting process</p> | <p>Convention for the prevention of pollution from ships, 1973/1978 (MARPOL). As such, all vessels have the responsibility to ensure that they prevent, minimise and mitigate potential pollution by vessels. While a waste management license is not required for offshore waste management activities, such as those related to sewage, the generation of potential waste will be minimised through ensuring employees are subjected to the appropriate environmental awareness campaigns before commencement. All waste generated will be disposed of in a responsible and legal manner.</p> |
| <p>National Heritage Resources Act, 25 of 1999.</p> | <p>During coring, drilling and grab sampling</p> | <p>A heritage impact assessment has been conducted to ensure that there are no substantial impacts on heritage sites. No prospecting activities shall take place within 50 m of any identified heritage resources such as shipwrecks.</p> |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED | HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT. |
|--|---|---|
| <p>Companies Act 71 of 2008</p> <p>The aim of this act is to:</p> <ul style="list-style-type: none"> provide for the incorporation, registration, organisation and efficient management of companies, the capitalisation of profit companies, and the registration of offices of foreign companies carrying on business within the Republic; record-keeping and reporting by companies; | Throughout the entire prospecting process | The client must ensure that this act is adhered to throughout the entire process. |
| <p>Restitution of Land Rights Act 22 of 1994</p> <p>The Act provides for the restitution of rights to land to persons or communities dispossessed of their rights after 19 June 1913 as a result of historical racially discriminatory laws and practices</p> | N/A | As this is an offshore application, this act is not applicable to this application. |
| <p>Climate Change – Carbon Tax Act 15 of 2019</p> <p>A taxpayer is liable to pay a carbon tax where it conducts any activities set out in Schedule 2 of the Carbon Tax Act and emits GHG emissions above the listed thresholds. Tax liability may be reduced through using the various allowances available and in some instances, the tax is only payable where the allowances are exceeded.</p> | Throughout the entire prospecting process | The client has the responsibility to ensure that they pay carbon tax should they emit emissions above the listed thresholds or ensure that they reduce their emissions. |
| <p>Climate Change – National Climate Change Response White Paper</p> <p>This paper provides guidance across all levels of government, sectors, and stakeholders in terms of climate change adaptation efforts in South Africa in the short to medium-term. Financial institutions must integrate environmental considerations into their decision-making frameworks and contribute to climate change mitigation and resilience. The paper acknowledges that financial institutions can play an important role in mobilizing finance to mitigate the impacts of climate change in South Africa and supporting a just transition to a low carbon economy.</p> | Throughout the entire prospecting process | The client has the responsibility to ensure that they integrate environmental considerations and mitigation measures to reduce the impacts of climate change as a result of any operations they conduct into their decision-making frameworks and business plans. |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED | HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT. |
|--|--|---|
| <p>National Water Act 36 of 1998</p> <p>South Africa’s waters are governed by the Water Services Act of 1997 and the National Water Act (NWA) of 1998. The NWA requires that certain water users obtain a license with the Department of Water Affairs and follow specific requirements.</p> <p>Activities that typically require water use licenses are abstraction of water from dams or boreholes for irrigation, forestry operations, discharging waste water into water courses and altering the physical structures of rivers and streams.</p> | <p>N/A</p> | <p>As this is an offshore prospecting activity that will not require any water uses, this act is not applicable to this activity.</p> |
| <p>The Occupational Health and Safety Act No. 85 of 1993</p> <p>The Act governs health and safety at all workplaces. It is focused on the health and safety of persons at work and places the responsibility on employers “to do everything reasonably practical” to protect the welfare of their employees</p> <p>The Act requires that every company with more than 20 employees has to have a health and safety committee, which should be tasked with identifying potential hazards, examining the causes of any workplace incidents, investigating employee complaints and consulting with health and safety inspectors. The Act also directs employers to provide and establish precautionary measures and systems to prevent workplace injuries.</p> | <p>Throughout the entire prospecting process</p> | <p>The client has to ensure that they adhere to the conditions set out in this act throughout the entire process. They also have to appoint a Health and Safety Officer to supervise the health and safety performance of the company, as well as to represent the employer and management at Health and Safety Committee meetings.</p> |
| <p>National Environmental Management: Protected Areas Act</p> <p><i>“To provide for the protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes”</i></p> | <p>During coring, drilling and grab sampling</p> | <p>Results from the Screening Report and specialist marine impact assessments should be taken into consideration to avoid prospecting in a protected area or area of conservation concern.</p> |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED | HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT. |
|--|--|---|
| <p>Maritime Zones Act (No 15 of 1994)</p> <p>The Act defines the maritime zones of South Africa which include the contiguous zone, territorial waters, the maritime cultural zone, the exclusive economic zone and the continental shelf. South Africa has the right to exercise and implement all laws within the contiguous zone.</p> | <p>Throughout the entire prospecting process</p> | <p>Concession Area 14A lies within the territorial waters. Any offshore are subject to National law and should be adhered to.</p> |
