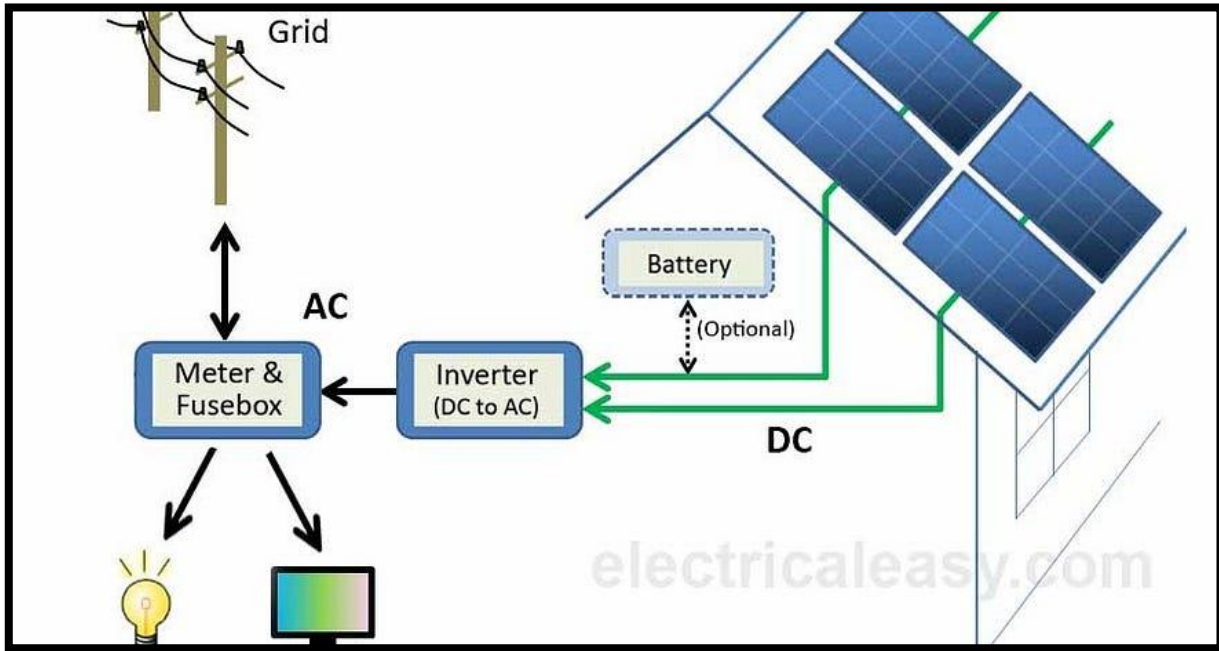


ENVIRONMENTAL MANAGEMENT PLAN
FOR SOLAR (PHOTOVOLTAIC (PV) PANEL) POWER PLANT
FACILITY (LIGHT INDUSTRIAL) WAREHOUSE & STORAGE IN
LISELO COMMUNAL AREA, ZAMBEZI REGION



Assessed by:

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Assessed for:

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(SSN INVESTMENT CC)

