

Northern Namibia Development Company (NNDC)

Environmental Management Plan (EMP) Report for
Mining License (ML) 156 under the Exclusive Prospecting
License (EPL) No. 2633, Kunene Region, Northern,
Namibia

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Executive Summary

1. Introduction

The Environmental Management Plan (EMP) provides a detailed plan of action required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts respectively. The EMP also provides the management actions with roles and responsibilities requirements for implementation by NNDC. The EMP gives commitments during and after the proposed diamond mining project. Regular assessments and evaluation of the environmental liabilities during the mining phase will need to be undertaken and will ensure adequate provision of the necessary resources towards good environmental management at various stages of the project development.

2. The EMP

The Environmental Management Plan, described below, is based on the findings as outlined in the Baseline Environmental Report and EIA. Within the framework of the existing Environmental Policy of NNDC, the EMP is to be incorporated in the Environmental Management System (EMS) of the company. The EIA and the EMP incorporate the Environmental Policy of NNDC, Namibian environmental regulatory framework as provided in the Environmental Management Act, 2007 (Act No. 7 of 2007) and as described in the Environmental Assessment Policy for Sustainable Development and Environmental Conservation of 1995, published by the Ministry of Environment, Forestry and Tourism (MEFT) as well as international environmental best practices covering diamond exploration and mining related activities.

Figure 1, Summarizes the outline of the procedures undertaken starting with the preparation of the baseline environmental report, the EIA and this EMP as well as the recommendations on the resource requirements for the implementation, monitoring and awareness training materials developed. It's hereby recommended that NNDC takes all the necessary steps to implement all the recommendations of the EMP for the successful implementation and completion of the planned project activities from construction to final closure and aftercare stages.

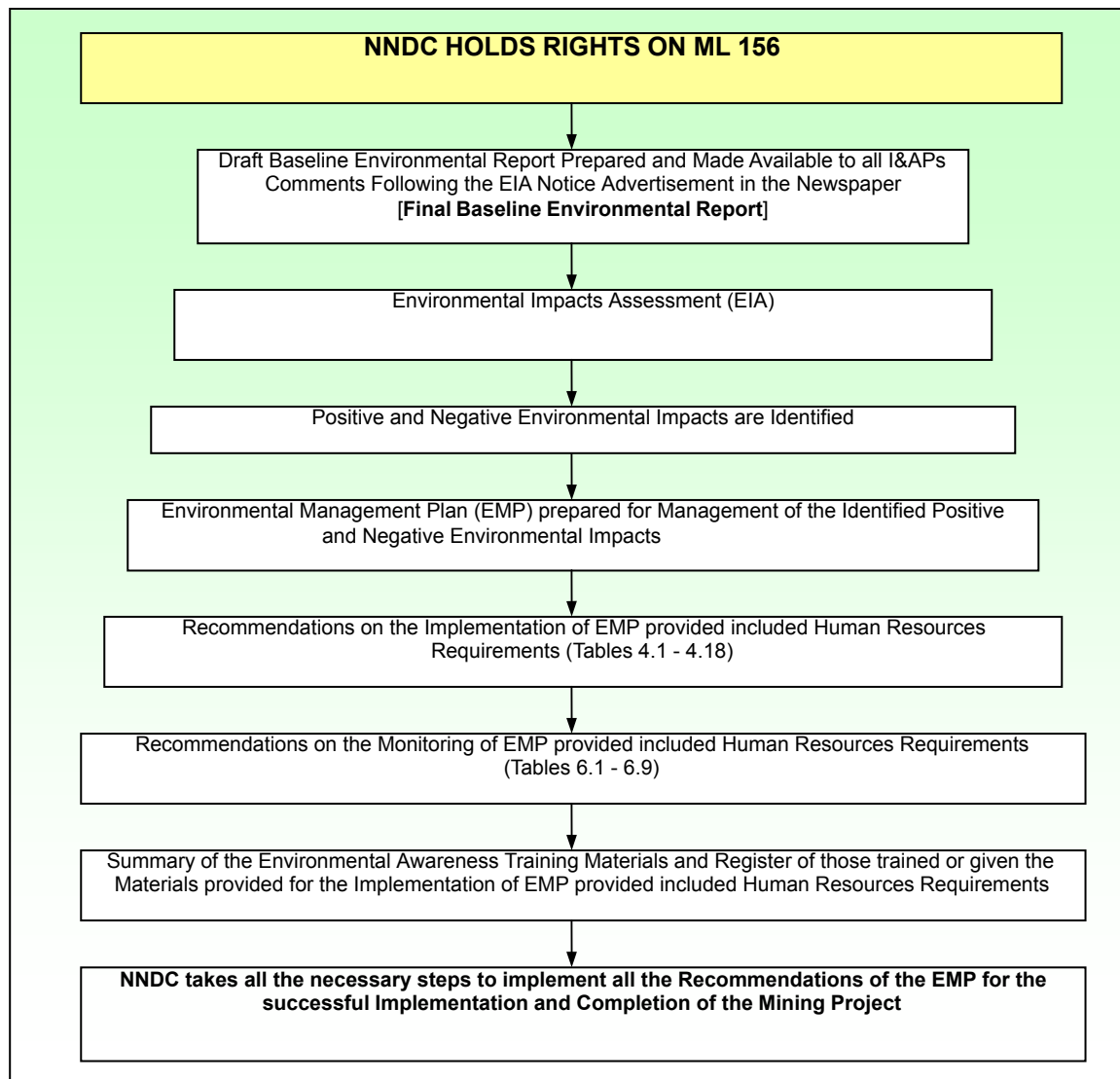


Figure 1: Summary outline of the procedures for the development of the baseline environmental report, the EIA Report and the EMP Report as well as the recommendations on the implementation, monitoring and awareness training materials.

3. Actions and Responsibilities

Recommended actions to be executed by NNDC as part of the management of the impacts through implementations of the EMP are:

1. Contract an Environmental Officer / Consultant / suitable in-house resources person to lead and further develop, implement and promote environmental culture through awareness raising of the workforce, contractors and sub- contractors in the field during the whole duration of the proposed project;

2. Provide with other support, human and financial resources, for the implementation of the proposed mitigations and effective environmental management during the planned mine project life cycle;
3. Develop a simplified environmental induction and awareness programme for all the workforce, contractors and sub-contractors;
4. Where contracted, service providers are likely to cause environmental impacts, these will need to be identified and contract agreements need to be developed;
5. Develop and implement a monitoring programme that will fit into the overall company's Environmental Management Systems (EMS) as well as for any future EIA for drilling and production phases.

All the responsibilities, to ensure that the recommendations are executed accordingly rest with **NNDC**. Appropriate resources will be put in place to make sure that all members of the workforce including subcontractors and sub-contractors are aware of the EMP and the objectives.

1. Introduction to the EMP

1.1. Project Overview

Northern Namibia Development Company (NNDC) PTY LTD holds mineral rights under the Mining License (ML) No. 156. The ML Area No. 156 is situated in the Opuwo District, with the Atlantic Ocean to west and the Kunene River bordering the northern part of the license area (Figure 2). Overall the whole ML areas fall within the State land with the western part of the license falling within the Skeleton Coast Park. The ML No. 156 was granted on 31/07/2018 and will expire on the 30/07/2033. The targeted commodity groups are the precious stones (Diamonds - High Value Commodities) and semi-precious stones.

The company received a Mining License (ML) with respect to development of a diamond mine for the potential economic mineral commodities identified. Ongoing exploration activities will continue during the mining phase and will include geological mapping, drilling, trenching and sampling.

An Environmental Impact Assessment (EIA) was undertaken for the mine development and ongoing exploration activities within the framework of the Environmental Management Act, 2007 (Act No. 7 of 2007) as described in the Environmental Assessment Policy for Sustainable Development and Environmental Conservation of 1995, published by the Ministry of Environment, Forestry and Tourism (MEFT). Furthermore, and in accordance with the provisions of Minerals (Prospecting and Mining) Act (No. 33 of 1992), the Minister of Mines and Energy may, with due regard to good reconnaissance practices, good prospecting practices or good mining practices by notice in writing, give directions in relation to the environment and other matters to a holder of a mineral license as provided for in Section 57.

Following the preparation of the EIA report, a number of positive and negative impacts have been identified to be associated with the development. In minimising the likely negative impacts and maximising the positive impacts, this Environmental Management Plan (EMP) has been prepared for implementation by the developers.

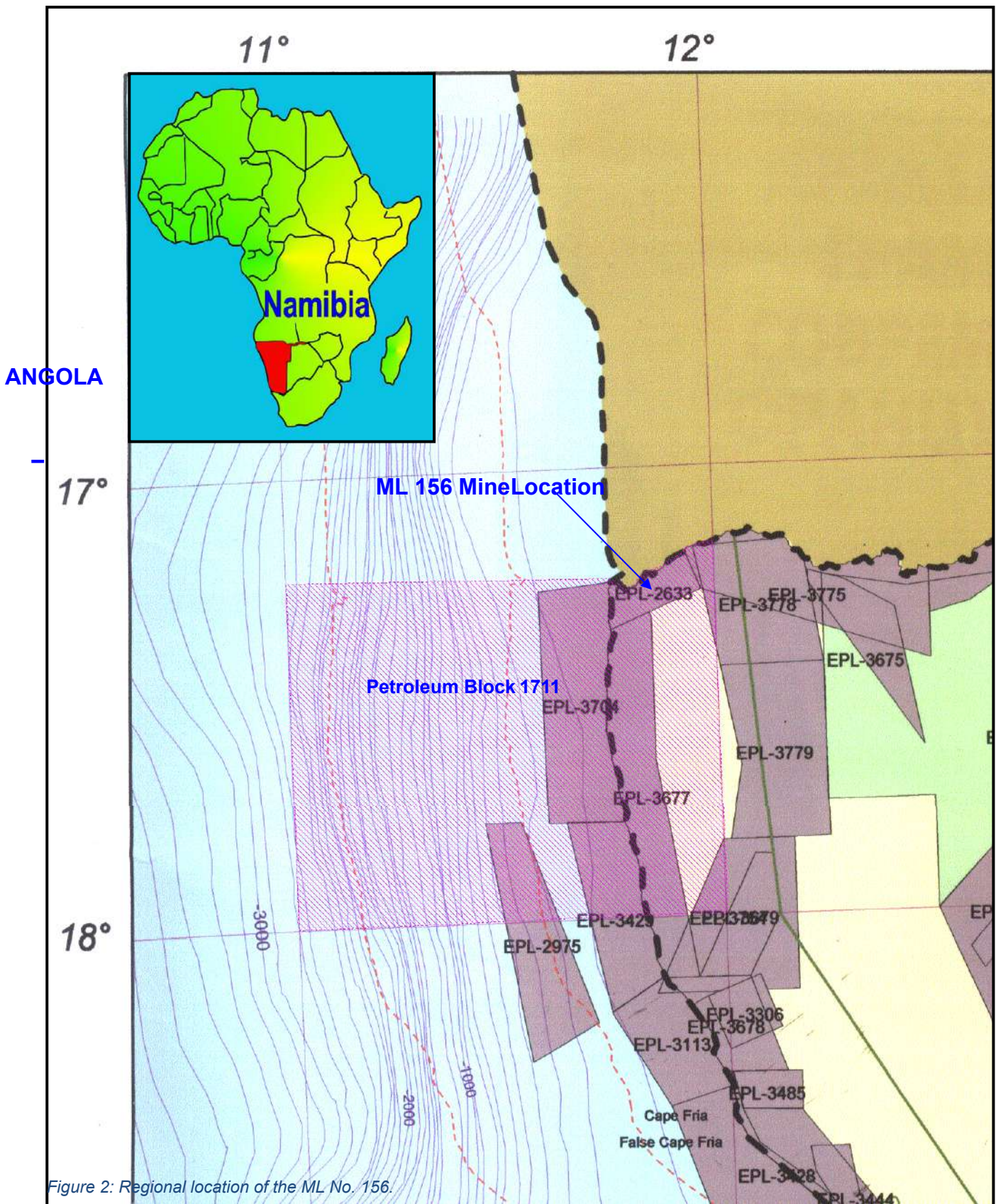


Figure 2: Regional location of the ML No. 156.

2. Summary of Key Sensitive Areas

2.1. Overview

At least two reasons allow us to consider pollution as the main, most widespread, and most dangerous factor of anthropogenic impact on the environment. First, pollution accompanies most kinds of human activities, including the proposed project activities. Second, in contrast with land ecosystems, in the water environment, pollutants quickly spread over large distances from the sources of pollution. In the freshwater and coastal ecosystems, the effects of pollution are obvious. They literally appear right in front of our eyes. In contrast, the World Ocean has a large inertia of response to all forms of external impact. It requires a long hidden (latent) period to manifest the evidence of non-obvious consequences of this impact. The danger of the situation is complicated by the fact that when it happens, it will be too late to do anything.

Among all the diversity of human activities and sources of pollution, we can distinguish two main ways that pollutants are likely to enter the environment:

- Direct discharge of effluents and solid wastes (industrial discharge, waste discharge, coastal sewage, and others) (Figure 5);
- Atmospheric emissions and fallout of pollutants transferred by the air masses (Figure 6).

Certainly, the relative contribution of each of these channels into the combined pollution input into the environment will be different for different substances and in different situations. Quantitative estimates of these processes are difficult because of the lack of reliable data and the extreme complexity of the natural processes, especially at the sea-land and sea-atmosphere boundaries. For a number of pollutants (metals, nitrates, phosphates, oil and some other hydrocarbons), this task is even more complicated. They are distributed in the marine environment in the background of natural biogeochemical cycles of the same substances. There are numerous examples when extremely high concentrations of oil and gas hydrocarbons, heavy metals, radionuclides, nutrients, and suspended substances are not connected with human activity at all. It can happen as a result of such natural processes as oil and gas seepage on the bottom; splits and breaks of the earth's crust; algae blooms; mud flows; river flooding; and many others.

Land and marine pollution components are very diverse with variety of their sources, scales of distribution, and degree of hazards. These pollutants can be classified in different ways, depending on their composition, toxicity, persistence, sources, volumes, and so on. In order to analyze likely pollution and its likely effects, it is common to distinguish a group of the most widespread pollutants. These include chlorinated hydrocarbons, heavy metals, nutrients, oil hydrocarbons, surface-active substances, and artificial radionuclides etc. These substances form the so-called background contamination that exists at present in any place in the hydrosphere.

Depending on the type of impact on the water organisms, communities, and ecosystems, the pollutants can be grouped in the following order of increasing hazard:

- Substances causing mechanical impacts (suspensions, films, solid wastes) that damage the respiratory organs, digestive system, and receptive ability;
- Substances provoking eutrophic effects (e.g., mineral compounds of nitrogen and phosphorus, and organic substances) that cause mass rapid growth of phytoplankton and disturbances of the balance, structure, and functions of the water ecosystems;
- Substances with saprogenic properties (sewage with a high content of easily decomposing organic matter) that cause oxygen deficiency followed by mass mortality of water organisms, and appearance of specific microflora;
- Substances causing toxic effects (e.g., heavy metals, chlorinated hydrocarbons, dioxins, and furans) that damage the physiological processes and functions of reproduction, feeding, and respiration;
- Substances with mutagenic properties (e.g., benzo(a)pyrene and other polycyclic aromatic compounds, biphenyls, radionuclides) that cause carcinogenic, mutagenic, and teratogenic effects.

