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# Environmental Management Programme for a Diamond Prospecting Right in Offshore Concession Areas 4C and 5C – West Coast of South Africa

Report Prepared for

**Samara Mining (Pty) Ltd**

Report Number 576461/Environmental Management Programme

DMRE Reference Number: NCS 30/5/1/1/2/1 (12855) PR

**Applicant, Future Rights Holder:**

Samara Mining (Pty) Ltd

**Acting Agent and Geologist:**



**Independent EAP:**



**May 2023**

# Environmental Management Programme for a Diamond Prospecting Right in Offshore Concession Areas 4C and 5C – West Coast of South Africa

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**May 2023**

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## Disclaimer

The environmental management measures provided in this Environmental Management Programme (EMPr) are based on information supplied to SRK Consulting (South Africa) (Pty) Ltd (SRK) by Samara Mining (Pty) Ltd (Samara). This report has been compiled to comply with the specific requirements of the National Environmental Management Act (Act No. 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations (2014).

SRK has exercised all due care in reviewing the supplied information provided by Samara during the course of the Environmental Assessment Process and has included the requirements of commenting authorities. The appropriateness and practicality of the management measures have been considered in terms of comments received and discussed with Samara as necessary. Samara is fully responsible for the implementation of the EMPr.

The EMPr has been provided to Samara for review, prior to submission, to determine whether the EMPr is implementable and accurate. SRK cannot be held responsible for failure of Samara to comply with the EMPr for any reason whatsoever. The EMPr by nature is a dynamic document and the NEMA provides for continual updating of the EMPr, with approval from the Competent Authority.

SRK does not accept responsibility for any errors or omissions in the information supplied by Samara and do not accept any consequential liability arising from commercial decisions, design changes or actions resulting from such decisions and/or changes. Management measures presented in this report relate to the project description and plans as they existed at the time of SRK's investigations, and those reasonably foreseeable. These management measures do not necessarily apply to conditions and aspects that may arise after the date of this report, about which SRK had no prior knowledge nor had the opportunity to evaluate.

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## List of Abbreviations

AEL	Atmospheric Emission Licence
BA	Basic Assessment
CBA	Critical Biodiversity Areas
DFFE	Department of Forestry, Fisheries, and the Environment
DMRE	Department of Mineral Resources and Energy
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMPr	Environmental Management Programme
GIS	Geographic Information System
GN	Government Notice
GN R	Government Notice Regulation
GPS	Global Positioning System
I&AP	Interested and Affected Party
LN	Listing Notice
MARPOL	International Convention for the Prevention of Pollution from Ships
MLRA	Marine Living Resources Act 18 of 1998
MMO	Marine Mammal Observer
MPA	Marine Protected Area
MPRDA	Mineral and Petroleum Resources Development Act 28 of 2002
MPRDAA	Mineral and Petroleum Resources Development Amendment Act 49 of 2008
NDI	NDI Geological Consulting Services (Pty) Ltd
NEM:AQA	National Environmental Management: Air Quality Act 39 of 2004
NEM:PAA	National Environmental Management: Protected Areas Act 57 of 2003
NEM:WA	National Environmental Management: Waste Act 59 of 2008
NEMA	National Environmental Management Act 107 of 1998 as amended
NHRA	National Heritage Resources Act
PAM	Passive Acoustic Monitoring
PWP	Prospecting Work Programme
QA	Quality Assurance
QC	Quality Control
S&EIR	Scoping and Environmental Impact Reporting
SADSTIA	South African Deep-Sea Trawling Industry Association
SAHLLA	South African Hake Longline Association
SAHRA	South African Heritage Resources Agency
SAMLMA	South African Marine Linefish Management Association
SAMSA	South African Maritime Safety Authority
SANHO	South African Navy Hydrographic Office

SHE	Safety, Health and Environmental
SRK	SRK Consulting (South Africa) (Pty) Ltd
UNCLOS	United Nations Convention on the Law of the Sea
VMS	Vessel Monitoring System

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## Glossary

Approved Professional Person	A person registered in terms of the Engineering Profession of South Africa Act, 1990 (Act 114 of 1990) and approved by the Minister after consultation with the Engineering Council of South Africa (established by section 2 of the National Water Act (Act No. 36 of 1998) (NWA).
Contractor	Any provider of services, goods, or people to Samara for the purpose of the CF 2 proposed Tanks Development Project. These may directly or indirectly include contractors, sub-contractors, hired labour agencies and consultants.
Contractor Safety Officer	An individual nominated by the Contractor Project Manager to represent the contractor on site and to act on behalf of the Project Manager in matters concerning the day-to-day implementation and monitoring of the Environmental Management Programme (EMPr) and conditions of the Environmental Authorisation (EA).
DFFE	Department of Forestry, Fisheries, and the Environment
Emergency Incident	An undesired event that results in an environmental impact and requires the notification of relevant statutory bodies and the Project Management Team.
Environment	As per definition in the National Environmental Management Act (Act No. 107 of 1998, as amended) (NEMA).
Environmental Consultant	An independent environmental consultant who may provide environmental services to the design and operation of the CF 2 proposed Tanks Expansion Project, guidance of the CF 2 proposed Tanks Expansion Project construction contracts under Samara control, and auditing of the construction and operation of the CF 2 proposed Tanks Development Project in terms of the Samara Environmental Authorisation, as required.
Environmental Control Officer	The Environmental Control Officer (ECO) is the person responsible for ensuring that the EMPr is implemented, and that revisions and updates to the EMPr are appropriately recorded in a control document. A control document is official only if the issue/revision has been approved.
Environmental Impact	A change in the environment, whether adverse or beneficial, wholly or partly, resulting from an organization's activities, products or services.
Environmental manager	Dedicated Samara employee that deals with environmental considerations in the management cycle of the Project, i.e., policy, planning and design, implementation (pre-construction, construction, operation, maintenance, and decommissioning), monitoring and corrective action and review.
Incident	An undesired event that may result in a significant environmental impact, although can be managed through internal response and procedures.
Operational controls	Mechanisms used to affect the EMPr requirements as well as the day-to-day operations of the activities.
Plan	Sets out the intended method and/or specific measures required to mitigate and/or enhance the negative and positive impacts of the Project. A plan usually focuses on one project activity, i.e., training and awareness, or phase, i.e., pre-construction, construction, operation, maintenance, and decommissioning.
Project Management Team	The responsibility of the EMPr implementation resides with this team. This team includes a Project Manager and Section Leader nominated to be of the Samara Environmental Department team, and representatives of the business units contributing to or receiving from the CF 2 proposed Tanks Development Project.
Programme	Identifies a series of interrelated measures (often contained in detailed plans) for managing the environmental effects of the Project. A programme provides broad direction and covers more than one project phase.
Safety, Health and Environmental Officer	A representative from each contractor, appointed as a Safety, Health and Environmental (SHE) Officer, assisting the construction manager on SHE aspects of the on-going construction, operation and decommissioning of the CF 2 proposed Tanks Development Project.

# 1 Introduction and Scope of Report

Samara Mining (Pty) Ltd (Samara) intends to undertake an exploration programme in Sea Concession Areas 4C and 5C located approximately from 10 km to 195 km seaward of the West Coast shoreline of South Africa.

Samara is represented in this application by acting agent, NDI Geological Consulting Services (Pty) Ltd (NDI) situated in Kimberley in the Northern Cape. NDI provides geological services and has submitted all the relevant project applications to the Department of Mineral Resources and Energy (DMRE). Accordingly, NDI is recognised as the independent Environmental Assessment Practitioner (EAP) at the DMRE. SRK Consulting (South Africa) (Pty) (SRK), acts on behalf of NDI as the independent EAP to undertake and manage the Environmental Impact Assessment (EIA) and to undertake the Stakeholder Engagement Process.

Samara lodged an application in terms of Section 22 of the Mineral and Petroleum Resources Act (Act No. 28 of 2002) (MPRDA), as amended by the Mineral and Petroleum Resources Development Amendment Act (Act No. 49 of 2008) (MPRDAA) for a Prospecting Right with the DMRE. The application is for a Prospecting Right for bulk sampling for diamonds, which will be undertaken in a phased approach.

To prospect for diamonds, Samara Mining intends to use both invasive and non-invasive methods. The non-invasive method will be made up of desktop studies, geophysical surveys, 3D geological modelling and resource estimation. The invasive methods will comprise of Exploration Drilling and Bulk (Trench) Sampling.

Desktop studies entail combining available historic data in order to get a clear understanding of the proposed diamond deposit character.

Geophysical surveys will be done to identify geological features where further exploration sampling will be undertaken. The equipment for the survey will be deployed from a vessel appropriate for the depth and survey method to be used.

Where geological features of interest (showing potential for diamond prospecting) have been identified, follow up surveys and sampling will be undertaken. Sampling will consist of two methods of which, the first will be extraction of unconsolidated sediment from the seabed using drill technology from a dedicated exploration vessel and the second method will be extraction of unconsolidated sediment using a dedicated bulk sampling vessel to dredge exploration trenches using crawler technology. The sampled material will be treated on board the vessels through a diamond processing plant inclusive of final diamond recovery.

The National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the EIA Regulations, 2014 (Government Notice Regulation (GN R) 982)<sup>1</sup> (promulgated in terms of NEMA) warrant that listed activities require an Environmental Authorisation (EA). The EIA Regulations, lays out two alternative authorisation processes. Depending on the type of activity that is proposed, either a Basic Assessment (BA) process or a Scoping and EIA process is required to obtain EA. Listing Notice (LN) 1<sup>2</sup> lists activities that require a BA process, while LN 2<sup>3</sup> lists activities that require Scoping and EIA. LN 3<sup>4</sup> lists activities in certain sensitive geographic areas that require a BA process.

<sup>1</sup> As amended by GN R327, GN R325 and GN R324 on 7 April 2017 & GN R517 on 11 June 2021

<sup>2</sup> GN R983 of 2014, as amended by GN 327 of 2017 & GN R517 on 11 June 2021

<sup>3</sup> GN R984 of 2014, as amended by GN 325 of 2017 & GN R517 on 11 June 2021

<sup>4</sup> GN R985 of 2014, as amended by GN 324 of 2017 & GN R517 on 11 June 2021

The proposed project triggers activities listed in terms of LN 1 and LN 2 of the EIA Regulations, 2014, requiring a Scoping and EIA (S&EIA) Authorisation process to be undertaken. As potential fossil material should be collected for later identification and evaluation, Samara should also apply to the South African Heritage Resources Agency (SAHRA) for a general permit to destroy, damage, excavate, disturb and collect fossils identified during sampling, as per the National Heritage Resources Act (Act No. 25 of 1999) (NHRA) and any recovered material is to be temporarily stored by the company.

It is not anticipated that other key authorisations, permits or licences might be required before the project may proceed.

## 1.1 Project Location

The location of the infrastructure will be determined based on the location of the prospecting activities, which will only be determined during Phase 1 of the Prospecting Works Programme, as well as the presence of sensitive environmental attributes such as sites of archaeological and palaeontological importance. All infrastructure will be temporary and/or mobile.

The project is located in Sea Concession Areas 4C and 5C (Figure 1-1), which are offshore areas located approximately from 10 to 195 km seaward of the West Coast shoreline of South Africa. The total Prospecting Right area is approximately 781 362 hectares (excluding Namaqua Fossil Forest Marine Protected Area (MPA)). The application area is approximately 12.5 km from Kleinsee and 60 km from Hondeklipbaai.

The study area is located in the central subregion of the Benguela region<sup>5</sup> dominated by the cold Benguela Current, but also influenced by intrusions of warm-water eddies of the Agulhas Current.

The terrestrial climate along the West Coast of South Africa is considered moderate. Weather patterns along the West Coast are influenced largely by the mid-latitude subtropical cyclones that are generated to the southwest of the country, and the South Atlantic and Indian Ocean high pressure systems (Schuman *et al.*, 1995).

The inner shelf along the West Coast is underlain by Precambrian bedrock (Pre-Mesozoic basement), whilst the middle and outer shelf areas are composed of Cretaceous and Tertiary sediments (Dingle, 1973; Dingle *et al.*, 1987; Birch *et al.*, 1976; Rogers, 1977; Rogers & Bremner, 1991). As a result of erosion on the continental shelf along the West Coast, the unconsolidated sediment cover is generally thin, often less than 1 m. Sediments are finer seawards, changing from sand on the inner and outer shelves to muddy sand and sandy mud in deeper water. Further offshore, benthic habitats are dominated by lower bathyal and abyssal unconsolidated muds and sandy muds. The continental slope, seaward of the shelf break, has a smooth seafloor, underlain by calcareous ooze.

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<sup>5</sup> The Benguela region extends the length of the Benguela Current from approximately Cape Point in the South, to the position of the Angola-Benguela front in the North. The Benguela Region can be divided into three subregions, namely the Southern Benguela (Cape Point to Cape Columbine), Central Benguela (Cape Columbine to Lüderitz) and Northern Benguela (Lüderitz to the Angola-Benguela front).

**Table 1-1: Co-Ordinates of the Boundary Points of Sea Concession 4C and 5C.**

Sea Concessions 4C and 5C (Coordinates of the boundary):	Point	Latitude	Longitude
	A	15° 23' 41.729" E	29° 53' 9.292" S
	B	17° 0' 39.610" E	29° 53' 30.475" S
	C	16° 55' 17.297" E	29° 38' 55.884" S
	D	16° 29' 4.514" E	29° 38' 36.963" S
	E	16° 27' 3.580" E	29° 36' 45.392" S
	F	16° 26' 57.021" E	29° 20' 59.416" S
	G	15° 25' 59.395" E	29° 20' 25.185" S
	H	15° 5' 18.746" E	29° 34' 0.002" S
	I	15° 31' 55.313" E	29° 42' 21.062" S
	J	15° 31' 15.615" E	29° 45' 55.726" S
<b>Application area (Ha)</b>	987 039 ha (Total for both concessions as per Prospecting Work Programme (PWP)); 781 362 ha (Total for both concessions excluding the Namaqua Fossil Forest MPA)		
<b>Magisterial district:</b>	Not Applicable		
<b>Distance and direction from nearest town</b>	The project is located in offshore areas approximately from 10 to 195 km seaward of the West Coast shoreline of South Africa. The application area is approximately 12.5 km from Kleinsee and 60 km from Hondeklip Bay.		
<b>21-digit Surveyor General Code for each farm portion</b>	Not Applicable. The Samara Concession Project is located offshore.		

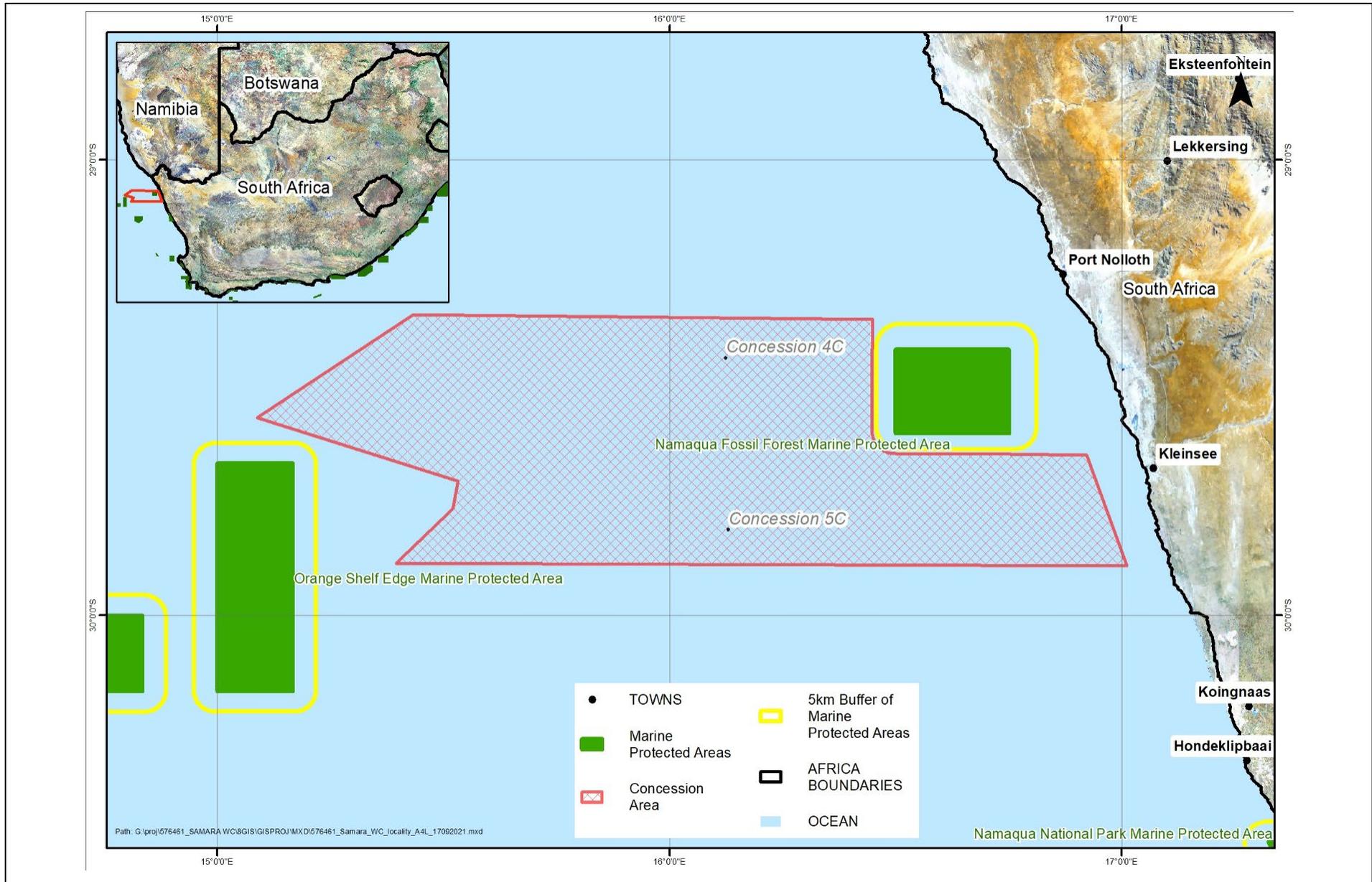


Figure 1-1: Locality map.