June 2025

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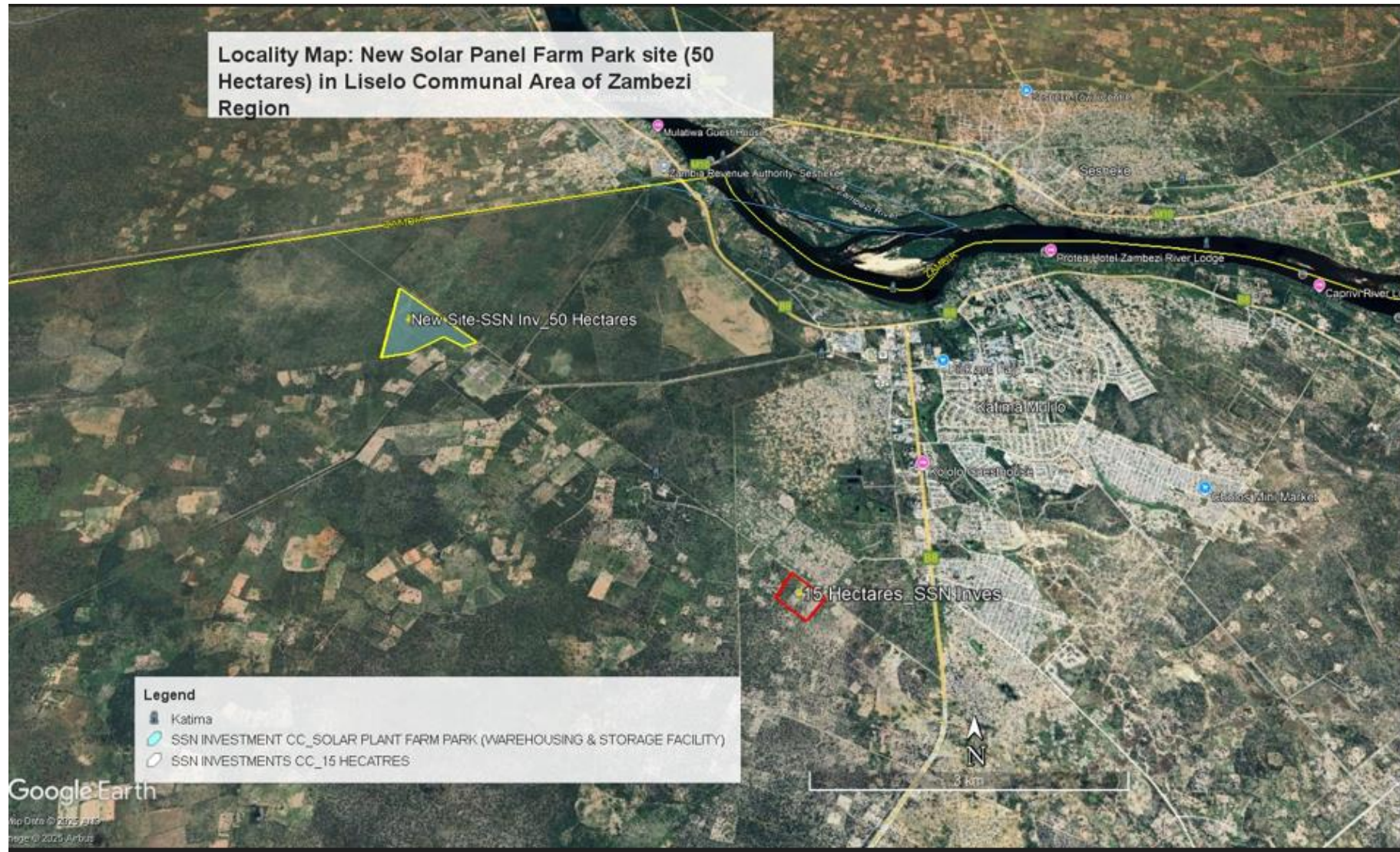
1. INTRODUCTION