Some of these pollutants (especially chlorinated hydrocarbons) may cause toxic and mutagenic effects. Others (decomposing organic substances) lead to eutrophic and saprogenic effects. Oil and oil products are a group of pollutants that have complex and diverse composition and various impacts on living organisms - from physical and physicochemical damage to carcinogenic effects. To estimate the hazard of different pollutants that may be associated with the proposed activities, the EIA has considered not only their hazardous properties but other factors such as the role of pathways and characteristics of the targets. These include the likely volumes of their input into the environment, the likely ways and scale of their distribution, the patterns of their behaviour in the water ecosystems, their ability to accumulate in living organisms, the stability of their composition, and other properties.

Figures 3 to 8, show key Kunene River Mouth, coastal and marine sensitive areas and resources found within the general area of the ML 156. The proposed activities are likely to have some positive and negative impacts with respect to these key coastal resources and sensitive ecological settings.

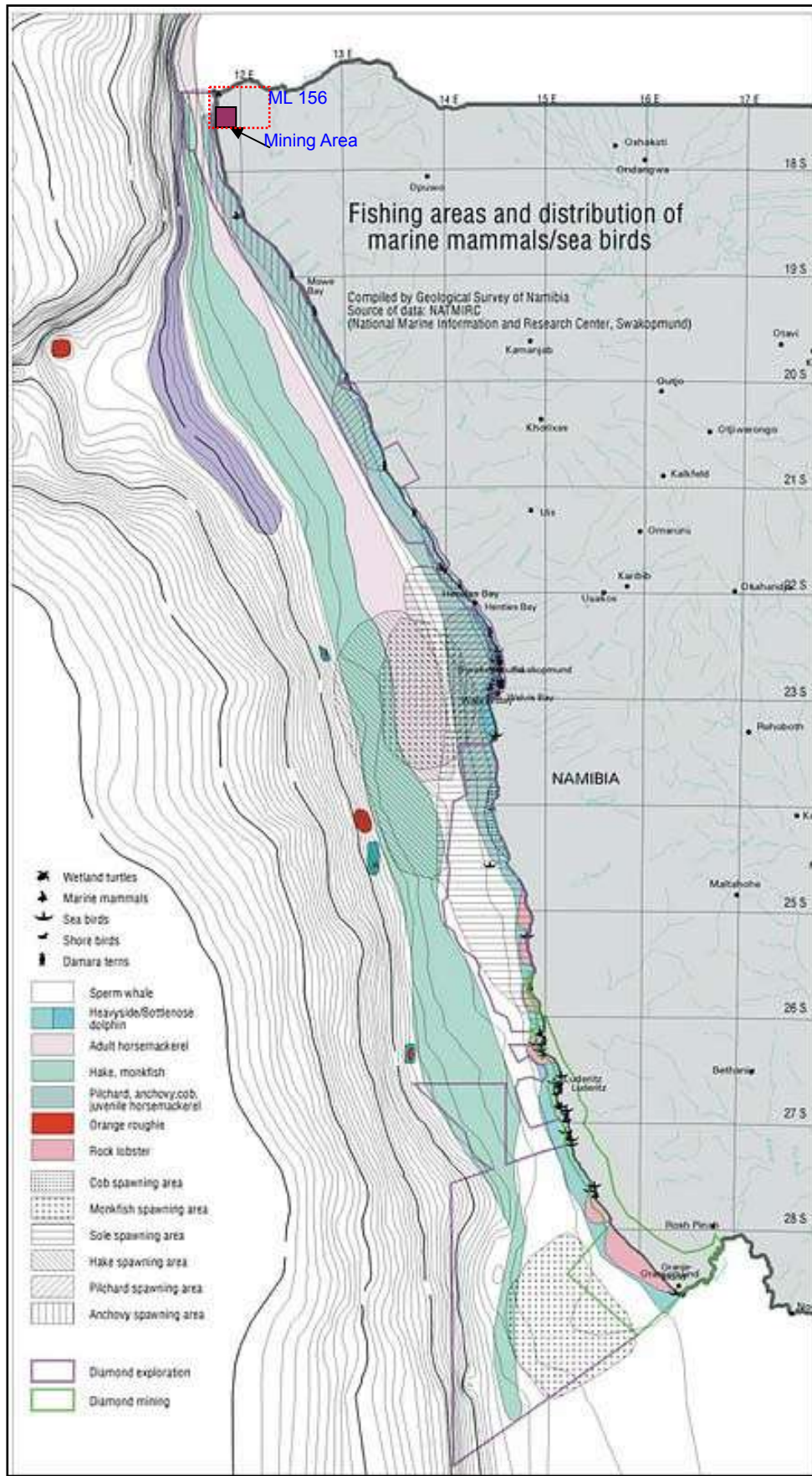


Figure 3: Key coastal and marine sensitive areas and resources.



Figure 4: Protected areas along the Namibian coastline (Maartens, 2003).



Figure 5: Example of river, coastal land degradation and beach destruction.



Figure 6: Example of the sources of coastal atmospheric pollution.



Figure 7: The highly sensitive vegetated dunes and river mouth areas.



Figure 8: Example of the coastal and river mouth bird life.

3. Positive and Negative Impacts

3.1. EIA Summary

The negative impacts of the proposed mine development can gradually destroy the environmental resources over time if ongoing effective management and rehabilitation are not implemented. On the other hand, the proposed development has the potential to create beneficial effects on the environment by contributing to environmental protection and conservation of the identified zones and in particular the vegetated dune belt, Kunene River and Mouth and beach zones. The protection of these two zones will raise awareness of environmental values to all workers and visitors and it can serve as a tool to finance protection of natural areas and increase their economic importance. [Tables 1 and 2](#), summarises the positive and negative impacts respectively, that have been identified and assessed at a local (Kunene River Mouth and Surrounding Areas), regional (Kunene Region), National (Namibia) and Global Scale.

Table 1: Summary of the likely positive impacts at local, regional, national and global levels.

Summary Type of Impacts		Local (Kunene River Mouth)	Regional\ (Kunene Region)	National (Namibia)	Glob al	
P o s i t i v e I m p a c t s	Clima tic, Envir onme ntal and Grou nd	Improved Regulatory Measures	High	High	Medium	Low
		Protection and Conservation	High	High	Medium	Low
		Awareness Raising	High	High	Medium	Low
		Environmental Education	High	High	Medium	Low
		Improved Environmental Management and Planning	High	High	Medium	Low
	Econ omic and Socia l Contri butio ns	Direct Financial Contributions	High	High	Medium	Low
		Environmental Funding and Research	High	High	Medium	Low
		Local Community Funding	High	High	Medium	Low
		Income Redistribution	High	High	High	Low
		Poverty Alleviation	High	High	High	Low
		Improved Standard of Living	High	High	High	Low
		Alternative Employment	High	High	Medium	Low
		Improved Infrastructure	High	High	High	Low
		Reevaluation of Culture and Traditions	High	High	High	High
		Civic Involvement and Pride	High	High	High	Low
		Strengthening Communities	High	High	High	Low
		Force for Promotion of Peace	High	High	High	High

Table 2: Summary of the likely negative impacts at local, regional, national and global levels.

Summary Type of Impacts		Local (Kunene River Mouth)	Regional\ (Kunene Region)	National (Namibia)	Glob al	
N e g a t i v e I m p a c t s	Clima tic, Envir onme ntal and Grou nd	Loss of Biological Diversity	High	High	Medium	Low
		Depletion of the OzoneLayer	High	High	Medium	Low
		Climate Change	Low	Low	Low	Low
		Water Resources	High	High	Medium	Low
		Local Resources	High	High	Medium	Low
		Land Degradation	High	High	Medium	Low
		Air Pollution and Noise	Medium	Low	Low	Low
		Solid Waste and Littering	High	High	High	Low
		Sewage	High	High	High	Low
		Aesthetic Pollution	High	High	Medium	Low
		Physical Impacts	High	High	Medium	Low
		Alteration of Ecosystems by Mining Related Activities	High	High	Medium	Low
		Trampling Impacts onVegetation	High	High	Medium	Low
		Trampling Impacts on Soil,Beach, Landscape	High	High	Medium	Low
		Anchoring and OtherMarine Fresh Water Activities	High	High	Medium	Low
	Alteration of Ecosystemsby Mining Activities	High	High	Medium	Low	
	Econ omic and Socia l Contri butio ns	Cultural Deterioration	Low	Low	Low	Low
		Conflicts with TraditionalLand-Uses	Low	Low	Low	Low
		Resource Use Conflicts	High	High	Medium	Low
		Crime Generation	Low	Low	Low	Low
		Poor Labour Practices	Low	Low	Low	Low
		Prostitution	Low	Low	Low	Low
		Spread of HIV and Aids	Low	Low	Low	Low
Job Level Friction		Low	Low	Low	Low	
Economic Inequality		High	Low	Low	Low	

3.2. Mine Development Opportunities

All the data collected and analyzed at different stages of the EIA study process, including all the findings and recommendations of the specialist studies, have been evaluated and interpreted and presented in form of Decision Support Tools (DSTs) comprising the following map layers:

- (i) Solid and Surficial layer showing all the geological setting of the whole ML area (Figure 9), the diamond mining area No. 1 (Figure 10) and the mine settlement (Figure 11);
- (ii) Geomorphology layer showing all the geomorphic features including potential habitat zones of the whole ML area (Figure 12), the diamond mining area No. 1 (Figure 13) and the mine settlement (Figure 14);
- (iii) Constraint layer showing all the various land use constraints or limitation associated with the various zones that have been delineated for the whole ML area (Figure 15), the diamond mining area No. 1 (Figure 16) and the mine settlement (Figure 17);
- (iv) Opportunity layer showing areas or zones suitable for specific development opportunities with management options for the whole ML area (Figure 18), the diamond mining area No. 1 (Figure 19) and the mine settlement (Figure 20).

Based on the data set collected and synthesized, Figure 15, 16 and 17 shows the constraints associated with potential land use of the entire ML Area, the proposed Diamond Area No. 1 and the mine settlement, respectively. The development opportunities that are possible within the different areas or zones of the entire ML Area and the mining area including the processing plant and mine settlement are shown in Figures 18, 19 and 20 respectively. According to Figures 18 – 20, the most suitable area for the proposed development is indicated. Based on the extent, duration, intensity and likely negative and positive impacts of the proposed development in the identified area / zone (Figures 18 – 20), an Environmental Management Plan (EMP), incorporating all the constraints, relevant mitigation measures with respect to likely impacts and recommendation has been prepared for implementation by the developer / operator. The EMP implementation and monitoring activities covers all the stages of the proposed project life cycle and is inclusive of the development, construction, operation, rehabilitation and closure as well as the aftercare stages as well as possible alternative land use options such as tourism development in the area.

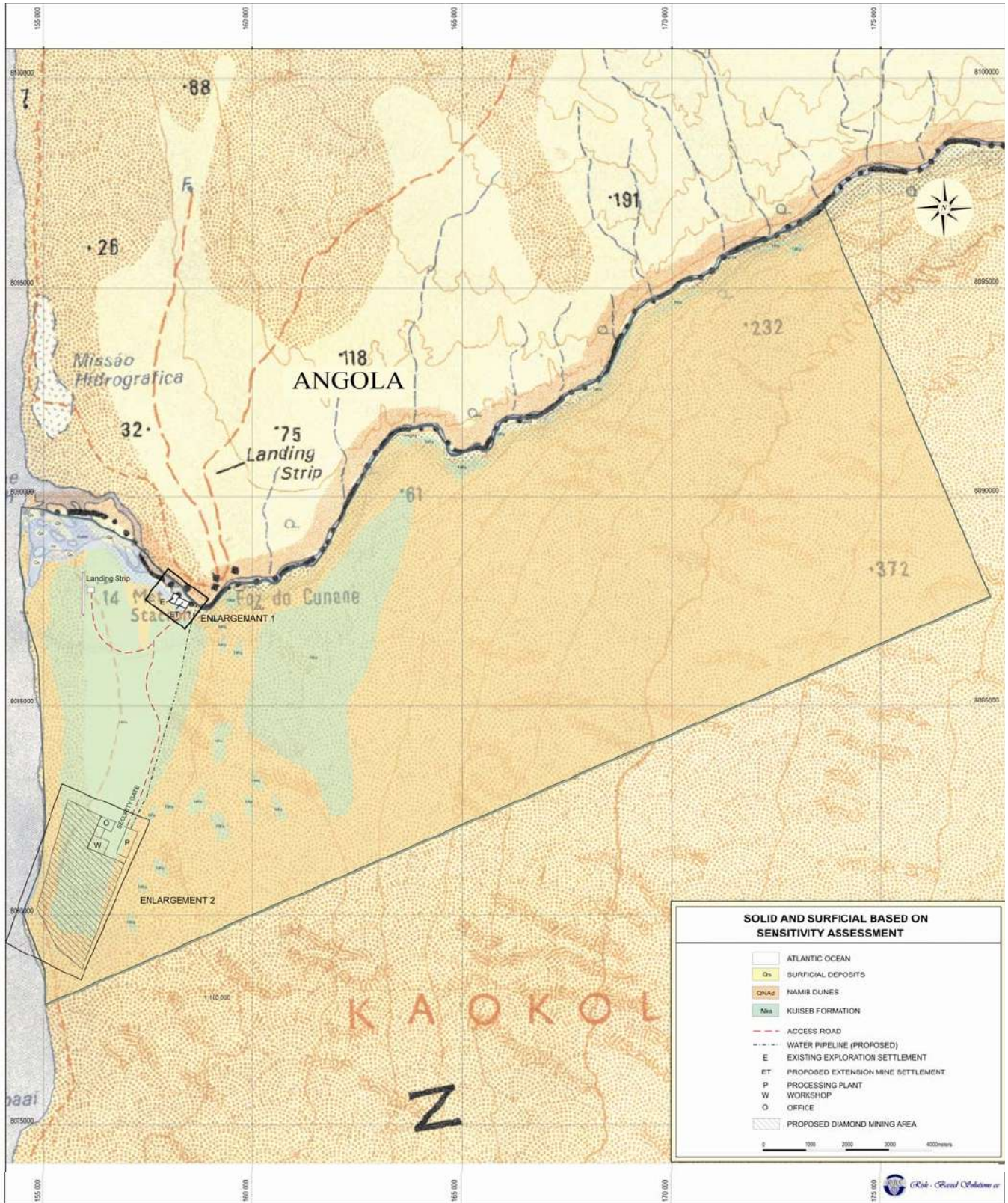


Figure 9: DST Solid and Surficial Layer - Entire ML Area.

