

PART 4: DESCRIPTION OF THE PROPOSED PROJECT

4.1 DETAILED PROJECT DESCRIPTION

The inshore portions of Concessions 2C, 3C, 4C and 5C have undergone extensive geophysical surveys, sampling and test mining programmes over the past 30 years. Based on these investigations and subsequent geological, geotechnical and mineralization models, a patchy, low to medium grade diamond deposit has been identified overlying the Pre-Cambrian and Cretaceous bedrock. The diamonds are concentrated in gravels associated with storm lag beach deposits between 100 - 160 m below current sea level.

As resource generation in the marine environment is an ongoing process, the principal objective of the current proposed prospecting applications is to further delineate and re-estimate the potential diamond resource for further future mining in the area.

The geophysical surveying will be undertaken using the group-owned dedicated survey vessel, the *DP STAR* (Figure 18). With an overall length of 45.15 m and a gross tonnage of 498 t, the vessel is equipped with:

- a multibeam echosounder designed to produce high resolution digital terrain models of the seafloor (Figure 19, left) by transmitting a 30 kHz sounding in a wide swath below the vessel; and
- a parametric sub-bottom profiler, which uses shallow (35 to 45 kHz) and medium penetration (1 to 10 kHz) "Chirp" seismic pulses to generate profiles up to 60 m beneath the seafloor (Figure 19, right), thereby giving a cross section view of the sediment layers.

All the systems are hull-mounted and no towed equipment will be used. Sound levels from the acoustic equipment would range from 190 to 220 dB re 1 μ Pa at 1 m. The proposed surveys would be undertaken in specific priority areas in each of the four concessions, at water depths between approximately 100 - 150 m and at distances of between 10 - 30 km from the shore (see Figure 1). Only a small proportion of the available concession area would thus be affected by proposed prospecting operations. The areas to be surveyed and the proportion of the available concession areas affected are provided in Table 7.

Initially the surveys will have a line spacing of 1 000 m by 5 000 m. In areas of particular interest this will be reduced to a spacing of 200 m for main lines and 1 000 m for cross lines. The total line kilometres surveyed per concession will be between 750 and 1 500 km.

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Figure 18: The proposed survey vessel *DP Star*.

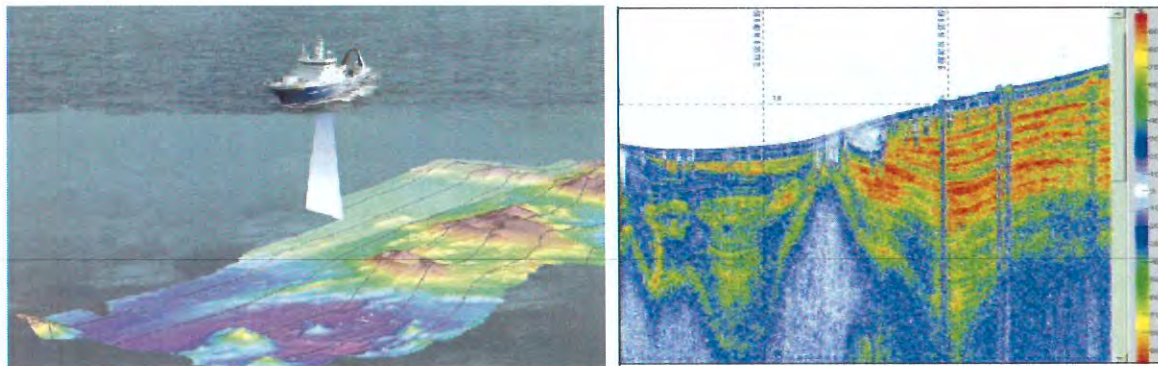


Figure 19: Swath bathymetry (left) and sub-bottom profiling (right) will be the geophysical survey techniques employed during Phase I of the proposed prospecting operations.

Table 7: The proportion of the total concession areas to be surveyed.

Concession	Total Area (km ²)	Survey Area (km ²)	Proportion of Total Area affected
2C	1 369.6	634.9	46.3%
3C	3 253.6	576.0	17.7%
4C	4 962.1	701.8	14.1%
5C	4 790.4	817.1	17.1%

4.2 PROPOSED TIMETABLE, DURATION AND SEQUENCE

The proposed exploration project comprises four phases to be completed over a period of four years, with an additional year possibly required depending on the outcome of the prospecting activities and the subsequent evaluation of the deposit. The phases are outlined in more detail below:

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- PHASE I:** Geophysical surveying (this application) conducted over a total period of four months for all four of the concessions. The data collected during the surveys will be analysed by an exploration geologist to determine the seafloor geology and distribution of potentially mineralised deposits, and the results presented in the form of a report submitted three months after completion of the survey. The objective of this phase is to identify selected areas for subsequent drill and bulk sampling.
- PHASE II:** Drill sampling to 8 m below the seafloor is proposed for a total of 40 days per annum over a period of four years for all four of the concessions. The sampling will be conducted at intervals of 500 m to 50 m in selected areas. The data collected will be analysed by an exploration geologist and metallurgist to evaluate the potential resource in areas that are mineralised, to obtain an estimate of the extent and size of the resource present and to make recommendations for a bulk sampling programme. The results will be presented in the form of a report submitted nine months after completion of the drill sampling.
- PHASE III:** The bulk (trench) sampling programme would be undertaken for a total of 20 days per annum over a period of three years for all four of the concessions. In each concession it is planned to excavate 10 trenches to a depth of between 2 - 8 m, each 60 m long by 22 m wide. The data collected will be analysed by an exploration geologist and metallurgist and form part of the mining pre-feasibility study to be presented six months after the sampling campaign.
- PHASE IV:** A mining feasibility study for all four concessions will be undertaken over a period of a year. The objective of the study will be to assess the size and extent of the mineable resource and its economic viability.

As part of this application for prospecting rights to undertake geophysical surveying, Belton Park Trading 127 (Pty) Ltd has committed to providing the necessary **amendments to the EMPRs** to include any future drill and bulk sampling campaigns. As these sampling campaigns will also trigger various listed activities in Government Notice (GN) R544 of the Environmental Impact Assessment (EIA) Regulations 2010 promulgated in terms of Chapter 5 of NEMA, a **Basic Assessment or EIA** (whichever is applicable at the time) will have to be conducted, and environmental authorisation obtained before sampling operations can commence. The amendments and environmental requirements as part of Phase II and III of this project will be initiated towards the completion of Phase I.



PART 5: ENVIRONMENTAL IMPACT ASSESSMENT

This chapter describes and assesses the significance of potential impacts related to the proposed prospecting activities in Concessions 2C, 3C, 4C and 5C. All impacts are assessed according to the rating scale defined in Section 5.1. Mitigation measures are proposed which could ameliorate the negative impacts or enhance potential benefits, respectively. The status of all impacts should be considered negative unless otherwise stated. The significance of impacts with and without mitigation is assessed.

5.1 ASSESSMENT PROCEDURE

The following convention was used to determine significance ratings in the assessment:

Rating	Definition of Rating
<i>Extent - defines the physical extent or spatial scale of the impact</i>	
Local	Extending only as far as the activity, limited to the site and its immediate surroundings
Regional	Limited to the South African West Coast
National	Limited to the coastline of South Africa
International	Extending beyond the borders of South Africa
<i>Duration - the time frame over which the impact will be experienced</i>	
Short-term	0 - 5 years
Medium-term	6 - 15 years
Long-term	Where the impact would cease after the operational life of the activity, either because of natural processes or by human intervention
Permanent	Where mitigation either by natural processes or by human intervention would not occur in such a way or in such time span that the impact can be considered transient
<i>Intensity - establishes whether the magnitude of the impact is destructive or benign in relation to the sensitivity of the receiving environment</i>	
Low	Where natural environmental functions and processes are not affected
Medium	Where the affected environment is altered, but natural functions and processes continue, albeit in a modified way
High	Where environmental functions and processes are altered to the extent that they temporarily or permanently cease

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Using the core criteria above, the significance of the impact is determined:

Significance - attempts to evaluate the importance of a particular impact, and in doing so incorporates extent, duration and intensity	
VERY HIGH	Impacts could be EITHER: of high intensity at a regional level and endure in the long term; OR of high intensity at a national level in the medium term; OR of medium intensity at a national level in the long term.
HIGH	Impacts could be EITHER: of high intensity at a regional level enduring in the medium term; OR of high intensity at a national level in the short term; OR of medium intensity at a national level in the medium term; OR of low intensity at a national level in the long term; OR of high intensity at a local level in the long term; OR of medium intensity at a regional level in the long term.
MEDIUM	Impacts could be EITHER: of high intensity at a local level and endure in the medium term; OR of medium intensity at a regional level in the medium term; OR of high intensity at a regional level in the short term; OR of medium intensity at a national level in the short term; OR of medium intensity at a local level in the long term; OR of low intensity at a national level in the medium term; OR of low intensity at a regional level in the long term.
LOW	Impacts could be EITHER of low intensity at a regional level, enduring in the medium term; OR of low intensity at a national level in the short term; OR of high intensity at a local level and endure in the short term; OR of medium intensity at a regional level in the short term; OR of low intensity at a local level in the long term; OR of medium intensity at a local level, enduring in the medium term.
VERY LOW	Impacts could be EITHER of low intensity at a local level and endure in the medium term; OR of low intensity at a regional level and endure in the short term; OR of low to medium intensity at a local level, enduring in the short term.
INSIGNIFICANT	Impacts with: Zero intensity with any combination of extent and duration.
UNKNOWN	Where it is not possible to determine the significance of an impact.

Status of the Impact - describes whether the impact would have a negative, positive or zero effect on the affected environment	
Positive	The impact benefits the environment
Negative	The impact results in a cost to the environment
Neutral	The impact has no effect
Probability - the likelihood of the impact occurring	
Improbable	Possibility very low either because of design or historic experience
Probable	Distinct possibility
Highly Probable	Most likely
Definite	Impact will occur regardless of preventive measures



<i>Degree of confidence in predictions - in terms of basing the assessment on available information and specialist knowledge</i>	
Low	Less than 35% sure of impact prediction.
Medium	Between 35% and 70% sure of impact prediction.
High	Greater than 70% sure of impact prediction

Additional criteria to be considered, which could “increase” the significance rating are:

- Permanent / irreversible impacts (as distinct from long-term, reversible impacts);
- Potentially substantial cumulative effects; and
- High level of risk or uncertainty, with potentially substantial negative consequences.

Additional criteria to be considered, which could “decrease” the significance rating are:

- Improbable impact, where confidence level in prediction is high.

The relationship between the significance ratings after mitigation and decision-making can be broadly defined as follows:

<i>Significance after Mitigation - considering changes in intensity, extent and duration after mitigation and assuming effective implementation of mitigation measures</i>	
Very Low; Low	Will not have an influence on the decision to proceed with the proposed project, provided that recommended measures to mitigate negative impacts are implemented.
Medium	Should influence the decision to proceed with the proposed project, provided that recommended measures to mitigate negative impacts are implemented.
High; Very High	Would strongly influence the decision to proceed with the proposed project.

5.2 IDENTIFICATION OF IMPACTS

The potential environmental impacts to the marine environment of the proposed geophysical prospecting operations identified during the Scoping Phase are:

- Disturbance of marine mammals by the sounds emitted by the geophysical survey equipment;
- Potential injury to marine mammals and turtles through vessel strikes;
- Marine pollution due to discharges such as deck drainage, machinery space wastewater, sewage, etc. and disposal of solid wastes from the survey vessel; and
- Marine pollution due to fuel spills during refuelling, or resulting from collision or shipwreck.

Potential social and cultural impacts of the proposed geophysical prospecting operations are:

- Interaction with recreational users in the survey areas;
- Interaction with petroleum exploration licence block holders; and
- Interaction with local fishing vessels that traverse the survey areas; in all instances during the periods that the surveys are being undertaken.

5.3 ASSESSMENT OF IMPACTS

5.3.1 Acoustic Impacts of Geophysical Prospecting

Description of Impact

The ocean is a naturally noisy place and marine animals are continually subjected to both physically produced sounds from sources such as wind, rainfall, breaking waves and natural seismic noise, or biologically produced sounds generated during reproductive displays, territorial defence, feeding, or in echolocation (see references in McCauley 1994). Such acoustic cues are thought to be important to many marine animals in the perception of their environment as well as for navigation purposes, predator avoidance, and in mediating social and reproductive behaviour. The cumulative impact of increased background anthropogenic noise levels in the marine environment is an ongoing and widespread issue of concern (Koper & Plön 2012), as such sound sources interfere directly or indirectly with the animals' biological activities. Reactions of marine mammals to anthropogenic sounds have been reviewed by McCauley (1994), Richardson *et al.* (1995), Gordon & Moscrop (1996) and Perry (1998), who concluded that anthropogenic sounds could affect marine animals in the surrounding area in the following ways:

- Physiological injury and/or disorientation;
- Behavioural disturbance and subsequent displacement from key habitats;
- Masking of important environmental sounds and communication;
- Indirect effects due to effects on prey.

There is considerable difference in the hearing sensitivities of marine animals (McCauley 1994). The greatest auditory sensitivity of marine animals likely to be encountered during geophysical surveying operations is summarised below:

- Fish and elasmobranchs : <50 Hz to 1 kHz
- African penguins : 600 Hz to 4 kHz, with the upper limit of hearing at 15 kHz;
- Marine Turtles : 250 - 700 Hz;
- Fur seals : 2-32 kHz, with greater sensitivity to higher frequency sounds (>1 kHz);
- Baleen whales : <1 kHz; and
- Toothed whales and dolphins : 10 and 100 kHz.

It is the received level of the sound, however, that has the potential to traumatise or cause physiological injury to marine animals. As sound attenuates with distance, the received level depends on the animal's proximity to the sound source and the attenuation characteristics of the sound. Of all human-generated sound sources, the most persistent in the ocean is the noise of shipping. Depending on size and speed, the sound levels radiating from vessels range from 160 to 220 dB re 1 μ Pa at 1 m (NRC 2003). Especially at low frequencies between 5 to 100 Hz, vessel traffic is a major contributor to noise in the world's oceans, and under the right conditions, these sounds can propagate 100s of kilometres thereby affecting very large geographic areas (NRC 2003; Pidcock *et al.* 2003).

Similarly, the noise generated by the acoustic equipment to be utilized during the proposed geophysical surveys falls within the hearing range of most fish and marine mammals, and at sound levels of between 190 to 220 dB re 1 μ Pa at 1 m, will be audible for considerable distances (in the order of tens of km) before attenuating to below threshold levels (Findlay 2005). However, unlike the noise generated by airguns during seismic surveys, the emission of

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underwater noise from geophysical surveying and vessel activity is not considered to be of sufficient amplitude to cause auditory or non-auditory trauma in marine animals in the region. Only directly below the systems (within metres of the sources) would sound levels be in the 220 dB range where exposure result in trauma. As most pelagic species likely to be encountered within the concessions are highly mobile, they would be expected to flee and move away from the sound source before trauma could occur. Whereas the underwater noise from the survey systems may induce localised behavioural changes in some marine mammal, there is no evidence of significant behavioural changes that may impact on the wider ecosystem (Perry 2005).

Assessment

The effects of high frequency sonars on marine fauna is thus considered to be localised, short-term (for duration of survey i.e. weeks) and of medium intensity. The significance of the impact is considered of **LOW** significance without mitigation and **VERY LOW** significance with mitigation.

Mitigation

Despite the low significance of impacts, the Joint Nature Conservation Committee (JNCC) provides a list of guidelines to be followed by anyone planning marine sonar operations that could cause acoustic or physical disturbance to marine mammals (JNCC 2010). These have been revised to be more applicable to the southern African situation.