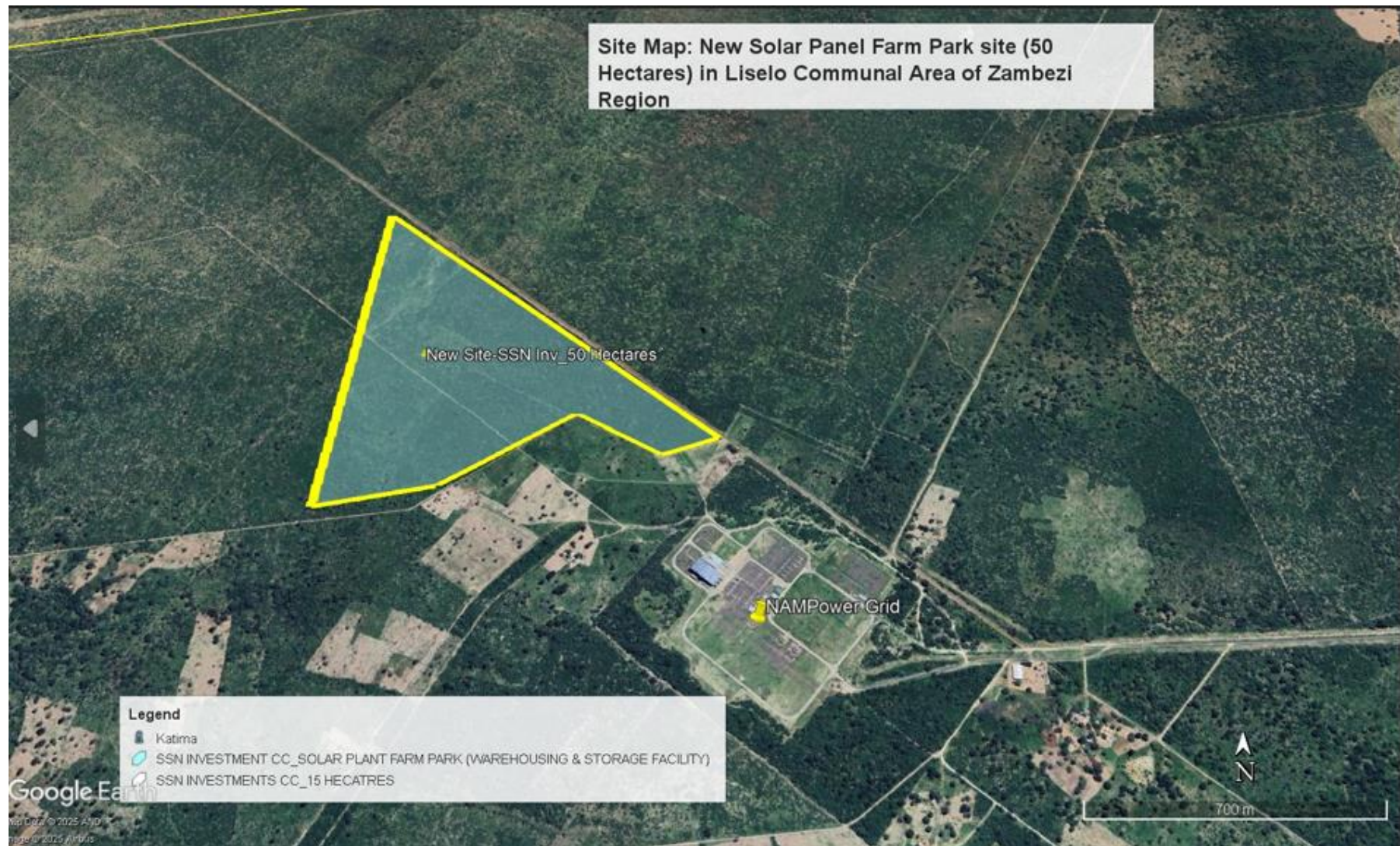
The proposed Solar Power plant park (light industrial) project is on a 50 Hectares of Land and is nonfunctional. The Solar plant farm park Infrastructure is proposed to be developed on remaining 50 hectares excluding warehousing & storage facility development. The project is situated in the Liselo communal area, situated about +- 1 kilometres from the town of Katima Mulilo in the Katima Rural Constituency. The light industrial Solar Plant Farm Park project is engaged in different activity that leads to its successful operations.

The current land use or usage of the site is virgin land, where there are no activities taking place onsite. The investor, SSN Investment cc came up with an initiative, where it decided to make use of this un-utilised land thereby proposing the development of a 30mw Solar Plant Farm Park (light industrial) on the land. The proposed site has a total size of 50 hectors and will various components that supports the solar panel plant operational system. This will include warehouse or storage area (where materials other movable products will be kept, and will also consist of administrative office on the same area. Project area coordinates are *Lat -17.49761; Lon 24.21883*