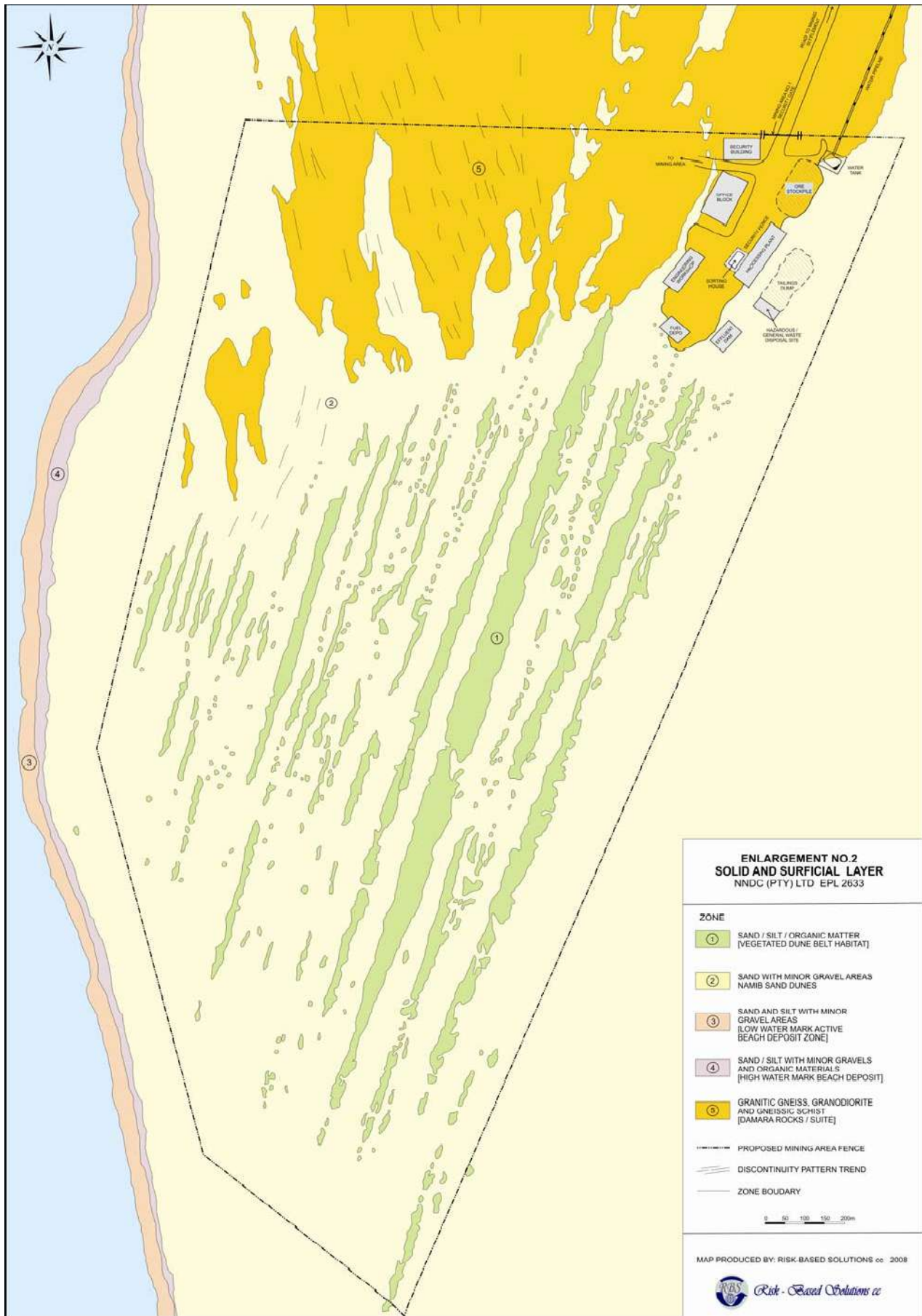


Figure 10: DST Solid and Surficial Layer - Mining area and processing plant.

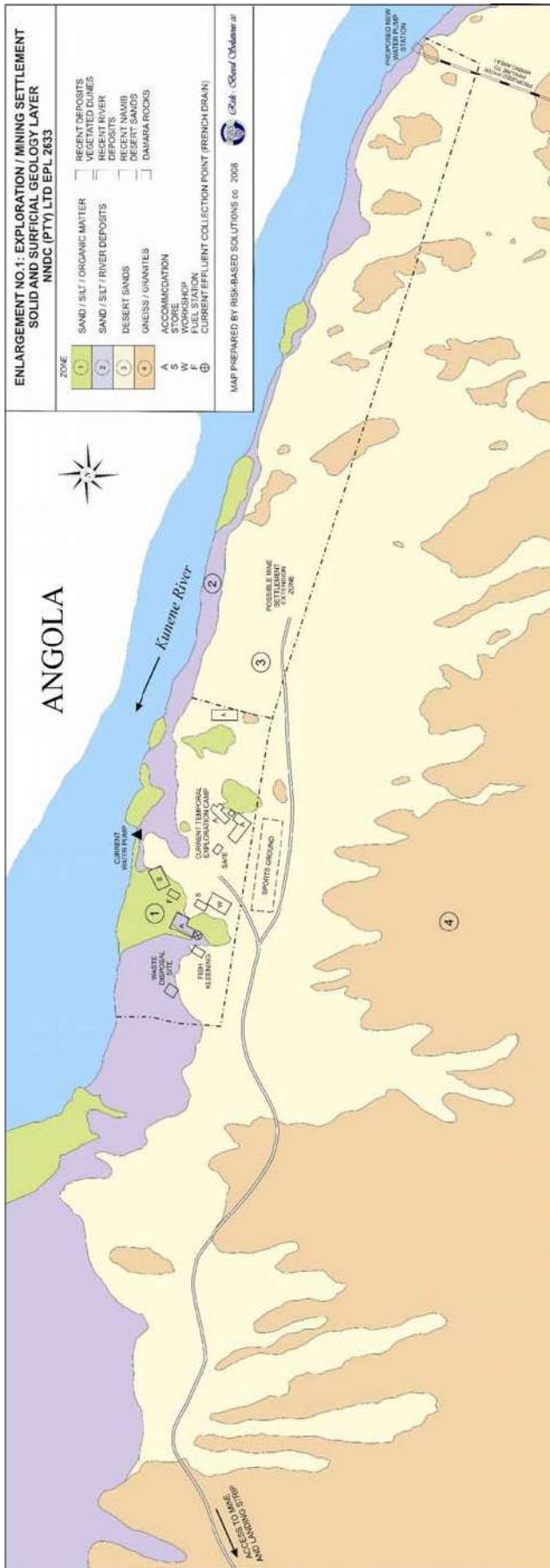


Figure 11: DST Solid and Surficial Layer - Mine settlement area.

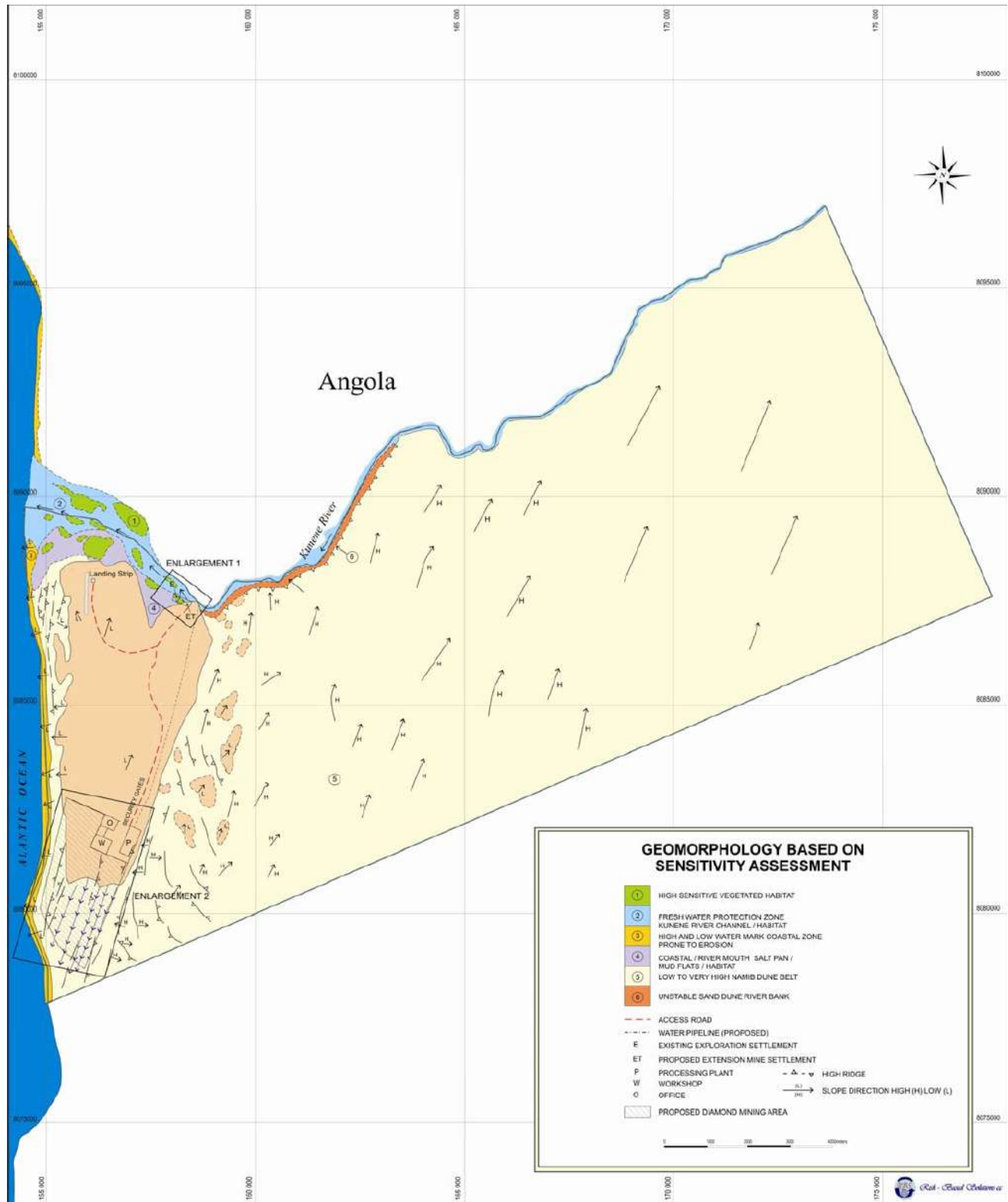


Figure 12: DST Geomorphology Layer - Entire ML Area.

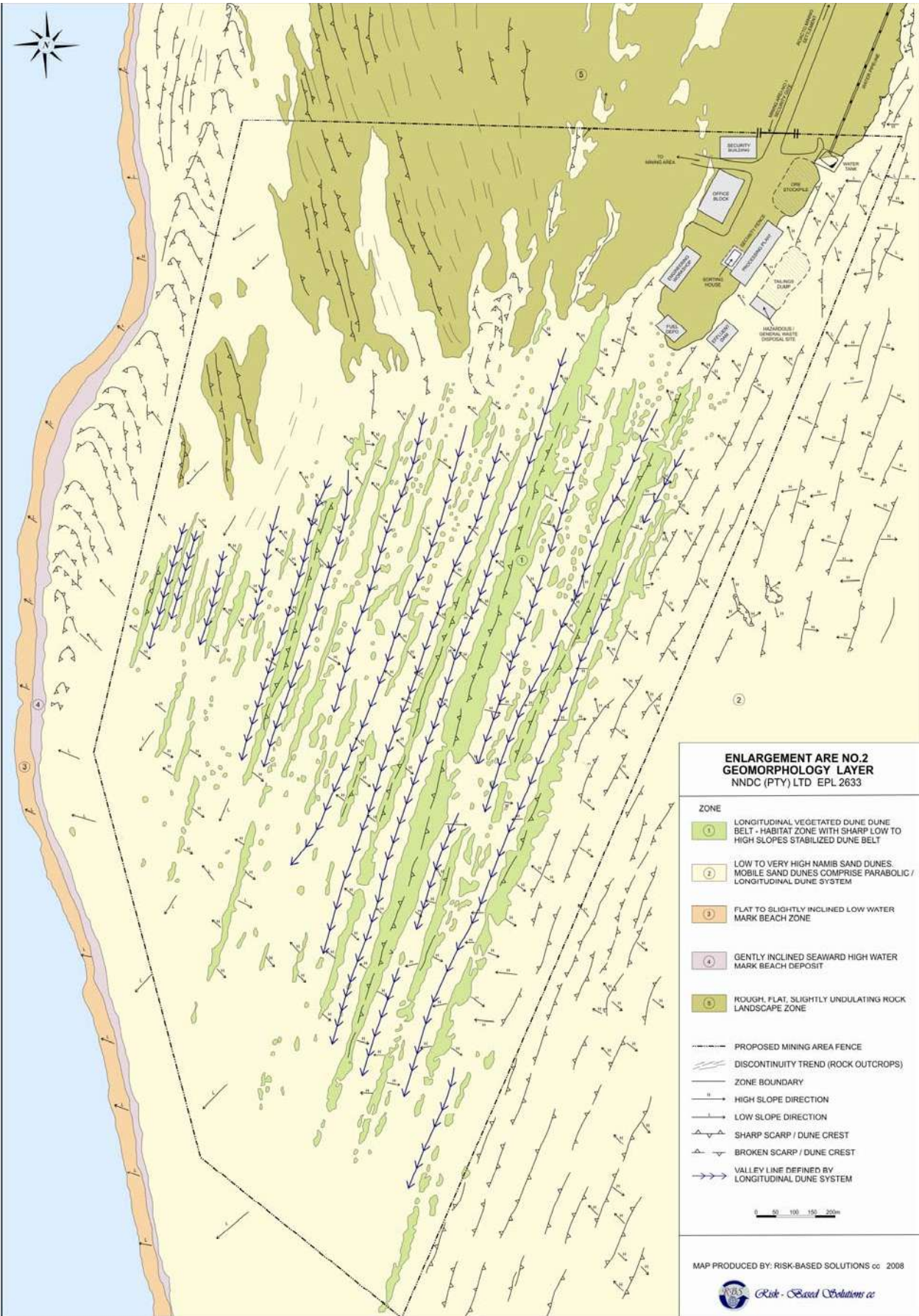


Figure 13: DST Geomorphology Layer - Mining area and processing plant.

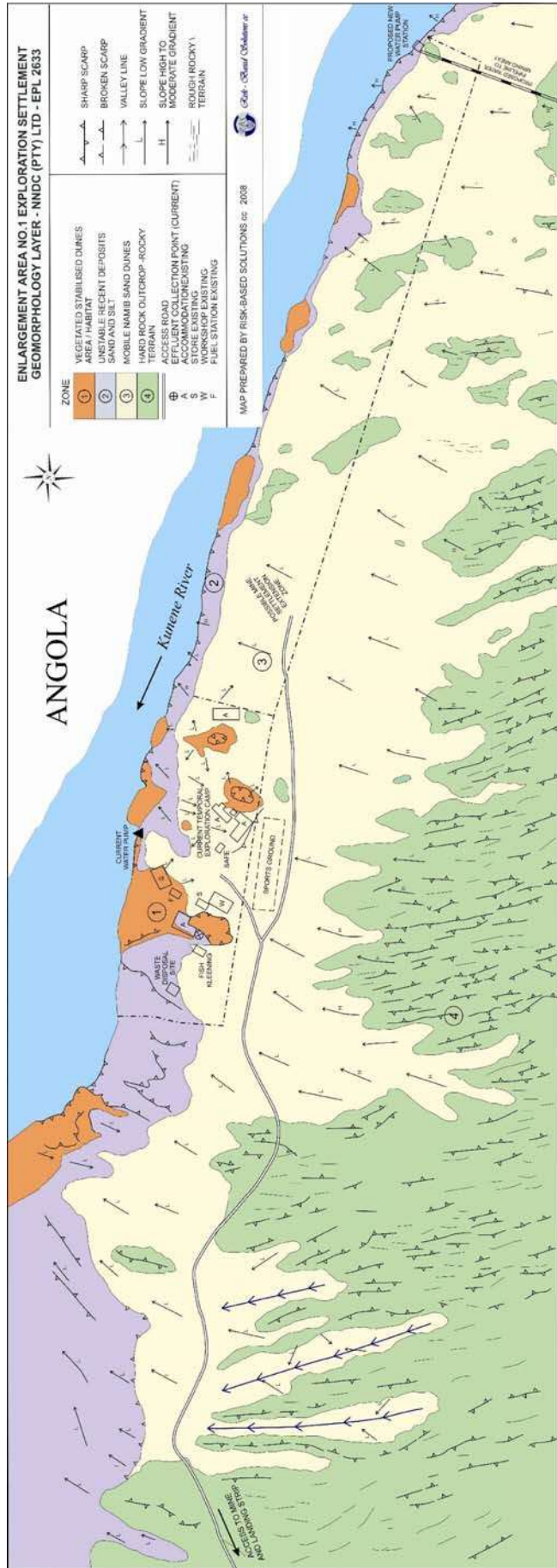


Figure 14: DST Geomorphology Layer - Mine settlement area.