- Onboard Marine Mammal Observers (MMOs) should conduct visual scans for the presence of cetaceans around the survey vessel prior to the initiation of any acoustic impulses.
- Pre-survey scans should be limited to 15 minutes prior to the start of survey equipment.
- "Soft starts" should be carried out for any equipment of 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.
- 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. As no seasonal patterns of abundance are known for odontocetes occupying the proposed exploration area, a precautionary approach to avoiding impacts throughout the year is recommended.
- Ensure that PAM (passive acoustic monitoring) is incorporated into any surveying taking place between June and November.
- A MMO should be appointed to ensure compliance with mitigation measures during seismic geophysical surveying.

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<i>Impacts of multi-beam and sub-bottom profiling sonar on marine fauna</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local: limited to survey area	Local
Duration	Short-term	Short-term
Intensity	Medium	Low
Significance	Low	Very Low
Status	Negative	Negative
Probability	Probable	Probable
Confidence	Medium	Medium
Nature of Cumulative impact	Considering the number of seismic surveys recently conducted in the area, some cumulative impacts can be anticipated. However, any impact is likely to be at individual level rather than at species level.	
Degree to which impact can be reversed	Fully reversible - any disturbance of behaviour, auditory "masking" or reductions in hearing sensitivity that may occur as a result of survey noise below 220 dB would be temporary.	
Degree to which impact may cause irreplaceable loss of resources	Negligible	
Degree to which impact can be mitigated	Low	

5.3.2 Impact of the Survey Vessel

Discharges to the marine environment from the survey vessel include deck drainage, machinery space drainage, sewage, galley wastes and solid wastes.

5.3.2.1 Deck Drainage

Description of Impact

Drainage of deck areas may result in small volumes of oils, solvents or cleaners being lost to the marine environment. Pollution by oil poses a great risk for many marine organisms (see later), but generally, the toxicity of the solvents and detergents typically used is relatively low.

Assessment

Only small volumes of oils, solvents and cleaners would enter the marine environment through accidental spillage and drainage of deck areas. As dilution and dispersal would be rapid, the potential impacts of deck drainage would be of low intensity, highly localised and of short duration, and is thus considered to be of **VERY LOW** significance with or without mitigation.

Mitigation

The following mitigation measures are recommended:

- Machinery spaces must drain into bilge tanks in compliance with MARPOL Annex I;
- 'Save-alls' must be utilised around specific equipment, bunkering points and vents on open deck areas to prevent release of contaminated water overboard;



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- Contamination and spills can be minimised through spill management training and awareness of the vessel's crew;
- Low-toxicity biodegradable detergents and reusable absorbent cloths should be used in cleaning of all deck spillage; and
- All hydraulic systems should be adequately maintained.

<i>Impacts of deck drainage from the survey vessel</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Short-term	Short-term
Intensity	Low	Low
Significance	Very Low	Very Low
Status	Negative	Negative
Probability	Highly Probable	Highly Probable
Confidence	High	High
Nature of Cumulative impact	The nominal quantity of deck drainage that would enter the sea would not result in a cumulative impact.	
Degree to which impact can be reversed	Fully reversible - deck drainage would be quickly dispersed and diluted by the high wind and wave energy of the offshore sea environment	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Very Low	

5.3.2.2 Machinery space drainage

Description of impact

Small volumes of oil such as diesel fuel, lubricants, grease, etc. used within the vessel's machinery space could enter the marine environment if strict onboard waste management practices are not implemented.

Assessment

All vessel operations would comply fully with international agreed standards regulated under MARPOL 73/78. In accordance with the MARPOL requirements, all machinery space drainage would pass through an oil/water filter to reduce the oil-in-water concentration to 15 parts per million before release overboard.

Concentrations of oil reaching the marine environment through drainage of machinery spaces are therefore expected to be low, and consequently the potential impacts would be of low intensity and highly localised over the short-term. The potential impact of machinery space drainage on the marine environment is thus considered to be of **VERY LOW** significance with or without mitigation.



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Mitigation

Assuming compliance with the Marpol 73/78 standards, no further mitigation measures are deemed necessary.

<i>Impacts of machinery space drainage from the survey vessel</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Short-term	Short-term
Intensity	Low	Low
Significance	Very Low	Very Low
Status	Negative	Negative
Probability	Highly Probable	Highly Probable
Confidence	High	High
Nature of Cumulative impact	The nominal quantity of machinery space drainage that would enter the sea would not result in a cumulative impact.	
Degree to which impact can be reversed	Fully reversible - machinery space drainage would be quickly dispersed and diluted by the highly turbulent sea-surface conditions in the offshore marine environment.	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Very Low	

5.3.2.3 Sewage

Description of impact

Sewage, when discharged to the marine environment, poses an organic and bacterial loading on the natural biodegradation processes. Inadequate dispersal and dilution of this organic matter could result in an increased biological oxygen demand with the potential development of hypoxic or anoxic conditions in sub-surface waters. Relative to the natural organic inputs typical of the region following the die-back of phytoplankton blooms, and the resulting development of near-bottom low-oxygen water masses in the Orange River Bight, the organic inputs from sewage discharge are insignificant.

Assessment

The volumes of sewage wastes released from the survey vessel would be limited, and comparable to discharges from other vessels of similar crew compliment. The typically highly turbulent conditions near the sea surface would ensure rapid dilution and dispersal of discharged sewage.

The potential impact on the marine environment of sewage effluent from the survey vessel will be limited to within the immediate vicinity of the vessel over the short-term, and is therefore considered to be of **VERY LOW** significance with or without mitigation.



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Mitigation

- The vessel would be required to comply with the MARPOL 73/78 Annex IV requirements, wherever possible.

<i>Impacts of sewage effluent discharged from the survey vessel</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Short-term	Short-term
Intensity	Low	Low
Significance	Very Low	Very Low
Status	Negative	Negative
Probability	Highly Probable	Highly Probable
Confidence	High	High
Nature of Cumulative impact	The nominal quantity of sewage that would be discharged would not result in a cumulative impact.	
Degree to which impact can be reversed	Fully reversible - sewage would be quickly dispersed and diluted by the highly turbulent sea-surface conditions in the offshore marine environment.	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Very Low	

5.3.2.4 Galley waste

Description of impact

Galley wastes, comprising mostly biodegradable food wastes, would place a small organic and bacterial loading on the marine environment, potentially leading to the development of hypoxic or anoxic conditions in sub-surface waters. Relative to the natural organic inputs typical of the region following the die-back of phytoplankton blooms, and the resulting development of near-bottom low-oxygen water masses in the Orange River Bight, the organic inputs from galley waste disposal are insignificant.

Assessment

The volume of galley waste discharged from the survey vessel would be small and comparable to wastes from any other vessels of similar crew compliment. According to MARPOL 73/78 Annex V standards, galley wastes must be comminuted to particle sizes < 25 mm prior to disposal to the marine environment if less than 12 nautical miles (\pm 22 km) from the coast, with no disposal at all permitted within 3 nautical miles (\pm 5.5 km) of the coast. As the potential impact of galley waste disposal on the marine environment would be of low intensity and limited to the survey area over the short-term, the impact is therefore considered to be of **VERY LOW** significance with or without mitigation.



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Mitigation

- Minimise the discharge of waste material should obvious attraction of marine fauna be observed.

<i>Impacts of galley waste disposal from the survey vessel</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Short-term	Short-term
Intensity	Low	Low
Significance	Very Low	Very Low
Status	Negative	Negative
Probability	Highly Probable	Highly Probable
Confidence	High	High
Nature of Cumulative impact	The nominal quantity of galley waste that would enter the sea would not result in a cumulative impact.	
Degree to which impact can be reversed	Fully reversible - galley waste would be quickly dispersed and diluted by the highly turbulent sea-surface conditions in the offshore marine environment	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Very Low	

5.3.2.5 Solid waste

Description of impact

During surveying litter will be generated on board the vessel and if not properly managed can enter the marine environment. The disposal of non-biodegradable domestic waste, packaging and operational industrial waste into the sea could pose a hazard to marine fauna, may contain harmful chemicals and could end up as marine litter or as visual pollution on the seashore. Marine litter is a cosmopolitan problem, with significant implications for the environment and human activity all over the world. Marine litter travels over long distances with ocean currents and winds. It originates from many sources and has a wide spectrum of environmental, economic, safety, health and cultural impacts. It is not only unsightly, but can cause serious harm to marine organisms, such as birds, fish and marine mammals. Considering the very slow rate of decomposition of most marine litter, a continuous input will result in a gradual increase in litter in coastal and marine environment. Although waste management protocols will be in place onboard the survey vessel, littering should be avoided at all costs.

Assessment

Assuming that stringent waste management practices are NOT in place, the potential impact of the disposal of solid waste on the marine environment would be of low to medium intensity, but depending on the type of waste, degeneration times can extend over years or even decades, with potential distribution of the marine litter at national or even international scales. Without mitigation, the impact would thus be of **VERY HIGH** significance. However, as



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all solid waste generated by the survey vessel would be transported onshore for disposal on land, there would be no impact on the marine environment. Recycling should be practiced onboard and the solid waste sorted in separate containers before being taken to an appropriate onshore recycling facility. Hazardous waste would be disposed of by specialist waste disposal contractors. With mitigation, the potential impact of the disposal of solid waste on the marine environment is therefore **INSIGNIFICANT**.

Mitigation

- No solid waste may be disposed to the marine environment; and
- Ensure that stringent waste management practices are in place at all times.

<i>Impacts of solid waste disposal from the survey vessel</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local to International	Local
Duration	Short- to long-term	Short-term
Intensity	Low to Medium	Zero
Significance	Very high	Insignificant
Status	Negative	Negative
Probability	Improbable; as no wastes may be disposed to the marine environment	Probable
Confidence	Medium	Medium
Nature of Cumulative impact	Should solid wastes be discarded into the marine environment, they would contribute to marine litter thereby resulting in a cumulative impact	
Degree to which impact can be reversed	Depending on the type of waste discarded, impacts could potentially be reversible only over the long-term	
Degree to which impact may cause irreplaceable loss of resources	Low	
Degree to which impact can be mitigated	High	

5.3.2.6 Accidents and Emergencies

Description of impact

Grounding or sinking of the survey vessel, accidental and/or operational oil spills from the vessel, or whilst refuelling with marine diesel oil, may affect marine mammals, seabirds and other marine organisms. Pollution by oil poses a great risk for many marine organisms, and specifically for the African penguin. The impact of oiling not only results in the death of oiled penguins, but also has cascade effects through the entire population by decreasing the breeding success. Oil pollution thus represents a significant threat to the penguin population and may contribute to these birds becoming extinct in the wild. The nearest nesting ground for Cape Gannets is at Bird Island in Lambert’s Bay, while the nearest African Penguins nesting sites are at the Saldanha Bay Islands and Dassen Island. As these are all extended distances from the proposed survey areas, the likelihood of these seabird species being present in the survey area in large numbers is extremely low.



The consequences and effects of small (2,000 - 20,000 litres) diesel fuel spills into the marine environment are summarised below (NOAA 1998). Diesel is a light oil that, when spilled on water, spreads very quickly to a thin film and evaporates or naturally disperses within a few days or less, even in cold water. Diesel oil can be physically mixed into the water column by wave action, where it adheres to fine-grained suspended sediments, which can subsequently settle out on the seafloor. As it is not very sticky or viscous, diesel tends to penetrate porous sediments quickly, but also to be washed off quickly by waves and tidal flushing. In the case of a spill, shoreline cleanup is thus usually not needed. Diesel oil is degraded by naturally occurring microbes within one to two months. Nonetheless, in terms of toxicity to marine organisms, diesel is considered to be one of the most acutely toxic oil types. Many of the compounds in petroleum products are known to smother organisms, lower fertility and cause disease. Intertidal invertebrates and seaweed that come in direct contact with a diesel spill may be killed. Fish kills, however, have never been reported for small spills in open water as the diesel dilutes so rapidly. Due to differential uptake and elimination rates, filter-feeders (particularly mussels) can bio-accumulate hydrocarbon contaminants. Crabs and shellfish can be tainted from small diesel spills in shallow, nearshore areas. Small diesel spills can also affect marine birds by direct contact.

Assessment

The survey vessel carries 212 m³ of marine diesel, so under the worse-case scenario of a vessel grounding or sinking, in the region of 200 m³ (200,000 litres) could be lost to the marine environment. The potential impact of a spill of this size would be of high intensity as the affected seabirds/marine mammals are likely to die, or their breeding success may be reduced. Where species endemic to southern Africa are affected, impacts would have international implications through the Biodiversity Convention and IUCN conservation classification. As oiled seabirds or seals that feed in the area may utilise distant breeding sites, and slicks may be dispersed alongshore, the impact may extend regionally, and due to potentially reduced breeding success of affected fauna, persist over the long-term or even be permanent. The impact on marine fauna of a spill due to wreckage of the vessel would thus be of **HIGH** significance before mitigation. With mitigation, the significance would reduce to **MEDIUM** due to devastating effects of even one large spill.

It must be emphasised here that despite the high significance rating, the likelihood of collision, grounding or sinking of the survey vessel is extremely low.

Mitigation

- Seek to reduce the probabilities of accidental and/or operational spills through enforcement of stringent oil spill management systems. These should incorporate plans for emergencies.
- Refueling will occur under controlled conditions in a harbour only.

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<i>Impacts of a maritime casualty</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local to Regional	Local
Duration	Medium- to Long-term	Medium- to Long-term
Intensity	Medium to High	Medium
Significance	High	Medium
Status	Negative	Negative
Probability	Improbable	Improbable
Confidence	High	High
Nature of Cumulative impact	Due to the low incidence of marine accidents, the impact would not be cumulative.	
Degree to which impact can be reversed	Depending on species affected, impacts could potentially be reversible only over the long-term, although in some cases (African Penguin) they may be irreversible	
Degree to which impact may cause irreplaceable loss of resources	High	
Degree to which impact can be mitigated	Low	

5.3.2.7 Vessel strikes

Description of impact

The physical presence of the survey vessel and increased vessel traffic in this otherwise seldom-transited area will increase the likelihood of animal-vessel collisions and may result in either medium-term effects such as evasive behaviour by animals experiencing stress, or longer-term effects such as decreased fitness or habitual avoidance of areas where disturbance is common (see for example Constantine 2001; Hastie *et al.* 2003; Lusseau 2004; Lusseau 2005; Bejder *et al.* 2006; Lusseau *et al.* 2009). Ship strikes have been documented from many regions and for numerous species of whales (Panigada *et al.* 2006; Douglas *et al.* 2008; Elvin & Taggart 2008) and dolphins (Bloom & Jager 1994; Elwen & Leeney 2010), with large baleen whales being particularly susceptible to collision. Any increase in vessel traffic through areas used as calving grounds or through which these species migrate will increase the risk of collision between a whale and a vessel.

Assessment

As the surveys will be conducted in deep water at distances of between 10 - 30 km from the shore, the main migration paths of Humpback and Southern Right whales will be avoided and encounter rates of the survey vessel with these species are likely to be low. The likelihood of the survey vessel colliding with a marine mammal or turtle is thus very low, but should a strike occur, it would be of medium to high intensity over the long-term (or even permanent) due to potential death, injury or reduced breeding success of susceptible species. As the turtles and migrating whales likely to be involved in collisions utilise breeding/feeding sites beyond South Africa's borders, a vessel strike could have International implications. The impact is thus considered of **HIGH** significance as many of the species potentially at risk are rated as

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“vulnerable” (Southern right whale) to “critically endangered” (Leatherback turtle) in the IUCN Red Data book.

Mitigation

- Keep a regular watch for large marine mammals while surveying, and if necessary adjust the cruising speed to avoid collisions.
- Consider appointing an onboard independent Marine Mammal Observer (MMO). The MMO should have experience in seabird, turtle and marine mammal identification and observation techniques.