| <p>Constitution of South Africa</p> <p>This is the supreme law that provides the legal framework for the existence of the Republic of South Africa.</p> | <p>Throughout the entire prospecting process</p> | <p>The conducting of prospecting activities in the area shall be done in such a manner that avoids significant environmental impacts. In instances where this cannot be avoided, impacts must be minimised or mitigated in order to protect the environmental rights of South Africans.</p> |
| <p>National Environmental Management: Biodiversity Act 10 of 2004.</p> <p>This act provides legal protection and management of South Africa’s biodiversity within the context of the National Environmental Management Act and the sustainable use of biological resources.</p> | <p>Throughout the entire prospecting process</p> | <p>Strict compliance with the EMPr should be adhered to and mitigation measures implemented to reduce disturbance of biodiversity and aid in recovery.</p> |
| <p>Relevant specific environmental management Act (SEMA(s)) and their regulations.</p> <p>This refers to and includes subordinate regulations made in terms of section 1 of NEMA and specifically refers to the Protected Areas, Biodiversity, Air Quality, Integrated Coastal Management and Waste Acts.</p> | <p>Throughout the entire prospecting process</p> | <p>Applicable SEMA acts should be taken into account during the planning and design phase so that appropriate protocols are developed and maintained during the operational phase such as for waste management and protection of biodiversity areas.</p> |
| <p>CapeNature Western Cape Biodiversity Spatial Plan (WCBSP, 2017)</p> <p>A spatial assessment and biodiversity plan that is delineated on a Geographic Information System map that includes Critical Biodiversity, Ecological Support Areas to inform sustainable development in the Western Cape.</p> | <p>Planning and Design Phase</p> | <p>This spatial plan should be taken into account during the plan and design phase to inform areas for prospecting and activities should be adjusted accordingly.</p> |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED | HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT. |
|--|--|--|
| <p>The Western Cape Provincial Spatial Development Framework (2014) (Department of Environmental Affairs & Development Planning)8</p> <p>This includes land development policies, strategies, objectives as well as growth and development strategies for the province, all of which are spatially represented.</p> | <p>Throughout the entire prospecting process</p> | <p>This legislative framework should be taken into account to promote growth and development of local communities and should be considered during the planning and design phase.</p> |
| <p>The Mining and Biodiversity Guideline (2013)</p> <p>Outlines six principles that should be applied during any stage of the mining for decision-making. The document uses biodiversity information for decision-making throughout the mining cycle</p> | <p>Throughout the entire prospecting process</p> | <p>This should be employed to provide a practical guideline when making decisions regarding impacts to biodiversity with respect to the prospecting activities.</p> |
| <p>The Western Cape Land Use Planning Guidelines: Rural Areas (2019)</p> <p>Aims at Safeguarding priority biodiversity areas and their functionality and ecological infrastructure and ensuring sustainable development in rural locations throughout the Western Cape</p> | <p>Throughout the entire prospecting process</p> | <p>This guideline will inform the planning and design of the prospecting survey and can be used to develop protocols for implementation in the operation phase.</p> |
| <p>Western Cape Guideline on Biodiversity Offsets</p> <p>DEA&DP 2015. Western Cape Guideline on Biodiversity Offsets. Prepared by Susie Brownlie and Mark Botha for DEA&DP, Cape Town12</p> | <p>Throughout the entire prospecting process</p> | <p>This guideline should be used during the planning and design phase such that residual impacts of the prospecting activity on biodiversity should be reduced.</p> |
| <p>National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) (NEM: ICMA)</p> <p>ICMA governs the sustainable use of goods and services that are generated by coastal and marine ecosystems.</p> | <p>Throughout the entire prospecting process</p> | <p>The required discharge and dumping permits need to be obtained in terms of NEM: ICMA with reference to the discharge of sediment into the marine environment</p> <p>Implement the Provincial Coastal Management Programme (PCMP). Its purpose is to provide an integrated, coordinated and uniform approach to coastal management in accordance with the and the.</p> |
| <p>Marine Spatial Planning Act of 2019</p> <p>Makes provision for marine spatial planning system in South Africa so that the environment can be accessed by all users of the ocean, to facilitate responsible use of the ocean and conservation for future generations.</p> | <p>Planning and Design Phase</p> | <p>When planning the prospecting survey, areas of biological significance need to be taken into account and avoided.</p> |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED | HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT. |
|---|--|--|
| <p>National Estuarine Management Protocol (promulgated in GN No. 533 of 18 June 2021).</p> <p>This protocol was developed to determine a vision and objectives for integrated and effective management of South African estuaries.</p> | <p>Throughout the entire prospecting process</p> | <p>Relevant guidelines, Estuarine Management Plans and Mouth Management Plans need to be considered should activities impact the Olifants River Estuary</p> |
| <p>International Regulations for Preventing Collisions at Sea (Colregs 1972)</p> <p>These regulations refer to navigational rules that need to be adhered to by maritime vessels to minimise the likelihood of collisions.</p> | <p>Operation Phase</p> | <p>To prevent collision with other maritime vessels during survey operations, the operation vessel should adhere to this regulation, implement a safety zone and effectively signal this to other vessels.</p> |