## 2 Objectives of the Environmental Management Programme

The key objectives of the Environmental Management Programme (EMPr) are to:

- To avoid, minimise, or correct pollution and degradation of the environment;
- To avoid or minimise waste and to re-use or re-cycle waste where possible;
- To apply a risk averse and cautious approach;
- To anticipate and prevent negative impacts on the environment (physical, biological, social, economic, and cultural). Where these impacts cannot be prevented, such impacts must be minimised or remedied;
- That negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied;
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option; and
- The social, economic, and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed, and evaluated, and decisions must be appropriate in the light of such consideration and assessment.

The NEMA stipulates that anyone who causes pollution or degradation of the environment is responsible for preventing impacts occurring, continuing or recurring and for the costs of repair of the environment.

This EMPr, among other things:

- Presents an action plan for the implementation of mitigation measures with the purpose of regulating the Contractor's conduct or method of working;
- Provides specific environmental guidance for construction, operation, maintenance and decommissioning activities;
- Incorporates measures to manage and mitigate construction, operation, maintenance and decommissioning activities so that negative environmental impacts are avoided or reduced;
- Identifies and allocates responsibilities for specific actions associated with the management of construction, operation, maintenance, and decommissioning activities to mitigate negative environmental impacts; and
- Provides an outline of the activities, which require monitoring and the assessment thereof.

This EMPr serves as a stand-alone document to be disseminated to and used by the contractor/s and project managers/supervisors during the construction, operation, maintenance, and decommissioning phases of the project. By its very nature, the EMPr is a dynamic document and updating may be required.

The EMPr has been compiled on the basis of the outcome of work undertaken during the Scoping and EIA and represents management commitments of Samara, once approved by the Competent Authority, whereby the EMPr will be legally binding.

## 2.1 The Polluter-Pays Principle

This principle provides for “the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment”. The Polluter Pays Principle must be rigorously applied throughout the Construction, Operational and Closure Phase of this project.

## 2.2 Legal Requirements for an Environmental Management Programme

Sections 24 and 44 of the NEMA make provision for the promulgation of regulations that identify activities which may not commence without an EA issued by the competent authority (DMRE). In this context, the EIA Regulations, 2014 (GN R 982 of 2014, as amended), promulgated in terms of NEMA, govern the process, methodologies, and requirements for the undertaking of EIAs and EMPs) in support of EA applications. Appendix 4 of the EIA Regulations sets out the requirements for the EMP.

**Table 2-1: Requirement of an EMP in terms of the EIA Regulations, 2014 (As amended).**

Government Notice (GN) 982, Appendix 4:	Item	Section in Report
(1)	An EMP must comply with section 24N of the Act and include -	
(1) (a)	Details of -	
(1) (a) (i)	The EAP who prepared the EMP; and	Section 2.3
(1) (a) (ii)	The expertise of that EAP to prepare an EMP, including a curriculum vitae;	Section 2.4
(1) (b)	A detailed description of the aspects of the activity that are covered by the EMP as identified by the project description;	Section 2.4 Section 6.3
(1) (c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any should be avoided, including buffers;	Section 1.1
(1) (d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including -	
(1) (d) (i)	Planning and design;	Section 2.5 Section 6.3
(1) (d) (ii)	Pre-construction activities;	Section 2.5 Section 6.3
(1) (d) (iii)	Construction activities;	Section 2.5 Section 6.3
(1) (d) (iv)	Rehabilitation of the environment after construction and in the case of a closure activity, closure; and	Section 2.5 Section 6.3
(1) (d) (v)	Where relevant, operation activities;	Section 2.5 Section 6.3
(1) (f)	A description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in (d) and (e) will be achieved, and must, where applicable, include actions to -	
(1) (f) (i)	Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Table 6-1

Government Notice (GN) 982, Appendix 4:	Item	Section in Report
(1) (f) (ii)	Comply with any prescribed environmental management standards or practices; and	Table 6-1
(1) (f) (iii)	Comply with any applicable provisions of the Act regarding closure in case of a closure activity;	Table 6-1
(1) (g)	The method of monitoring the implementation of the impact management actions contemplated in (f);	Table 6-1
(1) (h)	The frequency of monitoring the implementation of the impact management actions contemplated in (f);	Table 6-1
(1) (i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	Table 6-1
(1) (j)	The time periods within which the impact management actions contemplated in (f) must be implemented;	Table 6-1
(1) (k)	The mechanism for monitoring compliance with the impact management actions contemplated in (f);	Table 6-1 Section 6.6
(1) (l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Table 6-1
(1) (m)	An environmental awareness plan describing the manner in which -	
(1) (m) (i)	The applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Section 6.8
(1) (m) (ii)	Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 6.8
(1) (n)	Any specific information that may be required by the competent authority.	None

## 2.3 Roles and Responsibilities

The prospecting activities will be undertaken and managed on behalf of Samara (Table 2-2) who is ultimately responsible to implement the EMP through all prospecting phases, including the End-of-Prospecting Phase. Responsibilities will be delegated by Samara as the prospecting progresses through each phase.

**Table 2-2: Proponent and EAP contact details.**

Details	Project Manager/EAP (SRK)	Client Contact (NDI)
<b>Name</b>	Dr Laetitia Coetser	Ndivhudzannyi Mofokeng
<b>Tel No</b>	012 361 9821	053 842 0687
<b>Fax No</b>	012 361 9912	086 538 1069
<b>E-mail Address</b>	<a href="mailto:LCoetser@srk.co.za">LCoetser@srk.co.za</a>	<a href="mailto:atshidzaho@gmail.com">atshidzaho@gmail.com</a>

## 2.4 Expertise of the EAP

As mentioned previously, Samara is represented in this application by acting agent, NDI. NDI provides geological services and has submitted all the relevant project applications to the DMRE. Accordingly, NDI is recognised as the independent EAP at the DMRE. SRK, acts on behalf of NDI as the independent EAP to undertake and manage the EIA and to undertake the Stakeholder Engagement Process.

NDI is a young South African based black and woman owned consulting company. The company has established offices in Kimberley and the Northern Cape. The company now has another branch in Johannesburg, Gauteng. NDI personnel have geological, environmental, and geotechnical engineering

experience in the exploration and mining background. The company has more than 20 years combined team experience in the exploration and mining fields. The team has experience in commodities such as gold, platinum, coal, iron ore, manganese, chrome, diamonds, uranium, rare earth elements and mineral sands. NDI is well versed with the government regulations and policies. NDI's experience has been acquired locally and in other African countries.

SRK (EAP) was established in 1974 and has since undertaken a large variety of environmental studies. SRK is a South African founded international organisation of professionals providing a comprehensive range of consulting services to natural resource industries and organisations. South African offices are staffed with over 400 professional consultants in nine offices, operating in a range of disciplines, mainly related to the environment, water, social, and mining sectors. Back-up and peripheral expertise are available within these offices for all environmental projects.

A copy of the EAP and project team's Curriculum Vitae and qualifications, as well as copies of professional registration certificates are attached in the Main Environmental Impact Assessment Report (EIAR). As required by NEMA, the qualifications and experience of the key independent EAPs undertaking the EIA are detailed as follow:

**Project Manager/Reviewer:** Dr Laetitia Coetser (SRK), PhD (Water Resource Management), *Pri.Sci.Nat 400312/06*,

Dr Laetitia Coetser is a Partner within SRK and has been involved in the field of water and environmental management for more than 25 years. She holds a PhD. in Water Resource Management at the University of Pretoria and is a registered Professional Natural Scientist (SACNASP) (Pr. Sci. Nat 400312/06). She has an in-depth understanding and application of Integrated Environmental Management. She provides specialist advise to EIAs and EMPs as well as to Water Use Authorisations/Permitting. Laetitia has a range of specialisations including water resource management, surface water management, stakeholder engagement, data management and interpretation, environmental compliance auditing and due diligences. She has solid knowledge and understanding of the environmental legislation and subsequent regulations. Laetitia has further been involved with acid mine treatment and diffuse pollution and has compiled numerous articles and presentations on these matters. She is therefore well placed to be the Team Leader on this project.

**Principal Scientist/Report Author:** Andrew Caddick (SRK), MSC (Environmental Management), *Pr.Sci.Nat. 400021/156, EAPASA (2019/1540)*

Mr. Andrew Caddick (Project Manager) holds a Master's degree in Geography and Environmental Science. He is an environmental scientist at SRK with 14 years' experience in the environmental field. His experience lies in the management of EIA and EMP processes, coordination and execution of stakeholder engagement, and management of multi-disciplinary project teams, mainly for mining related projects. He is also involved in conducting EMP audits, site assessments, Waste Management Licenses and plans, and closure liability assessment. Mr Andrew Caddick is appropriately qualified and registered with the relevant professional bodies as a Professional Natural Scientists (Pr.Sci.Nat. 400021/156) with the South African Council of Natural Scientific Professions, as well as a Professional Environmental Assessment Practitioner with the Environmental Assessment Practitioner Association of South Africa (2019/1540).

**Geologist and Client Representative:** Ndivhudzannyi Mofokeng (NDI), BSc (Hons) Earth Sciences in Mining and Environmental Geology

Ndivhudzannyi holds BSc (Hons) Earth Sciences in Mining and Environmental Geology. She has close to 13 years' experience in the exploration and open cast work in the mining industry. She has proven leadership skills from supervising exploration rigs (Reverse Circulation and percussion drilling). She has proven working experience in field exploration and mapping, borehole logging, borehole sampling,

sample preparation for laboratory analysis, handling of Global Positioning System (GPS), supervisory duties within the field, geological report and progress report writing, including PWP's and Environmental Management Plans, handling the DMRE documents in general. Ndivhudzannyi has as a solid technical background in Geographic Information System (GIS) Arcview software (GSSA Prof Reg), Rockworks, Turbo-Cad and Turbo-Sketch, and Global Mapper 9 Application.

## 2.5 Project Description

This project is associated with operations that take place within the Samara proposed prospecting area only. This project description therefore focuses on the proposed prospecting site.

To prospect for diamonds, Samara Mining intends to use both invasive and non-invasive methods. The non-invasive method will be made up of desktop (including analytical desktop) studies, geophysical surveys, 3D geological model and resource estimation. The invasive methods will comprise of Exploration Drilling and Bulk Sampling.

The prospecting programme aims to gather sufficient data on the proposed prospecting right concession to complete a feasibility and decision on proceeding with the mining project. A three phased approach to exploration will be undertaken. Phase 1 will commence with non-invasive methods of desktop studies, geophysical surveys and the identification of potential diamond trap-sites to plan and design the exploration drill sample programme on. Phase 2 will be the invasive method of reconnaissance exploration drill sampling that aims to identify which potential trap-sites carry a positive grade. Phase 3 will consist of non-invasive detail infill geophysical surveys and invasive detail infill drilling. Results will determine the level of confidence reached to either justify resource estimation or do a second programme of detail infill drilling to increase confidence for resource estimation and preliminary mine plan design. The preliminary mine plan will be followed by a trench bulk sampling programme to simulate mining, finalise the mine plan and gather geotechnical production data for the feasibility study. This phase will determine the feasibility and decision on proceeding with the mining project.

Commencing with additional geophysical data acquisition over areas where coverage is not adequate to support sampling and adjacent to areas onshore which show potential for diamond prospecting. The objective of the 1<sup>st</sup> phase of sampling will be to ground truth geophysics and identify mineralization. At the latter end of the sampling voyage, it is proposed that follow up sampling be taken around positive results to expand on mineralization continuity.

The prospecting activities will follow a standard phased approach which will be undertaken on a scheduled timeline, with some activities being run concurrently, while others will follow sequentially. A description of the project phases and requirements is provided in the following sections.

### 2.5.1 Phase 1: Non-invasive Methods (Month 1-23)

This phase will be implemented in eight stages as detailed below.

Stage one will comprise of a desktop-literature study that will investigate and source all available historical and recent data on regional and Concession Area scale. This stage aims to source geographical, geological, environmental, geotechnical, logistical, exploration, resource mineralisation, production, and commercial data.

Stage two will focus on studying the sourced data to compile a geological database with maps and reporting to enable an experienced marine geologist to extrapolate existing data into areas with little to no data coverage. The aim is to delineate areas within the Concession Areas that show high mineralization potential, moderate potential, and no potential on a reconnaissance scale.

Stage three consists of planning and layout of geophysical survey lines in areas of moderate to high mineralisation potential by an experienced marine geologist / geophysicist. The layout of the survey lines will focus on survey line orientation i.t.o. the prevailing swell and ocean current as well as the orientation of the prospective geological features. The ideal survey line orientation will provide the best possible quality geophysical data. Survey line spacing will be determined by the selection of the appropriate geophysical survey equipment to provide adequate coverage as well as by the water depth of each potential area.

Selection of the geophysical survey equipment will include a decimetre accurate GPS, tide gauge, high resolution swath bathymetric system and high resolution seismic sub-bottom profiler.

Deliverables of Stage three will be the survey design and scope of work for the reconnaissance remote geophysical survey to be conducted from a suitable survey vessel. This will include mapped-out survey lines with coordinates, total survey line kilometres, selection of geophysical survey equipment per survey line, survey vessel suitable to the water depths and selection of equipment and deliverables for the post-survey data processing. This comprehensive geophysical survey design is aimed at achieving the best outcome per line kilometre surveyed and will form the scope of work for the final costing of the geophysical survey.

Stage four will activate the tender process for selection of the best suitable geophysical survey contractor and survey vessel to conduct the survey programme as well as the post-survey data procession, interpretation, and specified deliverables.

Stage five is the execution of the reconnaissance geophysical survey programme at sea within the Concession Areas. This will be conducted by a well experienced and qualified survey team consisting of Samara's representative, Party Chief, Geophysicist, Surveyor, Technician and Data loggers/Data processors.

Stage five activities will start with mobilisation of all survey equipment onto the survey vessel in Cape Town, sea trials in Table Bay for testing vessel and equipment-offset positioning as well as equipment data capture, quality, and resolution. After successful sea trials and acceptance sign-off by Samara's representative, the survey vessel will transit to the Concession Areas.

Survey data collection at sea will be done during good to fair weather conditions to ensure the best possible quality geophysical data. Data collection will be stopped once sea conditions deteriorate from fair to poor, as data quality and accuracy will deteriorate and be of little use to map the identified areas. Therefore, the duration of the total sea time until completion is an estimate.

Data quality assurance and quality control (QA and QC) will be applied during surveying operations to ensure rectifying problems as soon as detected. The QA/QC process entails the regular on-board post-processing of data to allow evaluation of adjacent survey lines i.t.o. accurate positioning, data correlation with the different geophysical systems, resolution, and image quality. Once all planned survey lines have been surveyed and collected on board, the Samara representative will sign off completion of the at sea fieldwork part of the survey programme. The survey vessel will transit back to Cape Town and all geophysical equipment demobilised.

Stage six will commence with in-office geophysical data post-processing and interpretation after the geophysical survey datasets have been backed-up.

Post-processing of swath bathymetric data entails merging of the collected tide gauge data with the swath bathymetric data to achieve a mean sea floor level, as well as applying cleaning and signal enhancing filters to remove noise spikes and improve the 3D image. The final deliverable is a high resolution geographically accurate digital terrain model of the sea floor surface that will form part of the

GIS database. This data will allow interpretation of the sediment-rock contact, identifying different surface sediment coarseness areas and bedrock signature structures like fractures, joints, and faults.

Post-processing of the seismic sub-bottom profiler data involves applying filters to smooth out the sea swell oscillation of the sea floor surface reflector and enhance the signal and deeper reflectors. Interpretation will seek to digitise the deepest seismic bedrock reflector from the sea floor outcrop down to the deepest sediment cover as well as digitising internal reflectors within the sediment package that might indicate a consolidated layer that could have acted as a diamond trap site above bedrock or that may cause problems with penetration during drill sampling and mining.

All above datasets and interpretations are combined in the GIS database compiled from Stage two above.