<i>Impacts of vessel strikes</i>		
	Without Mitigation	Assuming Mitigation
Extent	National to International	Local
Duration	Medium- to long-term	Short-term
Intensity	Medium to High	Low
Significance	High	Very Low
Status	Negative	Negative
Probability	Improbable	Improbable
Confidence	High	High
Nature of Cumulative impact	No cumulative impacts are anticipated	
Degree to which impact can be reversed	Depending on species affected, impacts could potentially be reversible only over the long-term, although in some cases (African Penguin) they may be irreversible	
Degree to which impact may cause irreplaceable loss of resources	Medium	
Degree to which impact can be mitigated	Low	

5.3.3 Impact on Other Users of the Area

5.3.3.1 Potential Impacts on Fishing Industry

Description of Impact

Geophysical surveying could impact on some sectors within the fishing industry as a result of the presence of a survey vessel and equipment running along preselected survey lines.

Assessment

Of the commercial fisheries operational in the general project area, the demersal trawl and hake long-line fisheries focuss their efforts along the shelf edge between the 300 m and 1,000 m bathymetric contour, and therefore well offshore of the proposed survey area. Similarly, the large pelagic long-line fishery is primarily conducted at depths beyond the 500 m contour, with minimal effort in isolated areas around the 200 m contour just to the south of concession 5C. The purse-seine fishery for small pelagic species is concentrated to the south of Hondeklipbaai, with limited localised effort inshore of the 100 m depth contour off Kleinzee. The West Coast rock-lobster fishery comprises the inshore fishery operational in <30 m of



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water, and the offshore trap fishery, which operates in a water depth range of 30 m to 100 m along the entire coastline inshore of Concessions 2C, 3C, 4C and 5C, but with increased effort centred around Port Nolloth (Wilkinson & Japp 2012). As the proposed geophysical surveys will be conducted at depths between 100 - 160 m, there will be minimal overlap with commercial fisheries.

The potential impact of the proposed prospecting activities on these fisheries would thus be extremely localised and of low intensity, and persist only for the duration of the surveys (i.e. short-term). The significance of impact is thus considered to be **VERY LOW** both with and without mitigation.

Mitigation

- Communication channels should be set up with the fishing industry, the Department of Agriculture, Forestry and Fisheries: Marine Resource Management (DAFF: MRM) and all other interested and affected parties. This would involve notifications via email of scheduling of geophysical surveys and regular updates on the survey progress. Fishing industry associations should include: Association of Small Hake Industries, South African Deep Sea Trawling Industry Association, South African Pelagic Fishing Industry Association, South African Commercial Linefish Association, South African Tuna Longline Association and South African West Coast Rock Lobster Association. Interested and affected parties should include: South African Navy (SAN) Hydrographic office, the various neighbouring concession holders and any other relevant users of the sea.

<i>Impacts on the commercial fishing industry</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Short-term	Short-term
Intensity	Low	Low
Significance	Very Low	Very Low
Status	Negative	Negative
Probability	Probable	Probable
Confidence	High	High
Nature of Cumulative impact	No cumulative impacts are anticipated	
Degree to which impact can be reversed	Fully reversible	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Low	



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5.3.3.2 Potential Impacts on Petroleum Exploration

Description of impact

The geophysical surveying could affect petroleum exploration activities overlapping with the proposed survey areas, and vice versa.

Assessment

The proposed prospecting areas overlap with Block 1 held by PetroSA (Pty) Ltd. The geophysical surveying activities could affect and disrupt activities in these blocks if exploration/prospecting activities occur coincidentally in the same area. However, the likelihood of this happening is low.

The impact on petroleum exploration would be localised, short term and of low to medium intensity. The significance of impact is consequently very low to low, without mitigation and **VERY LOW** with mitigation.

Mitigation

- Notify PetroSA and its contractors, as well as any other neighbouring petroleum exploration rights holders, prior to the commencement of activities; and
- Liaise with all petroleum exploration operators to ensure that there is no overlap of activities in the same area over the same time period.

<i>Impacts on petroleum exploration</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Short-term	Short-term
Intensity	Low to Medium	Low
Significance	Very Low to Low	Very Low
Status	Negative	Negative
Probability	Probable	Probable
Confidence	High	High
Nature of Cumulative impact	No cumulative impacts are anticipated	
Degree to which impact can be reversed	Fully reversible	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Low	



5.3.3.3 Potential Impacts on Marine Diamond Mining and Prospecting

Description of impact

The presence of the geophysical survey vessel could interfere with other marine mining or prospecting operations in the neighbouring concession areas.

Assessment

Diver-assisted diamond mining is concentrated around Port Nolloth and Alexander Bay and typically confined to the inshore areas in the A-concessions, in depths < 30 m. Further offshore, diamond prospecting and mining is conducted to a very limited extent by Alexkor and Trans Hex Operations. No activities are currently taking place in the ‘d’ concession areas, located to the west of the study area.

The impact of geophysical surveying on other mining activities would be localised, in the short term and of low intensity. The significance of impact is consequently **VERY LOW** with or without mitigation

Mitigation

- Any companies undertaking marine prospecting or diamond mining activities within the study area should be contacted prior to geophysical surveying in order to notify them of the planned activities.

<i>Impacts on marine diamond mining</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Short-term	Short-term
Intensity	Low	Low
Significance	Very Low	Very Low
Status	Negative	Negative
Probability	Improbable	Improbable
Confidence	High	High
Nature of Cumulative impact	No cumulative impacts are anticipated	
Degree to which impact can be reversed	Fully reversible	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Very Low	

THE INFORMATION CONTAINED HEREIN IS UNCLASSIFIED



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5.3.3.4 Potential Impacts on Marine Transport Routes

Description of impact

The presence of the geophysical survey vessel could interfere with shipping in the area.

Assessment

The majority of shipping traffic is located on the outer edge of the continental shelf, well to the west of the proposed survey areas. The inshore traffic of the West Coast continental shelf primarily comprises fishing and mining vessels, especially in the nearshore areas between Kleinsee and Oranjemund. While it is unlikely that shipping transport routes would be affected by the proposed prospecting activities, interaction with fishing and mining vessels is likely. 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 **VERY LOW** with and without mitigation.

Mitigation

- Prior to the commencement of activities, the vessel operator must notify relevant bodies including: PASA, South African Maritime Safety Authority (SAMSA), the South African Navy (SAN) Hydrographic Office, relevant Port Captains and DAFF: MRM, providing the navigational coordinates of the survey areas;
- The survey vessel 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 would 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; and
- A Notice to Mariners should provide: the co-ordinates of the survey area and an indication of geophysical survey timeframes.

<i>Impacts on marine transport routes</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Short-term	Short-term
Intensity	Low	Low
Significance	Very Low	Very Low
Status	Negative	Negative
Probability	Improbable	Improbable
Confidence	High	High
Nature of Cumulative impact	No cumulative impacts are anticipated	
Degree to which impact can be reversed	Fully reversible	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Very Low	



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5.3.4 No-Project Alternative

Description of impact

The implication of not going ahead with the proposed prospecting activities is the loss of opportunity to further delineate a potentially viable offshore diamond resource in the concession areas.

Assessment

The potential impact related to the lost opportunity to further delineate the offshore diamond resource on the west coast and maximise the use of South Africa's own resources is considered to be of **LOW** to **MEDIUM** significance.

<i>Impacts related to the No-Go alternative</i>	
	Without Mitigation
Extent	Regional
Duration	Permanent
Intensity	Low
Significance	Low to Medium
Status	Negative
Probability	Improbable
Confidence	High
Nature of Cumulative impact	Potential loss of opportunity to expand South Africa's mineral resources
Degree to which impact can be reversed	Reversible
Degree to which impact may cause irreplaceable loss of resources	N/A
Degree to which impact can be mitigated	N/A



PART 6: ENVIRONMENTAL MANAGEMENT PROGRAMME

6.1 OUTLINE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

This Environmental Management Programme (EMP) has been prepared in accordance with the guidelines of the Mineral and Petroleum Resources Development Act and Regulations, 2002 (Act No. 28 of 2002) as well as the Environmental Regulations published under the National Environmental Management Act, 1998 (Act No. 107 of 1998).

6.2 DETAILS OF PERSON RESPONSIBLE FOR COMPILING THE EMP

Dr Andrea Pulfrich

Pisces Environmental Services (Pty) Ltd

Qualifications:

- PhD, Department of Fisheries Biology of the Institute for Marine Science at the Christian-Albrechts University, Kiel, Germany, 1995

Membership in Professional Societies:

- South African Council for Natural Scientific Professions (Pr.Sci.Nat. No: 400327/06)
- South African Institute of Ecologists and Environmental Scientists
- International Association of Impact Assessment (South Africa)
- Registered Environmental Assessment Practitioner (Certification Board for Environmental Assessment Practitioners of South Africa).

6.3 ENVIRONMENTAL OBJECTIVES

The environmental objectives of this EMP are to:

- Develop and implement environmental management measures to minimize the negative environmental impacts and optimise the positive environmental impacts of the proposed prospecting operations in Concessions 2C, 3C, 4C and 5C;
- Address all environmental legal requirements applicable to the proposed prospecting operations, including compilation of an environmental performance report and (when necessary) a closure report;
- Minimise disruption to other legitimate users of the sea by respecting their rights;
- Effectively manage waste flows on the survey vessel to minimise marine and air pollution, promoting reuse/recycling, and being conservative in use of natural resources;
- Have appropriate systems in place to deal with emergencies; and
- Make a contribution to the South African economy.

The EMP compiled for geophysical surveying activities is set out in Table 6.1. Specific issues are addressed under each of the following sections:

6.1 EMP Monitoring and Performance Assessment

6.1.1 EMP compliance

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- 6.1.2 EMP amendments
- 6.1.3 Financial provisioning
- 6.1.4 Closure

- 6.2 Natural Environmental Factors
 - 6.2.1 Geophysical surveying
 - 6.2.2 Air emissions
 - 6.2.3 Pollution control and waste management
 - 6.2.4 Dealing with emergencies / marine pollution

- 6.3 Socioeconomic factors
 - 6.3.1 Communication with interested and affected parties
 - 6.3.2 Presence of vessel / impact of prospecting activities on other industries
 - 6.3.3 Heritage Sites
 - 6.3.3 Incidental loss of equipment
 - 6.3.4 Location of oil and gas exploration wellheads
 - 6.3.5 Inform relevant parties of survey completion

The fundamental elements of this management programme are to be implemented at all times, as and when appropriate.



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Table 6.1: Environmental Management Programme for proposed prospecting activities in various concession areas off the west coast of South Africa.

6.1 EMP MONITORING AND PERFORMANCE ASSESSMENT			
Item No.	Action Plans & Control Measures	Responsibilities	Timing
6.1.1 EMP Compliance	<ul style="list-style-type: none"> Ensure that a copy of the EMP is onboard the survey vessel. Conduct monitoring of EMP compliance. Compile and submit EMP Performance Assessment Reports to the Department of Mineral Resources (DMR). Ensure compliance with the International Maritime Organisation's International Safety Management (ISM) Code developed for the proper development, implementation and assessment of safety and pollution prevention management in accordance with good practice. 	Manager	Continuous
6.1.2 EMP Amendments	<ul style="list-style-type: none"> On an ongoing basis, identify and address new activities and remove obsolete ones, particularly when new or changed surveying and prospecting methods and/or equipment are used. Amend the EMP as required and submit to DMR for approval. 	Manager	When there is a change in scope
6.1.3 Financial Provisioning	<ul style="list-style-type: none"> Ensure that the requirements of the MPRDA in terms of financial provision for remediation of environmental damage are met by: <ul style="list-style-type: none"> Allocating operational costs to meet EMP requirements; Maintaining adequate Protection and Indemnity (P&I) Insurance Cover to allow for cleanups in the event of oil spills and other eventualities; and Providing sufficient funds to execute the environmental management plan in the event of premature closure or in the event that on closure the environmental management plan has not been successfully executed. 	Manager	Ongoing
6.1.4 Closure	<ul style="list-style-type: none"> When applying for closure, submit the following documentation to the DMR: <ul style="list-style-type: none"> A final layout plan; A Closure Plan as contemplated in Regulation 62 of the MPRDA; An Environmental Risk Report as contemplated in Regulation 60 of the MPRDA; A Final Performance Assessment Report as contemplated in Regulation 55(9) of the MPRDA; and A completed application form to transfer environmental responsibilities and liabilities, if such transfer has been applied for. Submit Performance Assessment Report to the Department of Environmental Affairs. 	Manager	Prior to closure application

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6.2 NATURAL ENVIRONMENTAL FACTORS			
Item No.	Action Plans & Control Measures	Responsibilities	Timing
6.2.1 Geophysical surveying	<ul style="list-style-type: none"> Ensure that Geophysical survey activities are conducted in compliance with the following: <ul style="list-style-type: none"> Carry out visual scans around the survey vessel prior to the initiation of any acoustic impulses. Pre-survey scans should be limited to 15 minutes prior to the start of survey equipment. 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. "Soft starts" should be carried out for any equipment of source levels greater than 210 dB re 1 µPa at 1 m over a period of 20 minutes. <u>The geophysical surveying should largely be undertaken between December and May, however, during the transition periods in June and November, surveying would be possible with stricter mitigation measures.</u> <u>Ensure that PAM (passive acoustic monitoring) is incorporated into any surveying taking place in June and / or November.</u> <u>A Marine Mammal Observer (MMO) should be appointed to ensure compliance with mitigation measures during geophysical surveying.</u> 	Manager	Ongoing
6.2.2 Air emissions	<ul style="list-style-type: none"> Ensure that survey vessel complies with the MARPOL requirements with regards to exhaust emissions. 	Manager	Ongoing
6.2.3 Pollution control and waste management (of products disposed of: into the air (exhausts, CFCs and incinerators), to sea (sewage, food, oils), to land (used oils, etc, metals, plastics, glass, etc.)	<ul style="list-style-type: none"> Ensure that the survey vessel: <ul style="list-style-type: none"> Implements all applicable MARPOL standards for disposal of general waste, hazardous waste, organic waste (food waste and sewage effluent), greywater, sewerage, bilge water, incineration of shipboard waste and the maintenance of waste records. Minimises the discharge of waste material should obvious attraction of fauna be observed. Records types and volumes of chemical and hazardous substances brought on board during the prospecting programme (e.g. neon lights, fluorescent tubes, toner cartridges, batteries etc.) and destination of wastes. Disposes of wastes generated during BPT 127 operations through an acceptable recycling company or at a licensed landfill site. Ensure applicable crew is trained in spill management. 	Manager	Ongoing

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6.2 NATURAL ENVIRONMENTAL FACTORS			
Item No.	Action Plans & Control Measures	Responsibilities	Timing
6.2.4 Dealing with emergencies / marine pollution (owing to collision, vessel break-up, refuelling etc.)	<ul style="list-style-type: none"> Ensure that the survey vessel: <ul style="list-style-type: none"> Maintains all emergency procedures as legally required. Adheres to obligations regarding other vessels in distress. Where diesel, which evaporates relatively quickly, has been spilled, the water should be agitated or mixed using a propeller boat/dinghy to aid dispersal and evaporation. In the event of an emergency including fire, grounding or sinking, or collision, ensure that the approved Shipboard Oil Pollution Emergency Plan and Emergency Response Manuals are followed, which include: <ul style="list-style-type: none"> Ensuring safety of personnel onboard; Stabilising the ship and limit damages; Containing the spill, if possible; and Immediately reporting accidental spills to the relevant Authorities and Professional Bodies providing full details of the incident. 	Manager	Ongoing
	<ul style="list-style-type: none"> In the event of an oil spill immediately implement emergency plans and notify (a) the Principal Officer of the nearest SAMSA office, (b) the DEA's Chief Directorate of Marine Pollution in Cape Town and (c) PASA. Information that should be supplied when reporting a spill includes: <ul style="list-style-type: none"> The type and circumstances of incident, ship type, port of registry, nearest agent representing the ships company; Geographic location of the incident, distance off-shore and extent of oil spill; Prevailing weather conditions, sea state in affected area (wind direction and speed, weather and swell); and Persons and authorities already informed of the spill. Where feasible, provide facilities to rescue, stabilise, and fly oiled seabirds to SANCCOB for further rehabilitation. 	Manager	Per event
	<ul style="list-style-type: none"> Notification to Alexkor, De Beers Consolidated Mines and Transhex Operations of the occurrence of any Moderate or Major overboard spills during prospecting activities. 	Manager	Per event

