DEBMARINE
NAMIBIA

STATEMENT ON ENVIRONMENTAL IMPACTS OF DIAMOND RECOVERY BY DEBMARINE NAMIBIA IN THE ATLANTIC 1 MINING LICENCE AREA

Dated 14 July 2022

Endorsements

NAME	SIGNATURE
Prof George M Branch *(Biological Sciences, University of Cape Town)*	
Dr Hilkka O.N. Ndjaula *(Fisheries & Aquatic Sciences, University of Namibia)*	
Dr Andrea Pulfrich *(Director of Pisces Environmental Services)*	
Dr Natasha Karenyi *(Biological Sciences, University of Cape Town)*	
Dr Barry Clark *(Director of Anchor Environmental)*	

DEBMARINE NAMIBIA

STATEMENT ON ENVIRONMENTAL IMPACTS OF DIAMOND RECOVERY BY DEBMARINE NAMIBIA IN THE ATLANTIC 1 MINING LICENCE AREA

Debmarine Namibia recovers alluvial diamonds from the Atlantic 1 Mining Licence Area, located on the continental shelf of Namibia in the Benguela Upwelling System (BUS), immediately north of the Orange River Mouth. Diamonds are found in gravel deposits on the seafloor ,typically covered with a layer of fine sediment that varies from a few centimetres up to 20m in thickness. Marine recovery entails the removal of the seabed sediment and gravel through a transport system , for processing onboard the vessel, where the diamonds are extracted, and the remaining sediment (99%) is discharged back into the sea. Most of the sediment settles rapidly back to the seafloor (within a few hours) but finer sediments can remain in suspension for longer periods (days). Diamond recovery is currently conducted in water depth ranging from 90 to 140m and is focussed in areas where overburden is less than 4m thick (average thickness = 0.5m). No hazardous chemicals are used during the diamond recovery process.

Debmarine Namibia, supported by staff and students from local universities and independent scientists, has been monitoring and studying impacts of diamond recovery on the marine environment in Atlantic 1 since 1994. The monitoring activities are guided by a Marine Scientific Advisory Committee that was established in 2012 and comprises independent marine scientists from academia and industry. The primary aims of the monitoring programme are to assess the impact of diamond recovery processes on the benthic habitat and associated communities in the context of natural variability, and to monitor the seabed and benthic community recovery after disturbance.

A summary of the key findings of the monitoring programme are presented below.

1. The Atlantic 1 Mining Licence Area, 5,987 square kilometres in extent (only 1.2% of BCLME), is located in the Benguela Upwelling system which stretches from the southern Cape (South Africa) to Angola. The Benguela Upwelling system is regarded as one of the most productive marine ecosystems in the world. Abundance and biomass of marine species in the region is high, but species diversity is low, which is typical for eastern boundary upwelling systems.
2. The marine ecosystem has a high level of natural variability in both space and time. The main drivers of this are:
    - Water depth,
    - Proximity to Orange River Mouth,
    - Seabed type (soft or rocky/hard) and sediment type (grain size and composition),
    - Large regional-scale events such as freshwater and sediment outflow from the Orange River during floods or storms,
    - Episodic storm events,
    - Changes in wind-driven upwelling intensity, and
    - Natural low oxygen events and periodic hydrogen sulphide eruptions.
3. Diamond recovery constitutes a major localised disturbance to seabed habitats in Atlantic 1, and although the organisms that occur in this area are well adapted to high levels of natural variability, diamond recovery is expected to result in complete mortality of all non-mobile fauna and flora living in and on the substratum.

4. Recovery (infilling) of the seabed habitats occurs naturally at a rate dependent on availability and supply rates of sediment which is related to:
    - The depth of the seafloor at which diamond recovery takes place,
    - The depth of sediment removal,
    - The extent of past and current diamond recovery activities in surrounding areas,
    - Distance from Orange River sediment supply, and
    - Ongoing diamond recovery activities at the site or in its vicinity.
5. Where sediment infill rates are high (as is the case close to the Orange River Mouth and in the shallower parts of Atlantic 1), seabed recovery can take as little as 2 years. However, in areas of slower sediment infill, recovery can take longer, in the order of 3 to 12 years.
6. Seabed organisms begin recolonizing depleted areas as soon as sufficient sediment has accumulated on the seafloor, within a few weeks or months after diamond recovery is complete. Full recovery of the seabed communities, defined as the reestablishment of a functionally equivalent community to that present prior to diamond recovery or at comparable control sites, is usually only achieved once the habitat has fully recovered. Recovery of the benthic habitats and recolonisation by benthic organisms are both made easier by the patchwork nature of the diamond recovery operations, which ensures a good supply of sediment and new recruits in close proximity.
7. As at the end of 2021, less than 2% of Atlantic 1 has been disturbed by diamond recovery operations (0.024% of BCLME). This, coupled with the relatively rapid rates of recovery of the affected benthic habitats and communities, implies that impacts of diamond recovery are low.
8. Indirect impacts of diamond recovery on marine environment have received less attention than the direct impacts but are currently being investigated. This include the quantification of impacts of sediment plumes on pelagic and the benthic ecosystems, impacts on rocky substrata adjacent to the targeted mineral deposits, and remobilisation of carbon and trace metals from marine sediments. None of these are expected to be of significant concern though.

Endorsed by Dr Barry Clark, Director of Anchor Environmental, the company that conducts the seabed monitoring for Debmarine Namibia, and the independent members of the Debmarine Namibia Marine Scientific Advisory Committee:
Prof George Branch (Biological Sciences, University of Cape Town)
Dr Hilkka Ndjaula (Fisheries & Aquatic Sciences, University of Namibia)
Dr Natasha Karenyi (Biological Sciences, University of Cape Town)
Dr Andrea Pulfrich (Director of Pisces Environmental Services)