Stage seven is the process of designing the reconnaissance exploration drill programme. This process involves studying and modelling the GIS database by a marine geologist experienced in marine diamond exploration with focus on identifying diamond trap-site features. Once all trap-sites have been identified will they be given a rating i.t.o. their orientation, shape, size, sediment thickness and water depth to rank them in order of highest to lowest potential. This rating will form the basis of compiling exploration target areas required to design the reconnaissance exploration drill programme.

The parameters used to decide on the coordinates and spacing of exploration drill positions will depend on the ranking, size, and orientation of the trap-sites. Drill positions for a reconnaissance programme will typically be on a grid spacing of between 200 and 100 m. The total numbers of reconnaissance drill positions required will depend on the total trap-sites identified from geophysical data, the ranking, and their footprint size.

The reporting of above studies, the evaluation, drill positions and a scope of work will be compiled to design the reconnaissance exploration drill programme to allow for final costing of the drill programme.

Stage eight will identify suitable exploration drill contractors, completing the tender process and appointment of an experienced contractor with exploration drill and processing plant equipment mobilised on a fit-for-purpose vessel.

The choice of exploration drill equipment will be proven technology for marine diamond exploration providing reliable results which will place confidence in ultimately defining and estimating a resource to be mined with proven mine technology suitable for water depths of the Concession Areas.

The identified exploration drilling tool is Wirth Drill technology capable of vertical drilling 10 to 12 m into the sea floor that can operate in water depths up to 160 m. The footprint of this drill is typically 3 to 5 m<sup>2</sup> providing a large enough area for confidence in the results.

A vessel equipped with this drill technology typically has a central moonpool for deployment and recovery of the drill platform. Furthermore, the vessel will have deck capacity for an in-line dense medium separation (DMS) plant that will receive the drilled material and process it via an in-line X-Ray concentrator up to final recovery. This processing method will provide on board grade results to enable the on-board exploration geologist to evaluate and augment the exploration drill programme to achieve the best possible outcome per drill position.

Furthermore, the vessel will be equipped with a dynamic positioning (DP) system to provide < 1 m accuracy and able to move swiftly from one drill position to the next.

## 2.5.2 Phase 2: Invasive Methods (Month 24-37)

This phase will be implemented through four stages consisting of mostly invasive but also non-invasive methods.

Stage one will execute the reconnaissance exploration drill (vertical) programme within the Concession Areas to determine the mineralisation of each diamond trap-site feature.

The exploration drill vessel will depart from Cape Town and transit to the Concession Area with the on-board Samara representative. Drilling will be conducted in a specific pre-determined order to reduce sailing time in between drill sites thereby increasing drill sites per day. The successful and crucial execution of each drill site depends on the drill head reaching bedrock footwall and the dredge pump properly removing loose material from the bedrock surface.

During drill sampling, results of the mineralisation grade per drill site and grade per trap-site feature will be regularly evaluated on board and discussed to compare with trap-site rating given during design of the drill programme. This dynamic approach will allow shifting of following drill positions to align better with the mineralisation grade results and to gain more geological information on the trap-site features and related mineralisation model.

On completion of the reconnaissance drill programme all recorded data (drill logs, geotechnical data, and mineralisation grade) will be combined into the database for use in the next stage.

Stage two comprises detailed evaluation and correlation (ground-truthing) of drill data (geological, geotechnical and diamond grade) with geological bedrock features and seismic reflectors mapped out from the remote sensing geophysical survey data.

This process of ground-truthing is crucial to adjust interpretations from the geophysical survey data, to revisit and update the trap-site rating as well as to identify positive grade diamond trap-site features that require infill drilling to increase knowledge and confidence towards understanding and modelling the mineralised geological features. The ground-truthing process also identify areas where infill geophysical seismic survey lines are required where bedrock micro-topography lead to poor extrapolation in between adjacent seismic survey lines.

An all-important part of this stage is the study and evaluation of the geotechnical data to predict the mine-ability of the deposit since the vertical penetration ability of the drill does not simulate the mine tool geotechnical ability.

Deliverables from this Stage two will be a post-reconnaissance exploration drill programme report detailing mapped out diamond trap-site features with adjusted priority rating and an updated geological model.

Stage three will use the recommendations from Stage two report on further exploration work required which entails infill seismic survey lines followed by an infill drill programme at 100 to 50 m spacing to increase confidence to ultimately achieve a resource estimation as well as determining the geotechnical character of the ore body that could impact mining and the feasibility.

This study and recommendations will lead to the design of the infill geophysical survey and infill drill programmes.

The placing and number of infill seismic survey lines and infill drill sites are dependent on the results of the reconnaissance drill programme and therefore an unknown at this stage.

Stage four will repeat the process of engaging with the geophysical survey contractor and the drill contractor to cost and execute the next phase of an infill exploration programme. It is imperative to use the same contractors to ensure geophysical and geotechnical repeatability and therefore placing confidence in correlation and upgrading the previous reconnaissance programme drill results.

### 2.5.3 Phase 3: Invasive Methods (Month 38-60)

This phase will be implemented through eleven stages consisting of mostly invasive but also non-invasive methods.

Stage one will be execution of the infill geophysical survey programme at sea within the Concession Areas. This will be conducted with the same survey contractor as before with their team accompanied by the Samara representative.

Stage two will commence with geophysical data post-processing and interpretation of the infill survey lines.

The seismic reflectors mapped out will be added to the GIS database to improve the resolution to better define the bedrock topography, geological modelling and improve knowledge of bedrock features that control diamond trap-site grade and a better understanding of the mineralised features as identified through drilling.

Stage three will use the detailed geophysical infill data to augment the infill drill programme in adjusting drill positions to be better aligned with the higher resolution dataset.

Stage four is the execution of the infill exploration drill programme using the same drill contractor as previously, again accompanied by the Samara representative.

On completion of the infill drill programme all recorded data (drill logs, geotechnical data, and mineralisation grade) will be combined into the GIS database for use in the next stage.

Stage five is the culmination and focus of the systematic and comprehensive exploration programme (or the PWP) aimed at placing Samara in a well informed and results-based position to make a decision on the viability of a future mining programme.

This stage starts with detailed evaluation and correlation (ground-truthing) of the latest infill drill data (geological, geotechnical and diamond grade) with the infill survey data and existing dataset.

The careful evaluation of all geophysical survey and drill exploration data, interpretation, extrapolation, geological modelling, and delineation of diamond grade trap-site features will identify and allow estimation of diamond resource deposits.

The data coverage and detailed geological data mapped during the exploration programme will determine the level of confidence which will either identify data gaps for further infill exploration (Stage- 1, Stage-4) or justify proceeding to the next Stage 6 of the design of a preliminary mine plan.

Stage six follows the previous stage that will serve as basis to design a preliminary mine plan inclusive of geotechnical parameters to equal the chosen mine tool and vessel technical abilities and thereby supporting the feasibility and conclusion on proceeding with the mining project in concession 4C and 5C.

Stage seven will engage with the chosen mine contractor to deliberate the nature of the resource deposits, the expected bedrock type and topography, possible consolidated internal sedimentary layers, total sediment thickness, sedimentary assemblage and expected diamond grade.

Together with the mine contractor a trench (bulk) sampling programme will be agreed on. This programme design will stipulate that execution must be with the chosen future mine tool technology, thereby increasing confidence in mine ability of the deposits.

Stage eight is the execution of the trench sampling programme with the selected vessel and mine technology of the future mine contractor.

During the trench sampling programme, the future mine contractor will evaluate the diamond recovery (mining tool and processing plant) and geotechnical data to increase confidence in the mineability of the deposits.

Stage nine will comprise engagement with the selected future mine contractor to discuss the trench sampling results, nature of the resource deposits, bedrock type and topography, possible problematic consolidated internal sedimentary layers, total sediment thickness, sedimentary assemblage, gravel processing, diamond recovery and diamond grade expected for future mining operations.

Grade results from exploration drilling will be correlated with grades achieved during trench sampling to calculate the expected grade from drilling versus the real grade from mining. Results will be used to recalculate and improve confidence in the earlier resource estimation.

Stage ten addresses the rehabilitation of the sea floor after the invasive methods of exploration drilling and trench sampling.

Environmental impacts will be on a comparable scale to those by previous operators in the same environment with similar sampling tools. Given that the areas disturbed will be a very small percentage of the licence (less than 0.002%), that only lower biodiversity sediment areas are affected (i.e., not high biodiversity reef areas), that the sea floor tends to self-rehabilitate and that the beneficiation process is non-toxic the impact is likely to be of very low significance. Previous EIA's have shown that while marine diamond sampling does disturb the marine benthic fauna communities, the magnitude is low, the duration is short, the spatial extent very local and of low impact. There is little effect to sea water quality, marine fauna, cetaceans, marine mammals, or commercial fishing.

In light of the very small area impacted and that swell with sediment movement acts as a natural recovery of the sea floor, no rehabilitation is required.

Stage eleven will be a comprehensive feasibility study incorporating the geological model, defined resource deposits, resource estimation, geotechnical data, mine tool ability, expected daily mining rate, recoverable diamond grade, life of mine and diamond market.

Table 2-3 summarises the description of the bulk sampling activities.

**Table 2-3: Description of Bulk Sampling Activities.**

ACTIVITY		DETAILS		
<b>Number of pits/trenches planned</b>		Twenty trenches (an estimate, as exploration and geological results will determine requirement)		
<b>Dimensions of pits/trenches, per pit/trench</b>	<b>Number of pits/trenches</b>	<b>Length</b>	<b>Breadth</b>	<b>Depth</b>
	20 (est.)	240m	20m	1 to 4 m
<b>Locality</b>		Exact location of trenches will be determined on completion of Phase 3, Stage 5.		
<b>Volume Overburden (Waste)</b>		9 600 m <sup>3</sup> on each excavation		
<b>Volume Ore</b>		2 400 m <sup>3</sup> on each excavation		
<b>Density Overburden</b>		Estimate: 1.7 g/cm <sup>3</sup>		
<b>Density Ore</b>		Estimate: 2.0 g/m <sup>3</sup>		
<b>Phase(s) when bulk sampling will be required</b>		During Phase 3		
<b>Timeframe(s)</b>		4 months for design, execution and results of geotechnical analysis of trench sampling programme		

## 2.6 Vessel Emissions and Discharges

Types of emissions and discharges that are expected when undertaking the geophysical surveys, exploration and other related activities can be summarised as follows:

- Discharges to sea:
  - Deck drainage (including detergents used for washing exposed marine deck spaces), machinery space wastewater etc.: The concentration of oil in discharge water from any vessel needs to comply with the MARPOL Regulation 21 stand (less than 15 ppm oil in water). Further any oily water would be processed using a suitable separation and treatment system meeting the MARPOL Annex I standard before being discharged to sea. Drainage from the deck spaces will wash directly overboard;
  - Sewage: The contracted vessels will be required to comply with MARPOL Annex IV Regulations for the Prevention of Pollution by Sewage from ships;
  - Disposal of solid waste such as food (galley) waste: Food waste disposal into the sea is permitted in terms of MARPOL Annex V when it has been ground and the vessel is located more than 3 nautical miles (approximately 5.5 km) from land. Such ground food wastes shall be capable of passing through a screen with openings no greater than 25 mm. Disposal overboard without macerating can occur greater than 12 nautical miles (approximately 22 km) from the coast. The average daily discharge from a vessel is typically in the order of 0.15 m<sup>3</sup>;
- Waste (including general waste, scrap metal, drums, containers, chemicals and hazardous wastes, used oil, infectious waste) disposal to land: A number of other types of wastes generated during the Geophysical Surveying and Drill/Bulk sampling activities, would not be discharged at sea but would be transported onshore for ultimate disposal. Waste transported to land would be disposed at a licenced municipal landfill facility or at an alternative approved site. Operators would co-operate with local authorities to ensure that waste disposal is carried out in an environmentally acceptable manner.
- Vessel machinery emissions: Compliance with the requirements of MARPOL Annex VI - Prevention of Air Pollution from Ships will be required for all vessel engines and where vessels are fitted with garbage incinerators.

**Table 2-4: Project phases and requirements.**

Phase	Activity (What are the activities that are planned to achieve optimal prospecting)	Skill(s) required (Refers to the competent personnel that will be employed to achieve the required results)	Timeframe (In months) for the activity)	Outcome (What is the expected deliverable, e.g., Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome (Deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g., geologist, mining engineer, surveyor, economist, etc.)
1	<b>Non – Invasive methods</b>					
	Project initiation	Directors / Managers	1		8 months	Shareholders
	Stage-1: Sourcing of historical data	Geologist with relevant knowledge and experience	3	Geological GIS database and maps showing potential areas for exploration.		Exploration Geologist
	Stage-2: Desktop literature study of sourced data	Geologist with relevant knowledge and experience	4			
	Stage-3: Geophysical survey - Design	Geologist / Geophysicist with relevant knowledge and experience	2	Geophysical survey design as a report and scope of work.	4 months	Geophysicist
	Stage-4: Geophysical survey - Tender process and contractor appointment	Directors and Geologist / Geophysicist	2	Appointment of geophysical survey contractor.		Geophysicist / Directors
	Stage-5: Geophysical survey - Execution	Survey contractor and Client's representative Geologist / Geophysicist	2	Geophysical post-survey Report.	6 months	
	Stage-6: Geophysical survey - Data processing and interpretation	Survey contractor and Geologist / Geophysicist	4	Geophysical data interpretation and updated GIS database.		Geophysicist
Stage-7: Exploration drill programme - Design	Exploration Geologist with	3	Geological report with updated maps, geological models with drill	5 months	Senior Geologist	

Phase	Activity (What are the activities that are planned to achieve optimal prospecting)	Skill(s) required (Refers to the competent personnel that will be employed to achieve the required results)	Timeframe (In months) for the activity)	Outcome (What is the expected deliverable, e.g., Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome (Deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g., geologist, mining engineer, surveyor, economist, etc.)
		relevant knowledge and experience		target features and scope of work for exploration drill programme.		
	Stage-8: Exploration drill programme - Tender process and contractor appointment	Directors, Mine manager and Exploration Geologist	2	Appointment of exploration drill contractor.		Mine Manager / Directors
2	<b>Invasive methods</b>					
	Stage-1: Exploration drill programme - Execution	Drill contractor and Client's representative geologist	4	Drill programme reporting on drill results (grade, technical and geotechnical data), update database and ranking of mineralised features.	8 months	Senior Geologist
	Stage-2: Exploration drill programme - Update database with results and delineating mineralised features.	Exploration Geologist	4			
	Stage-3: Survey and Drill Infill programme - Design of infill survey and infill drill programme.	Exploration Geologist with relevant knowledge and experience	3	Geophysical infill survey and Drill infill programme design as a report and scope of work.	6 months	Exploration Geologist
	Stage-4: Infill geophysical survey + Infill exploration drill programme - Tender process and contractor appointment	Directors, Mine manager and Exploration Geologist	3	Appointment of Geophysical survey contractor. Appointment of Exploration drill contractor.		Mine Manager / Directors
3	<b>Non – Invasive and Invasive methods</b>					
	Stage-1: Geophysical infill survey – Execution	Survey contractor and Client's representative	2	Geophysical post-survey Report.	5 months	

Phase	Activity (What are the activities that are planned to achieve optimal prospecting)	Skill(s) required (Refers to the competent personnel that will be employed to achieve the required results)	Timeframe (In months) for the activity)	Outcome (What is the expected deliverable, e.g., Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome (Deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g., geologist, mining engineer, surveyor, economist, etc.)
		Geologist / Geophysicist				
	<u>Stage-2:</u> Geophysical infill survey - Data processing and interpretation.	Survey contractor and Geologist / Geophysicist	3	Geophysical data interpretation and updated GIS database.		Geophysicist
	<u>Stage-3:</u> Exploration infill drill programme - Augment drill positions in design report.	Exploration Geologist with relevant knowledge and experience	1		7 months	
	<u>Stage-4:</u> Exploration infill drill programme - Execution	Drill contractor and Client's representative geologist	2	Drill programme reporting on drill results, geo-modelling of mineralised features and resource estimation. In position to decide on requirement for further infill exploration or to develop mine plan.		
	<u>Stage-5:</u> Exploration infill programme - Update database with results, Make decision on further infill exploration required or proceed to future mine programme.	Exploration Geologist, Resource Geologist	4			Mine Manager
	<u>Stage-6:</u> Preliminary mine plan - Design	Resource Geologist, Mine Manager	2		8 months	
	<u>Stage-7:</u> Trench sampling programme - Design	Exploration Geologist, Mine Manager	1			Senior Geologist / Mine Manager
	<u>Stage-8:</u> Trench sampling programme – Execution	Mine contractor and Client's representative geologist	2			

Phase	Activity (What are the activities that are planned to achieve optimal prospecting)	Skill(s) required (Refers to the competent personnel that will be employed to achieve the required results)	Timeframe (In months) for the activity)	Outcome (What is the expected deliverable, e.g., Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome (Deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g., geologist, mining engineer, surveyor, economist, etc.)
	<u>Stage-9</u> : Trench sampling programme - Update drill grade to grade achieved from trenching, recalculate resource estimation	Exploration Geologist, Resource Geologist	3	Geological and geotechnical report on mineability and recovery of diamonds, updated resource estimation.		Resource Geologist
	<u>Stage-10</u> : Rehabilitation	Natural recovery of the sea floor	0	Statutory reporting.	0 months	Environmental Officer
	<u>Stage-11</u> : Feasibility study - Comprehensive study to allow decision to activate mining phase	Multidisciplinary team of specialist consultants	3	Feasibility study report to decide on activation of mining.	3 months	Economist / Directors

## 2.6.1 Rehabilitation

Direct impact on the seabed results in the localised removal of the seabed habitat where fine sediment surface layers are replaced with coarse sediments. After the primary screening process, the majority of the material pumped to surface is returned directly back to the sea. Thus, coarse and to some extent finer tailings are discharged directly back into the disturbed areas. This avoids reprocessing the same sediments, minimises the disturbance footprint and provides material for re-establishment of habitat.