4.2 Proposed impact management objectives and outcomes

4.2.1 Environmental and community sensitivities and awareness:

- Contractor personnel and staff should undergo environmental awareness training which would include being briefed about the sensitivities pertaining to the environmental and sensitive species, archaeological, heritage, and palaeontological resources, the consequences of any damage/removal of such resources.
- Appoint a fisheries liaison officer (FLO) to facilitate communication with fishing community in Doringbaai. The FLO should report daily on vessel activity and respond and advise on action to be taken in the event of encountering fishing gear in the survey area.
- The applicant may not restrict access or conduct any activity that restricts public access to the coastline.

4.2.2 Marine ecological resources:

- Appropriate buffers must be determined by a suitably qualified specialist to avoid MPA's, EBSA's and any other area of conservation concern. These include the northern and southern border of concession area 14A which are considered vulnerable in addition to the coastline which is considered Near Threatened. Once suitable buffers have been mapped it should be illustrated on a map and form part of the EMPr.
- Appoint a designated onboard Marine Mammal and Seabird Observer (MMSO) to ensure compliance with mitigation measures during geophysical surveying.
- The only strong mitigation measures are the "avoidance" mitigation measures -using the PAM and avoiding cetacean migratory seasons. Avoid migrating, mating seasons.
- Avoid planning geophysical surveys during the movement of migratory cetaceans and ensure that migration paths are not blocked by sonar operations.
- A passive acoustic monitoring (PAM) system should be used during survey activity to detect cetaceans that could be at risk.
- Grab samples collected should be analysed as soon as possible to determine the benthic macrofaunal communities in the area. Results of this monitoring should be used to inform additional mitigation measures if required. This will also establish a baseline for comparison of any future surveys and sampling.
- Reassess the potential marine impacts after completion of the geophysical surveys and biological analysis as these might elucidate areas that would need to be avoided and species of conservation concern.
- The inshore west coast coastal waters are important for the recruitment of pelagic fish species and recruitment seasons should be avoided where possible.

4.2.3 Heritage resources

- It is recommended that the onboard Trans Atlantic representative must undergo a short induction on archaeological site and artefact recognition, as well as the procedure to follow should archaeological material be encountered during sampling.
- The contractor must be notified that archaeological sites could be exposed during sampling activities, as well as the procedure to follow should archaeological material be encountered during sampling.
- Areas where shipwreck sites are identified during the geophysical surveys must be excluded prior to undertaking sampling activities.
- Heritage sites or objects may not be disturbed without a permit from the relevant heritage resources authority.
- Any core sample sections which contain alluvial material, particularly where organic remains are present, are retained and are subject to paleo-environmental assessment.
- Any fossils found during the processing of cores must have the details of context recorded, must be kept for identification by an appropriate specialist and, if significant, be deposited in an appropriate institution.
- If shipwreck material is encountered during the course of sampling in any of the concession areas, the following mitigation measure should be applied:
 - Cease work in the directly affected area to avoid damage to the wreck until the South African Heritage Resources Agency (SAHRA) has been notified and the contractor/De Beers has complied with any additional mitigation as specified by SAHRA; and
 - Where possible, take photographs of them, noting the date, time, location and types of artefacts found. Under no circumstances may any artefacts be removed, destroyed or interfered on the site, unless under permit from SAHRA.
- All updates and/or changes to the project, supporting documentation, correspondence, reports, or any other work relating to the project must be uploaded to the case on SAHRIS to provide SAHRA with the opportunity to comment. SAHRA does not accept emailed documents or hard-copy documents received via post.

4.2.4 Shipping and safety:

- Prior to the commencement of activities, the vessel operator must notify relevant bodies including: DMR, DEA, SAMSA, the SAN Hydrographic Office, relevant Port Captains and DAFF: MRM, providing the navigational coordinates of the survey and/or sampling areas.
- A health and safety officer should be appointed and Health and Safety Regulations should be adhered to.
- The survey and sampling vessels must be certified for seaworthiness through an appropriate internationally recognised marine certification programme (e.g. Lloyds Register, Det Norske Veritas). The certification, as well as existing safety standards, requires that safety precautions should be taken to minimise the possibility of an

offshore accident. Collision prevention equipment should include radar, multi-frequency radio, foghorns, etc. Safety equipment and training of personnel to ensure the safety and survival of the crew in the event of an accident is a further legal requirement.

- A Notice to Mariners should provide the co-ordinates of the survey and/or sampling areas.
- A buffer of 500m in extent should be placed around the ship in terms of the International Regulations for Preventing Collisions at Sea (Colregs 1972). To avoid or minimise potential negative impacts on fisheries due to the exclusion from fishing grounds in the vicinity of the ship, mitigation measures as recommended under the fisheries section should be implemented.

4.2.5 Socio-economic and fishing:

- Avoid designated fishing spots and undertake surveys preferably out of fishing seasons or when fishing effort is lower (including rock lobster fishing).
- Potentially affected user groups (fishers, other mining operations, abalone farm etc) should be consulted at least 1 month after the start of the survey.
- Appoint a fisheries liaison officer (FLO) to facilitate communication with fishing community in Doringbaai. The FLO should report daily on vessel activity and respond and advise on action to be taken in the event of encountering fishing gear in the survey area.
- Reef areas should be avoided as these support west coast rock lobsters in addition to other species important to fisheries.

4.2.6 Disturbance management:

- Planning and management of potential discharges to ensure that tailings are not discarded onto potentially sensitive habitats
- Avoid prospecting activity surrounding the seawater intake points
- Ensure compliance with relevant MARPOL standards;
- Develop a waste management plan using waste hierarchy;
- Government Departments' work and servitude will have priority and shall not be obstructed or interfered with.

4.2.7 Waste management and water pollution:

- Contractor personnel and staff should undergo waste management and spill management training.
- A Shipboard Oil Pollution Emergency Plan (SOPEP) must be prepared for all vessels and should be in place at all times during operations.
- Deck drainage should be routed to a separate drainage system (oily water catchment system) for treatment to ensure compliance with MARPOL (15 ppm).
- All process areas should be bunded to ensure drainage water flows into the closed drainage system.
- Drip trays should be used to collect run-off from equipment that is not contained within bunded areas and the contents routed to the closed drainage system.