1.1 Scope of work Project development

- ❖ A 30megawatt (MW) Solar Plant Farm Park (approximately on 47 hectares) and 3 hectares to be utilized for other infrastructure building such as:
- ❖ An integrated office building (consisting of reception, staff offices, staff toilets, & workers toilets)
- ❖ One Large warehouse serving as workshop area to repair damaged panels, assemble & disassemble and to other necessities
- ❖ A Storage area will store stocks solar panels, solar power batteries, backup generator, panel cable connectors/wires
- ❖ A parking area, Security guard gate room, loading & offloading zone
- ❖ Road-driveways, Pedestrian walkways & Landscaping





1.2 Objectives of the Environmental Management Plan (EMP)

The main objective of the EMP is to identify the project specific activities that should be considered as having significant adverse impacts, monitoring and required mitigation measures. It is therefore in the best interest of the Developer to ensure that the capacity of the ecosystem is sustained by mitigating environmental degradation that could potentially harm the enterprise.

The proposed management and mitigation measures, the environmental and social commitments that are supposed to be undertaken by the respective production managers and a framework for implementation of this management plan have been proposed and are for the protection of the environment and sustainability of the project and the fish industry.

As a result, the objectives of an Environmental Management Plan are to ensure the following:

- ensure that the Light industrial development operations comply with acceptable environmental standards;
- ensure that compliance with environmental legal standards is achieved and maintained in the ongoing management of operations;
- Provide clear directives for personnel regarding the actions required to prevent and/or minimise adverse environmental impacts; promote sustainable development through minimising the adverse environmental impacts in the local environment and utilizing environmental resources responsibly; and promote good relationships with the communities within which the business operates.
- To prescribe the best and practicable control methods to lessen the environmental impacts associated with the operations of the light industrial project
- To monitor and audit the performance and of operational personnel to supply such control

1.3 Proposed environmental Management System

The investor SSN Investment Cc should implement an Environmental Management System (EMS) similar to the ISO 14001 system. An environmental Management System is an internationally recognised and certified management system that will ensure ongoing incorporation of environmental constraints. At the heart of an ISO 14001 EMS is the concept of continual improvement of environmental performance with resulting increases in operational efficiency, financial savings and reduction in environmental, health and safety risks. An effective EMS would need to include the following factors:

- A stated environmental policy which sets the desired level of environmental performance
- An environmental legal register
- An institutional structure which sets out the responsibility, authority, line of communications and the resources needed to implement the EMS
- Identification of environmental, safety and health training needs
- An environmental program, stipulating environmental objectives and target to be met and work instructions and control to be applied in order to achieve compliance with the environmental policy
- Periodic internal and external audits and reviews of environmental performance and the effectiveness of the EMS.

Accordingly, commitment of the owner to effective environmental management provides the channel whereby strategies are transformed from the documented form and implemented. For the Light Industrial Warehouse & storage facility project, the developer is committed to implementing a comprehensive environmental management programme. The project manager/developer and Operations Manager have ultimate responsibility for the achievement of environmental targets during the construction and operational phases, respectively. The environmental programme commits the Owner to allocation of sufficient resources, continuous improvement of environmental management practices in order to fulfil social and ethical responsibility and compliance with national and international standards. The developer is responsible for the:

- Allocation of Resources & Risk Assessment

- ensuring that the environmental policy is in place and communicated to all workers
- Designating role of staff members in EMP
- Appointment and monitoring of environmental management team

2. POLICY AND LEGISLATIVE FRAMEWORK

LEGISLATION/GUIDELINE/POLICY	APPLICABLE CLAUSE/POLICY	COMMENTS
Environmental Management Act no 7 of 2007	List of activities that require EA.	• All activities performed should be in line with the following: Principles, Interested and affected parties should have an opportunity to participate in decision making and the Listed activities should be subject to an EIA
Communal Land Reform Act	List of activities that may not be undertaken without a clearance certificate: 6.tourism development activities	Conduct a EA in terms of the tourism development and submit to MET in order for a clearance certificate to be issued.
1994 White paper on tourism (MET 1994)	Tourism must provide direct benefits to local people and aid conservation.	Emphasis should be on local benefits from tourism.
1995 policy on wildlife, management, utilisation and tourism in communal area (MET 1995a)	To allow rural communities on state land to undertake tourism ventures and to enter into cooperative agreements with commercial tourism organisations to develop tourism activities on state land.	JV agreements with benefits to local communities should be negotiated between developers and local conservancies.
Inland fisheries resources act, 2003 and regulations	Promotion, sustainable utilisation and protection of inland fisheries resources. Restrictions by limiting number of nets, and damaging fishing methods.	A fishing licence needs to be obtained from the regional office to engage in recreational fishing in any inland waters by means of any regulated fishing gear.
Communal land reform act (act no 5 of 2002)	Allocation of rights in respect of communal land –part 2-right of leasehold. A right to leasehold	Application for the right of leasehold in respect of communal land must be made in the prescribed manner to the CCLB. Right of leasehold granted for
Namibia transport Act 22 of 1999	Guides and control the use of road by heavy and light vehicles on Namibian public roads	

