



**APPLICANT: *MOONSTONE DIAMONDS MARKETING (PTY)  
LTD - FORMERLY KNOWN AS TRANS HEX OPERATIONS  
(PTY) LTD***

**ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT:  
ENVIRONMENTAL AUDIT REPORT FOR SEA  
CONCESSIONS 11 (a), 12 (a), and 13 (a) AND  
CORRESPONDING SURF ZONES AND ADMIRALTY STRIP**

**DMRE REFERENCES:**

**WC10066MR, WC10130MR – WC 10138MR**

**DATE OF AUDIT: 05 DECEMBER 2021**

**ENVIRONMENTAL PERFORMANCE ASSESSMENT REPORT OF DIAMOND MINING ACTIVITIES ON VARIOUS FARMS AND SEA CONCESSIONS 11A,12A AND 13A, IN THE MAGISTERIAL DISTRICT OF VANRHYSORP, WESTERN CAPE REGION.**

**DOCUMENT CONTROL SHEET**

	<b>NAME</b>	<b>COMPANY</b>	<b>DESIGNATION</b>	<b>DATE</b>
<b>Prepared by</b>	Taole Matsoko	Azamath Projects Consulting	Projects Director	05 <sup>th</sup> December 2021
<b>Reviewed by</b>	Abegail Makgato	Moonstone Diamonds Marketing (Pty) Ltd	Environmental Management	04 January 2022
<b>Approved by</b>	David Jordan	Moonstone Diamond Marketing (Pty) Ltd	Mine Manager	17 January 2022
<b>Received by</b>	Thabelo Nempumbuluni	Department of Mineral Resources and Energy		

## TABLE OF CONTENTS

<b>1. INTRODUCTION.....</b>	<b>Page 4</b>
1.1 Project locality	
1.2 Project description	
1.3 Project background	
<b>2. LEGAL REQUIREMENT.....</b>	<b>Page 14</b>
<b>3. AUDIT PROCESS.....</b>	<b>Page 15</b>
3.1 Audit Team	
3.2: Auditor Qualifications	
<b>4. TAILINGS CHARACTERISTICS.....</b>	<b>Page 16</b>
<b>5. PERFORMANCE ASSESSMENT.....</b>	<b>Page 16</b>
5.1 Period applicable	
5.2 The scope of assessment	
5.3 Procedure used	
5.4 Environmental Operational Indicator	
<b>6. RISK MANAGEMENT.....</b>	<b>Page 21</b>
6.1 Criteria used for evaluation	
6.2 Environmental Performance Indicator	
<b>7. MONITORING .....</b>	<b>Page 29</b>
7.1 Intepretetion from monitoring	
7.2 Result of assessment	
7.3 Photographic record of areas working areas	
<b>8. RECOMMENDATION ON MITIGATION FOR NON- COMPLIANCE.....</b>	<b>Page 34</b>
<b>9. REVIEW OF QUANTUM FOR FINANCIAL PROVISION..</b>	<b>Page 35</b>
<b>10. OBJECTIVE FOR CLOSURE.....</b>	<b>Page 35</b>

## 1. INTRODUCTION

Environmental Performance Assessment (EPA) is defined as a management tool used to set specific, measurable goals and objectives to various stages of environmental management processes, including planning, implementation, monitoring, measurement and management review. The use of EPA is a process of measurement and analysis of factors, which have direct and indirect impacts on the environment (Wathey and O'Reilly, 2000). The EPA helps to improve the environmental performance by providing information on achievement in environmental policies, objectives, targets, actions, and responsibilities in organizations and provide continuous information on the implementation and operation of the programme.

In terms of the Regulation 55 of the MPRDA, 2002, read with NEMA Section 24Q as well as Regulation 34 of 2014 EIA regulations required thus:

*As part of the general terms and conditions for a prospecting right, mining right or mining permit and in order to ensure compliance with the approved environmental management programme or plan and to assess the continued appropriateness and adequacy of the environmental management programme or plan, the holder of such right must-*

- (a) conduct monitoring on a continuous basis;*
- (b) conduct performance assessments of the environmental management programme or plan as required; and*
- (c) compile and submit a performance assessment report to the Minister to demonstrate adherence to sub-regulation (b).*

Azamath Projects Consulting (Pty) Ltd was appointed as independent environmental consultants by Moonstone Diamonds Marketing (Pty) Ltd, for the mining activities of Moonstone Diamonds Marketing, De punt mine. It is an audit of the performance of the Environmental Management Programmme (EMP) for the mining activities of Sea Concessions 11(a), 12(a) and 13(a) and corresponding surf-zones and admiralty strips, which was approved in March 2003 and was amended in 2005. However, Moonstone Diamond Marketing (Pty) Ltd is in a process of amending the approved EMPr to be in line with NEMA. The application was lodged at the DMRE on 19 July 2021 and the scoping report has been accepted by the DMRE. The EIA process is underway. This assessment was undertaken in compliance with the requirements of Regulations 55 of the Minerals and Petroleum Resources Development Act (No 28 of 2002) (MPRDA) as well as Section 24Q of NEMA. Figure 1 overleaf shows the locality of the mining areas.