- Low-toxicity biodegradable detergents should be used in the cleaning of all deck spillages.
- All hydraulic systems should be adequately maintained and hydraulic hoses should be frequently inspected.
- No waste or pollution in the environment is allowed. The applicant shall be liable for the cost of any remedial action which has to be carried in addition to a fine equal to the transgression.

4.3 Aspects for inclusion as conditions of Authorisation.

It is the opinion of the EAP that the following conditions should form part of the authorisation:

- Grab samples should be analysed as soon as possible after collection to determine the benthic macrofaunal communities in the area. These results should be used to inform additional mitigation measures should unacceptable negative impacts be detected. This monitoring will also establish a baseline for comparison of any future surveys and sampling.
- Potential marine impacts should be reassessed after completion of the geophysical surveys and biological analysis, as these might elucidate areas that would need to be avoided and species of conservation concern.
- Landowners, land occupiers and affected stakeholders should be consulted at least 1 month after the start of the survey. A map detailing prospecting locations should be provided to the landowner/affected stakeholder as well as the DMR prior to commencement of prospecting activity.
- All environmental legislation must be complied with. Specific aspects to be adhered to from environmental legislation include National Environmental Management Act, Act 107 of 1998 (NEMA), Minerals and Petroleum Resources Development Act, Act 28 of 2002 (MPRDA).

4.4 Management Actions

4.4.1 General

Environmental Induction and Training

The ECO in consultation with the contractor shall ensure that adequate environmental awareness training of senior site personnel takes place and that all survey staff receive an induction presentation on the importance and implications of the EMPr. The presentation shall be conducted, as far as is possible, in the employees' language of choice. The contractor should provide a translator from their staff for the purpose of translating should this be necessary.

As a minimum, training should include:

- Explanation of the importance of complying with the EMPr and the employee's accountability.
- Discussion of the potential environmental impacts of prospecting activities.
- The benefits of improved personal performance.

- Employees' roles and responsibilities, including emergency preparedness (this should be combined with this induction, but presented by the contractors Health and Safety Representative).
- Explanation of the mitigation measures that must be implemented when carrying out their activities.
- Explanation of the specifics of this EMPr and its specification (no-go areas, etc.)
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr.
- Induction attendance registers must be included in any ECR documents.
- Should the staff turnover be high and with additional appointment of sub-contractors, it may be necessary to undertake additional induction training sessions. This is at the discretion of the ECO.
- The contractor must keep records of all environmental training sessions, including names, dates and the information presented.

Appointment of a Fisheries Liaison Officer (FLO)

The Marine Specialist has recommended that a Fisheries Liaison Officer (FLO) is appointed for the activity. Continuous and periodic monitoring and evaluation is required to ensure the achievement of milestones and the overall success of achieving the objectives envisaged for the project and stated below. The following activities are geared towards achieving acceptable and on-going monitoring standards:

- Undertake surveys when fishing effort is lower (preferably out of fishing seasons).
- Facilitate communication with fishing community in Doringbaai.
- The FLO should report daily on vessel activity and respond and advise on action to be taken in the event of encountering fishing gear in the survey area.

4.4.2 Measures applicable to planning and design phase

The planning and design phase of the proposed prospecting activities will be applicable to the desktop and literature review and, the stakeholder consultation. The specific roles and responsibilities for this phase are explained in Section 0 below.

Roles and responsibilities

The key role players during the design phase of the project are (1) Trans Atlantic Diamonds (Pty) Ltd, (2) Fisheries Liaison Officer and (3) Sampling contractor. Their roles and responsibilities during the detailed design phase with respect to the implementation of the EMPr are outlined below.

Trans Atlantic Diamonds (Pty) Ltd

- Ensure preparation of plans for any emergency that could result in environmental impact in accordance with MARPOL & SOPEP
- Ensure adequate systems in place to address oil pollution incidents that may occur
- Survey and sampling vessel seaworthiness
- Submit DMRE notification detailing specifics of the prospecting operation including timing, co-ordinates and duration, contractor details and other information on request
- Notify relevant stakeholders and government departments of the commencement of prospecting activities and the restrictions related to the operation.
- Ensure that the requirements of NEMA in terms of financial provision for remediation are met.

Fisheries Liaison Officer

- Consult relevant stakeholders within the fishing industry and relevant associations such as SAMSA, SAN hydrographic office and overlapping and or adjacent prospecting/mining right holders
- Notify relevant stakeholders prior to commencement of operational phase

Sampling Contractor

Provide specifics regarding prospecting programme such as timing, co-ordinates and duration as well as any. Other information on request.

Environmental Management Measures

There are no environmental management and mitigation measures that must be implemented during the design phase.

4.4.3 Measures applicable to operational phase

Operational Phase measures will apply to all sampling and prospecting activities taking place after the Planning and Design Phase and refers to geophysical surveys, drilling/ coring of the seabed and extracting sediment samples using a Van Veen grab.

Roles and Responsibilities

The key role players during the operation phase of the project are Trans Atlantic Diamonds (Pty) Ltd and Appointed Contractor. Trans Atlantic Diamonds (Pty) Ltd retain the final responsibility with regards to compliance with the EMPr and EA.

Key roles and responsibilities during the operation phase with respect to the implementation of the EMPr are outlined below.