3. THE IMPLEMENTATION OF THE ENVIRONMENTAL MANAGEMENT PLAN (EMP)

An Environmental Management Plan (EMP) for this solar power plant outlines the strategies and procedures to minimize negative environmental impacts during the plant's construction, operation, and decommissioning phases. It ensures compliance with environmental regulations and promotes sustainable practices throughout the project lifecycle.

The information below highlights the traditional construction environmental mitigation and management including awareness building for health and safety at work sites are regarded as significant adverse environmental impacts mitigation measures. There are obvious advantages to ensuring construction sites and borrow pits are properly managed and the surrounding environment is properly restored after construction work, that erosion is mitigated, and that there is limited off site pollution.

These measures can be very effective in mitigating environmental impacts for sustainable infrastructural and economic development. The following measures geared towards environmental mitigation and management is recommended to be implemented during and after construction work to address the various impacts. The proponent who is also the investor or owners of the business (SSN Investment Cc) would be responsible to assign the responsibilities and ensure that the tasks are executed.

3.1 Key EMP Components of the Solar Power Plant

❖ Project Description:

This aspect of the environmental management plan will include details about the project location, components (solar panels, inverters, etc.) and operational lifespan.

❖ Environmental Baseline:

It shall identify and establish the existing environmental conditions (air, water, soil, flora, fauna, etc.) before construction begins.

❖ Impact Assessment:

This process shall/will Identify potential negative impacts of the project on the environment, such as habitat loss, noise pollution, water contamination, and waste generation.

❖ **Mitigation Measures:**

These measures will specify actions to reduce or eliminate the identified negative impacts. These will include:

- **Construction Phase:** Dust control (wetting surfaces, limiting construction during windy conditions), noise reduction (limiting construction hours, using noise barriers), proper waste management, and erosion control.
- **Operational Phase:** Monitoring water and energy consumption, managing waste, preventing spills and leaks, and maintaining equipment to minimize environmental risks.

❖ **Monitoring Plan:**

Will outline how the effectiveness of mitigation measures will be tracked and reported, including frequency of monitoring and indicators to be measured.

❖ **Decommissioning Plan:**

Details the process for dismantling the plant and restoring the site to its original condition, including waste management and site rehabilitation.

3.2 Pros/ advantages of solar power plant development

- Solar energy is a clean and renewable source of energy which gives endless or unexhausted source of energy.
- After installation, the solar power plant produces electrical energy at almost zero cost.
- The life of a solar plant is very high. The solar panels can work up to 25 years.
- This plant is and shall not causing pollution.
- There are no moving parts in solar cells. So, maintenance is not needed to keep a solar plant running.
- It does not produce any noise.

- For a bulk generation, this plant can be installed on any land. So, there are no specific site selection criteria like thermal and hydropower plants.
- The solar plant can be installed on the house or flat. So, it reduces the transmission cost as it generates energy near the load centre.
- In a grid-tied power plant, the electrical generate power can directly transfer to the grid and this will reduce the burden of conventional power plants.

4. ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

The Solar power plant developers shall comply with the following Environmental Management and Monitoring Plan (EMMP) specific for this project. This EMP spells out all steps to be taken by the developer to protect the environment in accordance with provisions of regulations and guidelines of the Republic of Namibia. The developer should get familiar with this EMMP and implement all measures necessary to avoid undesirable adverse environmental and social impacts wherever possible, restore work sites to acceptable standards, and abide by any environmental performance requirements specified in the EMP.