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6.3. SOCIOECONOMIC FACTORS			
Task No.	Action Plans & Control Measures	Responsibilities	Timing
6.3.1 Communication with Interested and Affected Parties	<ul style="list-style-type: none"> Through normal maritime communication channels, Radio Navigation Warnings, Notices to Mariners and other notifications keep the following interested and affected parties updated on the prospecting activities: <ul style="list-style-type: none"> Overlapping and neighbouring users with delineated boundaries in the oil and gas exploration and production industries and any prospecting and mining industries; SAN Hydrographic Office (Silvermine); Fishing industry (including Association of Small Hake Industries, SA Deep Sea Trawling Industry Association, SA Pelagic Fishing Industry Association, SA Commercial Linefish Association, SA Tuna Longline Association, and SA West Coast Rock Lobster Association); Government departments with jurisdiction over marine activities, particularly DEA, DAFF: MRM, PASA and DMR; and SAMSA and local Port Captains. 	Manager	14 days prior to operations
6.3.2 Presence of vessel / impact of prospecting activities on other industries	<ul style="list-style-type: none"> Liaise with Alexkor, Transhex, Sunbird Energy, PetroSA and Thombo Petroleum regarding prospecting plans, including information regarding location of operations, specific starting and finishing dates, as well as progress of operation. 	Manager	During Work Plan Preparation & when appropriate thereafter
	<ul style="list-style-type: none"> Inform the West Coast Rock Lobster Sea Management Association if any activities are activated within the 100 m contour line. 	Manager	Per event
	<ul style="list-style-type: none"> Ensure that the Vessel master records sightings of and interactions with other vessels to note potential conflicts over rights of passage and access to resources. 	Manager	Per event
6.3.3 Heritage sites	<ul style="list-style-type: none"> Should any archaeological sites or historical material be identified during survey operations ensure that: <ul style="list-style-type: none"> Position of the site is documented; and The Maritime Archaeologist at the South African Heritage Resources Agency, Cape Town and the Maritime Archaeology Unit of Isiko Museum, Cape Town are notified 	Manager	Per event
6.4.4 Incidental loss of equipment - obstacles	<ul style="list-style-type: none"> Maintain hazards database listing the type of gear lost to the seabed and/or in the prospecting area with the dates of loss and locations and where applicable, the dates of retrieval. If requested, report these data to the relevant authority. 	Manager	Per event

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6.3. SOCIOECONOMIC FACTORS			
Task No.	Action Plans & Control Measures	Responsibilities	Timing
6.5.5 Inform relevant parties of survey completion	<ul style="list-style-type: none">Inform all key stakeholders that the survey vessel has completed operations as per normal maritime communication practice.	Manager	Within two weeks of completion

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PART 7: CONCLUSIONS AND RECOMMENDATIONS

Belton Park Trading 127 (Pty) Ltd have lodged an application for a prospecting permit to undertake geophysical surveys in 100-160 m water depth in SASA concessions 2C, 3C, 4C and 5C, off the South African West Coast. The objective of the proposed prospecting surveys is to further delineate and re-estimate the potential diamond resource for further future mining in the area.

7.1 CONCLUSIONS

No fatal flaws have been identified during the Scoping Phase or the Environmental Impact Assessment phase as part of the EMPR. Environmental, social and cultural impacts associated with the proposed geophysical surveying are summarised below:

Potential Impact	Significance	
	Without Mitigation	With Mitigation
Impacts on Marine Fauna:		
Noise associated with geophysical surveying	Low	Very Low
Vessel strikes	High	Very Low
Vessel Operations:		
Deck drainage into the sea	Very Low	Very Low
Machinery space drainage into the sea	Very Low	Very Low
Sewage effluent into the sea	Very Low	Very Low
Galley waste disposal into the sea	Very Low	Very Low
Solid waste disposal into the sea	Very High	Insignificant
Accidents and Emergencies	High	Medium
Impacts on Other Users:		
Fishing Industry	Very Low	Very Low
Marine mining and prospecting		
Petroleum exploration	Very Low to Low	Very Low
Marine transport routes	Very Low	Very Low
No-Go Alternative	Low to Medium	

Most of the potential impacts associated with the prospecting activities would occur in the immediate vicinity of the vessel, would be of short term duration and of low to high intensity, and can thus mostly be considered to be of **VERY LOW** to **LOW** significance. Exceptions are

potential collisions with marine mammals and grounding or sinking of the survey vessel when impacts can be considered of **HIGH** significance. The impacts identified above, along with other areas of concern raised by stakeholders during the scoping process and highlighted in this document, are addressed in more detail in the EMPR. The process followed meets the requirements of the MPRDA to ensure that the regulatory authorities receive sufficient information to enable informed decision-making.

7.2 RECOMMENDATIONS

7.2.1 Compliance with EMPE and marpol 73/78 standards

All phases of the proposed project must comply with the Environmental Management Programme presented in Chapter 6. Furthermore, the survey vessel must ensure compliance with MARPOL 73/78 standards.

7.2.2 Notification and communication with key Stakeholders

- Notify Sunbird Energy, PetroSA, Thombo Petroleum, Alexkor, Transhex, Transhex and its contractors, as well as any other operators, prior to the commencement of activities;
- Liaise with all petroleum exploration operators to ensure that there is no overlapping of activities in the same area over the same time period;
- Prior to the commencement of activities, notify relevant bodies including: DMR, South African Maritime Safety Authority (SAMSA), the South African Navy (SAN) Hydrographic Office, relevant Port Captains and DAFF: MRM. These bodies must be notified of the navigational coordinates of any location prior to commencement of such activities;
- Set up communication channels with I&APs. This would involve pre-survey notifications via email. Key stakeholders should include:
 - Fishing industry (Association of Small Hake Industries, SA Deep Sea Trawling Industry Association, SA Pelagic Fishing Industry Association, SA Commercial Linefish Association, SA Tuna Longline Association, and SA West Coast Rock Lobster Association);
 - Marine mining / prospecting industry (Transhex, Alexkor); and
 - Authorities (SAN Hydrographic office, DAFF: MRM, DMR, SAMSA and relevant Port Captains).
- Appropriate notices should be distributed timeously to mariners providing:
 - The co-ordinates of the sampling and survey activities;
 - An indication of the survey timeframes; and
 - Reports on the location of prospecting vessels.

7.2.3 Discharges and Emmissions

- Provide training and awareness 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;
- Use low toxicity, biodegradable detergents and reusable absorbent cloths during deck cleaning to further minimise the potential impact of deck drainage on the marine environment;
- Machinery spaces must drain into bilge tanks in compliance with MARPOL Annex I;

- 'Save-alls' must be utilised around specific equipment, bunkering points and vents on open deck areas to prevent release of contaminated water overboard;
- Undertake adequate maintenance of all hydraulic systems;
- Minimise the discharge of waste material should obvious attraction of marine fauna be observed;
- No solid waste may be disposed to the marine environment;
- Ensure that stringent waste management practices are in place at all times; and
- The vessel operator would be required to comply with the MARPOL 73/78 Annex IV requirements, wherever possible.

7.2.4 Vessel Seaworthiness and Safety

- The survey vessel must be certified for seaworthiness through an appropriate internationally recognised marine certification programme (e.g. Lloyds Register, Det Norske Veritas);
- The survey vessel should be equipped with collision prevention equipment including 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;
- Seek to reduce the probabilities of accidental and/or operational spills through enforcement of stringent oil spill management systems. These should incorporate plans for emergencies; and
- Refueling will occur under controlled conditions in a harbour only

7.2.5 Geophysical Surveying

- Onboard Marine Mammal Observers (MMOs) should conduct visual scans for the presence of cetaceans around the survey vessel prior to the initiation of any acoustic impulses.
- Pre-survey scans should be limited to 15 minutes prior to the start of survey equipment.
- "Soft starts" should be carried out for any equipment of 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.
- 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.
- The geophysical surveying should largely be undertaken between December and May, thereby avoiding the main migration period of baleen whales from their southern feeding grounds into low latitude waters. However, during the transition periods in June and November, surveying would be possible with stricter mitigation measures. As no seasonal patterns of abundance are known for odontocetes occupying the proposed exploration area, a precautionary approach to avoiding impacts throughout the year is recommended.
- Ensure that PAM (passive acoustic monitoring) is incorporated into any surveying taking place between June and November.
- A MMO should be appointed to ensure compliance with mitigation measures during seismic geophysical surveying. This will also reduce the chances of the vessel colliding with a marine mammal.

PART 8: STATUTORY REQUIREMENTS

Key legislative requirements that the proposed prospecting activities must comply with, include the following:

- Minerals and Petroleum Resources Development Act (No. 28 of 2002); and
- National Environmental Management Act (No. 107 of 1998) (NEMA).

Other legislation that may have minor relevance is listed below:

International Marine Pollution Conventions

- International Convention for the Prevention of Pollution from Ships, 1973/1978 (MARPOL);
- Amendment of the International Convention for the Prevention of Pollution from Ships, 1973/1978 (MARPOL) (Bulletin 567 - 2/08);
- International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC Convention);
- United Nations Convention on Law of the Sea, 1982 (LOSC);
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (the London Convention) and the 1996 Protocol (the Protocol);

Other South African legislation

- Carriage of Goods by Sea Act, 1986 (No. 1 of 1986);
- Dumping at Sea Control Act, 1980 (No. 73 of 1980);
- Hazardous Substances Act, 1983 and Regulations (No. 85 of 1983);
- Marine Living Resources Act, 1998 (No. 18 of 1998);
- Marine Traffic Act, 1981 (No. 2 of 1981);
- Marine Pollution (Control and Civil Liability) Act, 1981 (No. 6 of 1981);
- Marine Pollution (Prevention of Pollution from Ships) Act, 1986 (No. 2 of 1986);
- Marine Pollution (Intervention) Act, 1987 (No. 65 of 1987);
- Maritime Safety Authority Act, 1998 (No. 5 of 1998);
- Maritime Safety Authority Levies Act, 1998 (No. 6 of 1998);
- Maritime Zones Act 1994 (No. 15 of 1994);
- Merchant Shipping Act, 1951 (No. 57 of 1951);
- National Environmental Management: Air Quality Act, 2004 (No. 39 of 2004);
- National Environmental Management: Integrated Coastal Management Act, 2008 (No. 24 of 2008);
- National Heritage Resources Act, 1999 (No. 25 of 1999);
- Occupational Health and Safety Act, 1993 (No. 85 of 1993);
- Sea-Shore Act, 1935 (No. 21 of 1935);
- Sea Birds and Seals Protection Act, 1973 (No. 46 of 1973);
- Ship Registration Act, 1998 (No. 58 of 1998);
- Water Act, 1998 (No. 36 of 1998); and
- Wreck and Salvage Act, 1995 (No. 94 of 1995).

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PART 9: AMENDMENTS TO EMPR

As part of this application for prospecting rights to undertake geophysical surveying, Belton Park Trading 127 (Pty) Ltd has committed to providing the necessary amendments to the EMPRs to include any future drill and bulk sampling campaigns.

This section will be completed as and when required.



PART 10: REFERENCES AND SUPPORTING DOCUMENTATION

10.1 REFERENCES

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10.2 SCOPING REPORT

APPENDIX A: STAKEHOLDER DATABASE

NEIGHBOURING OR OVERLAPPING MARINE PROSPECTING/MINING RIGHTS HOLDERS	Read Receipt
<p>Alexkor Ltd Mine Manager Alexkor Ltd Private Bag X5 ALEXANDER BAY 8290 Fax (027) 8311910 Email leilanis@alexkor.co.za</p>	<p>Read on Monday, July 29, 2013 7:37:17 AM (UTC+02:00) Harare, Pretoria</p>
<p>AuruMar (Pty) Ltd Mr G van Eck DBM Gardens, Golf Park 2 Raapenberg Road PINELANDS Work 021 658 3213 Fax 021 658 3355 Email gary.vaneck@aurumar.co.za</p>	<p>Automatic Reply sent 31 July 2013 10:15 AM Read receipt, 31 July 2013 03:25 PM</p>
<p>Trans Hex Group Limited Mr V Madlela P O Box 723 PAROW 7499 Work 021 937 2000 vincentm@transhex.co.za</p>	<p>Read on Fri, 26 Jul 2013 15:03:27 +0200</p>
<p>De Beers Consolidated Mines Proprietary Limited Mining and Property Titles Administrator Private Bag X01 Southdale 2135 Work 011 3747201 Fax: 011 3747700 Email Christiaan.VanZyl@debeersgroup.com</p>	<p>Fax attempt 4 August Fax attempt 14 August Couriered 14 August</p>
<p>De Beers Marine Proprietary Limited Manager, De Beers Marine DBM Gardens, 2 Golf Park Raapenberg Road, Pinelands 7405 Tel: +27-21-658-3102 Fax: +27-21-658-3101 Email Domingos.Valbom@debeersgroup.com</p>	<p>Fax attempt 4 August Fax attempt 14 August Couriered 14 August</p>

NEIGHBOURING OR OVERLAPPING PETROLEUM RIGHTS HOLDERS	Read Receipt
<p>Anschutz (South Africa) (Pty) Ltd Mr T Weller Vice President - International Anschutz (South Africa) (Pty) Ltd 2402 Anaconda Tower 555 Seventeenth Street Denver, Colorado 80202 USA Work 1303 299 1418 Email tedwell@tac-denver.com</p>	<p>n/a now part of Sunbird Energy</p>
<p>Sunbird Energy Carla Mackay Email: cmackay@sunbirdenergy.com.au Office: +27 11 484 5005 Mobile: +27 83 390 7487 Fax: +27 11 484 5004 The Isle of Houghton,</p>	<p>Read on Friday, July 26, 2013 2:46:47 PM (UTC+02:00) Harare, Pretoria.</p>

EMP REPORT - SASA 2C, 3C, 4C and 5C Propsecting Permit Application

NEIGHBOURING OR OVERLAPPING PETROLEUM RIGHTS HOLDERS	Read Receipt
3rd Floor, Old Trafford 4, Boundary Road, Houghton 2198, South Africa	
Forest Exploration International (SA) (Pty) Ltd Ms A Friedrichs Suite 1B, Nautica, The Waterclub, Beach Road GRANGER BAY 8005 Work 021 401 4140 Email ajfriedrichs@forestoil.co.za	Read on Monday, July 29, 2013 4:40:30 PM (UTC+02:00) Harare, Pretoria.
Offshore Petroleum Association of South Africa (OPASA) OPASA Chairperson: Ms Alison Futter (PetroSA) Chairperson Tel: 021 929 3112 Private Bag X5 Fax: 021 929 9067 Parow, 7499 Cape Town Email: alison.futter@petrosa.co.za South Africa	Out of Office Autoreply Sent: 26 July 2013 02:46 PMI
Petroleum Agency SA Petroleum Agency SA P O Box 5111 TYGERVALLEY 7536 Email plu@petroleumagency.co.za Distributed via OPASA	
PetroSA (Pty) Ltd Ms J Courtoreille Private Bag X5 PAROW 7955 Work 021 929 3216 Fax 021 929 3018 Cell 083 253 6614 Email : jessica.courtoreille@petrosa.co.za	Read on 26 July 2013 01:09:22 PM UTC.
Thombo Petroleum Mr T Ridley Managing Director Thombo Petroleum 1c Barnes High Street London UNITED KINGDOM SW13 9LB Work +44 207 8344919 Email trevor@thombopetroleum.com	Response Email received 30 July 2013 08:35 AM