Trans Atlantic Diamonds (Pty) Ltd

- Minimize environmental damage by implementing response procedures efficiently
- Ensure compliance with the EMPr and EA by appointing relevant personnel/contractors

Appointed Contractor/s

- Minimise environmental damage by implementing response procedures efficiently
- Ensure compliance with the EMPr and EA
- Minimize hazards left on the seafloor or floating in the water column
- Ensure compliance with monitoring and auditing requirements for prospecting operations
- Minimize pollution and promote waste management
- Ensure the protection of heritage and cultural features by reducing disturbance of sampling activities on benthic biodiversity and heritage resources

Reporting and Corrective action

Trans Atlantic Diamonds (Pty) Ltd must make available annual prospecting reports to registered stakeholders for the duration of the project including at a minimum the following information:

- Extent of current operations;
- Key environmental monitoring results;
- Feedback on stakeholder concerns; and
- Any other relevant aspects.

EA and EMPr Compliance Audit Report

In accordance with Section 34 of the EIA Regulations, 2014 (as amended in 2017), compliance with the conditions of the EA and the EMPr must be audited by an independent person at intervals indicated in the EA and the report should be submitted to the DMRE. This should alternate between an internal auditor (Scientific officer) and an independent environmental assessment practitioner (EAP) or Environmental Control Officer (ECO). Environmental audit reports must comply with the specifications in Section 34 and Appendix 7 of the EIA Regulations, 2014 (as amended in 2017).

A review after the first six months after implementation shall be conducted focusing on an assessment of the overall progress and achievement of the objectives and milestones related to the specified targets of employment, enterprise development, preferential procurement and socio-economic development.

Reports must include at a minimum the following information:

- Monitoring/audit activities undertaken in reporting period;
- Overall compliance with the EMPr; and
- Key aspects of non-compliance.

Table 5 Summary of reporting to be conducted during the Operational Phase of the proposed prospecting project

| Report | Frequency | From | To |
|---|------------------------|-------------------------------|----------|
| Progress Reporting on vessel activity and fishing areas of interest | Daily/Weekly | Fisheries Liaison Officer | ECO/TAD |
| Environmental Sampling Reports | 6 months | Scientific Officer (Internal) | ECO/ TAD |
| EMPr Compliance Report | 6 months | Scientific Officer (Internal) | ECO/ TAD |
| Internal Audit Report | Annually | Scientific Officer (Internal) | ECO/TAD |
| EA and EMPr Compliance Audit | As indicated in the EA | Independent person | DMRE/TAD |

Environmental Management Measures

The environmental management and mitigation measures that must be implemented during the operation phase, as well as timelines for the implementation of these measures and monitoring thereof, are laid out in Table 6.

Corrective Action

Corrective action is a critical component of the implementation–review–corrective action–implementation cycle and it is through corrective action that continued improvement can be achieved. Where repeated non-compliance is recorded, procedures may need to be altered accordingly to avoid the need for repeated corrective action.

If environmental compliance monitoring indicates non-conformance with the EMPr, TAD will formally notify the operator through a Corrective Action Request. The Corrective Action Request documents:

- The nature of the non-conformance / environmental damage;
- The actions or outcomes required to correct the situation; and
- The date by which each corrective or preventive action must be completed.

Upon receipt of the Corrective Action Request, the operator will be required to report in the annual audit as to how the required actions were implemented and the success or failure of the corrective action.

Should proposed standards or targets be regularly exceeded, an independent committee or service provider should investigate and objectively assess the effectiveness of mitigation measures.

4.4.4 Measures applicable to the decommissioning and closure phase

The proposed prospecting activity will typically have a five-year life span. Decommissioning may take place at the end of the proposed prospecting project and includes:

- The survey vessel leaving the area.
- Informing the stakeholders of the closure of the project.
- Disposing any waste on the ship in a responsible manner.
- Compiling a closure report.

- Conducting a feasibility study to determine the feasibility of mining in Concession 14A.

The closure report should include the following:

- A description of the proposed closure project;
- A description of the affected environment;
- Summary of the closure process followed to date;
- Identify and assess the key risks associated with closing the prospecting right; and
- A closure plan for the project

It is generally accepted that inshore disturbed benthic marine habitats require a shorter period to recover than those in deeper water further offshore as the former areas are highly dynamic. Full recovery is expected to take place within the short to medium term (i.e., 5 – 10 years). Important drivers of inshore habitat recovery are related to the exposure to dynamic physical processes such as wave action and sediment refill from river mouths. No direct mitigation or rehabilitation is considered necessary although careful planning and management of potential discharges to ensure that tailings are not discarded onto sensitive reef habitat, should be implemented.

Roles and Responsibilities

The key role players during the decommissioning phase of the project are anticipated as follows:

- Trans Atlantic Diamonds (Pty) Ltd
- Contractors responsible for decommissioning

Individual contractors retain the final responsibility with regards to the compliance with the EMPr and EA. All instructions relating to the EMPr will be given to contractors via the respective scientific officer. Contractors will report issues of concern to the scientific officer, who in turn will report on progress to TAD.

Key roles and responsibilities during the decommissioning phase with respect to the implementation of the EMPr are outlined below.

Roles and responsibilities relating to environmental monitoring are laid out in Section XX

Trans Atlantic Diamonds (Pty) Ltd

In terms of environmental management:

- Ensure that environmental monitoring is undertaken in line with the monitoring plan until decommissioning is complete;
- Make decisions based on the outcomes of environmental monitoring, which could lead to the recommendations about the decommissioning process
- Receive and manage stakeholder comments
- Record and, if necessary, co-ordinate a response to environmental incidents during the decommissioning
- Provide updated information to the public

Appointed Contractor/s

- Ensure that all employees are aware and comply with the EMPr
- Ensure that all activities on site are undertaken in accordance with the EMPr
- Immediately notify TAD with any non-compliance with EMPr or any other issues of environmental concern
- Ensure that non-compliance is remedied timeously and to the satisfaction of TAD

Environmental Management Measures

The environmental management and mitigation measures that must be implemented during the decommissioning phase, as well as timelines for the implementation of these measures and monitoring thereof, are detailed in Table 6.