Sediments normally settle out to the seabed within minutes while mixing with descending seawater results in the dilution of finer sediment. Remaining particulate matter normally settles over a period of a few hours. Research programs have demonstrated the re-establishment of ecological functioning of the seabed after the removal of diamonds and recovery rates are linked to infill with fine sediment. Passive translocation of animals during storms or sediment slumping from nearby unaffected areas, immigration of mobile species, and immigration and settlement of pelagic larvae and juveniles result in recolonisation of the affected areas.

Given that the areas disturbed will be a small percentage of the licence, that only lower biodiversity sediment areas are affected (i.e. not high biodiversity reef areas), that the seafloor tends to self-rehabilitate and that the beneficiation process is non-toxic, the impact is likely to be of low overall significance. Previous EIA's have shown that while marine diamond sampling and mining does disturb the marine benthic fauna communities, the magnitude is "low", the duration "short", the spatial extent "very local", the likelihood "high" and the overall rating "low impact severity". There is little effect to sea water quality, marine fauna, cetaceans, marine mammals or commercial fishing.

## 2.7 Environmental Impact Assessment Process

This chapter summarises the impact of the proposed prospecting at the West Coast in the Northern Cape Province according to the EIAR. The principal findings are presented in this chapter.

Proposed prospecting to be undertaken by Samara will have both negative and positive impacts. The EIA has examined the available project design information and drawn on both available (secondary) and acquired (primary) baseline data to identify and evaluate environmental (biophysical and socio-economic) impacts of the proposed project.

### 2.7.1 Principal Findings

The proposed project concerned itself with environmental (taken to mean biophysical) sustainability, social equity, and economic efficiency. This serves as a useful construct to frame the evaluation of environmental impacts of the project.

The challenge for DMRE is to take a decision which is sustainable in the long term, and which will probably entail trade-offs between social, environmental, and economic costs and benefits. The trade-offs are documented in the EIAR, which assesses environmental impacts and benefits and compares these to the No-Go alternative. SRK believes it will be instructive to reduce the decision factors to the key points which the authorities should consider. These points constitute the principal findings of the EIA:

1. The potential environmental impacts associated with the proposed project considered in the S&EIR process include nuisance from the operation and presence of additional vessels; discharge of deck drainage, sewage, and galley wastes; accidental spillages of hazardous substances; dredging equipment operating on the seabed and pipelines connected to the vessels; pulses, noise, and light emitted from prospecting equipment; upwelling of sediment

by equipment under water; and the possible temporary closing of certain oceanic transport routes.

2. Assuming that the recommended mitigation measures will be effectively implemented, the project will not have unacceptably significant adverse impacts, while socio-economic benefits are also fairly modest.
3. The No-Go alternative entails the cessation of the proposed prospecting activities and effectively cancelling the Samara Concession Project. As such, significant benefits of this alternative have been identified. However, the negative socio-economic impact of the No-Go alternative is considered to be of **medium** significance and therefore not a recommended option.
4. A number of mitigation and monitoring measures have been identified to avoid, minimise and manage direct potential environmental impacts associated with the project. These are laid out in detail in Section 6.

Cumulative impacts are generally rated as being of **very low** significance when implementing mitigation measures, while the cumulative socio-economic benefit of mining in this region is considered to be **low**.

## 2.7.2 Quantitative Impact Assessment Outcomes

This section contains the assessment results of potentially positive and negative environmental impacts that can be caused by the Project. The impacts are linked to the activities conducted for the proposed prospecting phases. Specific emphasis was placed on any relevant environmental, social, and economic aspects identified by the specialist studies, comments received during the stakeholder engagement process, issues highlighted by relevant authorities; as well as a professional judgment of the project team and EAP through appraisals on the project description, listed activities, and the receiving environment.

The objectives for each of the potential environmental impacts identified was to determine their significance and to promote mitigation measures to reduce the impacts to an acceptable level where required.

Negative and positive impacts identified and assessed as part of the EIA are presented in Table 2-5 for the bulk sampling activities and geophysical sampling of prospecting.

**Table 2-5: Potential residual risk pre- and post-mitigation.**

Activities	Aspect	Potential Impact	Significance Without Mitigation	Significance With Mitigation
Geophysical surveying; Drill/bulk sampling activities.	Marine Ecology	Potential noise impacts on invertebrates.	VERY LOW	VERY LOW
		Potential noise impacts on fish.	VERY LOW	VERY LOW
		Potential noise impacts on marine mammals.	VERY LOW	VERY LOW
		Potential vessel strikes on marine mammals.	VERY LOW	INSIGNIFICANT
		Drill/bulk sampling impacts on benthic fauna.	LOW	VERY LOW
		Potential crushing of epifaunal communities by crawler tracks.	VERY LOW	VERY LOW

Activities	Aspect	Potential Impact	Significance Without Mitigation	Significance With Mitigation
		Increased turbidity in the water column due to the suspension of fine sediments during Drill/Bulk sampling activities.	VERY LOW	VERY LOW
		Potential sedimentation impacts on benthic communities due to coarse tailings.	LOW	INSIGNIFICANT
		Marine pollution originating from operational discharges during vessel operations.	VERY LOW	INSIGNIFICANT
	Fisheries	Impact of multi-beam and sub-bottom profiling sonar on fisheries.	VERY LOW	VERY LOW
		Impact of temporary exclusion of fishing operations during survey and sampling operations.	INSIGNIFICANT	INSIGNIFICANT
		Impact of noise from sampling/trenching operations on fisheries.	VERY LOW	VERY LOW
		Impact of sediment plumes on fish stock recruitment.	VERY LOW	VERY LOW
		Impact of temporary exclusion of fishing operations during exploration sampling operations.	INSIGNIFICANT	INSIGNIFICANT
	Archaeology/ Palaeontology	Potential significant loss of Cretaceous fossil woods.	MEDIUM	LOW (+)
		Potential significant loss of Cenozoic shelly macrofauna.	VERY LOW	VERY LOW
Potential significant loss of fossil bones and teeth.		MEDIUM	VERY LOW	
Potential significant loss of shells from the last Transgression Sequence		MEDIUM	LOW	
Potential significant loss of submerged prehistoric archaeological sites and materials		MEDIUM	LOW (+)	
Marine Prospecting/Exploration/Mining	The presence of survey and support vessels may have an impact due to the legislative requirement of a 500 m safety zone around these vessels.	LOW	VERY LOW	
Marine Transport Routes	The presence of survey and support vessels may have an impact due to the legislative requirement of a 500 m safety zone around these vessels.	LOW	VERY LOW	

Activities	Aspect	Potential Impact	Significance Without Mitigation	Significance With Mitigation
	Socio-Economic	Creation of employment and business opportunities.	LOW (+)	LOW (+)
	Cumulative	Potential impact on benthic environment.	LOW	LOW
		Potential impact on the socio-economic environment.	LOW	LOW
	No-Go alternative	Option of not continuing with the planned prospecting activities.	MEDIUM	MEDIUM

### 2.7.3 Authorisation Opinion

This EIAR has identified and assessed the potential biophysical and socio-economic impacts associated with the Samara Concession Prospecting Project, which entails planned prospecting, including bulk sampling, in an offshore area for diamonds in the Namaqua District Municipality around the Nama Khoi and Richtersveld Local Municipalities in the Northern Cape Province.

In terms of Section 31 (n) of NEMA, the EAP is required to provide an opinion as to whether the activity should or should not be authorised. In this section, a qualified opinion is ventured, and in this regard SRK believes that sufficient information is available for DMRE to take a decision.

The project will result in unavoidable negative environmental impacts, however, these are of limited intensity and limited scale, assuming the implementation of recommended mitigation and are not considered unacceptably significant. In addition, the project could potentially contribute to ongoing regional socio-economic benefits.

The Stakeholder Engagement Process conducted during the EIA process has given stakeholders the opportunity to assist with the identification of issues and potential impacts, and to submit their comments. Various Organs of State submitted comments, and none raised objections or fatal flaws.

Working on the assumption that Samara is committed to ensuring that the project is operated and constructed to high standards, achieved through implementation of the recommended mitigation measures and ongoing monitoring of performance, SRK believes, and the EIAR demonstrates that, through effective implementation of the stipulated mitigation measures, the adverse impacts can be reduced to levels compliant with national standards or guidelines.

The fundamental decision is whether to allow the prospecting for diamonds, which is generally consistent with development policies for the area, but which may have limited biophysical impacts.

The HIA specialist's reasoned opinion is that the proposed prospecting activities in Concession Areas 4C and 5C are likely to have a very low impact on palaeontological and submerged prehistoric archaeological resources, and no impact on maritime archaeological sites and materials. Provided the recommendations to mitigate and offset potential impacts are implemented, the proposed prospecting can be considered to be archaeologically acceptable.

According to the Marine Impact Assessment the most significant impact concern relating to the proposed prospecting application is that of bulk sampling and the dumping of tailings over potentially sensitive habitat types found within the Concession Area. While the existing Concession Area layout to excludes potentially sensitive areas around the two MPAs found in the immediate vicinity by including 5 km buffer zones, there are other areas that have been identified in the National Coastal and Marine Spatial Biodiversity Plan (NCMSBP) as Critical Biodiversity Areas (CBAs) which are not

compatible with the current proposed exploration proposal. The CBA maps identify 32% of the Concession Area as Critical Biodiversity Area in a natural state (CBA-N), 3% as an Ecological Support Area (ESA) and <0.001% considered as Critical Biodiversity Areas that require recovery (CBA-R). The remaining 65% of the Concession Area is unclassified in terms of the CBA maps. Based on this recent marine spatial planning, a significant portion of the proposed Concession Area is not compatible with the proposed bulk sampling methods. The remaining potential impacts on the marine environment include the presence of the ship and the associated surveying activities are not seen to be major cause for concern if specific mitigation measures are implemented which have been outlined in this report.

The Marine Impact Assessment specialist is thus of the opinion that exploration in the Concession Areas that fall outside the areas delineated on the CBA maps should be approved. Approval for non-invasive sampling in the CBA and ESA areas should be granted. Approval for invasive sampling in the CBAs and ESAs should be withheld at this stage pending further information on the mineral resources in this area based on the findings of the geophysical survey from which a detailed spatial sampling plan can be developed.

It is the opinion of the Fisheries Impact Assessment specialist that, if all environmental guidelines, and appropriate mitigation measures and management actions advanced in this report, and the EIA and EMPr for the proposed prospecting operations as a whole, are implemented, there is no reason why the proposed prospecting activities should not proceed.

In conclusion SRK is of the opinion that on purely 'environmental' grounds (i.e., the project's potential socio-economic and biophysical implications) the application as it is currently articulated should be approved, provided the essential mitigation measures are implemented. Ultimately, however, the DMRE will need to consider whether the project benefits outweigh the potential impacts (and if the negative socio-economic impact of the No-Go alternative is acceptable in the context of relatively low significance biophysical impacts of the development alternative).

If approved, it is SRK's opinion that the authorisation should be valid for a period of 5 years.

### 3 Applicable Legislation

Provides a summary of the applicable legislation, policies, and guidelines identified as relevant to the proposed project. In addition, a description of how the proposed activity complies with and responds to the legislation and policy context, is provided. This list is not exhaustive but rather represents an indication of the most applicable pieces of environmental legislation relevant to the project.

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**Table 3-1: Policy and legislative context of the proposed prospecting activities.**

Legislation	Description and Relevance	Responsible Authority
Constitution of the Republic of South Africa, Act 108 of 1996	<p>In terms of Section 24 of the Constitution of the Republic of South Africa (108 of 1996), everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected for the benefit of present and future generations, through reasonable legislation and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while prompting justifiable economic and social development. The needs of the environment as well as affected parties should thus be integrated into overall project management in order to fulfil the requirements of Section 24 of the Constitution.</p> <p>Chapter 2 encapsulates the Bill of Rights and Section 24 relates to Environmental Rights.</p> <p><b>Legal requirements for this project:</b>  <i>The proposed activities shall be implemented in such a manner that significant environmental impacts are avoided, where significant impacts cannot be all together avoided, be minimised and mitigates (as per this EMP) in order to protect the environmental rights of South Africans.</i></p>	Not Applicable
National environmental Management Act 107 of 1998	<p>NEMA establishes a set of principles which all authorities have to consider when exercising their powers. These include the following:</p> <ul style="list-style-type: none"> <li>• Development must be sustainable;</li> <li>• Pollution must be avoided or minimised and remedied;</li> <li>• Waste must be avoided or minimised, reused or recycled;</li> <li>• Negative impacts must be minimised; and</li> <li>• Responsibility for the environmental consequences of a policy, project, product or service applies throughout its life cycle.</li> </ul> <p>Section 28(1) states that “every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring”. If such degradation/pollution cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution. These measures may include:</p> <ul style="list-style-type: none"> <li>• Assessing the impact on the environment;</li> <li>• Informing and educating employees about the environmental risks of their work and ways of minimising these risks;</li> <li>• Ceasing, modifying or controlling actions which cause pollution/degradation;</li> <li>• Containing pollutants or preventing movement of pollutants;</li> <li>• Eliminating the source of pollution; and</li> <li>• Remedying the effects of the pollution.</li> </ul> <p><b>Legal requirements for this project:</b>  <i>Samara (the proponent) has a responsibility to ensure that the proposed activities and the S&amp;EIR process conform to the principles of NEMA. The proponent is obliged to take actions to prevent pollution or degradation of the environment in terms of Section 28 of NEMA, and to ensure that the environmental impacts associated with the project (of which none are anticipated) are considered and mitigated where possible.</i></p>	Department of Forestry, Fisheries and the Environment (DFFE); and Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform

Legislation	Description and Relevance	Responsible Authority
National Environmental Management: Waste Act 59 of 2008	<p>The National Environmental Management: Waste Act 59 of 2008 (NEM:WA) was implemented on 1 July 2009 and Section 20 of the Environment Conservation Act (Act No. 73 of 1989), under which waste management was previously governed, was repealed.</p> <p>The NEM:WA reforms the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; and to provide for:</p> <ul style="list-style-type: none"> <li>• National norms and standards for regulating the management of waste by all spheres of government;</li> <li>• Specific waste management measures;</li> <li>• The licensing and control of waste management activities;</li> <li>• The remediation of contaminated land; to provide for the national waste information system; and</li> <li>• Compliance and enforcement.</li> </ul> <p>In terms of the NEM:WA, all waste management activities must be licensed. According to Section 44 of the Act, the licensing procedure must be integrated with an EIA process in accordance with the Regulations GN R 982 published in terms of the NEMA. GN R 718 listed the waste management activities that require licensing. On 29 November 2013, GN R 718 was repealed and replaced by a new list of waste activities under GN R 921 and amended in July 2015 by GN R 633. A distinction is made between Category A waste management activities, which require a BA, and Category B activities, which require a full EIA (scoping followed by impact assessment), and Category C waste management activities which do not require a waste management licence but compliance with relevant requirements or standards.</p> <p><b>Legal requirements for this project:</b></p> <p><i>NEM:WA is not applicable to offshore activities and therefore no Waste Management Licence in terms of NEM:WA will be required. Waste aspects will be managed in terms of the requirements of the International Convention for the Prevention of Pollution from Ships (MARPOL 1973/1978).</i></p>	DFFE
National Environmental Management: Protected Areas Act 57 of 2003 (NEM:PAA)	<p>The protection and management of South Africa's protected areas are controlled by the NEM:PAA. The Act provides for:</p> <ul style="list-style-type: none"> <li>• Declaration of nature reserves and determination of the type of reserve declared;</li> <li>• Declaration of Marine Protected Areas (MPAs);</li> <li>• Cooperative governance in the declaration and management of nature reserves;</li> <li>• A system of protected areas to manage and conserve biodiversity; and</li> <li>• The utilization and participation of local communities in the management of protected areas.</li> </ul> <p>According to Section 14 of NEM:PAA, an MPA declared under the Marine Living Resources Act 18 of 1998 (MLRA), and which existed when the NEM:PAA Amendment Act, 2014 took effect, must be regarded as an MPA declared under Section 22A of the NEM:PAA.</p> <p><b>Legal requirements for this project:</b></p> <p><i>Although there are a number of declared MPAs off the West Coast, Samara Mining does not intend prospecting in these areas and consequently there will be no impact in or near these MPAs.</i></p>	DFFE