FISHING INDUSTRY	Read Receipt
Association of Small Hake Industries Chairman Association of Small Hake Industries P O Box 6259 ROGGEBAAI 8012 Work 021 421 2472 Fax 021 425 2716 Email andrew@kaytrad.co.za	Fax attempt 5 August 2013, no answer
SA Pelagic Fishing Industry Association & West Coast Rock Lobster Industry Association Mr D de Villiers P O Box 2066 CAPE TOWN 8000 Work 021 425 2727 Fax 021 425 4734 Email safish@new.co.za NOTE: dan@new.co.za	Sent by Fax 5 August 2013
Mr P Foley Secretary of West Coast Rock Lobster Industry Association & SA Pelagic Fish Industry Association P O Box 2066 CAPE TOWN 8000	Sent by Fax 5 August 2013

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EMP REPORT - SASA 2C, 3C, 4C and 5C Propsecting Permit Application

FISHING INDUSTRY	Read Receipt
Work 021 425 2727 Fax 021 425 4734 Email safish@new.co.za	
SA Tuna Longline Association Mr D Lucas P O Box 3277 CAPE TOWN 8000 Work 021 510 7924 Fax 021 696 1327 Email comfish@mweb.co.za	Read on 2013-08-05 01:05 PM
Mr R Ball P O Box 3277 CAPE TOWN 8000 Email rball@iafrica.com	Read on 2013/07/29 09:18 AM.
South African Commercial Line Fishing Association P O Box 383 YZERFONTEIN 7351 Email boating@telkomsa.net	
South African Deep Sea Trawling Association Mr R Bross P O Box 2066 CAPE TOWN 8000 Work 021 425 2727 Fax 021 425 4734 Email deepsea@iafrica.com	Sent by Fax 5 August 2013

OTHER	Read Receipt
S A Navy Hydrographic Office Mr M Nelson Private Bag X1 TOKAI 7966 Work 021 787 2408 Fax 021 787 2233 Email hydrosan@iafrica.com	Return Receipt: Fri 2013/07/26 03:30 PM
South African Heritage Resources Agency (SAHRA) The Provincial Manager – Northern Cape P.O. Box 1930 KIMBERLEY 8300 Tel: (053) 831 2537 Fax: (053) 833 1435 Email sberry@sahra.org.za	
South African Maritime Safety Authority (SAMSA) Principal Officer Private Bag X7025 ROGGEBAAI 8012 Work Fax +27 (0) 21 419 0730	Sent by Fax 31 July 2013
South African National Biodiversity Institute Dr K Sink Marine Program Manager Kirstenbosch Research Centre Private Bag X7 CLAREMONT 7735 Work 021 799 8855 Cell 082 831 0536 Email k.sink@sanbi.org.za	Read on 2013/07/31

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APPENDIX B: BACKGROUND INFORMATION DOCUMENT

<p>Applicant</p>  <p>BELTON PARK TRADING 127 (Pty) Ltd</p>	<p>APPLICATION FOR PROSPECTING RIGHTS SOUTH AFRICAN SEA AREAS 2C, 3C, 4C AND 5C</p>	<p>Independent Consultant</p>  <p>PISCES ENVIRONMENTAL SERVICES (PTY) LTD</p>
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Aim of this Document

The aim of this Background Information Document (BID) is to inform stakeholders about the applications for prospecting rights in four of the South African Sea Areas (SASA) concessions off the west coast of South Africa.

You are hereby invited to raise issues and concerns regarding the applications and the proposed geophysical prospecting to be undertaken. Potential impacts associated with the prospecting operations will be investigated during the compilation of Environmental Management Programme Reports (EMPRs) for each of the concessions.

The EMPRs, together with your comments, will form part of the Prospecting Applications submitted to the Department of Mineral Resources (DMR).

Please direct comments to:
**Andrea Pulfrich of
 Pisces Environmental Services (Pty) Ltd**
 Tel: 021 782 9553 Fax: 021 782 9552
 Email: apulfrich@pisces.co.za
 Postal address: PO Box 31228
 Tokai, 7966

**Please register or comment on or before
 19 August 2013**

BACKGROUND INFORMATION

Belton Park Trading 127 (Pty) Ltd have submitted applications to the Department of Mineral Resources for Prospecting Rights for marine diamond mining concession areas 2C, 3C, 4C and 5C. The concession areas are situated some 500 km north of Cape Town, with the inshore boundary 5 km seaward of the coastal towns of Kleinsee in the south and Alexander Bay in the north (Figure 1).

As part of the application process it is necessary to prepare a Scoping Report and an EMPR in terms of Regulations 3 and 48-55 of GN R 527 Mineral and Petroleum Resources Development Regulations of the Mineral and Petroleum Resources Development Act (28/2002). This BID forms part of the stakeholder engagement required for the Scoping Report, to be submitted to the DMR as part of the Prospecting Permit Application.

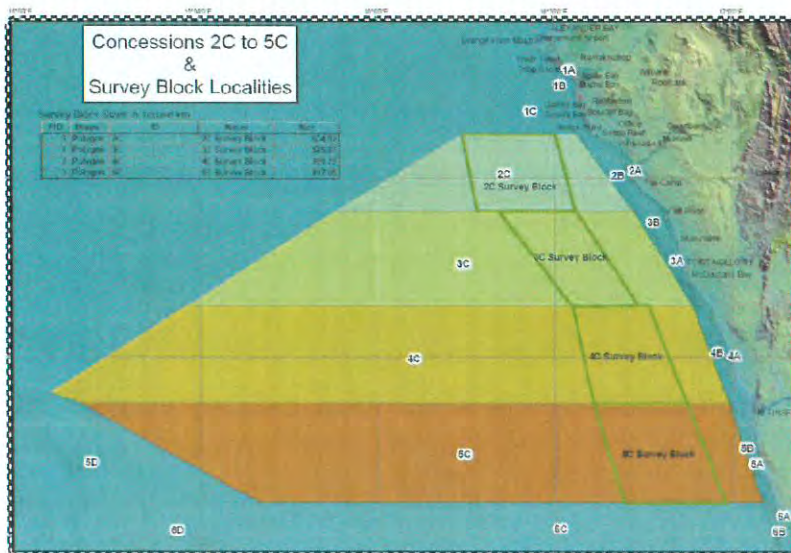


Figure 1: Location of the SASA concessions 2C- 5C, showing proposed geophysical survey blocks.



THE REPORT IS UNCLASSIFIED

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PROJECT DESCRIPTION

A phased approach would be adopted for the proposed prospecting activities in concessions 2C-5C, with each phase dependant on the results of the previous phase. The three phases, which will span a period of four years, are:

- Phase I: Geophysical Surveying
- Phase II: Drill sampling
- Phase III: Bulk (trench) sampling

The current applications cover Phase I only.

Detailed geophysical surveys would be undertaken in specific priority areas, at water depths between ~100 – 150 m, in each of the four concessions (Fig. 1). Only a small proportion of the available concession area would thus be affected by proposed prospecting operations.

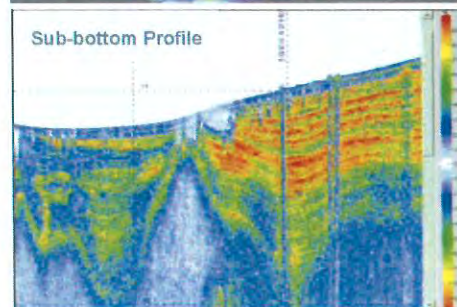
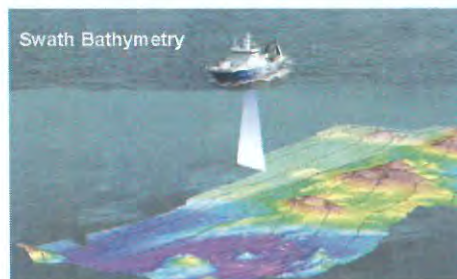


Proposed survey areas in relation to total concession areas			
Concession	Prospecting Right Reference No.	Survey Area (km ²)	Total Area (km ²)
2C	NC30/5/1/1/2/10951PR	634.9	1 369.6
3C	NC30/5/1/1/2/10950PR	576.0	3 253.6
4C	NC30/5/1/1/2/10949PR	701.8	4 962.1
5C	NC30/5/1/1/2/10948PR	817.1	4 790.4

The survey vessel would be equipped with :

- a multibeam echosounder designed to produce high resolution digital terrain models of the seafloor by transmitting a 30 kHz sounding in a wide swath below the vessel; and
- a parametric sub-bottom profiler, which uses shallow (35 to 45 kHz) and medium penetration (1 to 10 kHz) "Chirp" seismic pulses to generate profiles up to 60 m beneath the seafloor, thereby giving a cross section view of the sediment layers.

Initially the surveys will have a line spacing of 1 000 m by 5 000 m. In areas of particular interest this will be reduced to a spacing of 200 m for main lines and 1 000 m for cross lines. The total line kilometres surveyed per concession will be between 750 and 1 500 km.



POTENTIAL ENVIRONMENTAL IMPACTS

The proposed prospecting activities are largely non-intrusive to marine organisms. All the systems are hull-mounted and no towed equipment will be used that may be a hindrance to marine fauna. The signals generated by the sonars would be perceived by whales, dolphins and seals at frequencies within their functional hearing range. As the radius of influence of these high-frequency sonars is comparatively small, and the probability of crossing a marine mammal with the narrow swath is very low, the acoustic or physical disturbance to marine animals can be considered to be of very low significance.



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 <p>B P T 1 2 7</p>	<h2>STAKEHOLDER COMMENT SHEET</h2>
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You are invited to participate in the Prospecting Permit Application process and raise any issues and concerns you may have about the proposed Project. Your comments are a central part of the Application process and it is important that Belton Park Trading 127 (Pty) Ltd understand your concerns so that they can be responded to and addressed as part of the Scoping Report.

To be kept informed on the developments of the Prospecting Permit Application and to submit your comments, you need to register as an Interested and Affected Party. To register please complete the form below and email or forward it, together with your comments to:

Andrea Pulfrich
 Pisces Environmental Services (Pty) Ltd.
 Tel: 021 782 9553
 Fax: 021 782 9552
 Email: apulfrich@pisces.co.za
 Postal address: PO Box 31228
 Tokai, 7966

Please ensure you are registered and have submitted your comments by **19 August 2013** so that we can take your comments into consideration in compiling the Scoping Report and EMPR.

Please provide your details:

Name:	Organisation:
Telephone:	Position:
Mobile:	Email:
Address:	
Comments:	

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 19 AUG 2013
 10:11 AM
 BELTON PARK TRADING 127 (PTY) LTD

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COVERING EMAIL

From: Andrea Pulfrich [mailto:apulfrich@pisces.co.za]

Sent: 26 July 2013 02:46 PM

To: 'apulfrich@pisces.co.za'

Cc: 'jasper.nieuwoudt@dmr.gov.za'

Subject: Stakeholder Consultation - Prospecting Permit Applications for SASA 2C, 3C, 4C and 5C

[APPLICATION FOR PROSPECTING PERMITS FOR SOUTH AFRICAN SEA AREAS 2C, 3C, 4C AND 5C](#)

Belton Park Trading 127 (Pty) Ltd is preparing Applications for Prospecting Rights in South African Sea Areas 2C, 3C, 4C and 5C. The attached Background Information Document provides information regarding the applications. You have been identified as an Interested and Affected Party (I&AP) and are hereby invited to submit comment.

Should you wish to register as an I&AP and participate in the prospecting permit application process, please complete the attached Stakeholder Comment Sheet and email or post it to:

Andrea Pulfrich, Pisces Environmental Services (Pty) Ltd.

Email: apulfrich@pisces.co.za

Postal address: PO Box 31228, Tokai, 7966

Please ensure you have submitted your registration and comments for receipt by **19 August 2013**, so that they can be taken into consideration in compiling the Scoping Report and subsequent Environmental Management Programme Report to be submitted to the Department of Mineral Resources.

Kind regards,

Andrea Pulfrich

Dr Andrea Pulfrich

Director: Pisces Environmental Services (Pty) Ltd

PO Box 31228 Tokai, 7966

Ph: +27-21-7829553, Fax: +27-21-7829552

Mobile: 082 7818152

E-Mail: apulfrich@pisces.co.za

Skype: andrea.pulfrich

www.pisces.co.za



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FOLLOW-UP EMAIL

From: Andrea Pulfrich [mailto:apulfrich@pisces.co.za]

Sent: 31 July 2013 10:14 AM

To: apulfrich@pisces.co.za

Subject: FW: Stakeholder Consultation - Prospecting Permit Applications for SASA 2C, 3C, 4C and 5C

Good Morning,

It has come to my attention that the email below did not reach all the intended recipients when sent out on Friday afternoon.

I am re-sending it, with a request to please acknowledge receipt by sending the *Delivery Receipt*.

Thanks and kind regards

Andrea

31 JUL 2013 10:14 AM
APULFRICH@PISCES.CO.ZA



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EMP REPORT - SASA 2C, 3C, 4C and 5C Propsecting Permit Application

APPENDIX C: COMMENTS AND RESPONSES TRAIL

Stakeholder	Correspondence type and date received	Comment	Response	Date Responded
LeilaniSwartbooi Alexkor Ltd		No comments received		
Gary Van Eck Aurumar (Pty) Ltd	Autoreply: 31 July 2013 10:15 AM 31 July 2013 03:25 PM	Good day, I am currently travelling internationally. If urgent, please SMS me, or contact HermanWessels at AuruMar. Have a great day! Email received - thanks		
	16 August 2013 09:38 AM	None at this stage	Dear Gary, Thank you for your response. I have registered you as an Interested and Affected Party, and going forward, AuruMar will receive all relevant communications regarding the project. Kind Regards Andrea	Fri 2013/08/16 08:34 PM
Vincent Madlela Trans Hex Group Ltd		No comments received		
Aletta Dreyer De Beers Consolidated Mines (Pty) Ltd	Email: 19 August 2013 04:29 PM	See attached letter in Appendix D		
DomingosValbom De Beers Marine (Pty) Ltd		No comments received		

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EMP REPORT - SASA 2C, 3C, 4C and 5C Propsecting Permit Application

Stakeholder	Correspondence type and date received	Comment	Response	Date Responded
Carla Mackay/ A. Friedrichs Sunbird Energy	E-mail; 31 July 2013	<p>Dear Andrea, Please find attached our registration as Interested & Affected party to this application process. Could you please provide us with a map which indicates the prospecting permits as well as the petroleum licence blocks? It would be very valuable for us to see the relation of these permits to our Block 2A and possible pipeline landing sites. Thank you and kind regards, AnschensFriedrichs Public Officer</p> <p>Sunbird Energy is in the process of acquiring Forest Exploration and Anschutz South African assets and offices. Forest is currently operator of Block 2A, offshore on the West Coast of South Africa.</p>	<p>Dear Anschens, Thank you for your prompt response and for your interest in the Prospecting Permit Application for Concessions 2C, 3C, 4C and 5C. I have registered you as an Interested and Affected Party, and going forward, Sunbird Energy will receive all relevant communications regarding the project. I attach the requested map as it will appear in the Scoping Report, which is currently being prepared. From my understanding of the potential pipeline landing sites, these lie well to the south of the SASA 2C-5C concessions. Kind regards Andrea</p>	31 July 2013 03:20 PM
Alison Futter OPASA		No comments received		

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2013 JUL 31 10:10 AM

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EMP REPORT - SASA 2C, 3C, 4C and 5C Propsecting Permit Application

Stakeholder	Correspondence type and date received	Comment	Response	Date Responded
Jessica Courtoreille PetroSA (Pty) Ltd	16 August 2013 10:44 AM	Dear Andrea Please find attached preliminary comments on behalf of the Cairn India/PetroSA Joint Venture in Block 1. Regards Jessica Courtoreille Environmental Leader Corporate SHEQ Tel: 021- 929 3216 Fax: 021- 929 3018 PetroSA/Cairn India are involved in a joint venture in Petroleum Licence Block 1, which covers the same area. Communication is required to prevent conflict between prospecting and exploration activities.	Dear Jessica, Thank you for your response. I have registered you as an Interested and Affected Party, and going forward, Cairn India/PetroSA will receive all relevant communications regarding the project. Kind Regards Andrea	Fri 2013/08/16 08:30 PM

2013/08/16 08:30 PM

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EMP REPORT - SASA 2C, 3C, 4C and 5C Prospecting Permit Application

Stakeholder	Correspondence type and date received	Comment	Response	Date Responded
Trevor Ridley Thombo Petroleum	Email 30 July 2013 08:35 AM	Dear Andrea, Thank you for this notification. Thombo Petroleum would like to be kept informed of these activities to ensure we can co-ordinate and avoid any interference between our respective operations. I have accordingly attached our notice to register this interest. Kind regards Trevor Trevor Ridley Managing Director Thombo Petroleum Ltd.	Dear Trevor, Thank you for your prompt response and for your interest in the Prospecting Permit Application for Concessions 2C, 3C, 4C and 5C. I have registered you as an Interested and Affected Party, and going forward, Thombo Petroleum will receive all relevant communications regarding the project. Kind regards Andrea	30 July 2013
		Thombo is the Operator for the Petroleum Exploration Right over Block 2B, not far from the proposed operations by Belton Park. We would therefore like to be kept informed of plans and activities to co-ordinate and ensure there is no interference between our respective operations.		
Andrew Kaye Association of Small Hake Industries		No comments received.		
Dan De Villiers SA Pelagic Fishing Industry Association		No comments received.		
Peter Foley West Coast Rock Lobster Industry Association		No comments received.		