Table 6 Summary of the activities, impacts, mitigation measures and how these will comply with environmental standards.

| NAME OF ACTIVITY | PHASE IN WHICH IMPACT IS ANTICIPATED | POTENTIAL IMPACT | ASPECTS AFFECTED | MITIGATION MEASURE/ MANAGEMENT ACTION | COMPLIANCE WITH STANDARDS | RESPONSIBILITY | TIME |
|-------------------------------------|--------------------------------------|------------------|---|--|--|---|--|
| Planning and design Phase | Planning and Design Phase – Phase 1 | N/A | <ul style="list-style-type: none"> Preparation for environmental emergencies <p>Protection of underwater cultural heritage</p> | <p>Ensure that necessary emergency procedures and protocols are in place such as:</p> <ul style="list-style-type: none"> Shipboard Oil Pollution Emergency Plan (SOPEP) in accordance with MARPOL Emergency Response Plan Waste Management Plan in accordance with MARPOL <p>Additionally, the vessel should be certified as seaworthy with necessary documentation in place.</p> | <p>Compliance with the following legislation:</p> <ul style="list-style-type: none"> International Convention for the prevention of pollution from ships (MARPOL) Applicable legislation from the National Environmental Management Act I(NEMA). <p>Avoiding negative impacts and reducing impacts of prospecting activities</p> | Trans Atlantic Diamonds (Pty) Ltd (TAD) | Prior to commencement of operation phase |
| Desktop study and literature review | Planning and Design Phase – Phase 1 | N/A | Compliance with legislative requirements | <p>Ensure that financial provision is made for remediation of environmental damage by:</p> <ul style="list-style-type: none"> Allocating operational costs so as to comply with EMPr requirements Maintaining adequate Protection and Indemnity Insurance cover to allow for clean-ups in the event of a | Compliance with NEMA and the Marine living Resources Act, 1998. | TAD | Prior to commencement of operation phase |

| NAME OF ACTIVITY | PHASE IN WHICH IMPACT IS ANTICIPATED | POTENTIAL IMPACT | ASPECTS AFFECTED | MITIGATION MEASURE/ MANAGEMENT ACTION | COMPLIANCE WITH STANDARDS | RESPONSIBILITY | TIME |
|--------------------------|--------------------------------------|------------------|--|--|---|--------------------------------------|---|
| | | | | <p>hydrocarbon spill and other environmental emergencies</p> <ul style="list-style-type: none"> Provide sufficient funds to put the EMPr into effect should premature closure occur and, on closure, the EMPr has not been successfully executed. <p>All permits and or exemptions relating to marine resources deemed necessary should be applied for. The request must be sent DFFE.</p> | | | |
| Stakeholder Consultation | Planning and Design Phase – Phase 1 | N/A | Department of Mineral Resources (DMR) notification | <p>A detailed notification should be sent to the Department of Mineral Resources (DMR) and should provide details of the prospecting operation and should include:</p> <ul style="list-style-type: none"> Programme of prospecting activities such as location, time and intended operations Details of the contractor conducting the sampling survey <p>All other necessary information as requested by the DMR</p> | Mineral Petroleum Resources Development Act, 2002 (MPRDA) | TAD | 30 days prior to commencement of operation phase or as required by the DMR. |
| Stakeholder Consultation | Planning and Design Phase – Phase 1 | N/A | Stakeholder notification | <ul style="list-style-type: none"> Appoint a fisheries liaison officer (FLO) to facilitate communication with fishing community in Doringbaai. Consult with relevant government departments, fishing industry/associations and local communities to discuss important | NEMA, EIA regulations, MPRDA | Fisheries Liaison Officer (FLO), TAD | 30 days prior to commencement of operation. |

| NAME OF ACTIVITY | PHASE IN WHICH IMPACT IS ANTICIPATED | POTENTIAL IMPACT | ASPECTS AFFECTED | MITIGATION MEASURE/ MANAGEMENT ACTION | COMPLIANCE WITH STANDARDS | RESPONSIBILITY | TIME |
|------------------|--------------------------------------|------------------|------------------|--|---------------------------|----------------|------|
| | | | | <p>fishing grounds, harvesting times, other relevant information and the possibility of altering the prospecting programme so as to minimise disruptions to both parties as required.</p> <p>Key stakeholders that need to be notified of the commencement of operations (including navigational co-ordinates of the survey area, timing and duration of proposed activities) and the likely implications thereof:</p> <ul style="list-style-type: none"> • SA Marine Linefish Management Association (SAMLMA); • South African Pelagic Fishing Industry Association (SAPFIA) • West Coast Rock Lobster Association; and • Local fishing communities in Doringbaai • DFFE; • SAMSA; • South African Navy Hydrographic office; and • Overlapping and neighbouring right holders | | | |