Legislation	Description and Relevance	Responsible Authority
National Environmental Management: Integrated Coastal Management Act 24 of 2008	<p>NEM: ICMA provides for the integrated management of the coastal zone, including the promotion of social equity and best economic use, while protecting the coastal environment.</p> <p>Chapter 8 of the Act establishes an integrated system for regulating the disposal of effluent and waste into the sea. Section 70 prohibits incineration at sea and restricts dumping at sea unless done so in terms of a permit and in accordance with South Africa's obligations under international law.</p> <p><b>Legal requirements for this project:</b>  <i>As Samara Mining does not intend on disposing effluent and waste into the sea, no authorisations are required in terms of the National Environmental Management: Integrated Coastal Management Act 24 of 2008.</i></p>	DFFE
National Environmental Management: Air Quality Act 39 of 2004	<p>The National Environmental Management: Air Quality Act 39 of 2004 (NEM:AQA) lists activities that generate atmospheric emissions that have or may have a significant detrimental effect on the environment and require licensing in terms of NEM:AQA. An Atmospheric Emission Licence (AEL) from the competent authority is required for these activities, which are listed in GN 893 of 2013. All applications must conform to the requirements of NEMA and the application must be accompanied by "such documentation and information as may be required by the licensing authority".</p> <p><b>Legal requirements for this project:</b>  <i>Metropolitan and district municipalities are charged, in terms of Section 36 of the Act, to implement the AEL system, but as the project area is located offshore, the project area does not fall within the borders of a metropolitan or district municipality. In terms of NEM:AQA, there is no formal application of the AEL system in offshore environments. MARPOL dictates that on-board incineration of waste is permitted. Uncertainty thus exists on the applicability of NEM:AQA.</i></p>	DFFE and Namakwa District Municipality
Mineral and Petroleum Resources Development Act 28 of 2002	<p>The MPRDA makes provision for equitable access to and sustainable development of South Africa's mineral and petroleum resources and aims to inter alia provide for security of tenure in respect of prospecting, exploration, mining, and production operations. In terms of previous mining legislation, mineral rights were held privately by landowners (and in some instances by the State), but the MPRDA vests all mineral rights in the State. The fundamental principles of the MPRDA are:</p> <ul style="list-style-type: none"> <li>• Mineral resources are non-renewable;</li> <li>• Mineral resources belong to the nation and the State is the custodian;</li> <li>• Protection of the environment for present and future generations to ensure sustainable development of the resources by promoting economic and social development;</li> <li>• Promotion of local and rural development of communities affected by mining;</li> <li>• Reformation of the industry to bring about equitable access to the resources and eradicating discriminatory practices; and</li> <li>• Guaranteed security of tenure.</li> </ul> <p>In terms of the MPRDA, a Prospecting Right must be obtained prior to the commencement of any prospecting activities. A requirement for obtaining a Prospecting Right is that an applicant must submit an application in terms to Section 16 (1) of the MPRDA to the Regional Manager, who must accept the application within 14 days if, inter alia, no other person holds a Prospecting Right, Mining Right, Mining Permit or Retention Permit for the same mineral and land. If the application for a Prospecting Right is accepted, the Regional Manager must request that the applicant comply with Chapter 5 of NEMA with regards to consultation and reporting.</p>	Northern Cape DMRE

Legislation	Description and Relevance	Responsible Authority
	<p><b>Legal requirements for this project:</b>  <i>In support of the Prospecting Right application, Samara Mining is required to undertake an EIA and to obtain an EA in compliance with the requirements of NEMA and the EIA Regulations, 2014.</i></p>	
Marine Living Resources Act 18 of 1998	<p>The MLRA governs MPAs and states in Section 43 that:  (2) No person shall in any marine protected area, without permission in terms of subsection (3)—  (a) take or destroy any fauna and flora other than fish;  (b) dredge, extract sand or gravel, discharge or deposit waste or any other polluting matter, or in any way disturb, alter or destroy the natural environment;  (c) carry on any activity which may adversely impact on the ecosystems of that area.</p> <p><b>Legal requirements for this project:</b>  <i>Although there are a number of declared MPAs off the West Coast, Samara Mining does not intend prospecting in these areas and consequently there will be no impact on these MPAs.</i></p>	DFFE
National Heritage Resources Act 29 of 1999 (NHRA)	<p>SAHRA, replacing the National Monuments Act 28 of 1969 (as amended) and the National Monuments Council as the national agency responsible for the management of South Africa's cultural heritage resources.</p> <p>The NHRA reflects the tripartite (national/provincial/local) nature of public administration under the South African Constitution and makes provision for the devolution of cultural heritage management to the appropriate, competent level of government.</p> <p>Because national government is responsible for the management of the seabed below the mean high-water mark, however, the management of maritime and underwater cultural heritage resources under the NHRA does not devolve to provincial or local heritage resources authorities but remains the responsibility of the national agency, SAHRA.</p> <p><b>Legal requirements for this project:</b>  <i>As the proposed project can possibly damage palaeontological features and materials like fossils, maritime and underwater cultural heritage sites and materials, and submerged pre-colonial archaeological sites and materials, an Underwater Heritage Impact Assessment has been conducted as part of the EIA process.</i>  <i>The company must apply to SAHRA for a general permit to destroy, damage, excavate, disturb, and collect fossils identified during sampling, as per the NHRA and any recovered material is to be temporarily stored by the company.</i></p>	SAHRA
Maritime Zones Act 15 of 1994	<p>South Africa's Maritime Zones Act of 1994 is the national legislative embodiment of the international maritime zones set out in the United Nations Convention on the Law of the Sea (UNCLOS). The Act defines the extent of the territorial waters, contiguous zone (also known as the maritime cultural zone), Exclusive Economic Zone (EEZ) and continental shelf (which together comprises of some 4.34 million square kilometres of seabed) and sets out South Africa's rights and responsibilities in respect of these various maritime zones.</p> <p>Under the terms of Sections 4(2) and 6(2) of the Maritime Zones Act respectively, "any law in force in the Republic, including the common law, shall also apply in its territorial waters" and "subject to any other law the Republic shall have, in respect of objects of an archaeological or historical nature found in the maritime cultural zone, the same rights and powers as it has in respect of its territorial waters". The NHRA applies, therefore, within South Africa's territorial waters (12 nautical miles seaward of the baseline) and to the outer limit of the maritime cultural zone / contiguous zone (24 nautical miles seaward of the baseline).</p> <p>Any offshore activity that has the potential to disturb or damage cultural heritage resources located in or on the seabed within the territorial waters and maritime cultural zone requires the involvement of SAHRA, as a commenting body in respect of the</p>	SAHRA

Legislation	Description and Relevance	Responsible Authority
	<p>NEMA environmental assessment process (see below) and as permitting authority where impacts to sites or material cannot be avoided and damage or destruction will occur.</p> <p><b>Legal requirements for this project:</b></p> <p><i>Concession Areas 4C and 5C straddle the territorial waters, contiguous zone and the EEZ. Within the former two maritime zones the NHRA therefore applies to the proposed activities.</i></p>	

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### 3.1 NEMA Listed Activities and Description

Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities which may not commence without an EA issued by the competent authority (DMRE). In this context, the EIA Regulations, 2014 (GN R 982 of 2014, as amended), promulgated in terms of NEMA, govern the process, methodologies, and requirements for the undertaking of EIAs in support of EA applications. Listing Notices 1-3, in terms of NEMA, list activities that require EA (“NEMA listed activities”).

As mentioned previously, GN R 982<sup>6</sup> of the EIA Regulations lays out two alternative authorisation processes. Depending on the type of activity that is proposed, either a BA process or an S&EIA process is required to obtain EA. LN 1<sup>7</sup> lists activities that require a BA process, while LN 2<sup>8</sup> lists activities that require S&EIR.A. LN 3<sup>9</sup> lists activities in certain sensitive geographic areas that require a BA process.

The regulations for both processes – BA and S&EIR - stipulate that:

- Stakeholder engagement must be undertaken as part of the assessment process;
- The assessment must be conducted by an independent EAP;
- The relevant authorities must respond to applications and submissions within stipulated time frames;
- Decisions taken by the authorities can be appealed by the proponent or any other Interested and Affected Parties (I&APs); and
- A draft EMPr must be compiled and released for public comment.

GN R 982 (Appendix 1-5) sets out the procedures to be followed and content of reports compiled during the BA and S&EIA processes.

The NEMA National Appeal Regulations<sup>10</sup> make provision for appeal against any decision issued by the relevant authorities. In terms of the Regulations, an appeal must be lodged with the relevant authority in writing within 20 days of the date on which notification of the decision (EA) was sent to the applicant or I&AP (as applicable). The applicant, the decision-maker, I&APs, and organ of state must submit their responding statement, if any, to the appeal authority and the appellant within 20 days from the date of receipt of the appeal submission.

The proposed project includes activities that are listed in terms of the EIA Regulations, 2014, and require authorisation through this process (Table 3-2).

**Table 3-2: NEMA Listed Activities (2014) applicable to the Project which require Authorisation.**

No.	Listed activity	
Listing Notice 1 (GN R 983)		Comment
19A	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles, or rock of more than 5 cubic metres from the seashore.	Dredging of sea material as part of the prospecting activities over a 781 362 ha (excluding Namaqua Fossil Forrest MPA) area.

<sup>6</sup> As amended by GN R327, GN R325 and GN R324 on 7 April 2017 & GN R517 on 11 June 2021

<sup>7</sup> GN R983 of 2014, as amended by GN R327 of 2017 & GN R517 of 2021

<sup>8</sup> GN R984 of 2014, as amended by GN R325 of 2017 GN R517 of 2021

<sup>9</sup> GN R985 of 2014, as amended by GN R324 of 2017 GN R517 of 2021

<sup>10</sup> GN R993 of 2014, as amended by GN R205 of 2015

No.	Listed activity	
20	Any activity including the operation of that activity which requires a prospecting right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required to exercise the prospecting right.	Prospecting Right Application in terms of Section 16 and Regulation 7(1) of the Mineral and Petroleum Resources Development Act.
22	The decommissioning of any activity requiring a prospecting right.	Decommissioning of the prospecting activities.
Listing Notice 2 (GN R 984)		Comment
19	The removal and disposal of a mineral, which requires a permission acted in terms of Section 20 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the permission.	Bulk sampling as part of the prospecting activities over an area of 781 362 ha (excluding the Namaqua Fossil Forest MPA)

**Legal requirements for this project:**

*The proponent is obliged to apply for EA for the listed activity and to undertake a S&EIR process in support of the EA application, in accordance with the procedure stipulated in GN R 982 under NEMA.*

### 3.2 Other Key Relevant Policies

Policies provide the framework to applicable legislation and are used to provide support to legal interpretation or guidance regarding the implementation of governmental objectives. Relevant policies not mentioned before applicable to the proposed Samara prospecting activities include, but it not limited to:

- Companies Act 71 of 2008;
- Climate Change – Carbon Tax Act 15 of 2019;
- Climate Change – National Climate Change Response White Paper;
- Constitution of South Africa;
- Carriage of Goods by Sea Act 1 of 1986;
- Dumping at Sea Control Act 73 of 1980;
- Hazardous Substances Act 85 of 1983;
- Marine Pollution (Control and Civil Liability) Act 6 of 1981;
- Marine Pollution (Intervention) Act 65 of 1987;
- Marine Pollution (Prevention of Pollution from Ships) Act 2 of 1986;
- Marine Safety Authority Act 5 of 1998;
- Marine Safety Authority Levies Act 6 of 1998;
- Marine Traffic Act 2 of 1981;
- Marine Zones Act 15 of 1994;
- Merchant Shipping Act 57 of 1951;
- Occupational Health and Safety Act 85 of 1993;

- Sea Shore Act 21 of 1935;
- Sea Birds and Seals Protection Act 46 of 1973;
- Ship Registration Act 58 of 1998;
- Water Act 36 of 1998; and
- Wreck and Salvage Act 94 of 1995.

### 3.3 International Conventions

Relevant international conventions and protocols to which South Africa is a signatory include:

- United Nations Convention on Law of the Sea, 1982 (UNCLOS); and
- International Convention for the Prevention of Pollution from Ships and its amendment, 1973/178 (MARPOL) and its amendment.

Other conventions or agreements that are applicable to the project include but is not limited to:

- Agreement on the Conservation of Albatrosses and Petrels, 2004;
- Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, 1989;
- Conservation on International Trade of Wild Fauna and Flora Endangered Species (CITES), 1973;
- Convention concerning the Protection of the World Cultural and Natural Heritage, 1972;
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), 1983;
- Convention on the International Regulations for Preventing Collisions at Sea, 1972;
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (London Convention) and the Protocol, 1996;
- International Convention for the Conservation of Atlantic Tunas;
- International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2017;
- International Convention for the Safety of Life at Sea, 1974;
- International Convention on Load Lines, 1966;
- International Convention on Oil Pollution Preparedness, Response and Cooperation, 1990 (OPRC);
- International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001;
- International Convention relating to Intervention on the High Seas in case of Oil Pollution Casualties, 1969 and the Protocol on the Intervention on the High Seas in case of Marine Pollution by Substances other than Oil, 1973;
- International Labour Organisation Conventions;
- Kyoto Protocol on the Framework Convention on Climate Change, 1997;
- Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia, 2001;

- Memorandum of Understanding on the Conservation of Migratory Sharks, 2010;
- Montreal Protocol on Substances that Deplete the Ozone Layer, 1987;
- Protocol on the Intervention on the High Seas in Cases of Marine Pollution by substances other than oil, 1973;
- Revised African Convention for the Conservation of Nature and Natural Resources, 2017;
- United Nations Convention on Biological Diversity, 1992;
- United Nations Convention on Migratory Species, 1999;
- United Nations Educational, Scientific and Cultural Organisation Convention on the Protection of the Underwater Cultural Heritage, 2001;
- United Nations Framework Convention on Climate Change (Paris Agreement), 2016;
- United Nations framework Convention on Climate Change, 1992; and
- Vienna Convention for the Protection of the Ozone Layer; 1985.

### **3.3.1 The United Nations Convention on the Law of the Sea**

The UNCLOS, 1982 was established to reduce marine pollution from seabed activities (including prospecting activities) as well as from land-based sources from all its member states. UNCLOS specifically requires this in the Exclusive Economic Zone and continental Shelf. This Convention also makes provisioning for marine pollution caused by dumping waste at sea. UNCLOS also provides for compensation for damage caused by pollution in the ocean. It further prescribes and enforces pollution standards and consist of contingency plans to prevent and mitigate pollution and its impacts.

### **3.3.2 The International Convention for Prevention of Marine Pollution for Ships**

The MARPOL, 1973 and its Protocol, 1978 regulates pollution that is generated on ships. Accordingly, all vessels are responsible to prevent, minimise, and mitigate pollution originating from them. Even though a waste management license is not required for offshore waste management, the generation of waste, however, still needs to be minimised as part of environmental awareness. Waste created in this Project will be disposed of appropriately. Applicable sections of the MARPOL include Annex I (regulation and prevention of oil pollution), Annex II (regulation of controlled Noxious Liquid substance pollution), Annex III (regulation of harmful substance pollution), Annex IV (regulation of sewage pollution), Annex V (regulation of garbage pollution), and Annex VI (regulation of air pollution).

## 4 Approach to Environmental Impact Management

The goal of this EMPr is to provide mitigation and monitoring measures to ensure that potential impact by the Project and proposed prospecting activities are avoided or mitigated and to maximise potential positive impacts of the Project. The EMPr particularly aims to set environmental actions for Samara and its contractors and sub-contractors to implement and serve as indicators against which the environmental performance of the Project can be measured during all of its phases.

A key feature of the EMPr is that of continual improvement, which is an ongoing process of reviewing, corrective actions in order to approve the overall system. The most common approach for this is through the implementation of **Plan – Do – Check – Review**.

The responsibility of the EMPr implementation will ultimately reside in the Project Management Team of the Project. Table 4-1 illustrates the range of approaches to be undertaken to manage potential project activities.