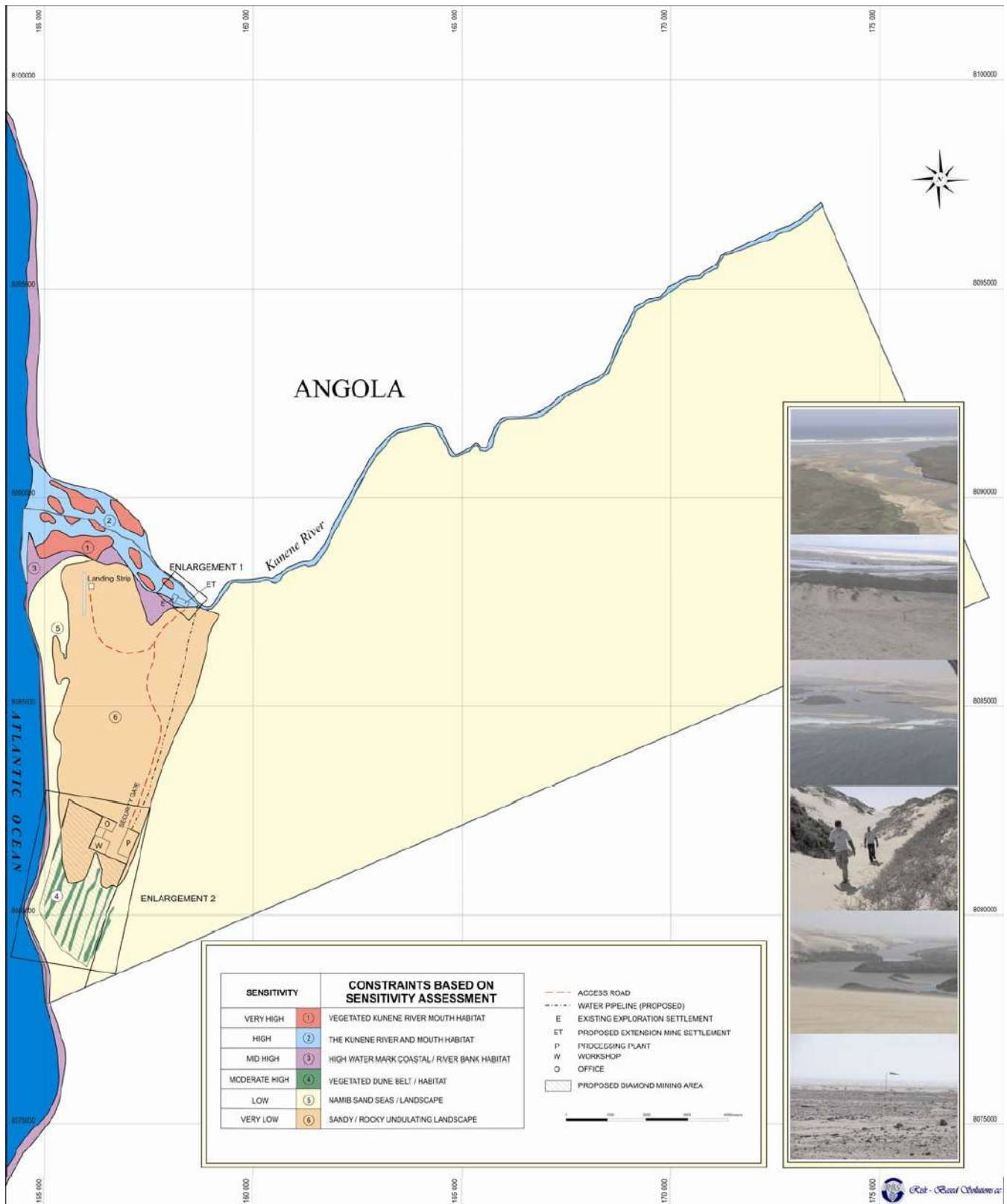


Figure 15: DST Constraints Layer - Entire ML Area.

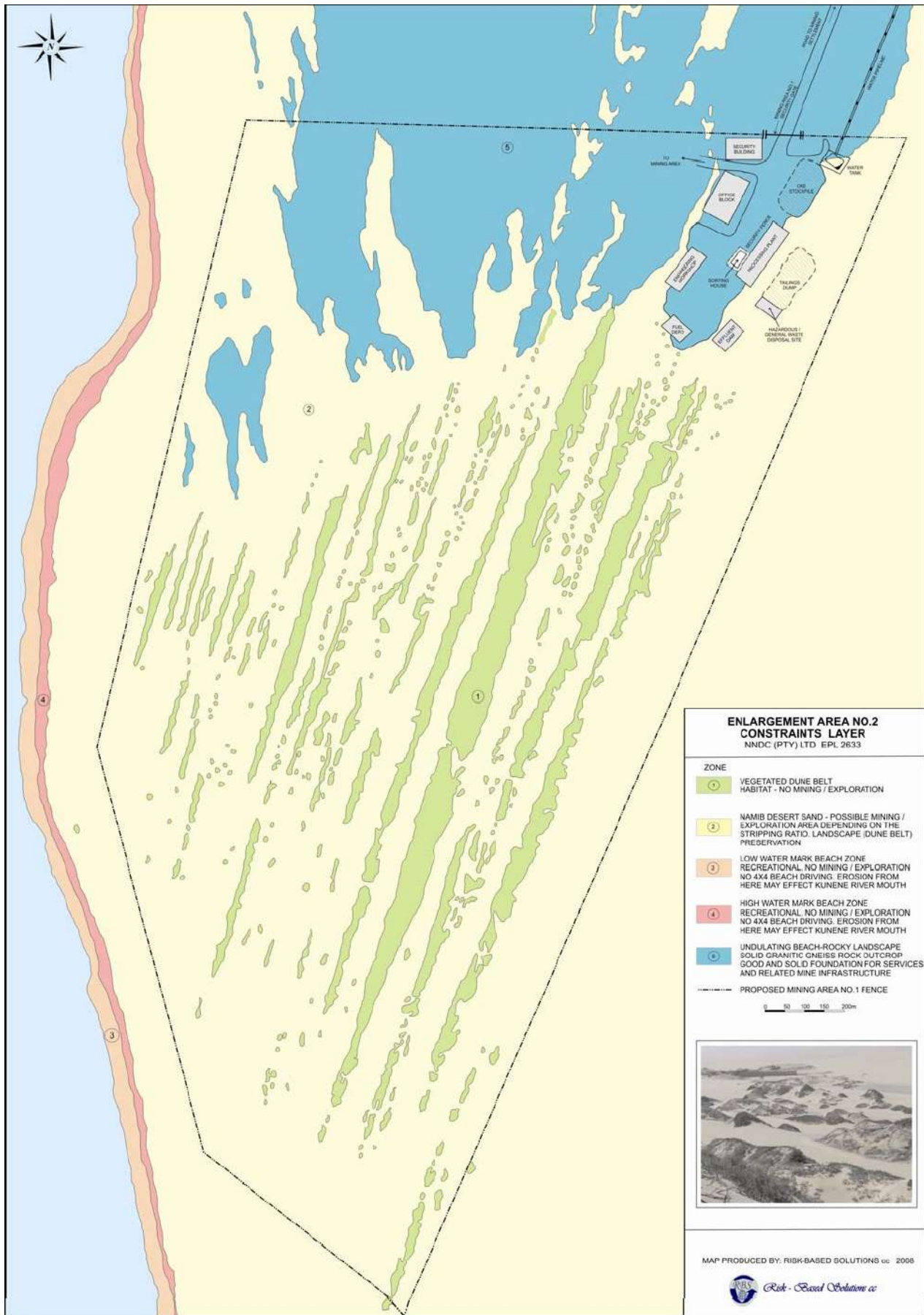


Figure 16: DST Constraints Layer - Mining area and processing plant.

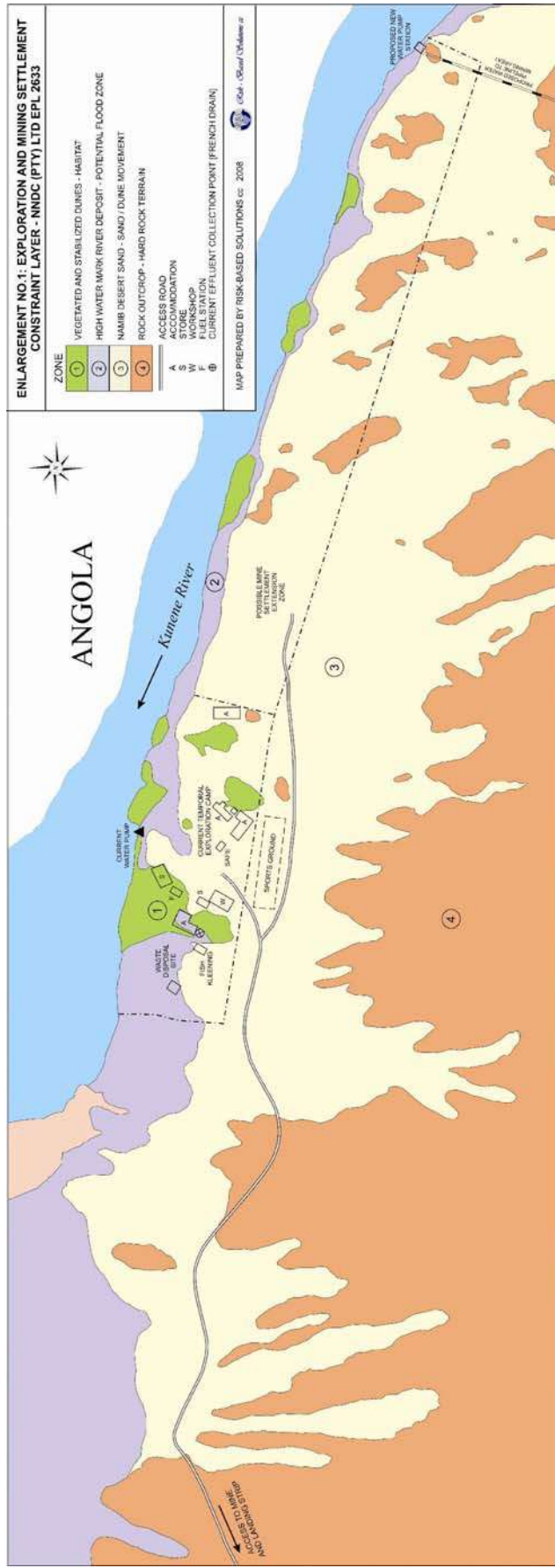


Figure 17: DST Constraints Layer - mine settlement area.

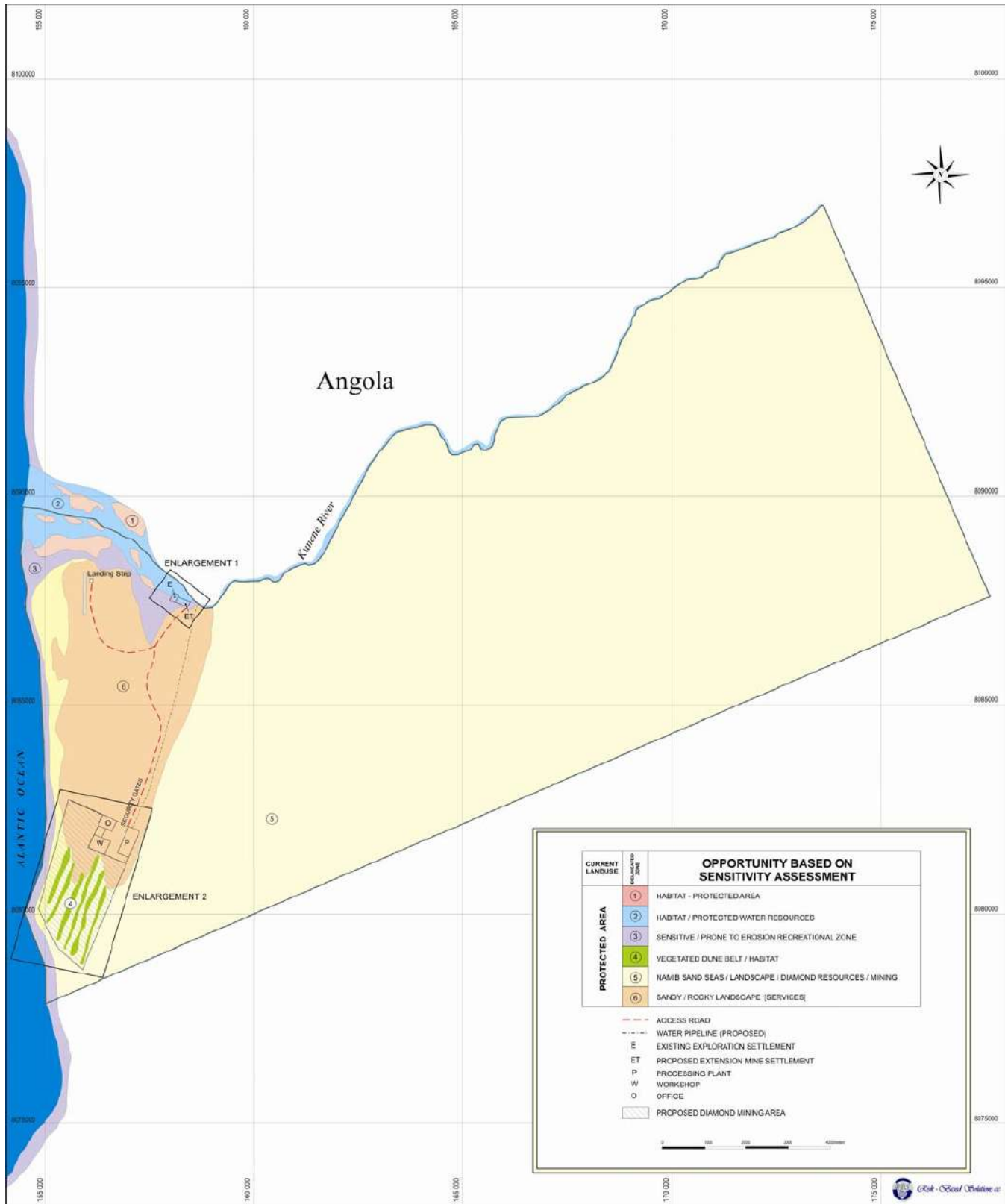


Figure 18: DST Opportunity Layer - Entire ML Area.