A 30 MW solar power plant management plan for SSN Investment cc in Liselo will involve several key areas: operations and maintenance, environmental management, safety protocols, grid integration and financial management. Effective management ensures reliable power generation, minimizes environmental impact, and optimizes the plant's lifespan.

The impacts are summarised in the following table, together with their significance rating:

Aspect	Impact	Significance of Impact (Negative unless stated otherwise)	
		Without Mitigation	with Mitigation
Socio Economic	Increased economic development	Medium +	
	Increased trade development with Zambia	Medium +	
	Job creation	Medium +	
	Increased influx of people to Katima Mulilo	Medium	Low
	Loss in property value	Medium	Low

Noise	Noise impact on residences during construction	Low	Low
	Noise impact on residences during operation, particularly those living at the T-Junction alongside Trans-caprivi highway (Nova location)	Low	Low
Traffic	Traffic impact traffic volumes and road sections with the town of Katima Mulilo	Low	Low
	Traffic impact on stakeholders within the project site	Low	Low
Visual	Visual impact during construction on surrounding residences	Medium	Medium
	Visual impact during operations on surrounding residences	Medium	Medium-low
Air Quality	Air quality impact during construction due to dust generation	Medium	Low
	Air quality impact during operations due to accidental ammonia release and carbon monoxide emissions	Low	Low
Groundwater	Groundwater impact during construction due to pollution	Medium	Low
	Groundwater impact during operations	Low	Low
Wastewater & Waste Material	Wastewater and waste material generated during both construction and operations	Low	Low

PLANNING /CONSTRUCTION PHASE			
ENVIRONMENTAL IMPACT	PROPOSED MITIGATION MEASURES	RESPONSIBLE ENTITY/PERSON	MONITORING PLAN
Air pollution	• Control speed and operation of construction vehicles. • Prohibit idling of vehicles. • Maintenance of vehicles and equipment. • Sensitize field exploration workers and contractors. • Workers should be provided with dust masks if working in sensitive areas	Contractor Site Manager	Amount of dust produced. Level of Landscaping carried out.
Noise Pollution	Maintain equipment and vehicles. Field work should only be carried out only during daytime i.e. 08h00 to 17h00. Workers should wear earmuffs if working in noisy section. Management to ensure that noise is kept within reasonable levels.	Contractor & SSN Investment Management	Amount of noise
Solid waste	• Any debris should be collected by a waste collection company • If trenches are dug, waste should be re-used or backfilled. • The site should have waste receptacles with bulk storage facilities at convenient points to prevent littering during exploration.	SSN Investment Management	Presence of well- Maintained receptacles and central collection point.
Oil leaks and spills	• Vehicles and equipment should be well maintained to prevent oil leaks. • Contractor should have a designated area where maintenance is carried out and that is protected from rainwater. • All oil products should be handled carefully.	Contractor	No spills and leaks on the site

First aid	A well-stocked first aid kit shall be maintained by qualified personnel	SSN Investment Management	Contents of the first aid kit
Visual	Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating	SSN Investment Management	Employees will be trained on the importance of minimising visual impacts
Archaeological Sites	• Buffer zones will be created around the sites. • Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of mineral exploration activities. • All archaeological sites to be identified and protected before further exploration commences.	Contractor & SSN Investment Management	• Register of all archaeological sites identified.
Occupational Health and Safety	• Provide Personal Protective Equipment • Train workers on personal safety and how to handle equipment and machines. • A well-stocked first aid kit shall be maintained by qualified personnel. • Report any accidents / incidences and treat and Compensate affected workers. • Provide sufficient and suitable sanitary conveniences which should be kept clean.	Contractor Management	• Workers using Protective Equipment. • Presence of Well stocked First Aid Box. • Clean sanitary facilities.
Fauna	• Some habitat areas such as trees of the riverbeds and tunnels outcrops will be avoided wherever possible. • A fauna survey will be conducted to determine the effect of fragmented habitat on game species should the need arise. • No animals shall be killed, captured or harmed in any way. • No foodstuff will be left lying around as these will attract animals which might result in human animal conflict	Contractor & SSN Investment Management	• Regular monitoring of any unusual signs of animal habitat