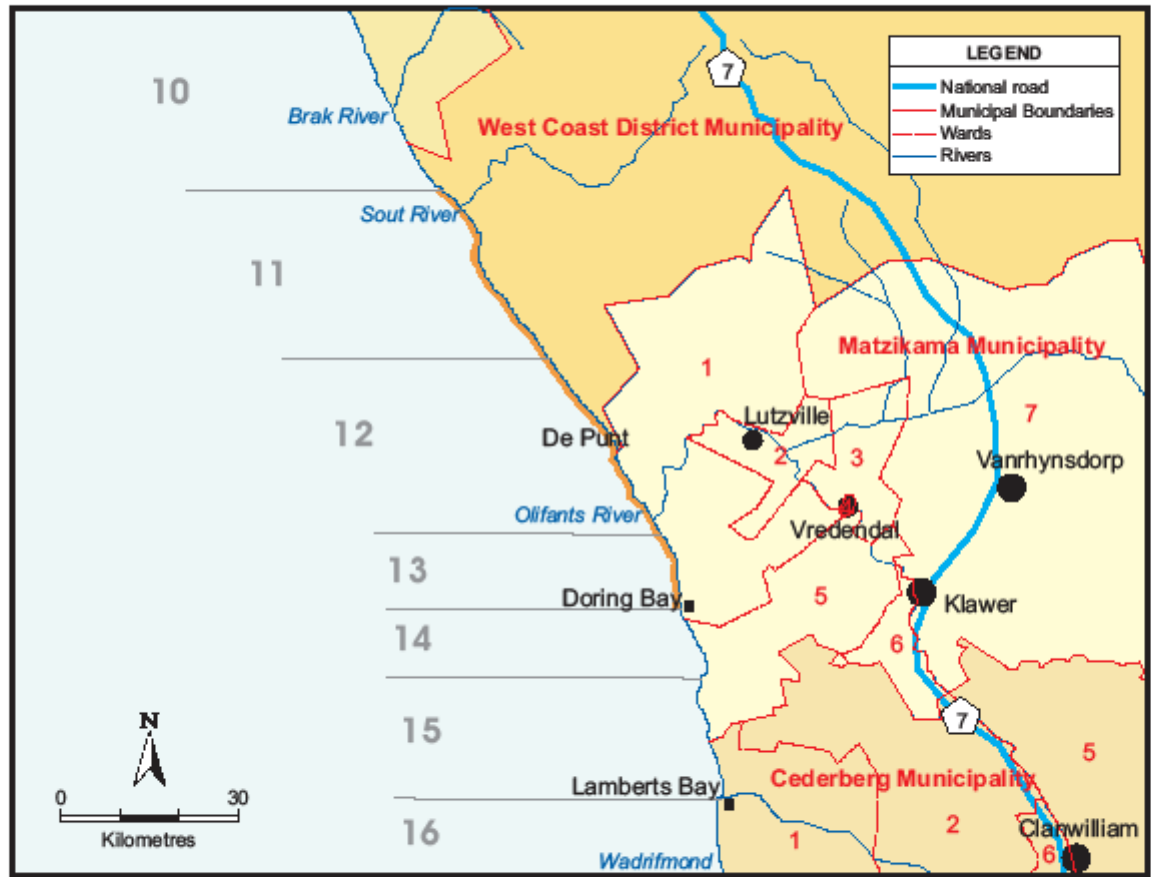


Figure 1. Map showing the position of concession areas 11(a), 12(a), 13(a) and associated surf-zone and admiralty strip concessions (shaded orange) in relation to local municipalities and wards.

## **1.1 PROJECT LOCALITY**

The area covered by this mining rights falls into the Matzikama municipality. Nearby settlements include Doringbaai, Strandfontein, Vredendal, Lutzville and Koekenaap. Most towns in the region are served by branches from the N7 (R362/R363 to Papendorp and Strandfontein via Vredendal or Lutzville, and R364 to Doringbaai), and a proclaimed gravel road runs parallel to the coast and approximately 1 km inland. As the whole of the coastal strip is privately owned and utilised for farming purposes, the area is characterized by a network of informal roads and tracks.

## **1.2 PROJECT DESCRIPTION**

The 13 A concession stretches along a ~15 km stretch of coastline south of the Olifants River mouth. Associated with these marine concessions are surf-zone concessions and admiralty strip areas. This coastline falls into the Matzikama Magisterial District and is administered from Vredendal situated on the Olifants River. The nearest fishing harbours are situated at Doringbaai and Lamberts Bay, ~14 km and ~50 km south of the river mouth, respectively.

The 120 ha De Punt onshore processing and production facility associated with the concessions is situated on ~1600 hectares of private land owned by Moonstone. With the exception of an ~50-hectare portion at the Olifants River mouth, the Moonstone property stretches to the Olifants River Mouth. The property is surrounded by farmlands with the nearest residential areas being situated at Koekenaap and Lutzville, 23 km and 30 km inland, respectively.

Concessions 11A, 12A and 13A occupy a coastal strip from 31.49 m seaward of the low water mark (LWM) to approximately 1000 m seawards of the high water mark (HWM) north of Doringbaai. The positions of these concession areas in relation to coastal features and the boundaries of neighbouring farms.

Concession 11A extends from Tietiesbaai in the north to approximately 2 km south of Koubaai. Concession 12A extends from 2 km south of Koubaai to ~1 km south of the Olifants River mouth. Concession 13A stretches along a ~15 km stretch of coastline from the Olifants River mouth south to Doringbaai.

The associated surf- zone and admiralty strip concessions Weskus, Bethel, Strykloof, De Punt, Papendorp and Hollebakstrandfontein occupy a narrow coastal strip ~70m to ~300m wide from 31.49 m seaward of the LWM to the edge of the adjacent farm boundaries, from ~1.5 km north of Jakkalshok to Doring Bay. All mining operations conducted by Moonstone on the above- mentioned concessions thus take place below the HWA only.

### **1.3 PROJECT BACKGROUND**

Diamondiferous gravels along the South African west coast are not distributed evenly on the ocean floor. They have discrete distribution patterns which can vary dramatically, both horizontally and vertically. Deposits tend to concentrate on, and immediately above, bedrock in gullies and potholes. In reality therefore diamondiferous gravels occur in only a small proportion of the available concession area. They are usually covered by overburden which first has to be stripped away to gain access to the mineralised sediments. However, due to difficulties in conducting geophysical surveys and sampling in the surf-zone and shallow water environments, it is not possible to accurately determine where viable deposits are concentrated, with the result that beach and shallow-water mining in themselves become the prospecting tools. To improve mining success, nearshore operations are using sophisticated tracking and positioning systems to help focus efforts on the more productive areas. Nonetheless, shallow-water diamond mining remains opportunistic in nature being highly dependent on weather and sea conditions. These effectively limit the periods in which mining can take place. Five days of mining per month by diver-operated systems are considered a good average for the South African west coast although longer individual periods may be workable, particularly in the summer months. Sea conditions also control where safe operations can be conducted, as these often have to be in areas with some wave shelter. Swell conditions and underwater visibility can vary enormously over small spatial and temporal scales, making it necessary to choose appropriate mining sites on specific days rather than sequentially mining a concession from one end to the other. A phased approach to mining the surf-zone and (a)-concessions is thus not possible, leading to the public misconception that shallow- water mining is conducted in an ad hoc fashion, and impacts the entire concession area. The concession areas under the jurisdiction of Moonstone are mined by smaller contractors who mine specific areas on behalf of the company.