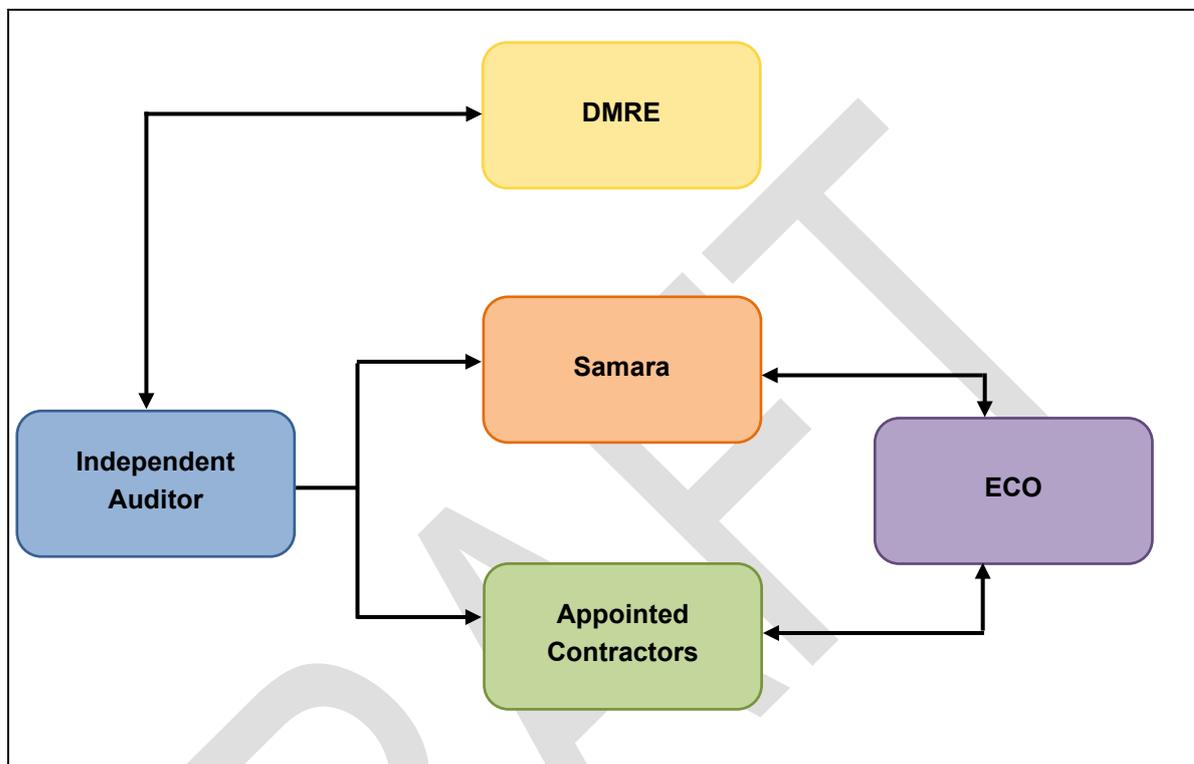
**Table 4-1: Approach to impact management.**

Avoidance	Avoiding activities that could result in adverse impacts and/or resources to areas considered sensitive.
Prevention	Preventing the occurrence of negative environmental impacts and/or preventing such an occurrence having negative impacts.
Preservation	Preventing any future actions that might adversely affect and environmental resource.
Minimisation	Limiting or reducing the degree, extent, magnitude, or duration of adverse impacts through scaling down, relocating, redesigning and/or realigning elements of the project.
Mitigation	Measures taken to minimise adverse impacts on the environment.
Enhancement	Magnifying and/or improving the positive effects or benefits of a project.
Rehabilitation	Repairing affected resources, such as natural habitats or water resources.
Restoration	Restoring affected resources to an earlier (possibly more stable and productive) state, typically 'background' or 'pristine' conditions. These resources may include soils and biodiversity.
Compensation	Compensating for lost resources, and where possible, the creation, enhancement, or protection of the same type of resource at another suitable and acceptable location.

## 5 Administration and Regulation of Environmental Obligations

### 5.1 Roles, Responsibilities and Organisational Structure

Figure 5-1 illustrates the anticipated management structure for this EMPr, which will be used as framework for all official communication and reporting lines.



**Figure 5-1: Organisational structure.**

DMRE is the designated competent authority responsible for the authorisation of this EMPr and has the overall responsibility for ensuring that the Samara prospecting activities complies with this EMPr, and any conditions listed in the EIA Regulations. Should any amendments to the EMPr be required, DMRE will also be the responsible authority. DMRE has the authority to take legal action if the conditions contained in the EA and EMPr are not complied with. Any amendments to the conditions also require approval from the DMRE.

The responsibility of the EMPr implementation and the provision of the financial costs for the implementation of all of the environmental control measures is that of Samara and the Environmental Manager. Samara will be responsible for the appointment of the contractors who will be responsible for the different phases of the Project. Contacts between Samara and the contractors will define the designated roles for the implementation of the EMPr and the different phases of the prospecting activities. Furthermore, Samara will ensure that all employees and contractors are made aware of possible environmental impacts, mitigation measures in the EA and EMPr, and the importance of complying with these measures. Incidents of non-compliance or spillage will be recorded and reported by Samara to DMRE. If such an incident occurs, corrective action will be taken by Samara.

The contractors (and sub-contractors) will be responsible for the implementation of the EMPr whilst Samara will be accountable to DMRE for compliance and the overall oversight of the project.

In order to plan and undertake the prospecting activities, it is important that all parties understand their functions and responsibilities. Samara and their contractors will be responsible for the construction

and operation of the Project and ensure that all activities undertaken by Samara are undertaken in compliance with the project's EA and EMPr. Samara will monitor activities at a frequency which will be determined by the schedule. Samara will also be responsible for appointing an independent auditor to conduct external audits.

The role of the independent auditor is to mainly report on the level of compliance to conditions set in the EA and EMPr. In line with this, the auditor should report on the success of mitigation and monitoring measures provided to minimise the environmental impacts. New impacts and risks should be identified and changes in the EMPr recommended where applicable to ensure more comprehensive and applicable measures. Audits will be undertaken by the independent officer at the end of the prospecting activities and submit the report to the DMRE.

## 5.2 Administration of the Environmental Management Programme

Samara shall:

- Make copies of the EMPr available to all contactors to be kept on the vessels;
- Brief the contractor staff on the contents and obligations contained in the EMPr as relevant to the different prospecting phases;
- Update the EMPr should findings of the environmental audit reports indicate that mitigation measures are insufficient;
- Ensure that any significant changes to the EMPr are approved by the DMRE before the implementation thereof;
- Other administrative actions to be undertaken by Samara and the contractors include, but is not limited to:
  - **Issuing of Commencement Notifications to DMRE.** DMRE shall be given written notice of the commencement of construction at least two weeks prior thereto (or as specified in the EA).
  - **Issuing of General Notification Letters to residents in Port Nolloth and Kleinsee.** Samara will notify residents and I&APs that the EA has been issued.
  - **Ongoing Interaction, Engagement and Communication with Key Stakeholder.** Prior to the commencement of establishment and during operation, Samara is to engage with key stakeholders including but not limited to the DMRE, DFFE (Managers of the research survey programmes), fishing industry/associations, local fishing operators, South African Maritime Safety Authority (SAMSA), South African Navy Hydrographic office, overlapping and/or adjacent prospecting/exploration/mining right holders etc.;
  - **Method Statements.** The contractors to submit method statements to Samara for environmentally sensitive aspects associated with the work performed;
  - **Record Keeping.** The contractors are to keep records of all environmental management activities undertaken on site. These shall include but not be limited to:
    - Meeting information;
    - Audit reports, non-compliances with the EMPr, corrective actions taken, safe disposal certificates of waste removed;
    - Method Statements received and approved;
    - Incident Reports;

- Evidence of training and awareness; and
- EA.
- **Review and auditing.** The contactors are to develop internal review procedures to monitor progress against the implementation of the EMPr. Compliance auditing is to be undertaken at the discretion of Samara and/or DMRE and is to include review of all environmental and social performance and compliance;
- **Emergency Preparedness and Response Plan.** Samara is to compile an Emergency Response Plan summarising steps to take in care of emergency (i.e., major spills);
- **Close-out audit.** A close out audit is to be undertaken once the prospecting activities has been concluded and an Environmental Audit Report compiled and submitted to DMRE; and
- **Bi-annual reporting.**

### 5.2.1 The Project Management Team (Samara) will:

- Ensure that the contractors are aware of the specifications, legal constraints, and Samara standards and procedures pertaining to activities taking place regarding the Project and planned prospecting activities;
- Ensure that all commitments in the EMPr are communicated and adhered to by Samara employees and contractors involved with the Project and planned prospecting activities;
- Monitor the implementation of the EMPr throughout the Project, by means of site inspections and meetings; and
- Familiarise themselves with the EIA/EMPr for this Project, the conditions set out in the EA, and all relevant environmental legislation.

### 5.2.2 The Contractor (including Sub-Contractors) will be responsible for:

- Complying with the EMPr commitments and any other legislative requirements;
- Adhering to any instructions issued by the project manager on advice of Samara's Environmental Specialist;
- Submitting an environmental report at each site meeting on the environmental incidents that have occurred within the period before the site meeting;
- Appoint a Safety Officer and/or SHE representative who will comply to the functions set out below; and
- Arrange that all employees and those of the sub-contractors receive appropriate training prior to the commencement of establishment and operation, taking cognisance of this EMPr and EA.

### **5.2.3 The Environmental Control Officer/Safety, Health, and Environment Representative (One Person) will:**

- Manage and report on the Project's environmental performance;
- Be responsible for undertaking internal environmental audits and arrange/coordinate external environmental audits;
- Liaise with environmental statutory bodies, should this be deemed necessary;
- Conduct environmental training and awareness to employees;
- Advise top management on environmental issues and recommendations for the Project and planned prospecting activities;
- Arrange for liaison with I&APs on environmental issues of concern, if required;
- Oversee all work done by the Environmental Auditor;
- Ensure corrective actions are followed up and closed out;
- Advise top management on environmental issues and recommendations for the Project and planned prospecting activities;
- Fully understand the commitments in the EIA/EMPr and EA;
- Familiarise him/herself and ensure compliance with the relevant legislation applicable to the project and Samara's Safety, Health and Environmental Policy and procedures;
- Communicate the contents of the EMPr to the contractor and sub-contractor staff members. Training will be required to ensure all staff members are aware of the requirements of this document;
- Regularly undertake site inspections to assess compliance with the EMPr and EA and take appropriate action to rectify non-conformances;
- Authorise the removal of personnel and/or equipment should they contravene the specifications of the EMPr;
- Compile progress reports on a regular basis for submission to the project manager; and
- Establish a communication path with the project manager to discuss monitoring on the site.

# 6 Environmental Management Programme Implementation

## 6.1 Permits and Agreements

The following permits and agreements will be required for the Project:

- EA – an application was submitted to DMRE on 9 February 2021;
- Prospecting Right – an application for bulk sampling was submitted to DMRE on 9 February 2021; and
- The company must apply to SAHRA for a general permit to destroy, damage, excavate, disturb, and collect fossils identified during sampling, as per the NHRA and any recovered material is to be temporarily stored by the company.

## 6.2 Transfer of Commitments to Contractors

As part of the appointment of preferred contractors, Samara will contractually transfer the responsibilities as outlined in this EMP to the responsible contractor.

## 6.3 Management Actions

The goal of this EMP is to avoid potential impacts where possible, and where the impacts cannot be avoided, measures are provided in this section to reduce them.

Table 6-1 and the following sub-sections provide recommended management actions to manage any potential impacts that might arise as set out in the EIA conducted for the Project and proposed prospecting activities. These actions have been organised according to project phase:

- Planning phase;
- Establishment phase;
- Bulk and Geophysical Sampling Phase; and
- End-of-prospecting, rehabilitation, and closure phase.

Samara's responsible persons have assessed the commitments listed in detail and committed to the management actions.

### 6.3.1 Planning Phase

Planning and design are necessary to ensure that the mitigation and impact management can be effectively implemented through the alternation and amendments of design bases to achieve a more cost effective, practical, and environmentally friendly development. Planning may involve the following:

- Identifying and defining the environmental aspects and related positive and negative impacts that may result from the activities;
- Establish a procedure whereby legal and any other requirements applicable to the Project and prospecting activities e.g., financial provisioning as subsidiary plans, as well as permits and exemptions; and
- Identifying and defining appropriate mitigation and management measures which can be incorporated into the on-going review and update of the operational aspects of the different units contributing to the prospecting activities.

The envisaged impacts to arise from the prospecting activities have been detailed and rated in the EIAR. The management measures presented in this EMPr are developed in response to these impacts and their associated ratings. Management actions listed in Table 6-1 will be applicable during the Planning Phase of the Project.

### **6.3.2 Establishment Phase**

This Phase includes activities and stages listed in the Project Description, Section 2.5. It is important to ensure that all training and preparation is in place during the Establishment Phase of the Project to ensure compliance with the EMPr and include:

- Environmental awareness training as detailed in Section 6.8 to ensure all Samara employees and contract workers are aware of the environmental sensitivity, sensitive species, and the impacts that their actions might have on the environment; and
- Notification of the commencement of activities to other sea users, stakeholders, and other IAP's.

### **6.3.3 Bulk and Geophysical Sampling Phase**

This Phase include mostly invasive techniques and some non-invasive techniques as listed in the activities and stages listed in the Project Description, Section 2.5.2 and Section 2.5.3. This Phase aims to ensure that:

- The EMPr is adhered to, and that awareness of the environment is present and that caution is taken;
- Emergencies like accidental oil spillages are prevented as far as possible, and if these occur, that it is dealt with accordingly to minimise the impact;
- Activities are undertaken with caution;
- Communication channels are established between other vessels and companies operating in the vicinity of the project area;
- Management and control measures are implemented to manage pollution, the storage and handling of waste, and refuelling at sea; and
- Vessels are properly lighted to be visible in all conditions, while also considering the potential environmental impact thereof.

### **6.3.4 End-of-Propecting, Rehabilitation and Closure Phase**

The rehabilitation Phase revolve around activities as provided in Section 2.6.1 and mainly revolves around the following:

- Rehabilitation activities such as backfilling of tailings and sediment in areas where removed;
- Final waste disposal in compliance with MARPOL;
- Removal of the sampling vessel and support vessel; and
- Informing stakeholders and I&APs of the completion of the prospecting activities and sharing information gained with I&APs.

**Table 6-1: Environmental management measures specific for the proposed Samara Concession prospecting activities.**

Objective	No.	Monitoring				Record keeping requirements
		Mitigation and management measures and principles	Timeframe	Executing Party	Monitoring Party	
<b>PLANNING PHASE</b>						
Finalisation of all plans before sampling	1.	<ul style="list-style-type: none"> <li>Plans that need to be prepared and should be in place for the vessels include: <ul style="list-style-type: none"> <li>A registration certificate;</li> <li>A classification certificate;</li> <li>A compliance document;</li> <li>A Shipboard Oil Pollution Emergency Plan;</li> <li>An Emergency Response Plan; and</li> <li>A Waste Management Plan.</li> </ul> </li> </ul>	Prior to commencement of sampling	Samara	Project Manager	A copy of the plans
Minimise disruption of sensitive features	2.	<ul style="list-style-type: none"> <li>As outlined in the project description, remote sensing data needs to be used first to identify sensitive areas in terms of heritage and the environment and areas where sampling activities can take place.</li> </ul>	Prior to commencement of sampling	Samara	Environmental Control Officer (ECO)	Survey data and maps
Notification of stakeholders about activities that will take place	3.	<ul style="list-style-type: none"> <li>DMRE should be notified about the specific details regarding prospecting activities to provide details regarding the programme and Samara's contact details.</li> </ul>	30 days before the commencement of sampling	Samara	ECO	Signed document as proof of submission
Minimise disruption of other activities at sea	4.	<ul style="list-style-type: none"> <li>The DFFE and other relevant stakeholders, governmental departments, and I&amp;APs should be consulted on the prospecting programmes and timelines.</li> <li>Disputes that may occur should be documented and referred to the DMRE.</li> <li>The vessel master should note and record interactions with other vessels.</li> <li>Keep the managers of the DFFE research survey programmes informed and obtain information on scheduling and location of their research programme.</li> <li>Any dispute arising with adjacent prospecting or exploration right holders should be referred to the DMRE or Petroleum Agency of South Africa for resolution.</li> </ul>	30 days before the commencement of sampling	Samara	Project Manager	Copies of communication; Register from vessel master

Objective	No.	Monitoring				Record keeping requirements
		Mitigation and management measures and principles	Timeframe	Executing Party	Monitoring Party	
Ensuring compliance with legal requirements in terms of required permits	5.	<ul style="list-style-type: none"> <li>An application should be submitted to the DFFE to be active within 300 m of whales in necessary to comply with conditions set out in the Marine Living Resources Act 18 of 1998.</li> </ul>	Prior to commencement of sampling	Samara	Project Manager; ECO	Application documents and approval from DFFE
Ensuring compliance with legal requirements in terms of financial provisioning	6.	<ul style="list-style-type: none"> <li>Financial provisioning for the remediation of environmental damage should be in place in terms of NEMA.</li> </ul>	Prior to commencement of sampling	Samara	Project Manger	Copies of agreements and other relevant documentation
<b>ESTABLISHMENT PHASE</b>						
Commitment from Samara to adhere to the EMPr	7.	<ul style="list-style-type: none"> <li>A copy of the approved EMPr should be present onboard the vessels.</li> <li>Auditing systems to verify compliance should be in place.</li> <li>Ensure that personnel and equipment used meets the EMPr requirements.</li> <li>Ensure compliance with the International Maritime Organisation's International Safety Management Code.</li> </ul>	Prior to commencement of sampling	Samara	ECO	Copies of relevant documents
Personnel should be appropriately trained	8.	<ul style="list-style-type: none"> <li>Environmental Awareness Training and induction should be provided to employees and contractors.</li> <li>Personnel should understand the responsibilities assigned to them.</li> </ul>	With appointment of new staff or contractors	Samara	Project Manager; ECO	Training registers
Ensuring that other companies active in the nearby area are aware of the Project Programme	9.	<ul style="list-style-type: none"> <li>Written requisitions should be issued to the South African Navy Hydrographic Office to release Radio Navigation Warnings and Notices during the sampling period that contains the coordinates, timeframes, the 500 m safety zone around the vessels, and movement details.</li> </ul>	Prior to commencement of sampling	Samara	Project Manager	Proof of requisitions and implementation
Marine flora in the prosecuting area should be protected	10.	<ul style="list-style-type: none"> <li>A Marine Mammal Observer (MMO) should be on board to take note of marine life activities and any incidents.</li> <li>A Passive Acoustic Monitoring (PAM) operator should be appointed.</li> </ul>	Prior to commencement of sampling	Samara	MMO; PAM; ECO	Incidents register; Monitoring reports
Management actions in the EMPr should be adequate	11.	<ul style="list-style-type: none"> <li>Changes to the EMPr should be recommended on an ongoing basis whether it be the removal of actions or addition of new management actions to ensure an EMPr that is appropriate and applicable to the Project activities.</li> </ul>	As required	Samara	ECO	Applications for amendment of the EMPr