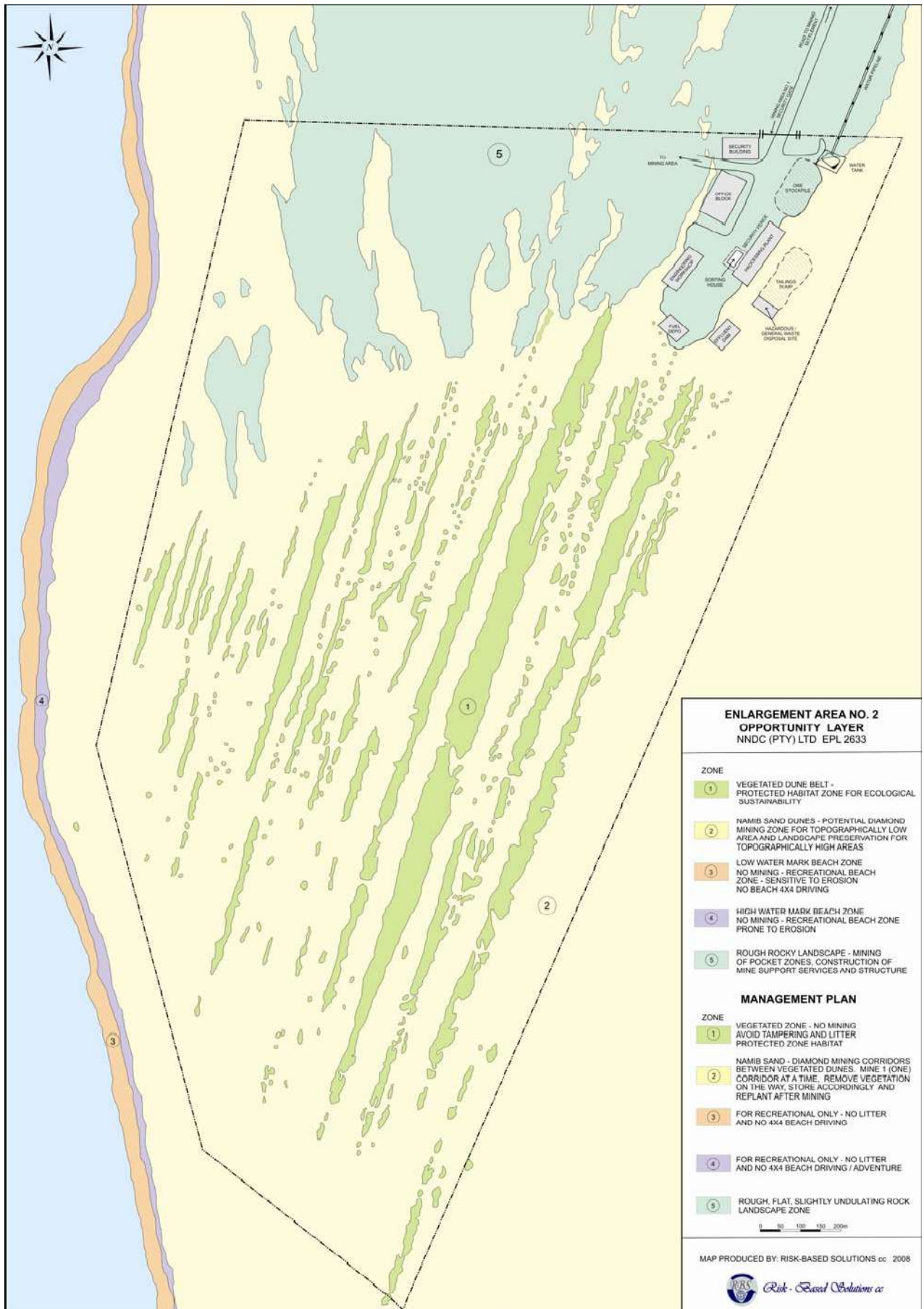


Figure 19: DST Opportunity Layer - Mining area and processing plant.

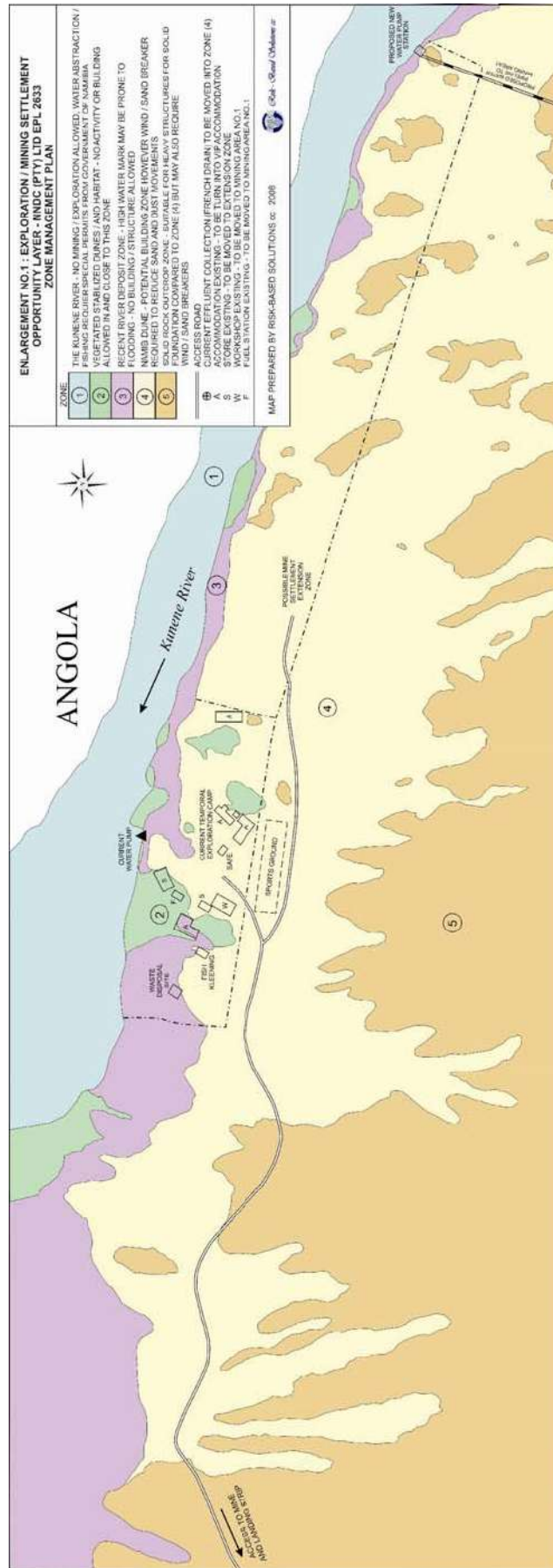


Figure 20: DST Opportunity Layer - Mine settlement area.

4. The EMP Framework

4.1. General Guidance

- (i) The field crew must try to avoid damage to vegetation and all other no-go zones and must adhere to the recommendations contained in this EMP concerning conservation and preservation of natural features;
- (ii) All crew members must be informed of special provisions of the Environmental Clearance, the Mining License as well as all other permits issued by any regulatory authorities. Every effort must be made to follow the various permit instructions and the contractor must strive to avoid excessive damage to the roads, trails and landscape. Damages to any natural structures must be reported to the Mine Manager who has to make sure that necessary repairs / remediation to environmental damage are undertaken in accordance with the recommended approach with the advice from the Environmental Officer. In the absence of the recommended approach, the repair / remediation to environmental damage will need to be undertaken in accordance with best available practices;
- (iii) All communications (public relations) with the other land users or visitors to the mining area and the local community must be channeled through one communication channel. The Mine Manager should play a significant role in this regard and contractor's personnel must be courteous and considerate when dealing with other land users, visitors or members of the general public.

4.2. Specific Guidance

1. Waste Management

- (i) In addition to addressing the prevention, detection, and cleanup of released waste, a plan of operations needs to be put in place;
- (ii) All litter in the area must be cleaned up at all times;
- (iii) After any excavations, all the removed materials must be carefully replanted and surrounding ground levelled with all litter removed;
- (iv) Pin flags, survey stakes and flagging, trail markers, powder boxes, oil cans, and all other forms of litter must be removed;
- (v) All solid and liquid waste generated from the activities shall be reduced, reused, or recycled to the maximum extent practicable. Burial of waste is not allowed and all waste must be disposed of at an approved waste disposal site;
- (vi) Waste may not be burned or buried, except at approved sites under controlled conditions in accordance with the regulations;
- (vii) Disposal of wastewater into any public stream is prohibited;

2. Facilities and Structures

- (i) The siting of a mine settlement and all related facilities or base other than in the designated zone is prohibited;

3. Local Hire

- (i) To the extent that are available with sufficient skills, the developer / operators are encouraged to employ local residents and subcontractors if needed;

4. Environmental Awareness Training

- (i) The operator of the proposed mine development must include in any plan to undertake the proposed mineral exploration and possible test mining, an Environmental Awareness Training programme for all personnel, including subcontractors, involved in any activity to be coordinated by the H&S Officer or Mine Manager. The programme must be designed to inform each person working on the project of environmental, social, and cultural concerns which relates to the individual jobs and responsibilities;
- (ii) The programme must employ effective methods to ensure that personnel understand and use techniques necessary to reduce the risk of fire, to preserve the environment, geological, archaeological, water, landscape, habitat zones, beachfront, and all associated biological resources. In addition, the programme must be designed to help personnel increase their sensitivity and understanding of the environment they are operating in.

5. Prehistoric, Historic, and Archaeological Sites

- (i) If prehistoric, historic, or archaeological materials or artefacts have been discovered in the process of mining and ongoing exploration, the operators must inform the Environmental Officer / Mine Manger who must evaluate and prepare an inventory of the discovery. The inventory must include consideration of information provided by local residents and documentation of oral history regarding prehistoric and historic uses of such sites. The Environmental Officer or Mine Manger must submit the inventory to the relevant authorities. The Environmental Officer / Mine Manager must make every reasonable effort to preserve and protect such site, structure, or object from damage until after consultation with the relevant authorities / specialists have given directions as to the actions that need to be taken;

5. Implementation of the EMP

5.1. Overview

Management of the environmental elements that may be affected by the different activities are grouped together into climatic, environmental and ground components. The EMP also identifies the activity groups / environmental elements, the aspects / targets, the indicators, the schedule for implementation and who should be responsible for the management to prevent major impacts that the different mining and exploration activities and processes may have on the environment (Table 3 - 20). Contents of Table 3 to 20, could be built into the regular Management System during the various planning phases of the proposed diamond mine development, operations and ongoing exploration.

The following abbreviations are used to indicate who should be responsible for the implementation:

- | | |
|--|----------|
| 1. Mine Manager | (MM), |
| 2. Project Geologist | (PG), |
| 3. Safety Officer | (SO), |
| 4. Contractor | (CONT), |
| 5. Environmental Officer | (ENV), |
| 6. Ministry of Environment, Forestry and Tourism | (MEFT), |
| 7. Ministry of Mines and Energy | (MME), |
| 8. Interested and Affected Parties | (I&APs). |

Table 3: Project Planning and Implementation.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
Establish a strong Environmental Awareness Protocol from project implementation to final closure in order to ensure the least possible impact to the environment.	<ul style="list-style-type: none"> Resources (Human and Financial) are provided for Environmental Awareness and Training, Regular Safety, Health and Environment meetings and for internal and external Environmental Monitoring Appointment of a senior person (Environmental Officer) to assume responsibility for environmental issues. All individuals including sub-contractors who work on, or visit, the sites are aware of the contents of the Environmental Policy and the EMP. The EMP and Environmental Policy will be included in Tender Documents. Field visits will take place to discuss the main access tracks with relevant stakeholders; 	<ul style="list-style-type: none"> At the start and for the duration of, each phase of any of the proposed project activities. In all tender documents. 	MM, PG, CONT, ENV, MET, MME, I&AP

Table 4: Implementation of the EMP.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> Define roles and responsibilities in terms of the EMP. To make all personnel, contractors and sub-contractors aware of these roles and responsibilities to ensure compliance with the EMP provisions. Implement environmental management that is preventative and proactive. Establish the resources, skills, etc. required for effective environmental management. 	<ul style="list-style-type: none"> Senior staff and senior contractors are aware of, and practice the EMP requirements. These persons shall be expected to know and understand the objectives of the EMP and will, by example, encourage suitable environmentally friendly behaviour to be adopted during the exploration; Recognition will be given to appropriate environmentally acceptable behaviour; Inappropriate behaviour will be corrected. An explanation to why the behaviour is unacceptable must be given, and, if necessary, the person will be disciplined. e.g. fees set out for non-compliance. 	<ul style="list-style-type: none"> At the start and throughout the duration of the exploration period. Senior staff use the EMP and make every effort to see that any new person on site has been introduced to the EMP. 	MM, PG, CONT, ENV

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Table 5: Public Relations.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> Maintain sound relationships with the other land users 	<ul style="list-style-type: none"> No littering or any other activity prohibited; Permission to utilise water as well as all applicable permits are obtained. 	<ul style="list-style-type: none"> At the start, and for the duration of the planned project development 	PG, MM, CONT

Table 6: Recruitment of Labour.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> Avoid exacerbating the influx of unemployed people to the area. Develop a standardised recruitment method for sub-contractor and field workers. 	<ul style="list-style-type: none"> Recruitment of people through the recommended recruitment process. Contractors will be informed of the method of recruitment of casual and other labourers. Every person who joins the mine and exploration team shall be given a copy of the Environmental Policy and EMP requirements explained. 	<ul style="list-style-type: none"> From the start and for the duration of the different phases of the proposed project activities. 	MM, PG, CONT

Table 7: Environmental Awareness Briefing and Training.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> Implement environmental awareness briefing / training for individuals who visit, or work, on site. 	<ul style="list-style-type: none"> Every senior/supervisory member of the team shall familiarise themselves with the contents of the EMP. They shall understand their roles and responsibilities with regard to personnel and project compliance with the EMP. Subject to agreement of the parties, the Environmental, an Environmental Awareness Briefing meeting, which shall be attended by all contractors before the start of the mineral exploration and possible test mining. Briefings on the EMP and Environmental Policy shall discuss the potential dangers to the environment of the following activities: public relations, littering, off-road driving, waste management, poaching and plant theft etc. The need to preserve soil, conserve water and implement water saving measures shall be presented. 	<ul style="list-style-type: none"> At the start and throughout the lifecycle of the project 	MM, PG, CONT, ENV, SO

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	<ul style="list-style-type: none"> Individuals can be questioned on the Environmental Philosophy and EMP and can recall contents. 		
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Table 8: Mining and Temporary Settlement Establishment.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> Get Environmental Clearance before implementation; Establishment of the mine settlement done on an area with the least disturbance to the environment and within the recommended zone; 	<ul style="list-style-type: none"> Documented Environmental Clearance from MET; Settlement and all related infrastructure (e.g. water tanks, sewage tanks, waste disposal) are not situated on an environmental sensitive area; No littering. 	<ul style="list-style-type: none"> At the start and for the duration of, each phase of any of the planned project development. 	MM, PG, CONT

Table 9: Use of Existing Access Roads and Tracks.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> Plan a road/track network that considers the environmental sensitivity of the area and a long-term tourism potential, and which is constructed in a technically and environmentally sound manner. Stick to the recommended track and sensitivity management zones. 	<ul style="list-style-type: none"> The following activities will minimise damage to the soil, vegetation and archaeology: <ol style="list-style-type: none"> use only existing tracks where possible; leave vehicles on tracks and walk to point of interest, when possible; drive slowly and carefully; use single tracks; use 4x4 drive to minimise damage to flora and soil structure; repair deep ruts rather than creating a new route; encourage the use of "3-point-turns" rather than "U-turns"; prohibit the use of vehicles for recreational use. 	<ul style="list-style-type: none"> At the start and for the duration of each phase of any of the proposed project. Establish access plan before new mining or exploration area. 	MM, PG, CONT, I&APs, ENV, SO