Alien Invasive Plants	• The explorer will ensure that debris is properly disposed off. • Vehicle tyre inspections can be carried out although this may not be a practical mitigation measure. • Eradicating alien plants by using an Area Management Plan	Contractor SSN Investment Management	• Regular monitoring of any unusual signs of alien species.
Loss of vegetation	• Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating. • Paths and roads will be aligned to avoid root zones. Permeable materials will be used wherever possible. • The movement of vehicles in riverbeds, rocky outcrops and vegetation sensitive areas will be avoided. • The movement of vehicles will be restricted to certain tracks on	SSN Investment Management	• Warning signs on site • restored vegetation
OPERATIONAL PHASE			
Archaeological Sites	• Buffer zones will be created around the sites. • Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of mineral exploration activities. • All archaeological sites to be identified and protected before further exploration commences.	SSN Investment Management & Contractor	• Update Register of all Archaeological sites identified.
First aid	• A well-stocked first aid kit shall be maintained by qualified personnel	SSN Investment Management	• Contents of the first aid kit.
Fire preparedness	• Firefighting drills carried out regularly. • Firefighting emergency response plan. • Ensure all firefighting equipment are regularly maintained, serviced and inspected. • Fire hazard signs and directions to emergency exit, route to follow and assembly point in case	SSN Investment Management	• Number of fire drills carried. • Proof of inspection on firefighting equipment. • Fire Signs put up in strategic places. • Availability of firefighting equipment.

	of any fire incidence		
Environment Health and Safety	• Train workers on personal safety and disaster preparedness. • A well-stocked first aid kit shall be maintained by qualified personnel. • Report any accidents / incidences and treat and compensate affected workers. • Provide sufficient and suitable sanitary conveniences which should be kept clean. • Conduct Annual Health and Safety Audits	SSN Investment Management	• Provide sanitary facilities. • Copies of Annual Audit
Grading/ground levelling	Dust generation during construction phase	SSN Investment Management	• Inspection and monitoring during operating hours are recommended
Operating plant and equipment	• Working hours should only be between 08:00-17:00 during the week and 08:00-13:00 on Saturdays where sand removal involves the use of power tools and heavy equipment. • Sunday is recommended as a rest day for the workers. • Regular maintenance of sand removal machinery and haulage trucks • Spilled oil should be treated as hazardous waste. • Drip trays for trucks to avoid oil leakages and to be used when refueling	SSN Investment Management	• Oil spills inspections must be conducted daily. • Regular maintenance must be carried out on the equipment • Visual inspections of the operations must be monitored on a daily basis.
DECOMMISSIONING PHASE			
Environmental/ Social Impact	Proposed mitigation measures	Responsible Entity/Person	Monitoring plan/indicator
Noise & Air pollution	• Maintain plant equipment. • Decommissioning works to be carried out only during daytime. • Workers working in noisy section to wear earmuffs.	SSN Investment Management	Amount of noise & public complaint register

	• Workers should be provided with dust masks.		
Solid waste	• Solid waste should be collected by a contracted waste collection company • Excavation waste should be re-used or backfilled.	• Contractor • SSN Investment Management	• Amount of waste on Site. • Presence of Well maintained Receptacles and central collection point
Occupational Health and Safety	• Provide Personal Protective Equipment. • Train workers on personal safety and how to handle equipment and machines. • A well-stocked first aid kit shall be maintained by qualified personnel. • Demarcate area under decommissioning.	SSN Investment Management	• Workers using Protective Equipment. • Presence of a First Aid Box.

5. DECOMISSIONING PHASE

Developmental projects are usually temporary to permanent in nature and after a certain period of operation, the associated infrastructures will be decommissioned and the sites closed. It will be important that activities during this phase are carried out in an environmentally sound manner, leaving as little impact as possible on the environment. To this end, a decommissioning and closure will be developed.