| NAME OF ACTIVITY | PHASE IN WHICH IMPACT IS ANTICIPATED | POTENTIAL IMPACT | ASPECTS AFFECTED | MITIGATION MEASURE/ MANAGEMENT ACTION | COMPLIANCE WITH STANDARDS | RESPONSIBILITY | TIME |
|----------------------|--------------------------------------|------------------|--|---|---------------------------|------------------------------------|--|
| Compliance with EMPr | Planning and Design Phase – Phase 1 | N/A | <p>Impacts associated with survey operations are kept to a minimum by:</p> <ul style="list-style-type: none"> • Properly training personnel in environmental awareness <p>Other user groups are made aware of the sampling/survey programme</p> | <ul style="list-style-type: none"> • Appointed contractors and or operators need to commit to the adherence of the EMPr and that a copy of the approved EMPr is on board the survey and sampling vessel during operation. • Ensure and verify that protocols are in place to comply with the EMPr. • Appoint the appropriate personnel and procure the relevant equipment are available to meet the requirements of the EMPr. • Environmental Awareness Training should be conducted to ensure vessel personnel are binformed of the requirements of the EMPr. • Allocate responsibilities to relevant personnel to ensure EMPr compliance. • Submit a written request to the SAN hydrographic office to release Radio Navigation Warnings and Notices to Mariners throughout the survey/sampling period, giving notice of the following: <ul style="list-style-type: none"> ○ Co-ordinates of the sampling/survey ○ Indication of the sampling/survey timeframes ○ Indication of the 500 m safety zone around the vessel | NEMA | TAD, Appointed Contractor/Operator | <p>Prior to commencement of Operation. The notification to the SAN hydrographic office should be sent 7 days prior to start of operations.</p> |

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| | | | | <ul style="list-style-type: none"> ○ Provide details of the support vessels servicing the operation. ○ A copy of this notice should also be distributed to the fishing community/associations | | | |
| Geophysical survey | Operations Phase – Phase 2 | Noise disturbance impacting marine fauna | Impacts to marine mammals, benthic fauna, and fishing grounds | <ul style="list-style-type: none"> • Activity must be restricted to specific areas or a time of year • Sound containment and improvement of current equipment used must be implemented • Protocol must be followed to avoid mortalities and/or injuries to marine animals when they are encountered • Implement airgun “soft-starts” of at least 20 minutes duration. • Employ on board independent observer(s) / MMSO(s) with experience in seabird, turtle and marine mammal identification and observation techniques to carry out daylight observations. • If surveys are to be undertaken at night, it is recommended that the vessel is fitted with Passive Acoustic Monitoring (PAM) technology. Utilise PAM technology when surveying at night or during adverse weather conditions and thick fog (commonly encountered on the west coast of South Africa). | NEMA | Appointed Contractor. | Throughout surveying operations. |

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| | | | | <ul style="list-style-type: none"> • Record marine mammal incidences and responses to geophysical survey activity, including data on position, distance from the vessel, swimming speed and direction and obvious changes in behaviour (e.g. startle responses or changes in surfacing/diving frequencies, breathing patterns) along with underwater noise levels. • Terminate acoustic survey if mass mortalities of fish are observed. • If spotted wait until all marine life (seabirds, seals, cetaceans and turtles) have cleared an area of 500 m radius of the centre of the sound source before resuming with the geophysical survey (initiate soft start procedure when resuming the geophysical survey). • Record incidences of encounters with marine life (seabirds, turtles, seals, fish) their behaviour and response to the geophysical survey activity. • Suspend operations if any obvious mortalities or injuries to marine life are observed. • Wait until all small cetaceans (<3 m in overall length) have cleared an area of 500 m radius of the survey vessel before resuming with the geophysical survey. If, after a period of 30 minutes, small cetaceans are still within 500 m of the airguns, the normal "soft start" procedure should be allowed to commence for at least | | | |

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| | | | | <p>20-minutes duration. Small cetacean behaviour during “soft starts” shall be monitored.</p> <ul style="list-style-type: none"> Record seabird incidences and behaviour, including any attraction of predatory seabirds and incidents of feeding behaviour around the survey vessel. Ensure that MMOs compile a survey close-out report incorporating all recorded data to the relevant DFFE authorities. Make marine mammal incidence data and sound source output data from surveys available on request to the Marine Mammal Institute (MMI), DAFF and DMR. Ensure that Passive Acoustic Monitoring (PAM) is incorporated into any surveying taking place at night and or marine mammal migratory months (June and or November) | | | |
| Sampling activities (Grab, drilling, core) | Operations Phase – Phase 2 | Disturbance to underwater cultural heritage, marine organisms in the water column and seabed | Heritage resources and biodiversity of marine organisms | <ul style="list-style-type: none"> An onboard Trans Atlantic representative must undergo a short induction on heritage and artefact recognition, as well as the procedure to follow should archaeological material be encountered during sampling. Any core samples are retained and subjected to assessment. If artefacts are found during the course of sampling in any of the concession areas, the following mitigation measure should be applied: | Heritage Resources Act; NEMA | Appointed Contractor | Throughout sampling operations. |

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| | | | | <ul style="list-style-type: none"> • Cease work in the directly affected area to avoid damage until SAHRA has been notified and the contractor has complied with any additional mitigation as specified by SAHRA; • Take photographs, noting the date, time, location and types of artefacts found. • Do not remove, disturb or, destroy the artefacts or site <p>Areas where shipwreck sites are identified during the geophysical surveys must be excluded prior to undertaking sampling activities</p> | | | |
| Compliance with the EMPr | Operations Phase – Phase 2 | Environmental degradation | Environmentally responsible operation | <ul style="list-style-type: none"> • Environmental Awareness training should be conducted to ensure all personnel are adequately informed of the requirements of the EMPr. • The onboard TAD representative should undergo a short induction on underwater cultural heritage and recognition of artefacts. The representative should also be informed of the procedure should any heritage material such as shipwreck be discovered. • Full compliance is required with the EMPr and a detailed record of compliance should be kept and made available upon request. • The FLO should report daily on vessel activity and respond and advise on action to be taken in the event of | NEMA, Heritage Resources Act | FLO, TAD, Appointed survey contractor | Prior to and throughout operation phase. |