The mining methods employed in the extraction of diamondiferous ores in concessions 11A, 12A, 13A and the corresponding surfzones and admiralty strips, are divided according to their area of operation on the shore. The three methods used to mine marine gravels are described in detail below.

### **Beach Mining**

Beach mining operations are typically conducted between the high water mark (HWM) and low water mark (LWM), during spring low tides, on tidally exposed sandy and mixed (rock and sand) beaches. The target beaches to be prospected and mined by contractors are in the Weskus surf-zone concession adjacent to 12(a), and the Doringbaai surf-zone and admiralty strip concession opposite 13(a). The coastline in the Geelwal area is characterised by medium to fine-grained beaches of medium incline. In most target areas, these beaches are backed at the HWM by steep clay and sandstone cliffs. Mineralization in shallow-water and surf-zone areas is generally erratic. The lack of suitable technology to effectively sample these zones furthermore prevents definitive ore reserve delineation. Consequently, the beach mining practiced by Moonstone's contractors more closely resembles prospecting operations than full-scale mining per se. Only once a bedrock feature yielding a viable reserve has been identified, do operations take on a larger, and more permanent scale by sequentially mining blocks following the feature. The modus operandi and scale of operation in beach mining therefore depends largely on whether the contractor is prospecting or mining and on the depth of overburden that needs to be removed before the target gravels can be accessed. In the Weskus concession, the overburden is composed primarily of beach sands, often containing embedded boulders. Target beaches in Strykloof, and at Hollebaksfontein opposite concession 13A are, however, composed primarily of pebbles and boulders. Mining targets are gravel beds underlying the beach sand, gravel overlying bedrock, as well as gravel in gullies and/or potholes in the bedrock. Depending on the degree of sand inundation on the beaches at the time of mining, the overburden layer may vary in thickness from <1 m to as much as 3 m.

Heavy machinery such as bucket-shovels, bulldozers or front-end loaders are used to expose gravels rapidly over low tide periods. Overburden is moved to immediately above the low tide level to prevent rapid re-covering of the target gravels. The underlying gravels are subsequently extracted using one of three basic approaches.

a. Removal of overburden sands or boulders creates an excavation. In order to prolong the time available for gravel extraction in this excavation during low tide periods, small protective seawalls are constructed with the overburden to provide shelter from waves and the rising tide, for divers and equipment. However, despite being protected from the sea, the excavation fills with water. The submerged target gravels are mined by two diver-guided 20 cm suction hoses which feed to a tractor modified to drive a centripetal pump and rotary classifier. The classifier, which is positioned in the intertidal area, sorts the pumped material and extracts the size fraction of interest. The diamondbearing gravel is bagged and transported on a daily basis to the central De Punt processing facility for diamond extraction. Large size fraction tailings (+25 mm) are accumulated around the classifier and the fine tailings (-2 mm) are returned directly to the sea as a sediment slurry. These fines may form turbid plumes in the nearshore but are generally rapidly dissipated by wave action. The oversize tailings heaps which accumulate around the classifier are dispersed during the high tide, or mechanically redistributed over the beach at the end of mining operations.

b. Alternatively, the gravels are extracted from the mine area by bucket-shovel and transferred to dump-trucks. The trucks transport the gravel along the beach and deposit it into a second excavation, centrally situated and protected from the sea by a large seawall. Although this wall is likewise constructed of locally sourced beach sands, for greater stability and resilience the base of the wall is reinforced using rocks and boulders excavated from the mining area. This creates a small cofferdam which provides a protected shallow-water environment for prolonged diver-operated gravel extraction. As in the previous operation, mined gravel is delivered to a classifier positioned below the HWM within the protected confines of the seawall. Oversize tailings are accumulated around the classifier and the fines are returned to the cofferdam. As the seawall required for such an operation is extensive and must by necessity be situated relatively far up the beach (around the mid-tide mark), the extremities of the wall tend to encroach onto the cliff-base. As this has been identified as a sensitive area on the cliffed coast, this type of large-scale cofferdam mining has been discontinued.

c. The larger scale beach mining operations more recently involve the placing of a grizzly and classifier below the HWM in a central position on the beach. The equipment is elevated on a platform built of locally sourced material and protected by a small seawall. Gravel is extracted from the mine area by bucket-shovel and transferred to dump-trucks. The mine area is protected by a rock-stabilized seawall. The trucks transfer the

gravel to the central processing area where it is stock-piled before being fed by a bucket-shovel or front-end loader into the classifier via the grizzly. Oversize tailings are accumulated around the classifier and the fines are returned to the sea across the beach. Alternatively, tailings are deposited into a sump sunk into the beach.

### **Shore-based operations**

For the purposes of marine diamond mining the surf-zone is defined as that area extending from the high-water mark to 31.49 m (100 Cape feet) beyond the low water mark. Mining in this zone, and to depths of 10 m in the (a)-concessions, is primarily shore-based. The operations are confined to small bays, and are typically conducted using small-scale, diver-assisted suction equipment, as described above. Large size fraction tailings (+25 mm) are accumulated around the classifier and the fine tailings (-2 mm) are returned to the sea across the intertidal zone as a sediment slurry. Care is taken to deposit oversize tailing below the HWM to allow natural redistribution by wave action. A shore-based operation typically consists of 2-4 divers, their assistants, and a tractor-driven classifier. The divers operate on surface supplied air and guide the distal end of the suction hose into the gravel deposits, which are sucked up and delivered directly to the classifier (Plate 4\_Annexure 1). Target ore bodies are subtidal gravels residing in gullies and potholes, and to access these, the divers may need to remove large rocks and boulders. In areas of dense kelp (*Laminaria pallida*) coverage, kelp may need to be cut to allow easy movement of the suction hoses and airlines when attempting to reach the diamondiferous deposits in the surf-zone and beyond. There are currently 4 shore-units operational in the surf-zones adjacent to concessions 11A and 12A, although the number of contractors varies constantly.