The main objectives of the plan will be to:

- Promote alternative economic activities in the area that are sustainable in the future;
- Ensure the safety of surrounding communities through public consultation and the erection of warning signs.
- Return the land to conditions capable of supporting the former land use, or where this is not practical, or feasible, an alternative sustainable land use; and
- Prevent potential significant adverse effects on adjacent environs.

Where possible, SSN Investment cc will ensure that progressive rehabilitation is undertaken so that the rate of rehabilitation is similar to the rate of borrow pit operations.

Fundamental criteria for closure

Issue	Closure Objectives
Physical stability	All remaining anthropogenic structures are physically stable
Chemical stability	The biological environment is restored to a natural, balanced ecosystem typical of the area, or is left in such a state so as to encourage and enable the natural rehabilitation and/or reintroduction of a biologically diverse, stable environment
	Closure aims at preventing physical or chemical pollutants from entering and subsequently degrading the downstream environment – including surface and ground waters
Geographical and climatic influences	Closure is appropriate to the demands and specifications of the location of the site in terms of climatic (e.g. rainfall, storm events,

	seasonal extremes) and geographic factors (e.g. proximity to human habitations, topography, accessibility of the mine)
Local sensitivities and opportunities	Closure optimized the opportunities for restoring the land and the upgrade of the land use is considered whenever appropriate and/or economically feasible
Land use	Rehabilitation is such that the ultimate land use is optimized and is compatible with the surrounding area and the requirements of the community
Funds for closure	Adequate and appropriate readily available funds need to be available to ensure the implementation of the closure plan
Socio-economic considerations	Consideration will be taken of opportunities to communities whose livelihoods may depend on the employment and economic fallout from project activities. adequate measures made to ensure that the socio-economic implications of closure are maximized

6. CONCLUSIONS AND RECOMMENDATIONS

This environmental scoping report has addressed the key issues as identified and no significant impacts have been identified.

6.1 Conclusion

The project, when implemented, will bring huge positives for the district of Liselo communal areas, Zambezi region and the entire Namibia. Both the primary, secondary and tertiary beneficiaries will be wide spread across Namibia but with the largest number and therefore more positive impacts in Katima Mulilo town and surrounding environs.

The EIA process has allowed both the developer and other stakeholders to interact, openly identify positive and potential negative impacts both from a social-human environment and biophysical environment. Based on these interactions and also on other national and international practices, it is concluded that on the basis of the environmental and socio- economic assessment undertaken and based on a very wider consultation and the professional expertise employed, the positive impacts of Warehouse & storage facility project far outweigh the negative impacts. SSN Investment

cc project proponents has followed the due process of the law on environment. The socio-economic impacts of the project are largely positive, while negative impacts are minimal. These impacts will be adequately avoided through best management practices and compliance. No family will be displaced by the project. In addition, a project impact management and monitoring framework has been proposed and therefore merits support.

The stakeholders more especially the communities of Liselo are highly positively expectant of the Solar power plant, Warehouse and Storage facility development in Zambezi region and want the project to start as soon as possible. NYEPEZ Consultant therefore recommends that the project be allowed to be implemented due to its outlined benefits.

6.2 Recommendations

To construct and establish a Solar power plant facility, development related impacts must be minimized and mitigated by implementing strict monitoring and control. All permits and approval must be obtained from the relevant ministries or authorities for the operation of the Liselo Solar power plant establishment. The approvals include business fitness certificates & certificates of operation from Ministry of Trade, approval from Electrical Board of Namibia and from Nam-power the take-off entity of the electricity generated. It is imperative that the mitigation measures as set-out in the EMP be implemented during the planning (layout design) construction and operational phases of the project to prevent unnecessary damage to the natural environment.

The EMP should be added to all contractors' agreements and be signed by such contractors. The recommendations made in this report places the developer under a legal obligation to ensure that all mitigation measures are implemented and followed through during construction and operation of the Solar Power Plant, Warehouse & storage facility.

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Nyepez Consulatncy cc
Environmental Assessment Practitioner