THE MEDICAL MANAGER

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EMP REPORT - SASA 2C, 3C, 4C and 5C Propsecting Permit Application

Stakeholder	Correspondence type and date received	Comment	Response	Date Responded
Don Lucas SA Tuna Longline Association		No comments received.		
South African Squid Management Industrial Association (SASMIA)	Email :16 August 2013 07:23 PM	Dear Mr.Pulfrich This email serves as confirmation that the South African Squid Management Industrial Association (SASMIA) would like to register as an I&AP. Thank you. Kind Regards BusiGumede SASMIA Secretary	Dear Busi, Thank you for your response. I have registered you as an Interested and Affected Party, and going forward, SASMIA will receive all relevant communications regarding the project. Kind Regards Andrea	Fri 2013/08/16 08:27 PM
Roy Bross South African Deep Sea Trawling Association	Email: 14 August 2013 03:24 PM Email: 14 August 2013 05:32 PM	Dear Ms Pulfrich The STAKEHOLDER COMMENT SHEET is in PDF format. This means in effect that it cannot be "filled in" prospective respondents cannot provide information by way of using the sheet. YF Roy Bross Comments: The document provides the frequencies but I didn't pick up amplitude (underwater) decibels. We would have the greatest difficulty if the	Dear Roy, Attached please find comment sheet in MSWord format. Hope this makes things easier. I did fax the BID with comment sheet to your offices as well. Looking forward to your response. Kind regards Andrea Dear Roy, Thanks for your prompt response. The amplitude of the anticipated underwater noise generated by	2013/08/14 05:07 PM 2013/08/14 06:21 PM

2013/08/14 11:13:00
2013/08/14 11:13:00

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EMP REPORT - SASA 2C, 3C, 4C and 5C Propsecting Permit Application

Stakeholder	Correspondence type and date received	Comment	Response	Date Responded
		prospective mining were to impinge on the trawl footprint	thegeophysical survey equipment will be detailed and assessed in the EMPR. Your comment on impingement of the trawl footprint by prospective mining is noted. At this stage, however, only prospecting is envisaged over the next few years. Should sampling and mining commence in future, these will in all likelihood be well inshore of the trawling lanes, and be covered by a full EIA process prior to start of operations. Kind regards Andrea	
M. Nelson S A Navy Hydrographic Office		No comments received.		
Shaun Berry SAHRA		No comments received.		
SAMSA		No comments received.		
Kerry Sink SANBI		No comments received.		

Pisces Environmental Services (Pty) Ltd
100 Waterfall Drive, Durbanville, Western Cape, South Africa

Handwritten pink scribble and the number '77' in the top right corner.

APPENDIX D: RESPONSES TRAIL



19 August 2013

Pisces Environmental Services (Pty) Ltd
PO Box 31228
Tokai
7966

Attention: Andrea Pulfrich
Email: apulfrich@pisces.co.za

Dear Ms Pulfrich

BELTON PARK TRADING 127 (PTY) LTD. APPLICATION FOR PROSPECTING RIGHTS
(DIAMONDS OVER SOUTH AFRICAN SEA AREAS 2C, 3C, 4C AND 5C)

We refer to your invitation to participate in the applications by Belton Park Trading 127 (Pty) Ltd for prospecting rights over the abovementioned sea areas.

As you are aware, De Beers Consolidated Mines Proprietary Limited holds a prospecting right for gold, heavy minerals (general), platinum group metals and sapphire (gemstone) over the abovementioned sea areas.

We would like to comment on your client's applications, but cannot do so without sight of the relevant documentation. We would accordingly be most grateful if you would let us have a copy of the applications made by Belton Park Trading 127 (Pty) Ltd together with all supporting documentation, as well as a copy of the relevant Environmental Management Plan.

In your invitation to stakeholders you ask for comments to be submitted by today. However, I must point out that, taking account of the amended definition of "day" in the Mineral and Petroleum Resources Development Act 28 of 2002 ("the Act") read with section 10 of the Act, anybody wishing to lodge an objection to your client's applications will have 30 business days after 22 July 2013 (being the date of acceptance by the Department of Mineral Resources of the applications) to do so.

We look forward to receiving copies of the requested documentation at your earliest convenience.

Yours faithfully

Aletta Dreyer
Lead: Mining & Property Titles

De Beers Consolidated Mines

De Beers Consolidated Mines Proprietary Limited: Registration No. 1885/000007/07

Head Office 36 Stockdale Street Kimberley 8301
PO Box 816 Kimberley 8300 South Africa
Tel +27 (0)53 839 4111 Fax +27 (0)53 839 4210

www.debeersgroup.com

Directors: B Petersen (Chairman), E M Dingo (Deputy Chairman), A P Barton (Chief Executive Officer),
Ms C A Carols, B A Cleaver, P A J Lowery, P J C Mellor (French), G Mestyn (British)

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

FOR SOUTH AFRICAN SEA AREAS
2C, 3C, 4C AND 5C

Addendum for Sampling Operations

For DMR Reference Numbers:

2C: NC30/5/1/1/2/10951PR

3C: NC30/5/1/1/2/10950PR

4C: NC30/5/1/1/2/10949PR

5C: NC30/5/1/1/2/10948PR

Prepared on behalf of:



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BELTON PARK TRADING 127 (Pty) Ltd

THE REGIONAL MANAGER
NORTHERN CAPE REGION



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INTRODUCTION

Belton Park Trading 127 (Pty) Ltd, a company of the International Mining and Dredging Holding Limited group (IMDH), has submitted on 27 June 2013 applications to the Department of Mineral Resources (DMR) for Prospecting Rights for marine diamonds in the South African Sea Areas concessions 2C, 3C, 4C and 5C. The DMR Reference Numbers for the various applications are:

- 2C: NC30/5/1/1/2/10951PR
- 3C: NC30/5/1/1/2/10950PR
- 4C: NC30/5/1/1/2/10949PR
- 5C: NC30/5/1/1/2/10948PR

As part of the application submitted by Belton Park Trading 127 (Pty) Ltd, an Environmental Management Programme Report (EMPR) was prepared and submitted in due course to the DMR for approval. This EMPR provided details for proposed geophysical surveying (Phase I of the application) in concessions 2C, 3C, 4C and 5C only, and specified that subsequent Phases involving drill and bulk sampling would be covered in amendments to the EMPR, as and when required. The rationale behind this approach was to undertake preliminary surveys to determine the current condition of the seabed following intensive sampling and mining operations by De Beers Marine (see below). Belton Park Trading 127 (Pty) Ltd intends nonetheless to submit an addendum to their EMPR in order for the Minister to have additional elements for making an informed decision regarding granting of the exploration licences.

This document comprises an addendum to the EMPR already submitted. It provides details of the proposed drill and bulk sampling operations, assesses the impact these will have on the marine environment and provides a management programme specifically for seabed sampling. It should thus be read in conjunction with the original EMPR, which follows the same structure and paragraphing for easy cross-referencing.

It is important to note that, in accordance with the Environmental Impact Assessment (EIA) Regulations 2010 promulgated in terms of Chapter 5 of the National Environmental Management Act, a Basic Assessment or Environmental Impact Assessment process will be undertaken, and environmental authorisation obtained, before the proposed sampling operations commence. This will include further consultation with Interested and Affected Parties to inform them of the details and scheduling of the proposed sampling operations.



PART 1: GENERAL INFORMATION

1.1 BRIEF DESCRIPTION OF THE PROPOSED SAMPLING OPERATIONS

1.1.1 Prospecting Target Mineral

Target Mineral : Diamond

1.1.2 Extent of Sampling Target Area

Drill sampling will affect an estimated area not exceeding 0.1 km² or 0.003% of the total area of all four concessions.

The area to be bulk sampled can only be determined following analysis of drill samples and estimation of the potential resource.

1.1.3 Proposed Sampling Method

Drill sampling using:

- a 2.5 m diameter drill tool operated from a seabed-positioned drill-frame structure; and

Bulk sampling using:

- a seabed crawler.

1.1.4 Planned Sampling Duration

The drill sampling programme would be undertaken for a total of 10 to 40 days per annum over a period of four years for all four of the concessions.

The bulk sampling programme would be undertaken for a total of 10 to 20 days per annum over a period of three years for all four of the concessions.

PART 2: DESCRIPTION OF THE PROPOSED PROJECT

2.1 DETAILED PROJECT DESCRIPTION

The inshore portions of Concessions 2C, 3C, 4C and 5C constitute Mining Licence MPT 25/2011 and Prospecting Right MPT 399/2009, currently held by De Beers Consolidated Mines (Pty) Ltd (DBCM). De Beers Marine (Pty) Ltd, under contract to the right holder, has since 1984 been prospecting in this area, with mining being undertaken between 2007 and 2010. The areas have thus undergone extensive geophysical surveys, sampling and test mining programmes over the past 30 years. Based on these investigations and subsequent geological, geotechnical and mineralization models, the previous licence holders have identified diamond deposits overlying the Pre-Cambrian and Cretaceous bedrock. The diamonds are presumed, on the basis of common knowledge of the depositional processes involved, to be concentrated in gravels associated with storm lag beach deposits between 100 - 160 m below current sea level.

THE REGIONAL MANAGER
NORTHERN CAPE REGION



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The principal objective of the current proposed prospecting applications is to rediscover and re-estimate the potential diamond resource for possible future mining in the area.

Following interpretation of geophysical survey data obtained during Phase I of the project, drill sampling will be undertaken using the group-owned dedicated sampling vessel, the *MV EXPLORER* (Figure 1). With an overall length of 114.4 m and a gross tonnage of 4,677 t, the vessel is equipped with a subsea sampling tool (Figure 2), which can be implemented in water depths up to 180 m. The sampling tool comprises a 2.5 m diameter drill bit operated from a drill frame structure, which is launched through the moon pool of the support vessel and positioned on the seabed.



Figure 1: The proposed sampling vessel *MV Explorer*.



Figure 2: The 2.5 m diameter drill bit within the drill frame structure.

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The drill frame structure has a base of 6.5 x 6.5 m, stands 23 m high and weighs 147 tons. The drill bit can penetrate unconsolidated sediments up to 12 m depth above the rock or clay footwall. The sediments are fluidised with strong water jets and airlifted to the support vessel where they are treated in the onboard mineral recovery plant. All oversized and undersized tailings are discharged back to the sea on site.

A sample spacing of as little as 20 m can be achieved by the dynamically positioned vessel. Depending on sea and the soil's geotechnical conditions, up to 60 samples can be successfully taken per day. Between 4000 and 20,000 samples are to be taken at intervals of 500 m to 50 m in selected areas across all four concessions, thereby sampling a total area measuring from 20,000 m² to 100,000 m², since the drill has a footprint of 5 m². This amounts to at most, ~0.003% of the total seabed area of 14,376 km² of the four concessions.

Following analysis of the drill samples and establishment of a potential resource, further trench sampling may be conducted to confirm the economic viability of the resource if mined. Trenching would be undertaken by the seabed crawler, deployed off the group-owned dedicated mining vessel, the *MV Ya Toivo*. With an overall length of 150 m and a gross tonnage of 9,111 t, the vessel is equipped with a track-mounted subsea crawler (Figure 3) capable of working to depths up to 200 m below sea level. The crawler, which is fitted with highly accurate acoustic seabed navigation and imaging systems, and equipped with an anterior suction system, is lowered to the seabed and is controlled remotely from the surface support vessel through power and signal umbilical cables. Water jets in the crawler's suction loosen seabed sediments, and sorting bars filter out oversize boulders. The sampled sediments are pumped to the surface for shipboard processing. The area of seabed to be sampled by crawler can only be determined following analysis of drill samples and development of a resource model.



Figure 3: The *MV Ya Toivo* (left) and its MK2 seabed crawler (right)

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PART 3: ENVIRONMENTAL IMPACT ASSESSMENT

This chapter describes and assesses the significance of potential impacts related to the proposed drill and bulk sampling activities in Concessions 2C, 3C, 4C and 5C. All impacts are assessed according to the rating scale defined in Section 3.1. Where appropriate, mitigation measures are proposed, which could ameliorate the negative impacts or enhance potential benefits, respectively. The status of all impacts should be considered negative unless otherwise stated. The significance of impacts with and without mitigation is assessed.

3.1 ASSESSMENT PROCEDURE

The following convention was used to determine significance ratings in the assessment:

Rating	Definition of Rating
<i>Extent - defines the physical extent or spatial scale of the impact</i>	
Local	Extending only as far as the activity, limited to the site and its immediate surroundings
Regional	Limited to the South African West Coast
National	Limited to the coastline of South Africa
International	Extending beyond the borders of South Africa
<i>Duration - the time frame over which the impact will be experienced</i>	
Short-term	0 - 5 years
Medium-term	6 - 15 years
Long-term	Where the impact would cease after the operational life of the activity, either because of natural processes or by human intervention
Permanent	Where mitigation either by natural processes or by human intervention would not occur in such a way or in such time span that the impact can be considered transient
<i>Intensity - establishes whether the magnitude of the impact is destructive or benign in relation to the sensitivity of the receiving environment</i>	
Low	Where natural environmental functions and processes are not affected
Medium	Where the affected environment is altered, but natural functions and processes continue, albeit in a modified way
High	Where environmental functions and processes are altered to the extent that they temporarily or permanently cease



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Using the core criteria above, the significance of the impact is determined:

Significance - attempts to evaluate the importance of a particular impact, and in doing so incorporates extent, duration and intensity	
VERY HIGH	Impacts could be EITHER: of high intensity at a regional level and endure in the long term; OR of high intensity at a national level in the medium term; OR of medium intensity at a national level in the long term.
HIGH	Impacts could be EITHER: of high intensity at a regional level enduring in the medium term; OR of high intensity at a national level in the short term; OR of medium intensity at a national level in the medium term; OR of low intensity at a national level in the long term; OR of high intensity at a local level in the long term; OR of medium intensity at a regional level in the long term.
MEDIUM	Impacts could be EITHER: of high intensity at a local level and endure in the medium term; OR of medium intensity at a regional level in the medium term; OR of high intensity at a regional level in the short term; OR of medium intensity at a national level in the short term; OR of medium intensity at a local level in the long term; OR of low intensity at a national level in the medium term; OR of low intensity at a regional level in the long term.
LOW	Impacts could be EITHER of low intensity at a regional level, enduring in the medium term; OR of low intensity at a national level in the short term; OR of high intensity at a local level and endure in the short term; OR of medium intensity at a regional level in the short term; OR of low intensity at a local level in the long term; OR of medium intensity at a local level, enduring in the medium term.
VERY LOW	Impacts could be EITHER of low intensity at a local level and endure in the medium term; OR of low intensity at a regional level and endure in the short term; OR of low to medium intensity at a local level, enduring in the short term.
INSIGNIFICANT	Impacts with: Zero intensity with any combination of extent and duration.
UNKNOWN	Where it is not possible to determine the significance of an impact.