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| | | | | encountering fishing gear in the survey area | | | |
| Stakeholder Communication | Operations Phase – Phase 2 | N/A | Key stakeholders such as in fishing industry/associations and local communities | <p>Co-operation with ships, vessels and other users of the sea should be encouraged by:</p> <ul style="list-style-type: none"> • Keeping key I&APs, government departments and other relevant stakeholders updated on the prospecting programme. • Be on a continuous look out for other users of the sea • A detailed record should be kept of any interactions with other users of the sea such as ships and vessels. | NEMA, MPRDA | Appointed Contractor/Operator | During the Operation, as necessary. |
| Emergencies (Prevention and Protocols) | Operations Phase – Phase 2 | Damage to the environment as a result of oil spills, vessel collisions etc. | Marine flora and fauna, other marine user groups | <ul style="list-style-type: none"> • Should an emergency occur, emergency protocols should immediately be actioned and emergency response agencies should be contacted such as the Directorate of Marine Pollution at the DFFE, the DMR, and SAMSA. • To avoid collisions with other users of the sea, a standby watch should be implemented and vessel lights by night. • A safety zone should also be implemented around the survey vessel of 500 m and other users notified of this. • Hazardous spills should be prevented by properly storing, sealing and labelling all hazardous materials required for the operation of the vessel. | MARPOL, NEMA, MPRDA | Appointed Contractor and or Operator | Throughout Operation. |

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| | | | | <ul style="list-style-type: none"> • Should an oil spill occur, immediately implement emergency plans and notify the relevant emergency response agencies such as Directorate of Marine Pollution at the DFFE, the DMR, and SAMSA. • A detailed oil spill incident report should be provided and include details of: <ul style="list-style-type: none"> • The person reporting the incident (Name, contact details). • Circumstance of the incident, including reason for spill, date, time and location of the spill • Details of the ship (type, port of registry, ship company) • Current status of the situation such as the amount of oil spilled and the likelihood of further pollution • Weather and sea conditions; • Immediate response and further actions as per ships emergency protocols <p>It is imperative that the operation vessel be well equipped and have proper protocols to effectively deal with emergency situations</p> | | | |

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| Vessel Operation | Operation Phase – Phase 2 | Marine hazards left on sea floor, disturbance and or damage to marine organisms. | Marine and coastal organisms | <ul style="list-style-type: none"> Items that have been lost overboard should be recovered as far as possible and of those that have not been recovered, a detailed record of should be kept. Records of lost items should include details such as location of loss, date , cause, type of equipment and prevailing sea and weather conditions. Vessels are not permitted to bunker offshore within EEZ without prior consent from SAMSA Should it become necessary for survey vessels to refuel at any point, SAMSA should be notified prior to this and an application should be submitted. Discharge of hydrocarbons such as oil is not permitted Only essential lighting for ship operation should be kept, especially at night so as to avoid ship strikes and stranding of seabirds Should a seabird become stranded, it should be carefully recovered and released when it is safe to do so. | MARPOL, Marine Pollution Act, NEMA | TAD, Appointed Contractor, Vessel Captain | Throughout operation and notification of refuelling to be sent 5 days prior |
| Monitoring and Auditing | Operation Phase – Phase 2 | N/A | Environmental Compliance | <ul style="list-style-type: none"> Internal audits should regularly be undertaken to ensure compliance with the EMPr and the conditions of the EA. An environmental audit report complying with EIA regulations should | MPRDA, NEMA, EIA regulations | Independent Auditor appointed by TAD | Prospecting activities should be audited annually, and audit report |

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| | | | | also be submitted to the DMR every two years. | | | submitted to the DMR every two years. |
| Operation vessel leaving the concession area | Decommission Phase – Phase 3 | Environmental degradation because of operational activities and waste generated | Marine and coastal environment | <ul style="list-style-type: none"> Before leaving the area, the survey vessel should make every effort to ensure that no debris or lost equipment is left behind. The benefits of this should outweigh and perceived health and safety risks. Waste generated during vessel operation and stored on board should be disposed of at a licensed waste facility. | NEMA | Appointed Contractor/ Operator | Once survey is complete. Waste to be disposed of at vessel port |
| Stakeholder consultation | Decommission Phase – Phase 3 | N/A | Fisheries industry/association, local communities, and other users of the sea. | <ul style="list-style-type: none"> Key I&APs should be made aware of the completion of the survey operation. Relevant navigational warnings should be cancelled with the SAN Hydrographic office. | NEMA, EIA Regulations | TAD | Within the four-week period that succeeds the completion of the Operation phase. |
| Rehabilitation, Closure, and data sharing | Decommission Phase – Phase 3 | N/A | Marine and coastal environment | <p>A closure report should be submitted to the DMR upon completion of the Operation phase and should include:</p> <ul style="list-style-type: none"> Closure and final layout plan Environmental Risk Report | MPRDA, NEMA | TAD | On completion of Operation phase |

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| | | | | <ul style="list-style-type: none"> • Final Audit Report <p>It is also recommended that data collected during the survey be made available to aid in research.</p> | | | |