Mining rates for diver/tractor systems are about 0.25 m<sup>3</sup> of gravel supplied to the classifier per hour. Because of the tidal cycle and weather/sea state limitations plants operate for less than 6 hours per day for an average of 5–6 days per month. Consequently, each diver/tractor unit processes approximately 100 m<sup>3</sup> of gravel per year. The overall extent of the concessions mined is low, being estimated as <0.03% per year of the available A-concession area. To gain access to the water, the contractors attempt to locate their equipment as close to the sea as possible in the supratidal and intertidal regions. The network of existing roads is more than adequate to provide contractors with access to their mining sites, and no new roads need to be created. Unlike for beach mining, substantial upgrading of these tracks will, however, not be necessary as vehicles and equipment used for shore-based operations are lighter than those used in beach mining. Nonetheless, those

roads and tracks used regularly by contractors are maintained by Moonstone. The topography of the bays targeted by shore contractors, enables the storage of classifiers and hoses above the HWM on site. As classifiers and suction hoses are too cumbersome to be removed from the site each time pumping operations are interrupted for short periods, this circumvents excessive use of the tracks. The equipment storage areas are usually restricted to an area of <5 m<sup>2</sup> and damage to strandveld vegetation is thus limited. In some areas (e.g., Die Toring, cliffs between Middlestrand and Robeiland) where steep cliffs preclude access to the shore by road, small cableways have been constructed to ferry equipment and gravel to and from the mining site. Personnel use small paths to reach the site. At some sites it has also been necessary to erect structures, throw foundations or construct gravel platforms to access the mining sites in the littoral zone. However, contractors are contractually bound to remove all such infrastructure and rehabilitate the area as necessary on closure of operations. Contractors are likewise bound to acceptable environmental practices as stipulated under the environmental obligations and undertakings in their contracts with MDM.

### **Vessel-based Operations**

The A-concessions extend from seaward boundary of the surf-zone to 1000 m offshore. Due to the physical characteristics of this zone mining is carried out by boat-based divers using similar procedures to those applied by shore-based divers. A typical boat-based operation used to mine the nearshore areas to depths of ~25 m, consists of a 12–20 metre vessel with a 8–10 man crew, of which 4-5 are divers. The vessels, which are either converted fishing boats or purpose-built catamarans, are equipped with centrifugal pumps that operate one or two suction hoses, with the duration of their activities limited to daylight hours for 3 – 10 diving days per month. Vessel-based divers operate on surface supplied diving equipment, and due to the water depths involved, their bottom-working time is limited by decompression commitments. Similar to the surf-zone operations divers guide the pump nozzles into gullies, potholes and basin areas to retrieve gravel. In the mining process large rocks may either be exposed or removed by divers to allow the suction nozzle to reach deeper gravel layers.

The rocks are sometimes accumulated by the divers into rock piles. The gravels are processed through a classifier mounted on the vessel. Fine material (<2mm) discharged from the screening units washes directly back into the sea whilst the oversize fraction (>19 mm) is discharged directly overboard on site. The diamond-bearing gravel is

bagged, offloaded at the Lamberts Bay and/or Doringbaai jetty, and transported by road to Moonstone's processing facility at De Punt.

Boat-based mining generally only operates in exposed rocky shore areas where gravel is pumped from deeper gullies, or on the edges of sandy bays where the layer of overburden is relatively thin. For these areas the amount of gravel removed in total from the sea floor ranges from 50 – 450 m<sup>3</sup>/month, depending on the layer of overburden which needs to be removed before the diamondiferous deposits can be accessed. It is estimated that <0.02% of the total area available in the A- concessions is mined by vessels annually. There are currently between 5 and 6 vessels working in concessions 11A, 12A and 13A, although the number of contractors varies constantly.

Mining of sand areas is generally unprofitable for the small-scale operators due to the large volumes of overburden that have to be removed before it is possible to gain access to the heavier gravel. However, some vessels operating in shallower waters are fitted with blowers to displace the overlying fine surficial sediment from the seabed thereby allowing exploitation of deeper gravel deposits in areas dominated by sand which were previously uneconomic to recover.

During mining operations all the mining vessels are self-contained and self-sufficient mining units. Contractors are bound to acceptable environmental practices as stipulated under the environmental obligations and undertakings in their contracts with Moonstone.

### **Jack up Platform**

The mining methods employed in the extraction of diamondiferous ores in concessions 11, 12 and 13 are divided according to their area of operation namely beach mining, shore-based (shallow water, a-concessions) and vessel-based (deeper water a-concessions and b-concessions). Shallow-water 'Jack-Up Platform and dredging/barging techniques will also be employed by some of the more entrepreneurial contractors.

The onboard equipment includes a purpose designed dredge pump mining and deployment system, operator's cabin, on-board primary processing plant, product transfer system, power generation and hydraulic system.

The processing plant will treat sand and gravel and pick out diamonds. The beaches of the West Coast have been mined by small diver operated spreads dependent on the few calm days, which occur each month. The Jack-up platform is designed for almost continuous operation, dramatically increasing productivity of a mining unit.

It is one of a range of versatile walking jack-ups, which are capable of walking and safely operating in water depths of up to 30 m. The walking platforms can move and operate

completely independently in rough seas, strong currents or on beaches and other inter-tidal locations, considerably boosting the productivity of a variety of traditional jack-up platform operations.

Like traditional jack-up platforms, the platform has four jacking legs, which can be raised and lowered from fixed jacking points at each end of the platform. In addition, it has another moveable pair of jacking legs on each side of the platform. The four auxiliary legs are connected to a sliding frame, which can be jacked horizontally back and forth along the side of the platform deck.

Processing of tailings to extract Pebbles: An appointed local contractor will rework the tailings to extract different sizes of pebble stones.