Status of the Impact - describes whether the impact would have a negative, positive or zero effect on the affected environment	
Positive	The impact benefits the environment
Negative	The impact results in a cost to the environment
Neutral	The impact has no effect
Probability - the likelihood of the impact occurring	
Improbable	Possibility very low either because of design or historic experience
Probable	Distinct possibility
Highly Probable	Most likely
Definite	Impact will occur regardless of preventive measures



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<i>Degree of confidence in predictions - in terms of basing the assessment on available information and specialist knowledge</i>	
Low	Less than 35% sure of impact prediction.
Medium	Between 35% and 70% sure of impact prediction.
High	Greater than 70% sure of impact prediction

Additional criteria to be considered, which could “increase” the significance rating are:

- Permanent / irreversible impacts (as distinct from long-term, reversible impacts);
- Potentially substantial cumulative effects; and
- High level of risk or uncertainty, with potentially substantial negative consequences.

Additional criteria to be considered, which could “decrease” the significance rating are:

- Improbable impact, where confidence level in prediction is high.

The relationship between the significance ratings after mitigation and decision-making can be broadly defined as follows:

<i>Significance after Mitigation - considering changes in intensity, extent and duration after mitigation and assuming effective implementation of mitigation measures</i>	
Very Low; Low	Will not have an influence on the decision to proceed with the proposed project, provided that recommended measures to mitigate negative impacts are implemented.
Medium	Should influence the decision to proceed with the proposed project, provided that recommended measures to mitigate negative impacts are implemented.
High; Very High	Would strongly influence the decision to proceed with the proposed project.

3.2 IDENTIFICATION OF IMPACTS

The potential environmental impacts to the marine environment of the sampling operations are:

- Disturbance and loss of benthic fauna in the drill sample footprints and crawler excavated trenches;
- Crushing of epifauna and infauna by the drill frame structure/ crawler tracks;
- Generation of suspended sediment plumes through discard of fine tailings;
- Smothering of benthic communities through re-settlement of discarded tailings; and
- Potential loss of equipment on the seabed.

Other potential impacts of the proposed sampling operations include:

- Marine pollution due to discharges such as deck drainage, machinery space wastewater, sewage, etc. and disposal of solid wastes from the sampling vessel; and
- Marine pollution due to fuel spills during refuelling, or resulting from collision or shipwreck.
- Interaction with recreational users in the sampling areas;
- Interaction with petroleum exploration licence block holders; and



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- Interaction with local fishing vessels that traverse the licence areas in all instances during the periods that sampling operations are being undertaken.

As these have all been covered in the assessment of impacts associated with geophysical prospecting, they will not be repeated here.

3.3 ASSESSMENT OF IMPACTS AS A RESULT OF SAMPLING OPERATIONS

3.3.1 Disturbance and loss of benthic fauna

Description of Impact

The proposed sampling activities are expected to result in the disturbance and loss of benthic macrofauna through removal of sediments by the drill bit and crawler suction head. Each drill sample will remove a surface area of 5 m². At a penetration of 8 m this would result in the removal of 40 m³ of sediment per sample. It is proposed to take in the order of 4,000 to 20,000 drill samples in the four concessions, thereby impacting a total cumulative area of between 20,000 m² (0.02 km²) and 100,000 m² (0.1 km²) and removing at most 800,000 m³ of sediment. The area of seabed disturbed during bulk sampling by crawler can only be determined following analysis of drill samples and development of the inferred resource model.

Assessment

As benthic fauna typically inhabit the top 20 - 30 cm of sediment, the sample operations would result in the elimination of the benthic infaunal and epifaunal biota in the sample footprints. As many of the macrofaunal species serve as a food source for demersal and epibenthic fish, cascade effects on higher order consumers may result. However, considering the available area of similar habitat on the continental shelf of the West Coast, this reduction in benthic biodiversity can be considered negligible and impacts on higher order consumers are thus unlikely.

The ecological recovery of the disturbed seafloor is generally defined as the establishment of a successional community of species that achieves a community similar in species composition, population density and biomass to that previously present (Ellis 1996). The rate of recovery (recolonisation) depends largely on the magnitude of the disturbance, the type of community that inhabits the sediments in the sampling area, the extent to which the community is naturally adapted to high levels of sediment disturbances, the sediment character (grain size) that remains following the disturbance, and physical factors such as depth and exposure (waves, currents) (Newell *et al.* 1998). Generally, recolonisation starts rapidly after a sampling/mining disturbance, and the number of individuals (*i.e.* species density) may recover within short periods (weeks). Opportunistic species may recover their previous densities within months. Long-lived species like molluscs and echinoderms, however, need longer to re-establish the natural age and size structure of the population. Biomass therefore often remains reduced for several years (Kenny & Rees 1994, 1996; Kenny *et al.* 1998).

The structure of the recovering communities is typically also highly spatially and temporally variable reflecting the high natural variability in benthic communities at depth. The community developing after an impact depends on (1) the nature of the impacted substrate, (2) differential re-settlement of larvae in different areas, (3) the rate of sediment movement back into the disturbed areas and (4) environmental factors such as near-bottom dissolved

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oxygen concentrations etc. For the current project, the proposed sampling would be undertaken in depths beyond the wave base (>40 m) and near-bottom sediment transport is thus expected to be less than in shallower waters affected by swell. Excavations are therefore expected to have slow infill rates and may persist for extended periods (years). Long-term or permanent changes in grain size characteristics of sediments may thus occur, potentially resulting in a shift in community structure if the original community is unable to adapt to the new conditions. Depending on the texture of the sediments at the sampling target sites, slumping of adjacent unconsolidated sediments into the excavations can, however, be expected over the very short-term. Although this may result in localised disturbance of macrofauna associated with these sediments and alteration of sediment structure, it also serves as a means of natural recovery of the excavations.

Natural rehabilitation of the seabed following sampling operations, through a process involving influx of sediments and recruitment of invertebrates, has been demonstrated on the southern African continental shelf (Penney & Pulfrich 2004; Steffani 2007, 2009, 2010, 2012). Recovery rates of impacted communities were variable and dependent on the sampling /mining approach, sediment influx rates and the influence of natural disturbances on succession communities. Results of on-going research on the southern African West Coast suggest that differences in biomass, biodiversity or community composition following mining with drill ships or crawlers below the wave base may endure beyond the medium term (6-15 years) (Parkins & Field 1998; Pulfrich & Penney 1999; Steffani 2012). Savage *et al.* (2001), however, noted similarities in apparent levels of disturbance between mined and unmined areas off the southern African west coast, and areas of the Oslofjord in the NE Atlantic Ocean, which is known to be subject to periodic low oxygen events. Similarly, Pulfrich & Penney (1999) provided evidence of significant recruitments and natural disturbances in recovering succession communities off southern Namibia. These authors concluded that the lack of clear separation of impacted from reference samples suggests that physical disturbance resulting from sampling or mining may be no more stressful than the regular naturally occurring anoxic events typical of the West Coast continental shelf area.

The medium-intensity negative impact of sediment removal during sampling operations and its effects on the associated communities is unavoidable, but as it will be extremely localised and constitute only about 0.003% of the overall area of the four concessions, the impact can confidently be rated as being **VERY LOW**.

Mitigation

No mitigation measures are possible, or considered necessary for the direct loss of macrobenthos due to drill and bulk sampling. However, sampling activities of any kind should avoid rocky outcrop areas or other identified sensitive habitats in the concession areas.



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<i>Disturbance and loss of benthic fauna</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Medium-term	Medium-term
Intensity	Medium	Medium
Significance	Very Low	Very Low
Status	Negative	Negative
Probability	Definite	Definite
Confidence	High	High
Nature of Cumulative impact	No cumulative impacts are anticipated	
Degree to which impact can be reversed	Reversible	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Very Low	

3.3.2 Crushing of benthic fauna

Description of Impact

Some disturbance or loss of benthic biota adjacent to the sample footprint can also be expected as a result of the placement on the seabed of the drill-frame structure and the seabed crawler tracks. Epifauna and infauna beneath the footprint of the frame/crawler tracks would be crushed by the weight of the equipment resulting in a reduction in benthic biodiversity.

Assessment

Considering the available area of similar habitat on the continental shelf of the West Coast, the reduction in benthic biodiversity through crushing can be considered negligible. The impacts would be of medium intensity but highly localised, and short-term as recolonization would occur rapidly from adjacent undisturbed sediments. The potential impact is consequently deemed to be of **VERY LOW** significance.

Mitigation

No mitigation measures are possible, or considered necessary for the indirect loss due to crushing by the drill-frame structure and the seabed crawler tracks. However, sampling activities of any kind should avoid rocky outcrop areas or other identified sensitive habitats in the concession areas.



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<i>Crushing of benthic fauna</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Short-term	Short-term
Intensity	Medium	Medium
Significance	Very Low	Very Low
Status	Negative	Negative
Probability	Definite	Definite
Confidence	High	High
Nature of Cumulative impact	No cumulative impacts are anticipated	
Degree to which impact can be reversed	Fully Reversible	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Very Low	

3.3.3 Generation of suspended sediment plumes

Description of Impact

The sampled seabed sediments are pumped to the surface and discharged onto sorting screens on the sampling vessel. The screens separate the fine sandy silt and large gravel, cobbles and boulders from the size fraction of interest, the 'plantfeed' (usually 2 - 20 mm). The fine tailings are immediately discarded overboard where they form a suspended sediment plume in the water column which dissipates with time. The 'plantfeed' is mixed with a high density ferrosilicon (FeSi) slurry and pumped under pressure into a Dense Medium Separation (DMS) plant resulting in a high density concentrate. The majority of the ferrosilicon is magnetically recovered for re-use in the DMS plant and the fine tailings (-2 mm) from the DMS process are similarly deposited over board. Furthermore, fine sediment re-suspension by the sampling tools will generate suspended sediment plumes near the seabed.

Assessment

Distribution and re-deposition of suspended sediments are the result of a complex interaction between oceanographic processes, sediment characteristics and engineering variables that ultimately dictate the distribution and dissipation of the plumes in the water column. Ocean currents, both as part of the meso-scale circulation and due to local wind forcing, are important in distribution of suspended sediments. Turbulence generated by surface waves can also increase plume dispersion by maintaining the suspended sediments in the upper water column. The main effect of plumes is an increase in water column turbidity, leading to a reduction in light penetration with potential adverse effects on the photosynthetic capability of phytoplankton. Poor visibility may also inhibit pelagic visual predators. Egg and/or larval development may be impaired through high sediment loading. Benthic species that may be impacted by near-bottom plumes include bivalves and crustaceans. Suspended sediment effects on juvenile and adult bivalves occur mainly at the sublethal level with the predominant response being reduced filter-feeding efficiencies at concentrations above about 100 mg/l.



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Lethal effects are seen at much higher concentrations (>7,000 mg/l) and at exposures of several weeks. Negative impacts may also occur when heavy metals or contaminants associated with fine sediments are remobilised.

In general though, the low-intensity negative impact of suspended sediments generated during sampling and onboard processing operations and its effects on the associated communities is extremely localised and short-term. The suspended sediments in plumes settle fairly rapidly and water sampling undertaken by De Beers Marine in the ML3 area has confirmed that contaminant levels in plumes are well below water quality guideline levels (Carter 2008). The impacts from suspended sediment plumes can confidently be rated as being **VERY LOW**.

Mitigation

No mitigation measures are possible, or considered necessary for the discharge of fine tailings from the sampling vessel.

<i>Suspended sediment plumes</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Short-term	Short-term
Intensity	Low	Low
Significance	Very Low	Very Low
Status	Negative	Negative
Probability	Definite	Definite
Confidence	High	High
Nature of Cumulative impact	None	
Degree to which impact can be reversed	Fully Reversible	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Very Low	

3.3.4 Smothering of benthos in redepositing tailings

Description of Impact

The sampled seabed sediments are pumped to the surface and discharged onto sorting screens, which separate the large gravel, cobbles and boulders and fine silts from the 'plantfeed'. The oversize tailings are discarded overboard and settle back onto the seabed beneath the vessel.

Assessment

Following discharge overboard of the fine and coarse tailings, these settle back onto the seabed where they can result in smothering of benthic communities adjacent to the sampled areas. Smothering involves physical crushing, a reduction in nutrients and oxygen, clogging of feeding apparatus, as well as affecting choice of settlement site, and post-settlement survival. In general terms, the rapid deposition of the coarser fraction from the water column is likely to



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have more of an impact on the soft-bottom benthic community than gradual sedimentation of fine sediments to which benthic organisms are adapted and able to respond. However, this response depends to a large extent on the nature of the receiving community. Studies have shown that some mobile benthic animals are capable of actively migrating vertically through overlying sediment thereby significantly affecting the recolonization of impacted areas and the subsequent recovery of disturbed areas of seabed (Maurer *et al.* 1979, 1981a, 1981b, 1982, 1986; Ellis 2000; Schratzberger *et al.* 2000; but see Harvey *et al.* 1998; Blanchard & Feder 2003). In contrast, sedentary communities may be adversely affected by both rapid and gradual deposition of sediment. Filter-feeders are generally more sensitive to suspended solids than deposit-feeders, since heavy sedimentation may clog the gills. Impacts on highly mobile invertebrates and fish are likely to be negligible since they can move away from areas subject to redeposition.

Of greater concern is that sediments discarded during sampling operations impact rocky-outcrop communities adjacent to sampling target areas potentially hosting sensitive deep-water coral communities. As deep-water corals tend to occur in areas with low sedimentation rates (Mortensen *et al.* 2001), these benthic suspension-feeders and their associated faunal communities are likely to show particular sensitivity to increased turbidity and sediment deposition associated with tailings discharges. Exposure of elevated suspended sediment concentrations can result in mortality of the colony due to smothering, alteration of feeding behaviour and consequently growth rate, disruption of polyp expansion and retraction, physiological and morphological changes, and disruption of calcification. While tolerances to increased suspended sediment concentrations will be species specific, concentrations as low as 100 mg/l have been shown to have noticeable effects on coral function (Roger 1999). As high proportions of hard ground have been identified between 180 m and 480 m depth in the concession areas, and video footage from southern Namibia and to the south-east of Child's Bank has identified vulnerable communities including gorgonians, bryozoans and octocorals, the potential occurrence of such sensitive deep-water ecosystems in the concession areas cannot be excluded.

Considering the available area of unconsolidated seabed habitat on the continental shelf of the West Coast, the reduction in biodiversity of macrofauna associated with unconsolidated sediments through smothering can be considered negligible. The impacts would be of low intensity but highly localised, and short-term as recolonization would occur rapidly. The potential impact of smothering on communities in unconsolidated habitats is consequently deemed to be of **VERY LOW** significance. In the case of rocky outcrop communities, however, impacts would be of medium intensity and highly localised, but potentially enduring over the medium-term due to their slow recovery rates. The potential impact of smothering on rocky outcrop communities is consequently deemed to be of **LOW** significance.

Mitigation

No mitigation measures are possible, or considered necessary for the loss of macrobenthos due to smothering by redepositing sediments. However, sampling activities of any kind should avoid rocky outcrop areas or other identified sensitive habitats in the concession areas.