Objective	No.	Monitoring				Record keeping requirements
		Mitigation and management measures and principles	Timeframe	Executing Party	Monitoring Party	
<b>BULK AND GEOPHYSICAL SAMPLING ACTIVITIES</b>						
<b>Marine Ecology</b>						
Minimise pollution at sea and manage waste	12.	<ul style="list-style-type: none"> <li>The vessels should implement a waste management plan in compliance with MARPOL to monitor:               <ul style="list-style-type: none"> <li>General Solid Waste;</li> <li>Secure storage of on-board solid waste;</li> <li>Galley waste;</li> <li>Deck drainage;</li> <li>Machinery space drainage;</li> <li>Sewage;</li> <li>Medical waste;</li> <li>Metals;</li> <li>Waste oil;</li> <li>Minor oil spills;</li> <li>Atmospheric emissions; and</li> <li>Other hazardous waste.</li> </ul> </li> </ul>	During sampling phases	Samara and contractors	ECO	Waste Management Plan
Minimise hazards left on seabed	13.	<ul style="list-style-type: none"> <li>Items lost overboard should be retrieved if possible.</li> <li>Equipment or items lost at sea should be recorded and the SAMSA and South African Navy Hydrographer should be notified.</li> </ul>	During sampling phases	Samara and contractors	ECO	Register of items lost and retrieved; Proof of notification
Minimise impacts from artificial lighting on marine fauna	14.	<ul style="list-style-type: none"> <li>Amount of lighting should be minimised to avoid marine fauna and bird confusion.</li> <li>Stranded birds should be retrieved and released during daylight.</li> </ul>	During sampling phases	Samara and contractors	ECO	Register of bird stranding
Noise pollution impacts on invertebrates	15.	<ul style="list-style-type: none"> <li>No mitigation measures are proposed.</li> </ul>	During sampling phases	Samara and contractors	ECO	Induction material and register; Monitoring reports; Incident reports; List of equipment and technology used

Objective	No.	Monitoring				Record keeping requirements
		Mitigation and management measures and principles	Timeframe	Executing Party	Monitoring Party	
Noise pollution impacts on fish	16.	<ul style="list-style-type: none"> <li>Implement “soft starts” for the surveys for sound levels &gt; 210 dB re 1 <math>\mu</math>Pa at 1 m over a period of 20 minutes to give sensitive species an opportunity to move away from the sampling area, particularly if large aggregations of fish are observed on the ship’s sonar.</li> </ul>	During sampling phases	Samara and contractors	ECO	Induction material and register; Monitoring reports; Incident reports; List of equipment and technology used
Noise pollution impacts on marine mammals	17.	<ul style="list-style-type: none"> <li>Undertake a visual scan of the area 15 minutes prior to the commencement of surveying activities and soft starts. Visual scans should be undertaken by a trained MMO;</li> <li>Implement “soft starts” for the surveys for sound levels &gt; 210 dB re 1 <math>\mu</math>Pa at 1 m over a period of 20 minutes to give sensitive species an opportunity to move away from the sampling area;</li> <li>Cease survey activities if abnormal behaviour in marine mammals is observed until the animal has moved away from the area;</li> <li>Avoid surveys during known periods of cetacean migration into the area for feeding (beginning of June to the end of November) and ensure that cetaceans are able to move around sonar operations; and</li> <li>Implement PAM on board survey ships, with a view to               <ul style="list-style-type: none"> <li>Detect the range and frequencies of marine mammal vocalisations expected to be present in the survey area;</li> <li>Detect and identify vocalising marine mammals and establish bearing and range in a reasonable period of time; and</li> </ul> </li> <li>Ensure real time relaying of the recordings to the PAM operator to allow for immediate mitigation activities to be implemented.</li> </ul>	During sampling phases	Samara and contractors	ECO	Induction material and register; Monitoring reports; Incident reports; List of equipment and technology used
Potential vessel strikes impacts on marine mammals	18.	<ul style="list-style-type: none"> <li>Marine Mammal Observer to be onboard the survey vessel at all times;</li> <li>Reduce vessel speed to &lt; 10 knots during the geophysical surveys;</li> <li>Avoid known areas of high marine mammal activity; and</li> <li>Where possible avoid periods of high marine mammal activity within the Concession Area (June-November).</li> </ul>	During sampling phases	Samara and contractors	ECO	Induction material and register; Surveying programme; Monitoring reports; Vessel pathways and deviation reports; Incident reports

Objective	No.	Monitoring				Record keeping requirements
		Mitigation and management measures and principles	Timeframe	Executing Party	Monitoring Party	
Bulk sampling impacts on benthic fauna	19.	<ul style="list-style-type: none"> <li>Exclude Critical Biodiversity Areas (CBAs) and Ecological Support Areas from bulk sampling activities unless significant mineral resources can be demonstrated through non-invasive techniques;</li> <li>Additional in situ assessment will be required for any invasive sampling within CBA areas;</li> <li>Leave undisturbed areas between excavated pits to enhance recolonisation opportunities; and</li> <li>Monitor incoming benthic sediment for coral or fossil fragments, if observed halt sampling and mark the location.</li> </ul>	During sampling phases	Samara and contractors	ECO	Dredging/sampling programme; Induction material and register; Water quality test results
Crushing of epifaunal communities by crawler tracks.	20.	<ul style="list-style-type: none"> <li>No mitigation measures are proposed.</li> </ul>	N/A	N/A	N/A	N/A
Increased turbidity in the water column due to fine sediment suspension.	21.	<ul style="list-style-type: none"> <li>No mitigation measures are proposed (assumes CBAs are excluded from sampling area).</li> </ul>	N/A	N/A	N/A	N/A
Sedimentation impacts on benthic communities due to coarse tailings.	22.	<ul style="list-style-type: none"> <li>No discharge of tailings to be undertaken within the CBA areas; and</li> <li>Non-invasive geophysical survey data should be used to identify hard substrate and these areas should be avoided when discharging coarse tailings.</li> </ul>	During sampling phases	Samara and contractors	ECO	Dredging/sampling programme; Induction material and register; Water quality test results
Marine pollution from vessel operational discharges.	23.	<ul style="list-style-type: none"> <li>Implement MARPOL regulations to manage ship effluent and discharges.</li> </ul>	During sampling phases	Samara and contractors	Project Manager; ECO	Proof of relevant documentation and approved plans; Schedules; Monitoring reports

Objective	No.	Monitoring			Record keeping requirements	
		Mitigation and management measures and principles	Timeframe	Executing Party		Monitoring Party
<b>Fisheries</b>						
Impacts of multi-beam and sub-bottom profiling sonar on fisheries.	24.	<ul style="list-style-type: none"> <li>• “Soft starts” should be carried out for any equipment of source levels greater than 210 dB re 1 <math>\mu</math>Pa at 1 m over a period of 20 minutes to give adequate time for marine fauna to leave the vicinity;</li> <li>• The pole-and-line sector targets snoek inshore of the Concession Area during the period March to July. Timing of the survey activities to avoid taking place within the inshore extent of the Concession Area during this fishing period could reduce the impact on the sector;</li> <li>• The traditional linefish sector operates in close proximity to Port Nolloth and Doringbaai over the period March to September. Timing of the survey activities to avoid taking place within the inshore extent of the Concession Area during this fishing period could reduce the impact on the sector; and</li> <li>• A demersal research survey is undertaken each year and trawls are expected to be undertaken within the Concession Area over the period January/February. Acoustic surveys for small pelagic species are carried out twice a year and may be expected within the Concession Area any time from mid-May to mid-June and from mid-October to mid-December. It is recommended that prior to the commencement of the proposed activities, Samara consult with the managers of the DFFE research survey programmes to discuss their respective programmes and the possibility of altering the prospecting programme in order to minimise or avoid disruptions to both parties, where required.</li> </ul>	During sampling phases	Samara and contractors	Project Manager; ECO	Consultation records; Schedule of warnings; Additional documentation
Impacts of temporary exclusion of fishing operations during survey and sampling operations.	25.	<ul style="list-style-type: none"> <li>• A process of notification and information-sharing should be followed with key identified fishing industry associations including the SA Tuna Association; SA Tuna Longline Association, South African Deep-Sea Trawling Industry Association (SADSTIA), South African Hake Longline Association (SAHLLA), West Coast Rock Lobster Association, South African Linefish Associations (various) and the South African Marine Linefish Management Association (SAMLMA). Other key stakeholders: the South African Navy Hydrographic Office (SANHO), South African Maritime Safety Association, representatives of small-scale local fishing co-operatives and DFFE Vessel Monitoring, Control and Surveillance Vessel Monitoring System (VMS) Unit in Cape Town.</li> </ul>	During sampling phases	Samara and contractors	Project Manager; ECO	Consultation records; Schedule of warnings; Additional documentation

Objective	No.	Monitoring				Record keeping requirements
		Mitigation and management measures and principles	Timeframe	Executing Party	Monitoring Party	
		<p>These stakeholders should again be notified on completion of the project when the survey/sampling vessel is off location;</p> <ul style="list-style-type: none"> <li>The required safety zones around the survey and sampling vessels should be communicated via the issuing of Daily Navigational Warnings for the duration of the sampling operations through the South African Naval Hydrographic Office;</li> <li>The pole-and-line sector targets snoek inshore of the Concession Area during the period March to July. Timing of the survey activities to avoid taking place within the inshore extent of the Concession Area during this fishing period could reduce the impact on the sector;</li> <li>The traditional linefish sector operates in close proximity to Port Nolloth and Doringbaai over the period March to September. Timing of the survey activities to avoid taking place within the inshore extent of the Concession Area during this fishing period could reduce the impact on the sector; and</li> <li>A demersal research survey is undertaken each year and trawls are expected to be undertaken within the Concession Area over the period January/February. Acoustic surveys for small pelagic species are carried out twice a year and may be expected within the Concession Area any time from mid-May to mid-June and from mid-October to mid-December. It is recommended that prior to the commencement of the proposed activities, Samara consult with the managers of the DFFE research survey programmes to discuss their respective programmes and the possibility of altering the prospecting programme in order to minimise or avoid disruptions to both parties, where required.</li> </ul>				
Impact of noise from sampling/trenching operations on fisheries.	26.	<ul style="list-style-type: none"> <li>“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 to give adequate time for marine fauna to leave the vicinity;</li> <li>The pole-and-line sector targets snoek inshore of the Concession Area during the period March to July. Timing of the survey activities to avoid taking place within the inshore extent of the Concession Area during this fishing period could reduce the impact on the sector;</li> <li>The traditional linefish sector operates in close proximity to Port Nolloth and Doringbaai over the period March to September. Timing of the survey activities to avoid taking place within the</li> </ul>	During sampling phases	Samara and contractors	Project Manager; ECO	Consultation records; Schedule of warnings; Additional documentation

Objective	No.	Monitoring				Record keeping requirements
		Mitigation and management measures and principles	Timeframe	Executing Party	Monitoring Party	
		<p>inshore extent of the Concession Area during this fishing period could reduce the impact on the sector; and</p> <ul style="list-style-type: none"> <li>A demersal research survey is undertaken each year and trawls are expected to be undertaken within the Concession Area over the period January/February. Acoustic surveys for small pelagic species are carried out twice a year and may be expected within the Concession Area any time from mid-May to mid-June and from mid-October to mid-December. It is recommended that prior to the commencement of the proposed activities, Samara consult with the managers of the DFFE research survey programmes to discuss their respective programmes and the possibility of altering the prospecting programme in order to minimise or avoid disruptions to both parties, where required.</li> </ul>				
Impact of sediment plumes on fish stock recruitment.	27.	<ul style="list-style-type: none"> <li>No mitigation measures are proposed.</li> </ul>	N/A	N/A	N/A	N/A
Impacts of temporary exclusion of fishing operations during exploration sampling operations.	28.	<ul style="list-style-type: none"> <li>A process of notification and information-sharing should be followed with key identified fishing industry associations including the SA Tuna Association; SA Tuna Longline Association, SADSTIA, SAHLLA, West Coast Rock Lobster Association, South African Linefish Associations (various) and SAMLMA. Other key stakeholders: SANHO, South African Maritime Safety Association, representatives of small-scale local fishing co-operatives and DFFE Vessel Monitoring, Control and Surveillance VMS Unit in Cape Town. These stakeholders should again be notified on completion of the project when the survey/sampling vessel is off location;</li> <li>The required safety zones around the survey and sampling vessels should be communicated via the issuing of Daily Navigational Warnings for the duration of the sampling operations through the South African Naval Hydrographic Office;</li> <li>The pole-and-line sector targets snoek inshore of the Concession Area during the period March to July. Timing of the survey activities to avoid taking place within the inshore extent of the Concession Area during this fishing period could reduce the impact on the sector;</li> <li>The traditional linefish sector operates in close proximity to Port Nolloth and Doringbaai over the period March to September. Timing of the survey activities to avoid taking place within the</li> </ul>	During sampling phases	Samara and contractors	Project Manager; ECO	Consultation records; Schedule of warnings; Additional documentation

Objective	No.	Monitoring				Record keeping requirements
		Mitigation and management measures and principles	Timeframe	Executing Party	Monitoring Party	
		<p>inshore extent of the Concession Area during this fishing period could reduce the impact on the sector; and</p> <ul style="list-style-type: none"> <li>A demersal research survey is undertaken each year and trawls are expected to be undertaken within the Concession Area over the period January/February. Acoustic surveys for small pelagic species are carried out twice a year and may be expected within the Concession Area any time from mid-May to mid-June and from mid-October to mid-December. It is recommended that prior to the commencement of the proposed activities, Samara consult with the managers of the DFFE research survey programmes to discuss their respective programmes and the possibility of altering the prospecting programme in order to minimise or avoid disruptions to both parties, where required.</li> </ul>				
<b>Archaeology/Palaeontology</b>						
Potential significant loss of Cretaceous fossil woods.	29.	<ul style="list-style-type: none"> <li>The Namaqua Fossil Forrest MPA is excluded from prospecting activities through the implementation of a 5 km exclusion zone around the MPA boundary;</li> </ul>	During sampling phases	Samara and contractors	Project Manager; ECO	Induction material and register; Map indicating pre-identified shipwrecks; Incident report & proof of notification if sites/artefacts are encountered
Potential significant loss of Cenozoic shelly macrofauna.	30.	<ul style="list-style-type: none"> <li>The EMPr must include provisions for the collection of representative examples of the fossils that occur.</li> <li>"Run of mine" material on the oversize screen should be monitored for fossils as part of normal sampling and mining process.</li> </ul>				
Potential significant loss of fossil bones and teeth.	31.	<ul style="list-style-type: none"> <li>Potential fossil material should be collected for later identification and evaluation. The company must apply to SAHRA for a general permit to destroy, damage, excavate, disturb and collect fossils identified during sampling, as per the NHRA and any recovered material is to be temporarily stored by the company. When a collection of fossil material has been accumulated, the appointed palaeontologist should undertake the identification and evaluation of the fossil material and compile the report for submission to SAHRA. The Environmental Manager/Officer) is to liaise with the appointed palaeontologist on the progress of the fossil collection and the scheduling of the evaluation.</li> </ul>				
Potential significant loss of shells from the last transgression sequence.	32.	<ul style="list-style-type: none"> <li>For overall monitoring purposes it is suggested that a few small bulk samples of shells (~5 litres) are collected on occasion. The idea is to sample the typical assemblage at a few points in the sampling/mining area. It is possible that an uncommon</li> </ul>				

Objective	No.	Monitoring				Record requirements	keeping
		Mitigation and management measures and principles	Timeframe	Executing Party	Monitoring Party		
		<p>assemblage may be encountered, such as a shallow-water fauna or a lagoonal fauna, in which case it should also be sampled.</p> <ul style="list-style-type: none"> <li>• Any fossils found during the processing of drill samples must have the details of context recorded, must be kept for identification by an appropriate specialist and, if significant, be deposited in an appropriate institution.</li> <li>• As part of the normal sampling and mining process the material crossing the oversize screen must be monitored for the occurrence of the various fossil types. Potential fossil material should be collected for later identification and evaluation.</li> <li>• For overall monitoring purposes it is suggested that a few small bulk samples of shells (~5 litres) be collected on occasion. The idea is to sample the typical assemblage at a few points in the sampling/mining area. It is possible that an uncommon assemblage may be encountered, such as a shallow-water fauna or a lagoonal fauna, in which case it should also be sampled. Data to be recorded during fossil collection includes: <ul style="list-style-type: none"> <li>○ Date</li> <li>○ Company name</li> <li>○ Sample no.</li> <li>○ Collector's name</li> <li>○ Position (co-ordinates)</li> <li>○ Water depth</li> <li>○ Sample subsurface depth</li> <li>○ Vessel</li> <li>○ Brief description and photographs</li> </ul> </li> <li>• A copy of the graphic log of the sample drill hole or mining face showing the vertical sequence of units and the estimated location of the fossil in the sequence.</li> <li>• A map of the fossil finds in the particular sampling/mining area, such as a contoured multibeam bathymetric image showing the context of samples in relation to the bedrock topography and sediment bodies.</li> <li>• During all operations, personnel can send queries and images by email to an appointed palaeontologist for evaluation and prompt feedback.</li> </ul>					