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Table 10: Management of the Natural Environment including the Habitat.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> Avoid, or reduce, the potential negative impact on the biophysical environment, including the scenic value (DuneBelt Landscape) thereof. 	<ul style="list-style-type: none"> Disturbed areas are kept to a minimum. Barriers are erected to minimise unauthorized entrance. Incidents of poaching or illegal plant or reptile collection and fishing are reported. Infrastructure is kept off and away from sensitive areas. No domestic or other animals are brought to the mine site. Persons causing willful or malicious damage to the environment held responsible for repairing the damage. 	<ul style="list-style-type: none"> At the start and for the duration of each phase of any of the proposed projects. 	PG, CONT, ENV, I&APs

Table 11: Surficial Material Management.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
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<ul style="list-style-type: none"> • Avoid and limit damage to the fragile surface soil / gravel layer through careful planning of mining and exploration activities and the preservation of the topsoil seed bank layer in areas where disturbance does occur. • Maximise the availability of topsoil for rehabilitation and preserve the inherent characteristics and potential of the topsoil to support vegetation growth. • Minimise soil erosion from disturbed areas and stockpiles. • Minimise the risks of soil pollution. 	<ul style="list-style-type: none"> • <u>If appropriate or possible</u>, the top 15 cm of topsoil / seed bank layer is removed from disturbed areas and stockpiled in 1.5 m high piles that are protected against wind erosion; • Leave sufficient buffer between the mining / exploration area and any sensitive habitant zone; • Areas where hazardous materials could pollute the soil are bunded (secondary containment); • Reduce trampling and removal of vegetation to what is strictly necessary in order to proceed with mining or exploration activities; • Erect barriers where appropriate. 	<ul style="list-style-type: none"> • At the start and for the duration of each phase of any of the proposed project. 	<p>MM, PG, ENV,CONT</p>
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Table 12: Managing Natural Heritage Sites and Artefacts.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> Avoid disturbance of known archaeological paleontological sites. Record new sites found and report to the responsible authority. 	<ul style="list-style-type: none"> Known archaeological and paleontological sites likely to be affected by project activities are fenced off. Documented consultation with an archaeologist, and/or local expertise. All individuals are aware of which areas are sensitive. Every pile of stones is treated as a possible archaeological site. Do not use them, as the rocks could be a burial cairn or hunting blind. No heritage objects are moved without a permit from the National Monuments Council and any permitted removal of heritage objects is done under the supervision of a qualified archaeologist, paleontologist or historian. Archaeological sites are not to be disturbed. They should be carefully photographed, the location recorded and the finding reported to the National Monuments Council. 	<ul style="list-style-type: none"> At the start and for the duration of the proposed projects. 	ENV, PG, CONT

Table 13: Surface and Groundwater Management.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> Conserve water. Avoid water pollution and prevent polluted water from entering Kunene River, any stream channels or underground aquifers. Monitor water quality including effluent quality both at the mine settlement and plant. 	<ul style="list-style-type: none"> Water and effluent quality monitoring are recorded. Working areas, where hazardous substances are handled or stored, are designed to collect and contain hazardous substances. Impervious materials are provided for drip trays, or sumps to collect and contain liquid pollutants. Latrines and French drains built >100m from watercourses or pans to avoid pollution of primary and secondary aquifers. All individuals can answer questions on water saving measures. 	<ul style="list-style-type: none"> At the start and for the duration of each phase of any of the proposed project activities, including the establishment of mining settlement. 	ENV, PG, GT, CONT

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Table 14: Management of Hazardous Substances.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> • Minimise the risk of pollution through the implementation of all reasonable measures to prevent leakage, spillage or inappropriate disposal of hazardous substances. • Minimise the risk of hazardous substances affecting the health of all individuals, plants and animal life. • Use biodegradable products as far as is reasonably possible. 	<ul style="list-style-type: none"> • The Mine Manager and Contractor have identified all activities that involve the handling of potentially hazardous substances and protocols for the handling of these substances have been put in place and their implementation supervised. Hazardous substances are handled in accordance with the manufacturer's specifications, and the legal requirements. • The Mine Manager encourages the use of the least polluting, most rapidly biodegradable cleaning product, solvent, etc. • All involved ensure that all individuals who could be exposed to hazardous substances are adequately protected and educated about the safe and proper methods for handling these substances. • Procedures for the containment and clean-up of accidental hazardous accidents are developed and implemented. • Procedures are implemented to stop or reduce and contain any spills. • Implementation of the necessary clean up procedures and proper disposal of contaminated soil, water and other materials at an approved facility always supervised. 	<ul style="list-style-type: none"> • At the start and for the duration of each phase of any of the proposed project, including the establishment of mine settlement • At any, time when there is a hazardous spill / leakage. 	<p>MM, ENV, PG, SO, CONT</p>

Table 15: Waste Management.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> Adopt a sound and hierarchical approach to waste management, which would include waste minimisation, re-use, recovery, recycling, treatment, and proper disposal. Maintain a clean and tidy site. Anything taken in shall be taken out. 	<p>Waste management procedures are implemented:</p> <ul style="list-style-type: none"> minimise the production of waste; where possible, compact waste to reduce its bulk; cardboard and paper are burnt at an approved site; waste bins with suitable lids are provided on site; individuals are encouraged to use appropriate bins or bags for rubbish; waste bins are emptied when full, at an approved disposal facility illegal dumping and littering are not tolerated. specific drums are provided for the disposal of waste oils / diesel or grease and should be periodically taken to a suitable disposal facility. 	<ul style="list-style-type: none"> At the start and for the duration of each phase of any of the proposed projects. 	MM, PG, CONT, SO, ENV

Table 16: Air quality Management.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> Implement the best practicable means to prevent fugitive dust and offensive gases and odours. Protect employees and work force during handling of substances that can produce potential harmful gases or vapours. 	<p>Implemented measures to manage dust include:</p> <ul style="list-style-type: none"> avoidance of unnecessary vehicle movement; limitation of vehicle speed; rehabilitation of disturbed and exposed areas as soon as practically possible. limitation of disturbed areas (camps, holes, tracks etc.) to as small an area as is practicable. no open fires, except braziers or 'braai drums' used for cooking. Preferably gas or electricity is provided for cooking purposes. individuals wear protective clothing when at all times. 	<ul style="list-style-type: none"> At the start and for the duration of the proposed project. 	MM, PG, SO, CONT, ENV

Table 17: Visual Quality Management.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> • Preserve the scenic aspects of the license area and surroundings. • Minimise visual impacts created by mining and exploration as far as is reasonably possible. 	<ul style="list-style-type: none"> • Mine settlement, drill or bulk sample sites, etc. appear tidy. • The areas in which different mine and exploration activities take place are clearly demarcated in order to contain the possible degradation of the site's appearance. • The movement and use of vehicles are limited to prevent unnecessary damage to vegetation. Exploration activities are undertaken on foot as far as is possible. • Sample locations are selected, if possible and practical, to minimize visual impact. Roads and tracks are kept to a minimum. • Mine settlement, profile lines, roads and any other disturbed area by mining and exploration activities are rehabilitated. 	<ul style="list-style-type: none"> • At the start and for the duration of the proposed project. • Rehabilitation should be ongoing. 	MM, PG, SO, CO NT, ENV

Table 18: Rehabilitation Plan.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
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<ul style="list-style-type: none"> Rehabilitate the mine, exploration sites and unwanted part of the mine settlement to as close an approximation of the pristine state as is technically, financially and reasonably possible. 	<p>The following rehabilitation actions are practiced:</p> <ol style="list-style-type: none"> small samples are preferably removed from site to avoid additional scars in the landscape; litter from the site has been taken to the appropriatedisposal site. debris, scrap metal, etc is removed before moving to anew site or closure of the mine. water tanks are dismantled and removed if not required forafter use. tracks on site and the access road are rehabilitated by smoothing the middle ridge between the tracks and raking the surface. <p>The following should be undertaken at all disturbed areas thatrequire further rehabilitation:</p> <ol style="list-style-type: none"> if applicable, the stockpiled topsoil to be replaced (spread) and/or the site is neatly contoured to establish effective wind supported landscape patterns; five (5) years after rehabilitation, sites should not be visiblefrom a 500 m distance. 	<ul style="list-style-type: none"> Ongoing during all phases of the proposed project activities 	<p>MM, CONT, ENV, PG, (EM)</p>
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Table 19: Health and Safety.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> • Protect the health and safety of employees and visitors to the area (mine settlement, mining and exploration sites). • Be aware of the harshness of the environment in which they are working, intense heat or cold and shortage of water, a combination of which could be life threatening • Dust generated by natural wind and vehicles travelling along the surrounding gravel road as well as the gravel roads safety. 	<ul style="list-style-type: none"> • There is a comprehensive First Aid Kit on site with suitable anti-histamine for bee stings / snake bites should be available. • Rubber gloves are used in case of an accident to reduce the risk of contracting HIV/AIDS. • All individuals have received instructions concerning the dangers of dehydration or hyperthermia. Encourage all to drink plenty of clean water. • No person under the influence of alcohol or drugs is allowed to work on site. • The Mine Manager ensures compliance with the requirements of the relevant Namibian Labour, Mining and Health and Safety Regulations. • Dangerous or protected / sensitive areas are clearly marked and access to these areas is controlled or restricted. • Due care must be taken when driving any vehicles on any roads particularly the gravel roads. ALL Drivers must drive with their headlights switched on when travelling on the gravel roads (day and night). • Persons driving a vehicle must be in possession of a valid driver's license • Awareness on HIV/AIDS among workers is raised 	<ul style="list-style-type: none"> • At the start and for the duration of each phase of the proposed project. 	<p>MM, PG, SO, CONT, ENV</p>

Table 20: Environmental Data Collection.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ul style="list-style-type: none"> • Collect data that will add value to environmental monitoring and reporting to the regulators. • Collect data that will add to the general scientific and geographic knowledge of the environment in which the mining and / or exploration process takes place. • Acknowledged that the required skills and knowledge to collect all the suggested data may not be available within the mine /exploration team, however, as much data as is practical should be collected. 	<p>Environmental Monitoring Report Compiled and submitted by the Environmental Officer to the regulators. The following types of information should be gathered:</p> <ol style="list-style-type: none"> 1. Fauna - What tracks or signs of animal activity have been seen (photographs and GPS recording)? What animals, birds etc. were identified? Alternatively provide a description and/ or photo if unidentified. 2. Unusual weather conditions - e.g. records of the prevailing wind direction and the direction from which storm events come. Was there fog or rain, frost overnight or intense heat? Preferably have a thermometer and rain gauge on site. 3. Vegetation - Record trees, shrubs, grass, etc. that are found in the vicinity along each of the profiles. Some plants do only occur after rainfall and might not have been seen for decades. 4. Any archaeological, cultural or historical sites that may be found - GPS coordinates, photograph and plot the position on a 1: 50 000 map. 5. Other - including surface water, springs, large scale geological features etc. 	<ul style="list-style-type: none"> • From the start of the project during all phases of the proposed project cycle. 	<p>E N V</p>

6. Monitoring of the Environmental Performance

6.1. Overview

The monitoring process of the EMP performances for the proposed mining and exploration project is divided into two parts and these are:

- (i) Monitoring activities and effects to be undertaken by the Environmental Officer (ENV)
- (ii) Preparation of an Environmental Monitoring Report covering all activities related to the Environmental Management Plan at the during and at closure of the proposed mining project to be undertaken by the Environmental Officer (ENV) and Mine manager (MM).

As part of the condition of the Environmental Clearance Certificate that will be rewarded by the Ministry of Environment, Forestry and Tourism (MEFT) to NNDC, this EMP will be required to report on the mine's environmental performance every six months, as part of the ongoing environmental monitoring programme. The process of undertaking appropriate monitoring as per specific topic (Tables 21 - 28) and tracking performances against the objectives and documenting all environmental activities, is part of internal and external auditing to be coordinated by the Environmental Officer / Consultant / Suitable qualified in-house resource person. Tables 21 – 28 outline the type of information that shall need to be recorded on a regular by the Environmental Officer as part of the monitoring process of the activities and the effects.

The second part of the monitoring of the EMP performance will require a report outlining all the activities related to effectiveness of the EMP at the end of the planned mineral exploration and possible test mining to be undertaken by the Environmental Officer. The types of the data sets to be used in the preparation of such a report are outlined in Tables 21 - 28. The objective will be to ensure that corrective actions are reviewed and steps are taken to ensure compliance. The report shall outline the status of the environment and any likely environmental liability after completion of the proposed project. The report shall be submitted to the Ministry of Environment, Forestry and Tourism and will represent the final closure and fulfilment of the Environmental Contract conditions to be signed between MEFT and NNDC.

Table 21: Monitoring of environmental awareness training.

Mitigation	Comment	Follow-up Action Required	By Whom	By When
Is Environmental awareness training conducted regularly?				
How many people have been given environmental awareness training?				
How effective is the awareness training? Do people understand the contents of the EMP? Where are the weaknesses? (Ask 3 people at random various questions about the EMP).				

Table 22: Monitoring of hazardous and non-hazardous waste for the mine settlement.

Mitigation	Comment	Follow-up Action Required	By Whom	By When
Do containers for waste have scavenging animal proof lids?				
Is there littering around the mine site?				
Are there facilities for the disposal of oils / hazardous substances and is it regularly removed to an approved disposal site?				
Is there evidence of oil / diesel spills? Have they been cleaned up?				
Is good housekeeping evident?				
Have pit latrines been provided? Where are they situated?				

Table 23: Health and safety.

Mitigation	Comment	Follow-up Action Required	By Who m	By Whe n
Is there First Aid Kit containing anti-histamines etc?				
Are dangerous areas clearly marked off?				
Do vehicles appear to adhere to the recommended speedlimits?				
Do vehicles drive with headlights on along the gravel roads at all times?				

Table 24: Management of the natural habitat and surficial materials management..

Mitigation	Comment	Follow-up Action Required	By Who m	By Whe n
Has there been any developments on or very close to sensitive areas?				
Has there been willful or malicious damage to the environment?				
Has topsoil / seed bank layer been removed from demarcated camp, mining and exploration areas and appropriately stored?				
Are environmental records being kept? ML 156: NNDC				
Have archaeological sites been found / disturbed / described?				
Has new infrastructure been created? If so, is it well planned / built with respect to environment?				
Is the mine settlement positioned to avoid sensitive zones, river channels and potential archaeological sites?				

Table 25: Tracks and off-road driving.

Mitigation	Comment	Follow-up Action Required	By Whom	By When
Are existing tracks used and maintained?				
What new tracks have been developed and are they planned?				
What evidence is there of off-road driving? Who appears to be responsible?				
Have unnecessary tracks been rehabilitated and how well?				

Table 26: Management of surface and groundwater.

Mitigation	Comment	Follow-up Action Required	By Whom	By When
How is potable water supplied and how often? Position of tanks?				
Is water being wasted?				
Is there any leakage from pipes or taps?				
Have any records of water strikes been kept? Were water samples taken and RWL measured?				

Table 27: Public relations.

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Mitigation	Comment	Follow-up Action Required	By Whom	By When
Have any complaints been made about the mining and exploration activities by the different I&APs? If so, what, and how was the issue resolved?				