## **2. LEGAL REQUIREMENTS**

Rigorous environmental and mining legislation governs environmental impacts and permitting in South Africa, including:

- Constitution of the Republic of South Africa, 1996 (Chapter 30)
- National Environmental Management Act 107 of 1998, as Amended
- Mineral and Petroleum Resources Development Act No 28 of 2002
- National Water Act 36 of 1998
- Mine Health and Safety Act, 1996 (Act No. 29 of 1996);
- Environment Conservation Act, 1989 (Act No. 73 of 1989);
- Conservation of Agricultural Resources Act 43 of 1993
- Environment Conservation Act 73 of 1989;
- National Environmental Management: Protected Areas Act 57 of 2003;
- National Environmental Management: Biodiversity Act 10 of 2004;
- National Environmental Management: Air Quality Act, 2004 (Act no.39 of 2004);
- National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008).
- World Heritage Convention Act 49 of 1999;
- National Heritage Resources Act 25 of 1999;
- Mountain Catchment Areas Act 63 of 1970, and
- National Forest Act 84 of 1998 and National Veld and Forest Fire Act 101 of 1998 (administered by the Department of Agriculture, Forestry and Fisheries).
- Other Provincial ordinances and municipal by laws

### 3. AUDIT PROCESS

<b>Stages</b>	<b>Step</b>	<b>Application to De Punt</b>
<b>Pre-audit</b>	Define objectives	The objectives were defined as outlined in 1.
	Define the scope of the audit	Auditees: De Punt Mine Audit criteria are as outlined in the preceding table.
	Planning	Prepare a site-specific audit plan Make logistical arrangements for the audit.
<b>Audit</b>	Opening meeting	Present the audit aims, objectives Audit plan and process Confirmation of audit programme and schedule
	Documentation	Audit checklist review.
	Collection of audit evidence	This involved interviews with staff members, verification of statements on site.
	Closing meeting	Collation of audit findings Drawing of conclusions linked to the audit objectives. Discussing key audit findings
<b>Reporting</b>		To be submitted to the DMRE and auditees

#### 3.1 Audit team

The following persons acted as members of the performance assessment team:

<b>Name</b>	<b>Affiliation</b>	<b>Qualifications/Experience</b>
David Jordan	Moonstone Diamond Marketing (Pty) Ltd	Mine Manager
Abegail Makgato		Environmental Management
Taole Matsoko	Azamath Projects Consulting (Pty) Ltd	Environmental Assessment Practitioner

#### 3.2 Auditor Qualifications

Taole Matsoko has the following qualifications

- B.Sc Biological Science
- Advanced Project management
- SABS ISO 14001

## 4. TAILINGS CHARACTERISTICS

The only tailing dumps are within the mining area are at the plant area in De Punt Farm. All the on-site processing dumps the oversize back to the mined area and only bring bagged diamond bearing material to the plant. The characteristics of the plant tailings are represented on the table below.

### 4.1 Physical characteristics

Extent	1 ha
Permeability	0.625m <sup>3</sup> /tonne
Density	1850kg/m <sup>3</sup>
Strength of compaction	
Specific gravity	3,1
Water content of the material	1.2%
Slope	27 <sup>0</sup>

## 5. PERFORMANCE ASSESSMENT

Environmental performance assessment is a critical tool of Environmental Management System in checking, reviewing, monitoring and evaluating environmental performance of organizations. It is an ongoing process of collection and assessment of data and information to evaluate performance, and trends over time.

### 5.1 Period applicable to the assessment

The period of the assessment is from 2020 to 2021.

### 5.2 The scope of the assessment

The document is the report for the assessment of the performance of the mining right holder with regards to the Environmental Impact Assessment and Environmental Management Programme in accordance with Section 38(1) (c) that reads as follows: *the holder of the mining right must manage the environmental impacts in accordance with the approved EMPlan and as ongoing part of the operation.*

Review of all existing environmental and relevant legal documentation including the Financial Provision Update and the Coastline Cliff Stability report compiled in 2018 by Site Pan.

### 5.3 Procedure used



This is an ongoing observation on the site, including:

- The regular or periodical in loco in house inspections conducted
- Meeting all relevant stakeholders
- The exercise includes the mitigation options undertaken against the impact resulting from the operation.
- Site visit from DMRE

**Land management – total area of land (ha) owned, leased or managed for production activities or extractive use by operation**

<b>Total land managed (ha)</b>	<b>9950ha</b>
<b>Total land disturbed and not yet rehabilitated (ha) – opening balance</b>	<b>0,5%</b>
<b>Total area of land newly disturbed within the reporting year (ha)</b>	<b>0%</b>
<b>Total area of land rehabilitated to agreed upon end of use (ha)</b>	<b>0%</b>
<b>Total area of land disturbed and not yet rehabilitated (ha) – closing balance</b>	<b>0.5%</b>

As mentioned in Section 1.3 of the report, mining activities are generally in the sea and on the beach. In those areas natural rehabilitation takes place by wave action, Hence the estimated percentages above of areas to be rehabilitated are low, the main liability is the access roads and the tailings at the plant area.

**5.4 Environmental Operational Indicators (EOI)**

<b>Number</b>	<b>Indicator</b>	<b>EMPlan Commitment</b>	<b>Objective</b>	<b>Management practice</b>	<b>Current status</b>	<b>Recommendation</b>
F 1.1	General Requirements	F 1.1 Mapping and setting out  1.2 Demarcating the mining area	-Updated layout plan (Reg 2.2) reflecting the progress  Clear demarcation at all times	Layout plan was provided during application and is updated on an ongoing basis  The area is demarcated with beacons	Updated  The area is demarcated with beacons	The plan must be updated throughout the lifetime of the project  Clear demarcation throughout the lifetime of the operation

		1.3 Restrictions	Prohibit operation	N/A	N/A	Mine according to the approved EMPR /EIA
		1.4 Responsibility	The holder is liable for rehab			
F 2	Infrastructural requirement	2.1 Topsoil	Remove, store separate	Remove & store in bund wall outside 1:50 flood level	Stored separately	Protected from erosion
		2.2 Access Roads	Establish; maintain; dust control & rehab	Consult land owner & use existing avoid steep areas create berms	Berms erected; water spray	To be rehabilitated at the end of the project
		2.3 Site Offices	Establish; toilets & rehab	No offices, mobile toilets available	Mobile toilets available	To be rehabilitated at the end of the project
		2.4 Maintenance and storage yard	Establish; maintain and waste disposal on designated area and rehab	Maintenance conducted offsite; spillages are removed immediately	No spillages on site; waste disposal bin on site	Avoid; prevent; remedy and minimise
F 3	Operating procedure	3.1 Limitation on mining	Operating within approved area (5m buffer area)	excavation takes place within the demarcated area	Reclamation takes place within the demarcated area	Operating within the approved area
				No operation next to the water-course	No operation next to the water-course	