Objective	No.	Monitoring				Record keeping requirements
		Mitigation and management measures and principles	Timeframe	Executing Party	Monitoring Party	
		<ul style="list-style-type: none"> <li>Collected samples are to be temporarily stored by the company but when a collection of fossil material has been accumulated, the appointed palaeontologist should undertake the identification and evaluation of the fossil material and compile the report for submission to SAHRA. A selection of material could be removed for further study. The Environmental Manager/Officer) is to liaise with the appointed palaeontologist on the progress of the fossil collection and the scheduling of the evaluation.</li> </ul>				
Potential significant loss of submerged prehistoric archaeological sites and materials.	33.	<ul style="list-style-type: none"> <li>If the stone and gravel fraction of the sampled sediments is retained, archaeological review of this material is strongly recommended.</li> <li>The making available to archaeological research of information about the presence of certain seabed features from particularly the seismic Chirp data is strongly recommended.</li> <li>The absence of historical wrecks in the Concession Areas can be confirmed from the geophysical data to be acquired for the proposed prospecting.</li> <li>Any wreck or possibly anthropogenic seabed anomaly identified in the geophysical data during Phase 2 of the prospecting programme must be is flagged.</li> <li>These sites and/or anomalies must be excluded from the areas to be subject to bulk seabed sampling. The implementation of a buffer of at least 50 m around each such site and/or anomaly will serve to ensure that they are not impacted by the bulk sampling.</li> <li>Any such sites or flagged anomalies must be reported to SAHRA.</li> <li>If an undetected wreck is encountered during seabed sampling, it is recommended that the following mitigation measures must be implemented: <ul style="list-style-type: none"> <li>Seabed sampling activities in the area must be stopped immediately;</li> <li>The responsible Environmental Manager must be informed immediately;</li> </ul> </li> </ul>	During sampling phases	Samara and contractors	Project Manager; ECO	Induction material and register; Map indicating pre-identified shipwrecks; Incident report & proof of notification if sites/artefacts are encountered

Objective	No.	Monitoring				Record keeping requirements
		Mitigation and management measures and principles	Timeframe	Executing Party	Monitoring Party	
		<ul style="list-style-type: none"> <li>○ The Environmental Manager must inform SAHRA immediately;</li> <li>○ A suitably qualified maritime archaeologist must be contacted to assess the find;</li> <li>○ If any artefacts have been recovered from the site these must be kept wet and retained for assessment by the maritime archaeologist; and</li> <li>○ The location of the find and any associated data used to identify the wreck must be provided to SAHRA be added to the national shipwreck database.</li> </ul> <ul style="list-style-type: none"> <li>● Following consultation with SAHRA and the maritime archaeologist, an exclusion zone around the site is likely to be required within which seabed sampling activities may not take place.</li> </ul>				
<b>Marine Prospecting/Exploration/Mining Activities</b>						
Ensure a 500 m safe zone around vessels	34.	<ul style="list-style-type: none"> <li>● Establish a communication and notification procedure with other marine prospecting and mining companies undertaking activities in the vicinity prior to the start of planned activities.</li> <li>● Vessels should be visible and have the correct signalling system in place during day and night-time.</li> </ul>	During sampling phases	Samara and contractors	Project Manager; ECO	Proof of communication; Record of measures taken to ensure visibility
<b>Marine Transport Routes</b>						
Ensure a 500 m safe zone around vessels	35.	<ul style="list-style-type: none"> <li>● Establish a communication and notification procedure, in particular transport companies and the South African Navy Hydrographic Office, SAMSA, DFFE, and relevant port Captains.</li> <li>● Daily Navigational Warnings need to be communicated during sampling operations.</li> <li>● Only certified seaworthy vessels should be used that is internationally recognised.</li> <li>● Vessels should be visible and have the correct signalling system in place during day and night-time.</li> </ul>	During sampling phases	Samara and contractors	Project Manager; ECO	Proof of communication; Record of daily warnings; Proof of certification onboard vessels; Visibility measures onboard
<b>Socio-Economic</b>						
Maximise the creation of employment opportunities and local revenue	36.	<ul style="list-style-type: none"> <li>● Where possible employ people from the local communities.</li> </ul>	During sampling phases	Samara and contractors	Project Manager	Employees' place of residents

Objective	No.	Monitoring				Record keeping requirements
		Mitigation and management measures and principles	Timeframe	Executing Party	Monitoring Party	
<b>END-OF-PROSPECTING, REHABILITATION PHASE AND CLOSURE</b>						
Minimise increase in turbidity during redeposition of tailings	37.	<ul style="list-style-type: none"> <li>Tailings and fine sediments to be replaced back to the seabed as soon as possible.</li> <li>Plan replacement of tailings to not be placed onto potentially sensitive habitats.</li> </ul>	Post sampling	Samara and contractors	ECO	Test results of water quality monitoring
Ensuring that all relevant parties know about the end of prospecting activities and rehabilitation	38.	<ul style="list-style-type: none"> <li>Inform DMRE, surrounding sea users, other stakeholders, and I&amp;APs when the prospecting activities and rehabilitation is completed.</li> </ul>	Upon completion of sampling and Prospecting	Samara	Project Manager	Proof of information distribution
Submission for closure	39.	<ul style="list-style-type: none"> <li>An application needs to submit to DMRE for closure of the Project and should contain: <ul style="list-style-type: none"> <li>Final layout plan;</li> <li>Closure Plan;</li> <li>Environmental Risk Report;</li> <li>Final Audit Report; and</li> <li>Application for to transfer environmental responsibilities.</li> </ul> </li> </ul>	Upon completion of sampling and Prospecting	Samara	Project Manager	Proof of application submission and approval

## 6.4 Checking and Corrective Action

Checking and implementing corrective action, should it be required, forms an important component of the EMPr management cycle. These ensure that:

- The required EMPr management conditions are being implemented;
- The desired outcomes are being achieved;
- Ongoing inspections of operational controls and general state of operation; and
- Internal audits to assess the compliance to the EMPr or to focus on a particular performance issue.

Many potential impacts are difficult to monitor quantitatively, such as waste management. However, an ongoing, but pragmatic inspection regime will be developed that allows for potential environmental transgressions to be identified proactively so that mitigation can be quickly and effectively implemented.

There are several mechanisms for implementing corrective action during all project phases. The main instruments used to address non-compliances are the following:

- Verbal instructions – Minor transgressions from an established procedure;
- Written instructions – Normally following an audit; and
- Contract notice – Following a breach in contract.

## 6.5 Site Documentation and Reporting

All non-conformances will be recorded and reported to responsible personnel. These non-conformances will be rated according to a developed weighing methodology to determine the significance of each incident. The following documentation will be required:

- Complaints register;
- Environmental incident register;
- Disposal certificates of waste generated as a result of the Project;
- Non-conformance reports;
- Written corrective action instructions;
- EA;
- Standard Samara operating procedures; and
- EMPr.

The findings of all inspections and internal audits will be structured into instructive reporting providing information to all responsible personnel. Corrective actions must be clearly defined where required. Withing the reporting function, a structured review component must be enforced. This review function will assist in prescribing necessary corrective actions.

## 6.6 Monitoring

All programmes and plans forming part of this document will be subject to monitoring. Monitoring will have two elements, namely: routine monitoring against set standards or performance criteria, and periodic review or evaluation. This will focus on the assessment of the effectiveness of the plan or programme.

Monitoring the performance of the Project and prospecting activities will fall under the inspection role of the ECO.

It is important to note that the operational units remain ultimately responsible for compliance to all the relevant performance criteria, procedures, and legislation and should therefore also institute the appropriate monitoring to ensure adherence to the relevant requirements.

The compliance monitoring is to verify that the responsible parties are adhering to the procedures, management conditions, and specifications contained in this EMPr, and associated regulations and waste management performance conditions.

### 6.6.1 Monitoring Programme

The monitoring programme contained in this EMPr shall be used to monitor the impacts associated with the project and to ensure that the mitigation measures are effective and sustainable.

### 6.6.2 Environmental Monitoring

The monitoring programme for the Project and proposed prospecting activities will be sufficient to cover the monitoring of impacts originating from the activities.

Samara will conduct internal audits by means of site visits/visits to the vessels. Table 6-1, Table 6-2, and Table 6-3 describe the monitoring requirements and general environmental management measures for the Project and proposed prospecting activities.

## 6.7 General Requirements

The general requirements during the establishment phase are to:

- Ensure proper and continuous liaison between Samara and the contractors to ensure that all parties are informed at all times;
- Ensure that the contractors adhere to all conditions of the EA and EMPr for the Project and proposed prospecting activities;
- Compile an emergency response plan summarising steps to take in case of emergency;
- Documentation and record keeping of all complaints/incidents and actions taken;
- Regular site/vessel inspections and control over the Establishment and Operational Phases throughout the period of each of these phases; and
- The contractors shall not be released from site until the SHE representative and Project Manager signed off the release documentation and is satisfied with the contractor's adherence to the EMPr and EA.

**Table 6-2: General Environmental Management.**

Element	Management Plan
Objectives	<ul style="list-style-type: none"> <li>• All personnel involved in the establishment, operation, and end-of-prospecting phases of the Project need to be made aware of the EMPr;</li> <li>• All personnel involved in the operation of the Project and associated activities will be made aware of sensitive species and the environmental consequences of their individual actions, and in a position to minimise the environmental impact of their activities, particularly with respect to potential spillages and dredging activities; and</li> <li>• Roles and responsibilities need to be clearly defined to effectively implement the environmental management procedures.</li> </ul>
Sources	<ul style="list-style-type: none"> <li>• Materials handling, storage, and processing leading to the generation of wastes or emissions and discharges into the ocean.</li> </ul>

Element	Management Plan
Action/Controls	<ul style="list-style-type: none"> <li>Samara is ultimately responsible for environmental management and costs associated with such management and possible environmental remediation where the cause of the incident is not attributed to the contractors' responsibility;</li> <li>Samara is responsible to enforce the implementation of the EMPr by its employees;</li> <li>All contractors are responsible for the implementation of the EMPr as applied to their specific activities;</li> <li>Samara's workforce and any contractors are to undergo an environmental induction covering the EMPr and roles and responsibilities with respect to environmental management; and</li> <li>All workers that have completed the induction should sign that they have understood and will implement the measures required.</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>Samara's environmental specialist and Project Manager shall be responsible for adequate monitoring of establishment, operation, and end-of-prospecting activities to ensure compliance with the EMPr.</li> </ul>
Corrective Actions/Reporting	<ul style="list-style-type: none"> <li>All incidents that occurred on site are to be recorded in an Incident Register, which will be made available to the Authorities upon request; and</li> <li>Samara will implement preventive and corrective actions, if necessary, in accordance with the requirements of the EMPr, outcomes of environmental audits, and changes to legislation as they may occur from time to time, and report on environmental incidents that may occur on site in accordance with the requirements of the EMPr and environmental legislation to Samara management responsible for the site.</li> </ul>

**Table 6-3: Environmental monitoring.**

Element	Management Plan
Objectives	<ul style="list-style-type: none"> <li>To monitor compliance with the EMPr and EA; and</li> <li>To monitor the effectiveness of management measures stipulated in the EMPr.</li> </ul>
Sources	<ul style="list-style-type: none"> <li>Work performed on the site that may impact on the environment.</li> </ul>
Action/Controls	<ul style="list-style-type: none"> <li>Appropriate frequency (weekly) checks during normal operation of the site to ensure minimal environmental risks are present as a result of operations/activities and/or tasks;</li> <li>Appropriate frequency records during operation/prospecting activities on site; and</li> <li>Records of waste removal or placed in storage for removal during all phases of the project and appropriate frequency records during prospecting.</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>Internal audits by Samara are to be undertaken to monitor compliance with the EMPr during all phases of the Project and proposed prospecting activities; and</li> <li>Internal audits by Samara are to be undertaken to identify any potential risk that may be arising and to promote preventive maintenance and risk reduction as required.</li> </ul>
Corrective Actions/Reporting	<ul style="list-style-type: none"> <li>Should non-compliances with the EMPr be identified, corrective measures should be taken to ensure compliance.</li> </ul>

## 6.8 Environmental Awareness Plan

It is important to ensure that the contractors and employees associated with the Project and proposed prospecting activities receive the appropriate level of training and awareness to ensure that continual environmental due diligence and conservation is exercised at all levels of work carried out. Employees, contractors, and sub-contractors must be made aware of their responsibilities in terms of relevant legislation, guidelines, and this EMPr and EA.

Environmental conditions will be included in the contracts issued to the contractors, making them aware of the potential environmental impacts and risks associated with the Project. The importance of implementing the conditions in the EMPr and the necessity of good housekeeping practices will be made known to the contractors and employees of Samara in order to prevent accidental spillages and avoid subsequent environmental impacts.

Training needs to be identified based on the EMPr requirements and capacity of Samara's employees and contractors. In order to ensure environmental due diligence and protection of environmental harm, it is vital that all employees are trained to perform their designated role in alignment with the EMPr and EA.

### 6.8.1 Aim of the Environmental Awareness Plan

The aim of the environmental awareness plan is to:

- Promote environmental education and conservation on board the vessels;
- Inform employees and contractors on the applicable environmental procedures and programmes adopted by Samara; and
- Provide job specific training on the specification of environmental conservation and protection applicable to the respective activities.

### 6.8.2 Environmental Awareness Training

The training pertaining to the environmental awareness will include the following:

- All personnel during all phases of the Project will undergo induction which, as a minimum will include safety, health, and environmental awareness;
- All attendees will sign an acknowledgement register upon receiving and understanding the induction; and
- Environmental risks will be identified together with the specific job training that may be required to address these risks. Operational Phase staff will be trained on the implementation of emergency procedures where relevant.

### 6.8.3 Content of the Environmental Awareness Training

The environmental awareness training material will include, but not be limited to the following:

- Definitions as stipulated in this EMPr;
- How and why environmental protection is necessary;
- Nature of the Project and proposed prospecting activities which can affect the environmental status quo;
- Management measures required to prevent environmental impacts;
- Awareness of emergency and spills response procedures;
- Environmental conditions in the induction should focus on the following:
  - Good housekeeping practices;
  - Spillages;
  - Waste management;
  - Materials storage, use, and handling.

Environmental training can be done verbally or in written format depending on the most effective means of training for the target audience. The contents of this EMPr must be included in the training material and proof of such training kept on record.

## **6.9 External Auditing**

The key to a successful EMPr is appropriate monitoring and review to ensure effective functioning of the EMPr and to identify and implement corrective measure in a timely manner. In the event where discrepancies are identified, the problem must be investigated and attended to. All the results obtained during environmental monitoring must be documented for auditing purposes.

An audit of the environmental monitoring and management actions undertaken is essential to ensure that it is effective in operation, is meeting specified goals, and performs in accordance with relevant regulations and standards. Audits should be conducted during the Operational Phase of the Project to ensure adherence to the management measures contained in the EMPr.

The audit schedule will be determined by the conditions of the EA. It is not anticipated that external audits be conducted during the Operational Phase of the Project and proposed prospecting activities. Any impacts that may arise will be monitored as part of the prospecting operations monitoring programmes.

The frequency of the establishment phase audits may vary and will be synchronised with the construction schedule. Monitoring should take place frequently by the on-site SHE Officer.

### **6.9.1 Record of Activities**

Record of all activities shall be kept by Samara's Environmental Officer who will attend meetings, facilitate audits, record incidents that might have an environmental impact, assess non-conformances, etc.

### **6.9.2 Managing Non-Compliance**

Samara will ensure that corrective action is taken when a non-compliance is recorded through a developed procedure that deals with such EMPr non-compliances.

## **6.10 Commissioning of Tenders**

All contractors and sub-contractors tendering for any aspect of the Project and proposes prospecting activities will be made aware of the contents of this EMPr and the consequences and penalties resulting from non-conformances will be communicated to them.

All appointed contractors and sub-contractors will be made aware of the EMPr and attend an induction focusing on the main aspects of the EMPr requirements.

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Andrew Caddick  
Principal Scientist

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## 7 Declaration of the Contractor's Acceptance

I, \_\_\_\_\_, (full name) representing  
\_\_\_\_\_, (company name) have read,  
understood and accept the above environmental management programme as a framework for my  
company's environmental performance during the above mentioned project.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

All data used as source material plus the text, tables, figures, and attachments of this document have  
been reviewed and prepared in accordance with generally accepted professional engineering and  
environmental practices.

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## 8 References

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