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<i>Redeposition of discarded sediments on soft-sediment macrofauna</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Short-term	Short-term
Intensity	Low	Low
Significance	Very Low	Very Low
Status	Negative	Negative
Probability	Definite	Definite
Confidence	High	High
Nature of Cumulative impact		
	None	
Degree to which impact can be reversed	Fully Reversible	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Very Low	

<i>Redeposition of discarded sediments: smothering effects on rocky outcrop communities</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Medium-term	Short-term
Intensity	Medium	Low
Significance	Low	Very Low
Status	Negative	Negative
Probability	Definite	Definite
Confidence	High	High
Nature of Cumulative impact		
	None	
Degree to which impact can be reversed	Fully Reversible	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Very Low	



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3.3.5 Potential loss of Equipment

Description of Impact

Equipment such as anchors and sampling tools are occasionally lost on the seabed, although every effort is usually made to retrieve them.

Assessment

If left on the seabed, large items such as anchors and sampling tools would form a hazard to other users. Although they would eventually be colonised by benthic organisms typical of hard seabeds, every effort should be made to remove such foreign objects. The low-intensity negative impact of lost equipment would be extremely localised but if not retrieved would endure permanently and would thus be rated as being of **LOW** significance.

Mitigation

The positions of all lost equipment must be accurately recorded in a hazards database, and reported to maritime authorities. Every effort should be made to remove lost equipment.

<i>Equipment lost to the seabed</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Permanent	Short-term
Intensity	Low	Low
Significance	Low	Very Low
Status	Negative	Negative
Probability	Definite	Definite
Confidence	High	High
Nature of Cumulative impact		
	None	
Degree to which impact can be reversed	Fully Reversible	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Very Low	

3.3.5 Potential disturbance of archaeological, paleontological or rare geological sites

Description of Impact

Shipwrecks and other paleontological or rare geological objects may be damaged or destroyed by the sampling tools.

Assessment

As the West Coast contains a wealth of shell middens, cave deposits, historical artefacts, paleontological sites and shipwrecks close to the shore, the occurrence of such sites further offshore cannot be excluded. In fact, Stevenson & Bamford (2003) describe an abundance of *in-situ* fossilised yellowwood tree trunks in an ~2 km² area of seabed outcrop in 136-140 m



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depth, about 32 km offshore in Concession 4C. The fossilized wood and accompanying cold water coral colonies are considered vulnerable to any activities that could impact on the seabed (FAO 2006; Rogers *et al.* 2008; FAO 2009; Sink *et al.* 2012a, b). Following application of the Conservation on Biological Diversity's (CBD) Ecologically or Biologically Significant marine Areas (EBSA) criteria, the area was identified as unique, and presented at the CBD Southeast Atlantic Ocean regional workshop for consideration as an EBSA warranting formal conservation (Sink & Kirkman 2013). Every effort should thus be made to avoid any seabed sampling activities in this area, as removal of seabed sediments during sampling operations may destroy or damage artefacts contained therein, leading to loss of unique historical information. The high-intensity negative impact resulting through disturbance or damage to shipwreck and other paleontological or rare geological material would be extremely localised. As damage would be permanent the impact would be of **HIGH** significance. However, as the likelihood of the impact occurring is extremely low, the significance of the impact would reduce to **MEDIUM**.

Mitigation

Avoid sampling in the outcrop area in Concession 4C identified as harbouring the fossilised forest.

If shipwreck material is encountered during the course of sampling in any of the concession areas, the following mitigation measure should be applied:

- Where possible recover any artefacts and take photographs of them, noting the date, time, location and types of artefacts found.
- Inform the Appropriate Authority (SAHRA).

<i>Damage to archaeological, paleontological or rare geological sites</i>		
	Without Mitigation	Assuming Mitigation
Extent	Local	Local
Duration	Permanent	Permanent
Intensity	High	Low
Significance	Medium	Low
Status	Negative	Negative
Probability	Improbable	Improbable
Confidence	Medium	Medium
Nature of Cumulative impact	None	
Degree to which impact can be reversed	Not Reversible	
Degree to which impact may cause irreplaceable loss of resources	N/A	
Degree to which impact can be mitigated	Very Low	



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PART 6: ENVIRONMENTAL MANAGEMENT PROGRAMME

6.1 OUTLINE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

This Environmental Management Programme (EMP) has been prepared in accordance with the guidelines of the Mineral and Petroleum Resources Development Act and Regulations, 2002 (Act No. 28 of 2002) as well as the Environmental Regulations published under the National Environmental Management Act, 1998 (Act No. 107 of 1998). It supplements the EMP (Part 6) submitted for geophysical prospecting in the concession areas. For ease of inclusion, the section numbering in this Part of the addendum thus reflects that of the EMP submitted in September 2013.

6.3 ENVIRONMENTAL OBJECTIVES

The environmental objectives of this EMP are to:

- Develop and implement environmental management measures to minimize the negative environmental impacts and optimise the positive environmental impacts of the proposed sampling operations in Concessions 2C, 3C, 4C and 5C;
- Address all environmental legal requirements applicable to the proposed sampling operations, including compilation of an environmental performance report and (when necessary) a closure report;
- Minimise disruption to other legitimate users of the sea by respecting their rights;
- Effectively manage waste flows on the survey vessel to minimise marine and air pollution, promoting reuse/recycling, and being conservative in use of natural resources;
- Have appropriate systems in place to deal with emergencies; and
- Make a contribution to the South African economy.

The EMP compiled for sampling activities is set out in Table 6.1. Only those issues specific to sampling operations are addressed and generic issues regarding EMP Monitoring and Performance Assessments and Socio-economic factors are not repeated here. The numbering of the specific items is consistent with that in Table 6.1 of the EMP compiled for geophysical prospecting.

The fundamental elements of this management programme are to be implemented at all times, as and when appropriate.



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Table 6.1: Environmental Management Programme for proposed sampling operations in various concession areas off the west coast of South Africa.

6.2 NATURAL ENVIRONMENTAL FACTORS			
Item No.	Action Plans & Control Measures	Responsibilities	Timing
6.2.5 Sampling excavations/Benthic community impacts	<ul style="list-style-type: none"> Ensure that the sampling vessel maintains an accurate record of the position and date of all samples taken in order to calculate and report on annual cumulative seabed disturbance. These data should be used in the planning of any future benthic sampling programmes undertaken as part of a mining application in the concession areas. Ensure that the benthic monitoring sites established by De Beers Marine as part of their long term benthic monitoring programme are not disturbed by sampling operations in any way (even by adjacent fallout of discarded tailings), until their planned post-closure surveys have been successfully completed. Consult with the Department of Environmental Affairs - Oceans and Coast regarding issues of benthic biodiversity in the licence areas. Cooperate with the South African National Biodiversity Institute regarding the allocation of conservancy areas on the west coast. 	Manager	Ongoing
6.2.6 Loss of ferrosilicon in tailings	<ul style="list-style-type: none"> Maintain records of all FeSi used/lost onboard with tailings. Maximise retrieval of FeSi by using shell-crushing equipment when operating in shelly substrates. 	Manager	Ongoing

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6.3. SOCIOECONOMIC FACTORS			
Task No.	Action Plans & Control Measures	Responsibilities	Timing
6.3.1 Environmental Compliance	<ul style="list-style-type: none"> In accordance with the Environmental Impact Assessment (EIA) Regulations 2010 promulgated in terms of Chapter 5 of the National Environmental Management Act, ensure that a Basic Assessment or Environmental Impact Assessment process is undertaken before the proposed sampling operations commence. As part of the EIA process, inform all Interested and Affected Parties of the proposed sampling operations. Sampling may not commence until Environmental Authorisation has been obtained. 	Manager	At the end of Phase I
6.3.2 Communication with Interested and Affected Parties	<ul style="list-style-type: none"> Through normal maritime communication channels, Radio Navigation Warnings, Notices to Mariners and other notifications keep the following interested and affected parties updated on the sampling activities: <ul style="list-style-type: none"> Overlapping and neighbouring users with delineated boundaries in the oil and gas exploration and production industries and any prospecting and mining industries; SAN Hydrographic Office (Silvermine); Fishing industry (including Association of Small Hake Industries, SA Deep Sea Trawling Industry Association, SA Pelagic Fishing Industry Association, SA Commercial Linefish Association, SA Tuna Longline Association, and SA West Coast Rock Lobster Association); Government departments with jurisdiction over marine activities, particularly DEA, DAFF: MRM, PASA and DMR; and SAMSA and local Port Captains. 	Manager	14 days prior to operations
6.3.3 Presence of vessel / impact of prospecting activities on other industries	<ul style="list-style-type: none"> Liaise with Alexkor, Transhex, Sunbird Energy, PetroSA and Thombo Petroleum regarding sampling plans, including information regarding location of sampling operations, specific starting and finishing dates, as well as progress of operation. Inform the West Coast Rock Lobster Sea Management Association if any activities are activated within the 100 m contour line. Ensure that the Vessel master records sightings of and interactions with other vessels to note potential conflicts over rights of passage and access to resources. 	Manager	During Work Plan Preparation & when appropriate thereafter
		Manager	Per event
		Manager	Per event

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6.3. SOCIOECONOMIC FACTORS			
Task No.	Action Plans & Control Measures	Responsibilities	Timing
6.3.4 Heritage sites	<ul style="list-style-type: none"> • Avoid sampling in the the outcrop area in Concession 4C identified as harbouring the fossilised forest. • If shipwreck material is encountered during the course of sampling: <ul style="list-style-type: none"> - Inform the designated person ashore or the environmental manager; - Where possible recover any artefacts and take photographs of them, noting the date, time, location and types of artefacts found; - Inform the Appropriate Authority (SAHRA). - If material is encountered during sampling that can potentially be declared a heritage object under the National Heritage Resources Act 25 of 1999 (e.g. paleontological or rare geological objects), an attempt must be made to establish the nature of the material, and (where applicable) the requirements of the Act and its Regulations must be complied with. 	Manager	Per event
6.4.5 Incidental loss of equipment - obstacles	<ul style="list-style-type: none"> • Maintain hazards database listing the type of gear lost to the seabed and/or in the sampling area with the dates of loss and locations and where applicable, the dates of retrieval. • If requested, report these data to the relevant authority. 	Manager	Per event
6.5.6 Inform relevant parties of survey completion	<ul style="list-style-type: none"> • Inform all key stakeholders that the sampling vessel has completed operations as per normal maritime communication practice. 	Manager	Within two weeks of completion

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PART 7: CONCLUSIONS AND RECOMMENDATIONS

7.1 CONCLUSIONS

No fatal flaws have been identified during the Environmental Impact Assessment phase for proposed sampling operations as part of the EMPR. Environmental impacts associated with the sampling operations are summarised below:

Potential Impact	Significance	
	Without Mitigation	With Mitigation
Impacts of Sampling Operations:		
Disturbance and loss of benthic fauna	Very Low	Very Low
Crushing of benthic fauna	Very Low	Very Low
Suspended sediment plumes	Very Low	Very Low
Redeposition of discarded sediments on soft-sediment macrofauna	Very Low	Very Low
Redeposition of discarded sediments on rocky outcrop communities	Low	Very Low
Equipment lost to the seabed	Low	Very Low
Disturbance of archaeological, paleontological or rare geological sites	Medium	Low

Most of the potential impacts associated with the proposed sampling activities would occur at the seabed. Due to the insignificant area of seabed disturbed relative to the total area of the concessions, most of the impacts of sampling are considered to be of **VERY LOW** to **LOW** significance. The impacts identified above, are addressed in the EMPR. The process followed meets the requirements of the MPRDA to ensure that the regulatory authorities receive sufficient information to enable informed decision-making.

7.2 RECOMMENDATIONS

7.2.1 Compliance with NEMA

In accordance with the Environmental Impact Assessment (EIA) Regulations 2010 promulgated in terms of Chapter 5 of the National Environmental Management Act, a Basic Assessment or Environmental Impact Assessment process must be undertaken, and environmental authorisation obtained, before the proposed sampling operations can commence. This will include further consultation with Interested and Affected Parties to inform them of the details and scheduling of the proposed sampling operations.



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7.2.2 Compliance with EMP and MARPOL 73/78 standards

All phases of the proposed project must comply with the Environmental Management Programme presented in Chapter 6. Furthermore, the sampling vessel must ensure compliance with MARPOL 73/78 standards.

7.2.2 Notification and communication with key Stakeholders

- Notify Sunbird Energy, PetroSA, Thombo Petroleum, Alexkor, De Beers Consolidated Mines, Transhex and its contractors, as well as any other operators, prior to the commencement of sampling activities;
- Liaise with all petroleum exploration operators to ensure that there is no overlapping of activities in the same area over the same time period;
- Prior to the commencement of sampling activities, notify relevant bodies including: DMR, South African Maritime Safety Authority (SAMSA), the South African Navy (SAN) Hydrographic Office, relevant Port Captains and DAFF: MRM. These bodies must be notified of the navigational coordinates of any location prior to commencement of such activities;
- Set up communication channels with I&APs. This would involve pre-sampling notifications via email. Key stakeholders should include:
 - Fishing industry (Association of Small Hake Industries, SA Deep Sea Trawling Industry Association, SA Pelagic Fishing Industry Association, SA Commercial Linefish Association, SA Tuna Longline Association, and SA West Coast Rock Lobster Association);
 - Marine mining / prospecting industry (Transhex, Alexkor); and
 - Authorities (SAN Hydrographic office, DAFF: MRM, DMR, SAMSA and relevant Port Captains).
- Appropriate notices should be distributed timeously to mariners providing:
 - The co-ordinates of the sampling activities;
 - An indication of the timeframes of the sampling operations; and
 - Reports on the location of sampling vessels.



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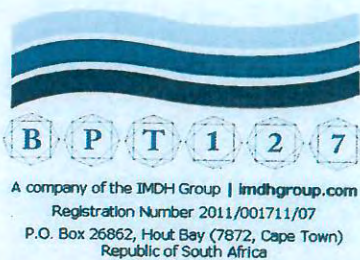
UNDERTAKING

I, PETER LOOIJEN, the undersigned and duly authorized thereto by BELTON PARK TRADING 127 (Pty) Ltd (company) have studied and understand the contents of this document¹ in its entirety and hereby duly undertake to adhere to the conditions as set out therein including the amendment(s) agreed to by the Regional Manager and approved on

Signed at Cape Town this 9th day of June 2014

[Handwritten Signature]
.....
Signature of applicant

DIRECTOR
.....
Designation



APPROVAL

Approved in terms of Section 39(4) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)

Signed at Kimberley this *03*..... day of *October* 2014.

[Handwritten Signature]
.....
REGIONAL MANAGER

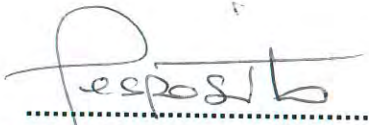
REGION: *northern Cape*.....

¹ Namely, the Environmental Management Programme relating to the following applications:
NCS 30/5/1/1/3/2/1(10948)PR Belton Park Trading 127 (Pty)Ltd
NCS 30/5/1/1/3/2/1(10949)PR
NCS 30/5/1/1/3/2/1(10950)PR
NCS 30/5/1/1/3/2/1(10951)PR

UNDERTAKING

I, PAOLO ESPOSITO.....the undersigned and duly authorized thereto by THE BOARD OF BPT 127 (Pty) Ltd ~~Company/Close Corporation/Municipality~~ (Delete that which is not applicable) have studied and understand the contents of this document in its entirety and hereby duly undertake to adhere to the conditions as set out therein including the amendment(s) agreed to by the Acting Regional Manager and approved on 03 Oct. 2014.....

Signed at Kimberley this 3rd.....day of October..... 2014


Signature of company

Special Counsel
Designation

APPROVAL

Approved in terms of Section 39(4) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)

Signed at Kimberley.....this 03.....day of October.....2014


REGIONAL MANAGER

REGION: northern Cape.....