		3.2 Excavations  3.3 Processing area  3.4 Tailing dams  3.5 Final rehabilitation	Adhere to the procedure; rehab  Establish; rehabilitate  Management of residue  Rehabilitate the area back to its natural state  Return the site back to its natural state	No excavations on site; only the removal of TSF heaps  Residue discarded to the Tailings dump  Slimes residue decarded to the slimes dam	No excavations on site; only the sloping of Tailings heaps	Sloping of the of TSF to the original surface level.  100% sloping of the tailings (closure application to be lodged)
F 4	Monitoring & Reporting	4.1 Inspection & Monitoring 4.2 Compliance reporting	Regular monitoring; ongoing reporting	Available on request	Available on request	Monitoring and reporting should be regularly.
F 5	Closure	5.1 Risk Management 5.2 Closure objectives 5.3 Closure plan	See attached	See Section 5 below	See Section 5 below	The site must be returned to its pre mining state
F 6	Financial provision review	The Mining holder is liable; financial provision must be reviewed	Review the financial provision	See attached as Appendix 1	See attached as Appendix 1	Review the financial provision to the satisfaction of the RM

## 6 RISK MANAGEMENT

### 6.1 THE EVALUATION CRITERIA USED DURING ASSESSMENT

Ranking scales were employed as follows:

<b>Probability(P):</b>	<b>Duration(D):</b>
<ul style="list-style-type: none"> <li>• 5 - Definite/don't know</li> <li>• 4 - Highly probable</li> <li>• 3 - Medium probability</li> <li>• 2 - Low probability</li> <li>• 1 - Improbable</li> <li>• 0 - None</li> </ul>	<ul style="list-style-type: none"> <li>• 5 - Permanent</li> <li>• 4 - Long-term (impact ceases after the operational life of the activity)</li> <li>• 3 - Medium-term (5-15 years)</li> <li>• 2 - Short-term (0-5 years)</li> <li>• 1 - Immediate</li> </ul>
<b>Scale(S):</b>	<b>Magnitude(M):</b>
<ul style="list-style-type: none"> <li>• 5-International</li> <li>• 4-National</li> <li>• 3-Regional</li> <li>• 2-Local</li> <li>• 1-Site only</li> </ul>	<ul style="list-style-type: none"> <li>• 10-Very high/don't know</li> <li>• 8-High</li> <li>• 6-Moderate</li> <li>• 4-Low</li> <li>• 2-Minor</li> <li>• 0-None</li> </ul>

**(Potential Significance)**= (Magnitude + Duration + Scale) x Probability

The maximum value is 100 significance points (SP).

SP: > 60 = high/inadequate (Unacceptable = U)

>30<59 = moderate (Acceptable = A)

<30 = low/adequate (Acceptable)

6.2 Environmental Performance Indicators

Potential Environmental Impact	Management and Mitigation Measures	Implementation Frequency	Action frequency	After mitigation	Current risk				Control measures (A/L) (M) (H/I)	A/U
					P	D	S	M		
Noise	<ul style="list-style-type: none"> <li>All the machinery will be serviced regularly, will be fitted with the silencers</li> </ul> Working hours are restricted to daylight hours,	Throughout the lifetime of the operation	Daily	Low sound	2	1	1	2	L	A
Erosion due to the loss of vegetation.	<ul style="list-style-type: none"> <li>The area of disturbance must be kept to a minimum.</li> </ul> Continual monitoring should take Limit movement of vehicles and equipment.	Daily	Weekly	No erosion; Well compact soil	3	2	1	2	L	A
Loss of areas of conservation importance: Possible ecologically sensitive sites.	<ul style="list-style-type: none"> <li>Mining activities must be aligned according to the buffer zones. Sites of high sensitivity must be avoided.</li> <li>No mining activities take place within 100m of water bodies.</li> </ul>	Pre-operational for any scans & daily in terms of routine operations.	Weekly	Restore biodiversity after final rehabilitation	2	2	1	2	L	A

	<p><b>The area of disturbance must be limited.</b></p> <p><b>The ecosystem should be restored to as close as possible to the original site.</b></p>									
<b>Impact on heritage resources:</b>	<ul style="list-style-type: none"> <li>• Areas of cultural and heritage importance must be avoided.</li> <li>• Graves and cemeteries must be avoided and must not be disturbed.</li> </ul>	<b>Pre-operational for any scans &amp; daily in terms of routine operations.</b>	<b>3 months</b>	<b>No heritage interest places on site</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>L(N/a)</b>	<b>A</b>
<b>Generation of dust/smoke/odours</b>	<ul style="list-style-type: none"> <li>• Dust suppression must be performed according to the seasonal changes and according to the prevailing site specific circumstances.</li> <li>• The speed limit and movement of the vehicles on site must be monitored and appropriately managed to reduce the generation of excessive dust.</li> </ul>	<b>Daily</b>	<b>Daily</b>	<b>Moderate soil; dust suppressed (water spray)</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>L</b>	<b>A</b>
<b>Landform Disturbance: Soil compaction is a potential impact due to the movement</b>	<ul style="list-style-type: none"> <li>• The area of disturbance must be kept at a minimum</li> <li>• The site camp must be demarcated with a fence and only</li> </ul>	<b>Rehabilitation must take place with finalization of each heap removal</b>	<b>3 months</b>	<b>No dust;</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>L</b>	<b>A</b>

of vehicles and people on site.	<p>allow single entrance point.</p> <ul style="list-style-type: none"> <li>• This areas must be completely rehabilitated after all mining activities are completed.</li> <li>• Topsoil shall be removed from all area where physical disturbance of the surface will occur.</li> <li>• Prevent the introduction of noxious weeds and pests.</li> </ul>									
Land/Soil Contamination is a potential impact due to the presence of vehicles	<ul style="list-style-type: none"> <li>• Proper maintenance facilities for vehicles shall be conducted outside.</li> </ul> <p>All other hydrocarbons such as grease and oil will be stored within a large plastic trough. In case of an accidental spillage of any type of hazardous waste, the appropriate immediate measures for clean up operations would be done.</p>	Daily	immediately	No spillages traces	3	2	2	3	M	A
Pollution of underground and surface water	<ul style="list-style-type: none"> <li>• Sites of high sensitive must be avoided</li> <li>• No mining will take place within 100m of</li> </ul>	Ongoing	ONGOING	None applicable	1	1	1	1	L (N/a)	A