7. Environmental Awareness

7.1. NNDC Environmental Policy

NNDC PTY LTD Environmental Statement

NNDC will ensure:

- Appropriate environmental care will be exercised in accordance with the EMP during the planning and actual undertaking of the project activities in our jurisdictions.
 - Environmental protection measures, appropriate to site-specific conditions will be applied in the absence of any legal guidance.
 - Promote the development of open and constructive partnerships with all the relevant stakeholders to address environmental concerns and advance necessary protection measures.
 - Promote the advancement of scientific knowledge to be applied to the identification and effective resolution of real environmental problems.
 - Encourage pollution prevention, waste minimisation and recycling efforts.
 - Observance of environmental legislation will be a priority in all company activities.
 - Conduct internal audits of operations to ensure adherence to this policy and compliance to all relevant regulations.
-

7.2. Environmental Awareness Guidance

1. The Environmental Rules apply to EVERYBODY. This includes all permanent, contract, or temporary workers as well as any other person who visits the mine settlement, mining and exploration area. Any person who visits the license areas will be required to adhere to the company Environmental Code of Conduct.
2. The Site Manager or Exploration Geologist will issue warnings and will discipline ANY PERSON who does not adhere to any one of the Environmental Rules and Procedures. Repeated and continued non-conformance of the Rules and Procedures will result in a disciplinary hearing and which may result in that person being asked to leave the site permanently.
3. The ENVIRONMENT means the whole surroundings around us. The environment is made-up of the soil, water, air, plants, fish and animals; and those characteristics of the soil, water, air, plant and animal life that influence human health and wellbeing.
4. If any member of the WORK FORCE does not understand, or does not know how to keep any of the Environmental Rules or Procedures, that PERSON must seek advice from the ENVIRONMENTAL OFFICER, PROJECT GEOLOGIST or SITE MANAGER or CONTRACTOR. The PERSON that

does

not understand must keep asking until s/he is able to keep to all the Environmental Rules and Procedures.

7.3. Environmental Awareness Training Materials

1. Control of Fires Guidance

- Never start an open fire and do not burn any vegetation.
- Do not smoke near refueling depots or any other area where fuel, oil, solvents or paints are used or stored. Make sure that cigarette butts are put-off before throwing them into the refuse bin.
- Do NOT throw cigarette butts any how in the field.
- Immediately notify your Contractor or the Environmental Officer, Exploration Geologist / Site Manager if you see a fire on site.

2. Natural Environmental Management Guidance

- Never feed, tease or play with, hunt, kill, destroy or set devices to trap any wild animal (including birds, reptiles and mammals). Do not bring any wild animal or pet to the exploration site.
- Do not pick any plant or take any animal out of the mining license area EVER. You will be prosecuted and asked to leave the project area.
- Never leave rubbish and food scraps or bones where it will attract animals, birds or insects. Rubbish must be thrown into the correct rubbish bins or bags provided.
- Protect the surficial material by not driving over it unnecessarily.
- Do not drive over, build upon, or camp on any sensitive habitats for plants and animals.
- Do not cut down any part of living trees / bushes for firewood.
- Do not destroy bird nests, dens, burrow pits, termite hills etc. or any other natural objects in the area.

3. Vehicle Use and Access Guidance

- Never drive any vehicle without a valid license for that particular vehicle and do not drive any vehicle that appears not to be road-worthy.
- Never drive any vehicle when under the influence of alcohol or drugs.
- DO NOT make any new roads without permission. Stay within demarcated areas.
- Avoid U-Turns and large turning circles. 3-point turns are encouraged. Do not ever drive on rocky slopes.
- DO NOT SPEED - keep to less than 60 km per hour on the tracks and site roads and drive with headlights switched on along any gravel road.
- No off-road driving is allowed. Vehicles may only drive on demarcated roads.

4. Control of Dust Guidance

- Do not make new roads or clear any vegetation unless instructed to do so by the Site Manager.
- Avoid disturbing the surface of the desert as little as possible.

5. Health and Safety Guidance

- Drink lots of water every day, but only from the fresh water supplies.
- Take the necessary precautions to avoid contracting the HIV/AIDS virus.
- Only enter or exit the exploration area at the demarcated gates.
- Always keep the gates as you found them.
- Never enter any area that is out of bounds, or demarcated as dangerous or wander off without informing or permission of the team leader.
- Never climb over any fence or trespass on private property without permission of the landowner or consultation with Exploration Geologist / Site Manager.
- Report to your Contractor or the Exploration Geologist / Site Manager if you see a stranger or unauthorised person in the exploration area.
- Do not remove any vehicle, machinery, equipment or any other object from the camp site or along the profile or at a seismic testing station without permission of your Contractor or the Exploration Geologist / Site Manager.
- Wear protective clothing and equipment required and according to instructions from your Contractor or the Exploration Geologist or Site Manager.
- Never enter or work in the mine or exploration area when under the influence of alcohol or drugs.

6. Preventing Pollution and Dangerous Working Conditions Guidance

- Never throw any hazardous substance such as fuel, oil, solvents, etc. into streams or onto the ground.
- Never allow any hazardous substance to soak into the soil.
- Immediately tell your Contractor / Project Geologist / Site Manager when you spill, or notice any hazardous substance being spilled anywhere in the field or camp.
- Report to your Contractor / the Project Geologist / Site Manager when you notice any container, which may hold a hazardous substance, overflow, leak or drip.
- Immediately report to your Contractor / the Project Manager when you notice overflowing problems or unhygienic conditions at the ablution facilities.
- Vehicles, equipment and machinery, containers and other surfaces shall be washed at areas designated by the Contractor / the Project Geologist / Site Manager.
- If you are not sure how to transport, use, store or dispose any hazardous substance - ASK your Contractor / Project Geologist / Site Manager for advice.

7. Saving Water Guidance

- Always use as little water as possible. Reduce, reuse and re-cycle water where possible.
- Report any dripping or leaking taps and pipes to your Contractor / the Project Geologist or Site Manager.
- Never leave taps running. Close taps after you have finished using them.

8. Disposal of Waste Guidance

- Know the difference between the two main types of waste, namely: General Waste; and Hazardous Waste.
- Know how to identify the containers, bins, drums or bags for the different types of wastes.
- Never dispose of hazardous waste in the bins or skips intended for general waste or exploration rubble.
- Never burn or bury any waste on the camp or in the field.
- Never overfill any waste container, drum, bin or bag. Inform the Contractor / the Project Geologist / Site Manager if the containers, drums, bins or skips are nearly full.
- Never litter or throw away any waste on the site, in the field or along any road.
- No illegal dumping.
- Littering is prohibited.

9. Religious, Cultural, Historical and Archaeological Objects Guidance

- If you find any suspected religious, cultural, historical or archeologically object or site around the campsite or in the field, you must immediately notify your Contractor or Environmental Officer / the Project Geologist / Site Manager.
- Never remove, destroy, interfere with or disturb any religious, cultural, historical or archaeological object or site around the campsite or in the field.

10. Dealing with Environmental Complaints Guidance

- If you have any complaint about dangerous working conditions or potential pollution to the environment, immediately report this to your Contractor or the Environmental Officer / the Project Geologist / Site Manager.
- If any person complains to you about noise, lights, littering, pollution, or any other harmful or dangerous condition, immediately report this to your Contractor / the Site Manager.

7.4. Environmental Personnel Register

8. Conclusion and Recommendation

8.1. Summary

Recommended actions to be executed by NNDC as part of the management of the impacts through implementations of the EMP are:

1. Contract an Environmental Officer / Consultant / suitable in-house resources person to lead and further develop, implement and promote environmental culture through awareness raising of the workforce, contractors and sub-contractors in the field during the whole duration of the proposed project;
2. Provide with other support, human and financial resources, for the implementation of the proposed mitigations and effective environmental management during the planned mine project life cycle;
3. Develop a simplified environmental induction and awareness programme for all the workforce, contractors and sub-contractors;
4. Where contracted service providers are likely to cause environmental impacts, these will need to be identified and contract agreements need to be developed with costing provisions for environmental liabilities;
5. Implement internal and external monitoring of the actions and management strategies developed during the project duration and a final Environmental Monitoring report be prepared by the Environmental Coordinator / Consultant / Suitable in-house resource person and to be submitted to the regulators and to end the proposed mine project;
6. Develop and implement a monitoring programme that will fit into the overall company's Environmental Management Systems (EMS) as well as for any future EIA for drilling and production phases.

All the responsibilities to ensure that the recommendations are executed accordingly rest with **NNDC**, with appropriate resources put in place to make sure that all members of the workforce including subcontractors and sub-contractors are aware of the EMP and the objectives.

MINISTRY OF ENVIRONMENT,
FORESTRY AND TOURISM
DIRECTORATE OF ENVIRONMENTAL AFFAIRS
1-1 JUN 2021
RECEIVED 1
Signature:.....

**IMPLEMENTATION AND COMPLIANCE OF THE
ENVIRONMENTAL MANAGEMENT PLAN FOR MINING LICENCE NO.156,
KUNENE REGION, NAMIBIA**



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1 Introduction

1.1 Background

Northern Namibia Development Company (Pty) Ltd (hereinafter referred to as Northern Namibia Development Company or NNDC) holds the mineral rights for precious stones under Mining License (ML) 156.

The ML, 3405.7815 hectares (ha) in size, is located about 700 kilometers (km) north of Swakopmund, in the north-western corner of Namibia's Skeleton Coast Park; it is bordered by the Atlantic Ocean (to the west), the Kunene River Mouth (north-west), and the Kunene River (and Angola) (to the north) (Figure 1).

Access to ML 156 is attainable by 4x4 vehicle from Terrace Bay, over Möwe Bay and from there, another 270 km along the shoreline through the Skeleton Coast Park. Apart from a Landing Strip at the Kunene River Mouth, there are also landing strips for light aircraft at Terrace Bay and Möwe Bay.

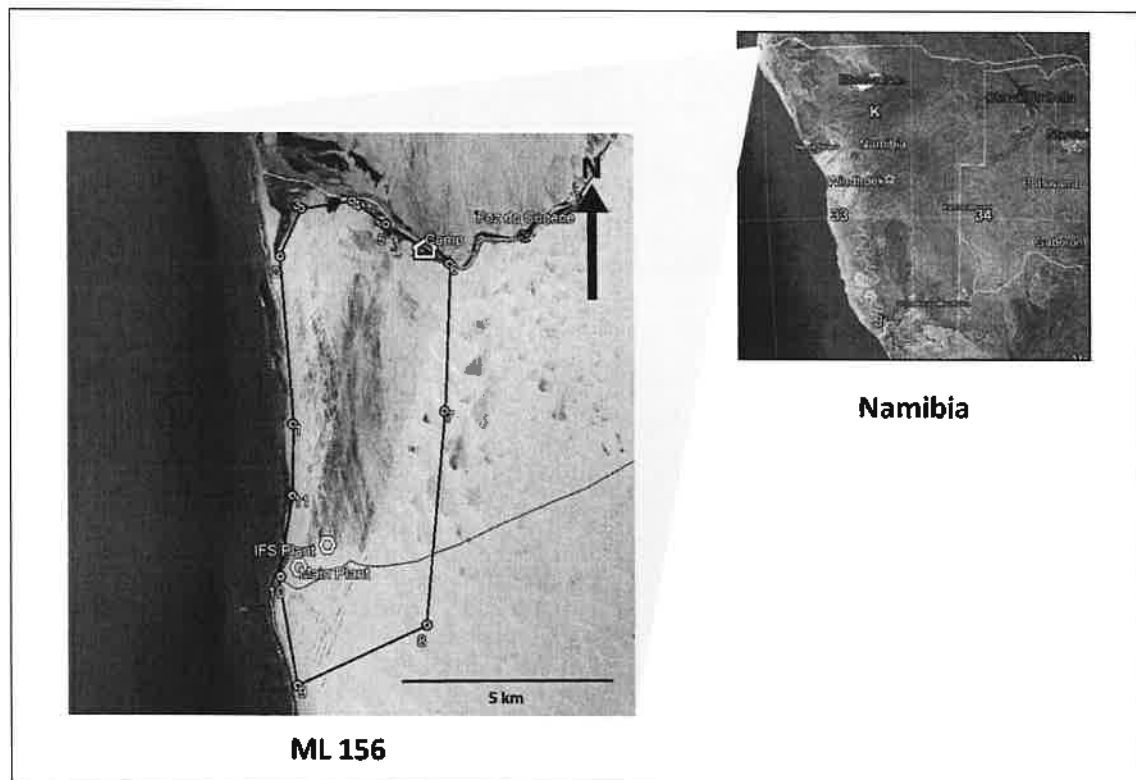


Figure 1: Location of Mining License 156, Kunene Region, Namibia.

In 2008, and in support of the renewal of Exclusive Prospecting Licence (EPL) No 2633, Risk-Based Solutions (RBS) cc conducted an Environmental Impact Assessment (EIA) and prepared an Environmental Management Plan (EMP) on behalf of NNDC. An Environmental Clearance Certificate was obtained from the Ministry of Environment, Forestry and Tourism (MEFT) on 11 August 2008.

An application for the renewal of the Environmental Clearance Certificate (ECC) was submitted to the Office of the Environmental Commissioner, Directorate of Environmental Affairs (DEA), MEFT on 10 January 2013. The ECC was issued by MET on 31 January 2013, valid for three years, i.e. until 30 January 2016.

NNDC submitted a new application, conditional to the approval of Mining Licence ML 156 on 23rd November 2017 which was granted on 11th July 2018 for another three years until 10th July 2021. Risk-Based Solutions cc was contracted by NNDC to conduct a new Environmental Impact Assessment (EIA) and an Environmental Management Plan (EMP) report to support the application for a Mining License which was submitted in line with the Environmental Clearance Certificate (ECC) application.

This report is prepared in aid of an application for the renewal of the ECC that expires on 11th July 2021 and it specifically deals with the implementation and compliance of the Environmental Management Plan (EMP) for ML 156, Kunene Region, Namibia. Compliance with the conditions to the ECC is also indicated.

2 Statutory Compliance

NNDC mine is committed to comply with all applicable legal requirements. NNDC Mine is operating under the following legal obligations and environmental approvals granted by the relevant authorities:

- Ministry of Mines and Energy: 2018, July; Mining License (ML) No.156
- Ministry of Environment, Forestry and Tourism: 2018, July; Environmental Clearance Certificate (ECC)

A complete list of current legal compliance permits and relevant environmental approvals can be found in the table below:

No.	Aspect	Permit/License #	Description	Status
1	Environment	ECC	Environmental Clearance Certificate for NNDC Mine (2018)	Current
2	Mining	ML 156	Mining License for NNDC Mine (2018)	Current
3	Radiation	EPL/325/01/20	Radiation License for the use of Radioactive sources	Current
4	Water	10799	Water abstraction from the Kunene River	Current
5	Water	11284	Water abstraction from the Atlantic Ocean	Current

Table 1: List of permits, authorisation and relevant environmental approvals made.

3 Operational Activities

All operational activities relating to mining, processing and associated engineering activities have been addressed in this report as regards potential impacts and environmental management.

Planned mining operations is by conventional surface mining methods which involve removing layers of sand and gravels using bulldozers and excavators. Material is loaded and hauled by articulated dump trucks to the processing plant for treatment. However, no production activities occurred during the current ECC reporting period (11th July 2018 to 10th July 2021) as a result of the following:

1. A requirement to upgrade the treatment plant as well as purchasing of additional mining fleet in order to increase production capacity from bulk sampling mode to full commercial production. The treatment plant upgrade is required to increase capacity, ensure liberation of diamonds from cemented material as well as to improve efficiencies in order to provide assurance of ultimate recoveries in line with best practice mineral resource management. The additional mining equipment is required to meet increased capacity as well as to manage waste material and tailings in line with the rehabilitation plan.
2. The downwards global economy trend, exacerbated by the Covid-19 pandemic, resulted in deferral of the capital required to execute the treatment plant upgrade project as well as new mining equipment. NNDC foresees that the current status of affairs will remain for the next 18 to 24 months with no impact on the environment. Only essential personnel are on site to continue with work related to care and maintenance of equipment and facilities which is planned to be retained.