	<p>water bodies or water courses.</p> <p>The use of all materials, fuels must be controlled.</p> <p>No vehicles/machinery must be maintained on site.</p> <p>Spill trays must be provided if refuelling of vehicles is done on site.</p>									
<b>Safety and Security</b>	land owners be informed, order for them to make necessary arrangements.	Ongoing	Daily		3	1	1	2	L	A
<b>Disturbance or loss of animal species</b>	no animals (Wild and domestic animals) be handled, removed, killed or interfered with.	Weekly	Daily	To be replaced after final rehabilitation	3	3	1	2	M	A
<b>Waste generation</b>	<ul style="list-style-type: none"> <li>Domestic waste must be disposed of at a registered landfill site.</li> <li>There must be no littering on site.</li> </ul> <p>Storage areas shall be securely fenced and all hazardous substances, diesel, oils etc., shall be stored therein.</p> <p>No vehicles will be extensively repaired in any place other than in the maintenance yard.</p>	Daily	weekly	No littering on site; refuse plastic bag available	2	2	1	2	L	A
<b>Health and Safety:</b>	<ul style="list-style-type: none"> <li>Observe 5m buffer area</li> </ul>	Ongoing	daily	Safety conditions	3	2	1	2	L	A

Fall of cliff/high walls	<ul style="list-style-type: none"> <li>Build bench and properly slope</li> </ul>									
--------------------------	--	--	--	--	--	--	--	--	--	--

Thus far all the impacts on site are of low significance and therefore acceptable or within the limits of good standards and practice.

### 6.3 Risk Assessment Matrix

E – Extreme risk – detailed action plan required  
H - High risk – needs senior management attention  
M – Medium risk – specify management responsibility  
L – Low risk – manage by routine procedures

High or Extreme risks must be reported to Senior Management and require detailed treatment plans to reduce the risk to Low or Medium.

		Consequence			
<b>People</b>	Injuries or ailments not requiring medical treatment	Minor injury or First Aid Treatment Case.	Serious injury causing hospitalisation or multiple medical treatment cases.	Life threatening injury or multiple serious injuries causing hospitalisation.	Death or multiple life threatening injuries.
<b>Reputation</b>	Internal Review	Scrutiny required by internal committees or internal audit to prevent escalation.	Scrutiny required by external committees or ACT Auditor General’s Office, or inquest, etc.	Intense public, political and media scrutiny. Eg: front page headlines, TV, etc.	Assembly inquiry or Commission of inquiry or adverse national media.
<b>Business Process &amp; Systems</b>	Minor errors in systems or processes	Policy procedural rule occasionally	One or more key accountability requirements not met. Inconvenient but	Strategies not consistent with Government’s agenda. Trends	Critical system failure, bad policy advice or ongoing non-compliance.

	requiring corrective action, or minor delay without impact on overall schedule.	not met or services do not fully meet needs.	not client welfare threatening.	show service is degraded.	Business severely affected.
<b>Financial</b>	1% of Budget or <\$5K	2.5% of Budget or <\$50K	> 5% of Budget or <\$500K	> 10% of Budget or <\$5M	>25% of Budget or >\$5M
	<b>Insignificant</b>	<b>Minor</b>	<b>Moderate</b>	<b>Major</b>	<b>Catastrophic</b>



	<b>Probability:</b>	<b>Historical:</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Likelihood</b>	>1 in 10	Is expected to occur in most circumstances	<b>5</b>	<b>Almost Certain</b>	<b>M</b>	<b>H</b>	<b>H</b>	<b>E</b>
	1 in 10 - 100	Will probably occur	<b>4</b>	<b>Likely</b>	<b>M</b>	<b>M</b>	<b>H</b>	<b>E</b>
	1 in 100 – 1,000	Might occur at some time in the future	<b>3</b>	<b>Possible</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>H</b>
	1 in 1,000 – 10,000	Could occur but doubtful	<b>2</b>	<b>Unlikely</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>H</b>

	1 in 10,000 – 100,000	May occur but only in exceptional circumstances	1	Rare	L	L	M	M	H
--	-----------------------	---	---	------	---	---	---	---	---

*Adapted from Standards Australia Risk Management AS/NZS 4360:2004*

## 7. MONITORING

<b>Effect</b>	<b>Impact</b>	<b>Mitigation</b>	<b>Action</b>	<b>Responsibility</b>
Hauling	<ul style="list-style-type: none"> <li>• Dust</li> <li>• Air quality</li> </ul>	Water spray	Daily	SHE officer
Machinery	<ul style="list-style-type: none"> <li>• Spillage</li> <li>• Noise</li> </ul>	<ul style="list-style-type: none"> <li>• Immediate treatment</li> <li>• PPE`s</li> </ul>	immediately	SHE officer
Health and safety	<ul style="list-style-type: none"> <li>• Accidents</li> <li>• diseases</li> </ul>	PPE`s	ongoing	SHE officer
Noise	Nuisance	PPEs; Silencers	Daily	SHE officer
Erosion	Soil leaching	Concurrent rehab	Monthly	SHE officer
Loss of habitat	Low biodiversity	Restore after rehabilitation	Monthly	SHE officer
Soil contamination	Low soil productivity	No maintenance on site	ongoing	SHE officer
Health and Safety (High walls/ cliff)	Fall of cliff	Benched and proper slope	Ongoing	SHE officer

## 7.1 THE INTERPRETATION OF INFORMATION FROM MONITORING

Monitoring systems helps personnel familiarize with organizational policies, procedures and programmes in environmental achievements and compliance. By monitoring the indicators, regular evaluation and target control can be exercised since they can highlight any adverse trends in the process of environmental control.