4 Environmental Clearance Certificate Requirements

Compliance with the conditions to the Environmental Clearance Certificate (ECC), dated 11 July 2018, is indicated below (*Table 3*):

Condition	Compliance
All provisions of applicable legislation and regulations concerning protected areas apply.	All applicable legislation and regulations were considered and applied.
This Environmental Clearance shall serve as a contract of agreement between the holder and the Ministry of Environment and Tourism, but it does not in any way make the Ministry of Environment and Tourism responsible for any wrong or insufficient information provided, nor any adverse effects that may arise from this project's activities. Instead, full responsibility and accountability rest with the developer and his/her consultants.	NNDC took full responsibility and accountability for the project's activities.
The Holder of this Environmental Clearance (hereafter referred to as the Holder) assumes full responsibility and liability for the safety and conduct of employees, contractors and/or visitors.	NNDC took full responsibility and liability for the safety and conduct of all its employees and visitors. NNDC has an ESHS Policy, Management System and legal appointees in place to ensure accountability.

Entry and exit points to the park as the driving routes to be followed in the Park, shall be determined by this Ministry in its sole discretion and shall be communicated to the Holder in writing. The Holder shall strictly adhere to the designated entry points, exit points and driving routes.	NNDC adheres to the designated entry and exit points and all driving routes.
Only existing tracks or roads may be used unless prior approval is obtained from the Ministry.	No new tracks during the reporting period (11 th July 2018 to current)
The Holder shall erect a signboard not smaller than 70 cm in height and 100 cm in width, at the major entrance to each of its license areas, specifying the name of the license, the duration of its validity and the name of the license holder, and a contact name and number for enquiries.	NNDC duly erected signboards according to the MEFT's specifications at all entrances (Figure 2).
The Holder acknowledges that designated staff of this Ministry may monitor the Park and the activities of the Holder within the park in order to verify adherence to the conditions imposed in this authorization. The Holder undertakes to give its full cooperation to the designated staff in this regard.	Representatives from the MEFT visited Mining Licence No. 156 area over the reporting period. These visits were conducted in good spirit and the representatives from MEFT were satisfied with the overall conditions of the area.
A six-monthly report on project progress and environmental management profile, starting from date of commencement of operations, must be submitted by the Holder to the Ministry of Environment and Tourism, particularly, the Department of Environmental Affairs, and Directorate of Parks and Wildlife Management.	Bi-annual (6 monthly) reports have been submitted for the reporting period (Table 5).
Boating, biking, swimming, fishing, hunting, wood gathering or the collection of soil, insects, birds, animals and plants, including the introduction of pets and weapons of all types, are strictly prohibited within the jurisdiction of a protected area.	Weapons and activities required for security protection are all declared and approved. No other prohibited activities are conducted within the Mining Licence No 156 area.
Unless permitted by the Ministry of the Environment Forestry and Tourism, the operation of an aircraft and the construction of a runway, including any other attempt to harvest natural resources for any form of construction purposes, shall not be allowed in all protected areas. Where the construction of structures is allowed, the design of such structures must be of a temporary nature.	The NNDC runway is required for emergency and export of product. The design is of temporary nature and part of the rehabilitation plan.
There shall be no voluntary disposal of any form of waste in all protected areas of the Republic of Namibia. A suitable waste storage facility must be constructed to serve as a waste retention device prior to transportation out of the protected area.	A waste management plan has been developed ensuring all waste is managed properly on site and sent off site to an approved disposal facility.
Using the best and affordable methodology, the Holder must ensure that all mining or quarrying and exploratory operations are thoroughly rehabilitated prior to closure of the operation. Wherever possible, the Holder must proceed with the rehabilitation process concurrently with the progression of the project rather than wait until the damage is far beyond the available means of management.	The mine plan includes concurrent rehabilitation of mining areas through planned stripping and non-diamond bearing (waste sand) material replacement.

The general standard for all rehabilitation processes must at all costs aim at restoring the natural character of the environment to the satisfaction of the Ministry of Environment and Tourism. Such rehabilitation processes shall be inspected and certified satisfactory or unsatisfactory by the Ministry of Environment and Tourism. Where a certificate of unsatisfactory is issued, the Holder shall be advised to carry-out certain tasks to meet the requirements. Failure to meet the basic rehabilitation requirements shall be regarded by this Ministry as a breach of this contract and of which serious consequences shall follow.

Rehabilitation conducted as per rehabilitation plan.

Table 2: ECC conditions and compliance



Figure 2: Mining License entrance signboard as per ECC specifications

5 Environmental Management Plan Implementation

The environmental management plan (EMP) was developed to address the operational environmental risks associated with the planned NNDC mining operations. The EMP is an action plan to facilitate the implementation of the commitments made to reduce the potential impacts identified. The EMP implementation is supported through the environmental management system with plans, procedures and measuring and monitoring programs specific to the site operational activities.

The NNDC environmental management performance, compliance and implementation to the approved EMP, has been reported to MEFT on a biannual basis. A summary of the EMP performance evaluation is included in the *Table 3* below.

No	Aspect	Potential significant impacts/issues of concern	Management Objectives and commitments	Status on commitment
1	Air quality	1. Excessive release of nuisance dust and particulate matter 2. Excessive release of hazardous gaseous emissions	<ul style="list-style-type: none"> Achieve compliance to the adopted best practice standards. 	Implemented and monitored / ongoing improvements
2	Surface water	3. Contamination of surface water due to operational activities	<ul style="list-style-type: none"> Minimize the discharge of contaminated surface water to the surrounding environment to reduce impacts to sensitive receptors. Avoid over abstraction from sea and river resource. 	Implemented and monitored / ongoing improvements
4	Biodiversity	4. Physical disturbance to fauna and flora due to operational activities 5. Functional disturbance to ecological drivers (loss of habitats, topsoil value)	<ul style="list-style-type: none"> Prevent disturbance to biodiversity or limit the unacceptable loss of biodiversity and related functionality through physical disturbance, a reduction in the key ecological drivers of surface water flow. 	Implemented and monitored – no disturbance in key ecological drivers.
5	Resources	6. Depletion of resources 7. Accidental release of resources may lead to contamination	<ul style="list-style-type: none"> Monitor the consumption of resources; energy, fuel, water manufactured materials and find ways to minimize consumption, optimize and ensure efficient use. 	Implemented and monitored / ongoing improvements
6	Waste	8. Pollution to land, ground and surface water 9. Nuisance	<ul style="list-style-type: none"> Minimize impacts of wastes to the environment, by minimal disposal and optimize on recovery, recycling and treatment. 	Implemented
7	Archaeology	10. Loss of significant heritage resources 11. Damage to heritage sites	<ul style="list-style-type: none"> Prevent the unacceptable loss of archaeological sites and related historical information. Ensure employees and contractors are aware of chance archaeological finds. 	Implemented and maintained
8	Noise	12. Noise pollution	<ul style="list-style-type: none"> Limit excessive noise pollution, 	Implemented and

				monitored / ongoing improvements
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Table 3: EMP performance evaluation

The following sections summarise the performance of the EMP implementation during the reporting period (2018 – 2021) for the Mining License (ML 156) area.

5.1 Surface Water management

The NNDC mine EMP commitments on surface water focused on water supply and contamination of surface water. The following objectives were set:

- To minimize the impact of the proposed water supply;
- To prevent unacceptable groundwater pollution related impacts.

Surface water is the main source of water for the NNDC operations. Two abstraction permits have been awarded to extract water from the Kunene River and from the Atlantic Ocean. The International Finance Corporation (IFC) performance standards are being followed to guide the management of surface water extraction.

NNDC's Kunene River abstraction permit (No.10799) allows for the abstraction of 75000m³ per annum for domestic and industrial purposes. NNDC's Kunene Seawater abstraction permit (No.11284) allows for the abstraction of seawater for industrial purposes only. Water abstraction was within permit allocation limits for the reporting period.

5.2 Waste management

NNDC has an effective waste management process to ensure minimal risks to the environment, wildlife and people. Mineral waste is managed and stored as approved through the EIA studies, EMP and rehabilitation plan.

Non-mineral waste generated through operational activities are managed through a waste management program supported by the waste management plan and EMP. The EMP commitment is to ensure proper storage, recycling, re-using, removal, transportation and disposal of non-hazardous solid waste and hazardous waste. Waste management is guided by the process of recovering as much reusable and recyclable waste materials as possible, treating and disposing the rest of the waste material which cannot be reused or recycled. As much as possible, waste is separated and collected for recycling. Non-mineral waste is therefore managed through daily site operational activities which include routine inspection of waste areas, maintenance of waste management resources, continuous awareness training of employees and visitors on waste practices, safe storage and transportation of waste and maintaining waste related records (*Figure 3*).



Figure 3: Waste and scrap material transported by truck from the mine and out of Skeleton Coast Park

5.3 Biodiversity

The rehabilitation plan requires that the planted vegetation and the invasive alien flora must be removed during closure whilst hummocks need to be re-vegetated with *Salsola* sp. where impacted by the mining activities. No disturbance of hummocks occurred during the reporting period.

5.4 Archaeology

No heritage finds were identified during the EIA studies. However, NNDC has committed to:

- To prevent the unacceptable loss of archeological sites and related historical information;
- To ensure that the correct actions are taken to preserve or document chance archeological finds.

There have been no new archaeological finds during the reporting period.

6 Stakeholder Consultations

6.1 Stakeholder Engagements

NNDC's communication and engagement with stakeholders is ongoing. Feedback on environmental management performance has been provided to the key government stakeholders as follows:

- Consultations with key government stakeholders on environmental issues; reporting, permit applications, amendments and general consultations;
- Site visits by regulatory authorities;
- Non-governmental organisations for educational and research purposes.

The following stakeholders visited NNDC during the reporting period:

Date	Activity	Description	Participants
08/09/2018	International Coastal Clean-up Day	NNDC participated in the International Coastal Clean-up day campaign that took place in the Skeleton Coast National Park under the leadership of the Chief Warden, Mr. Joshua Kazeurua.	Local youth group, Terrace Bay Police, Sam Nujoma Primary School, Namibia Wildlife Resort (NWR) staff and Torra Conservancy youth.
12/06/2019	Northern Skeleton Coast Park Stakeholder meeting	Meeting held to establish a Stakeholder's Forum for the Northern Section of the Skeleton Coast National Park (SCNP) in order to address specific challenges experienced in various areas of managing the park.	Chief Warden, Mr. Joshua Kazeurua; all park stakeholders.
21/09/2019	International Coastal Clean-up Day	NNDC participated in the International Coastal Clean-up day campaign that took place in the Skeleton Coast National Park under the leadership of the Chief Warden, Mr. Joshua Kazeurua.	Local youth group, Terrace Bay Police, Sam Nujoma Primary School, Namibia Wildlife Resort (NWR) staff and Torra Conservancy youth.
27/01/2020	Kunene Mouth area visit	Research team visit from NUST, conducting research survey work regarding the anticipated establishment of the Skeleton Coast IONA Trans-Frontier Park.	SCIONA Transboundary Workgroup (NUST) – <i>Figure 4.</i>
01/06/2020	MET Kunene Mouth area visit	Visit by consulting group from MEFT and other stakeholders to review the Park management Plan.	Dr Malan Lindeque, MEFT
15/06/2020	Kunene Mouth area visit	Visit by the Skeleton Coast Brown Hyaena Project members to observe, record, photograph and collar brown hyaenas in the northern part of the Skeleton Coast Park.	Ms Emsie Verwey, Skeleton Coast Brown Hyaena Project members
30/06/2020	Kunene Mouth area visit	The Governor of the Kunene Region with a management team visited the area.	Hon. Governor Marius Sheya; Management Team
01/09/2020 and	ECN Mine visit	The Electoral Commission visited the mine to provide awareness for the elections and to	Electoral Commission of Namibia.

07/09/2020		assist personnel with their voter's registration.	
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Table 4: Stakeholder engagements



Figure 4: SCIONA work group working at the Kunene Mouth and at the dunes

6.2 Stakeholder Communications

The EMP objectives set for the general stakeholder communication were as follows:

- To ensure that ongoing feedback is provided on the relevant mining activities, together with feedback on the environmental management performance of the mine, and that opportunity is provided for interested and affected parties to raise comments and concerns.
- To ensure communication/engagement strategies meet the needs of stakeholders

The following reports/applications (*Table 5*) have been submitted to the MEFT/MAWLR over the period the ECC was valid for:

Report / Application	Date of Submission	Status
Bi-Annual Environmental Report (Jul – Dec '18) for ML 156, Kunene Region, Namibia	17 January 2019 to DEA and Directorate of Parks and Wildlife Management.	A stamped and/or signed copy is kept on file as a form of proof acknowledgment of receipt.
Bi-Annual Environmental Report (Jan – Jun '19) for ML 156, Kunene Region, Namibia	26 June 2019 to DEA and 27 June 2019 to the Directorate of Parks and Wildlife Management.	A stamped and/or signed copy is kept on file as a form of proof acknowledgment of receipt.
Bi-Annual Environmental Report (Jul – Dec '19) for ML 156, Kunene Region, Namibia	26 February 2020 to DEA and the Directorate of Parks and Wildlife Management.	A stamped and/or signed copy is kept on file as a form of proof acknowledgment of receipt.
Abstraction permit renewal application for freshwater abstraction (Permit no.10799) for ML 156, Kunene Region, Namibia	26 March 2020 to the Department of Water affairs and Forestry.	A stamped and/or signed copy is kept on file as a form of proof acknowledgment of receipt. New permit received on 25 August 2020.

Bi-Annual Environmental Report (Jan – Jun '20) for ML 156, Kunene Region, Namibia	13 July 2020 to DEA and the Directorate of Parks and Wildlife Management.	A stamped and/or signed copy is kept on file as a form of proof acknowledgment of receipt.
Bi-Annual Environmental Report (Jul – Dec '20) for ML 156, Kunene Region, Namibia	29 January 2021 to DEA and the Directorate of Parks and Wildlife Management.	A stamped and/or signed copy is kept on file as a form of proof acknowledgment of receipt.
Bi-Annual Environmental Report (Jan – Jun '21) for ML 156, Kunene Region, Namibia	To be submitted within the first two weeks of July.	Due July 2021.

Table 5: Compliance Reporting

The objective to ensure communication and engagement strategies to meet the need of stakeholders has been addressed with the development of the communication policy. This policy includes internal and external communication.

7 Environmental Management System

The NNDC mine operates and manages environmental impacts under an Environmental Management System (EMS) to encourage diligence and consistency in environmental management across the project site. THE EMS provides structure, guidelines and standards for continuous improvement in environmental performance.

The EMS also provides for a process to identify, correct and mitigate operational risks and impacts. Incidents, non-compliances and non-conformances are recorded and corrective actions are applied.

Over the reporting period, no major environmental incidents were recorded. However, a vehicle accident occurred close to the NNDC mine and NNDC assisted recovering the vehicle as well as arranging an air ambulance to enable emergency evacuation of the injured people.

8 Conclusion

NNDC Mine operation's management commitments and mitigation measures continue to be implemented and maintained to minimise potential impacts during the current care and maintenance state as well as throughout the planned life of the mine. All legal requirements and other relevant standards and best practices are applied to provide effective management of environmental risks by the NNDC operations.

This report has provided the environmental performance and compliance on management commitments implemented as per the NNDC EMP. Effective environmental performance of the NNDC mine operations have been achieved.

Based on the accounts of this three-year compliance and performance report, it is kindly requested that the ECC for the NNDC mine operations be renewed for the operational phase to continue as soon as possible.