Thus far all the impacts on site are of low significance and therefore acceptable or within the limits of good standards and practice.

<b>The Identified Evaluation Factors</b>	<b>Aim</b>
Complaints/warnings received from governmental body	To ensure all of the involved construction processes comply with the regulations and ordinances
Non-compliance records of inspection received from government body	To ensure all of the involved construction processes are not affected the human behaviour for nearby sensitive parties
Fines and penalties on violation of environmental protection	To control the environmental seriousness on on-site construction activities for those not comply with regulations and ordinances
Top management support	To provide resources in implementing environmental management from top managerial staff
Management participation	To ensure all the organizational staff within the construction organization are aware in implementing environmental protection
Communication channels	To conduct regular meetings and channels in communicate the development of environmental protection
Availability and achievement of environmental policy, objectives and targets	To regular review the compliance of company environmental policy, objectives and targets over the construction period
Training to frontline staff	To increase the awareness on environmental issues from frontline staff
Quality of auditing materials	To ensure the sufficiency in the preparation of auditing materials
Frequency for specific auditing activities about environmental issues	To assess the fulfilment on implementing auditing activities on environmental issues
Non-conformance received	To assess the auditing activities in complying environmental protection
“Marginal cases put under observation” received	To assess the auditing activities in complying environmental protection
Monitor of corrective actions after auditing	To ensure the improvements provided after auditing
Investment on energy	To measure the financial investment used on energy
Monitor of energy consumption	To assess the reduction and control of the energy
Quality of equipment maintenance	To ensure the equipment provided with suitable maintenance

Cost-saving on paper	To assess the performance of cost savings in consuming paper, such as two-side copy and using internet
Water sprays for minimizing flying dusts	To ensure the air pollutants emitted outside construction site by water sprays
Measures to reduce generation of polluted air	To ensure the air pollutant emitted outside construction site by other means

## 7.2 The results of the assessment

<b>Indicator</b>	<b>Management measures</b>	<b>Baseline</b>	<b>Target</b>
<b>Management and training</b>	<ul style="list-style-type: none"> <li>• Training to middle level staff</li> <li>• Training to top managerial staff</li> <li>• Management participation</li> <li>• Availability and achievement of environmental policy, objectives and targets</li> <li>• Communication channels</li> </ul>	good	Continual improvement
<b>Pollution</b>	<ul style="list-style-type: none"> <li>• Water sprays for minimizing flying dusts</li> <li>• Time management for avoiding generation of noise at restricted hours and close to adjoining noise sensitive parties</li> <li>• Measures to reduce generation of polluted air</li> <li>• Measures to mitigate noise levels</li> </ul>	Within limits/ acceptable	Continual improvements
<b>Auditing</b>	<ul style="list-style-type: none"> <li>• Non-conformance received</li> <li>• “Marginal cases put under observation” received</li> <li>• Frequency for specific auditing activities about environmental issues</li> </ul>	Within good standards (every six months)	Continual improvements

	<ul style="list-style-type: none"> <li>• Monitor of corrective actions after auditing</li> <li>• Quality of auditing materials</li> </ul>		
<b>Waste</b>	<ul style="list-style-type: none"> <li>• Water reuse or recycle system</li> <li>• Monitor water usage and promote water conservation</li> <li>• Waste reuse and recycling</li> <li>• Chemical wastes treatment and procedures</li> </ul>	Within good standards	Continual improvement
<b>Cost saving on Resources</b>	<ul style="list-style-type: none"> <li>• Cost-saving on paper</li> <li>• Cost-saving on water</li> </ul>		
<b>Health and safety</b>	<ul style="list-style-type: none"> <li>• Provide the PPEs for all employees on site</li> <li>• Provide safe work place</li> <li>• Conduct safety sessions</li> </ul>	Acceptable work environment	Continual improvement
<b>Regulation compliance</b>	<ul style="list-style-type: none"> <li>• Complaints / warnings received from governmental body</li> <li>• Non-compliance records of inspection received from relevant authorities</li> <li>• Fines and penalties on violation of environmental protections</li> </ul>	Good relation with DMR	Continual improvement



### 7.3 Photographic record of areas visited:



**Ramp 3 - 5M buffer observed**



**Ramp 1- 5m buffer observed**



Slimes dam view from the DMS tailings

## **8. THE RECOMMENDATIONS ON MITIGATIONS OF NON-COMPLIANCE**

It shall be in the good interest of Moonstone Diamonds Marketing to take into cognisance the following:

- Co-existence with other mining company in the same area poses a threat to the proper regulatory compliance. Moonstone Diamonds should liaise with the DMRE ASAP to address the challenges faced.
- There is evident adherence to the 5m buffer zone in compliance with the monitoring protocol. All contractors must be instructed to observe the buffer zone at all times.
- There is evidence of cliff failure rehabilitation, at the time of in loco inspection, the problem was attended to by the other mining company.
- Periodical audits needs to be planned and conducted, at least on a monthly basis to address issues pertaining to co existence on the beach.
- Environmental awareness training needs to be conducted on all new employees and to form part of Induction on the mine.

## **9. FINANCIAL PROVISION REVIEW**

The financial quantum review report is attached as Appendix 1 of this report.

## **10. Objectives and Goals Relating to Closure**

As per the MPRDA Regulations GNR 527 of 2004, the objectives of the Right holder relating to mine closure are to ensure that:

- The reclamation operation itself contributes towards mine closure through the removal of a source of pollution. Rehabilitation of the contaminated footprint will result in the reduction of the long-term impacts from the Tailings dump.
- Public health and safety must be protected;
- Environmental damage must be alleviated or eliminated;
- Short and long term impacts on surface and groundwater quality must be minimised and contained at acceptable levels;
- Land use must be returned to original or pre-mining condition or an acceptable and sustainable land use alternative;
- Socio-economic benefits post-closure must be maximised;
- The need for long term monitoring and maintenance must be reduced or removed;  
and
- The mining operations must be closed efficiently and cost effectively.

## **Appendix 1: Financial quantum report**