zhero Molecules Walvis Bay

Solar PV Site and Transmission Line

Republic of Namibia

Environmental and Social Management Plan

March 2025

Document Information

Project Name	zhero Molecules Walvis Bay Solar PV Site and Transmission Line
5Cs Project Number	2310/002
Document Title	Environmental & Social Management Plan
Client	zhero
5Cs Project Manager	Barney Chesher
5Cs Project Director	Max Burrow

Document Control

Version	Version Date	Description	Author	Reviewer	Approver
1.0	27/03/2025	Initial Submission	JH, IM, BC, VZ, NM, SB	BC	MKB

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DOCUMENT INFORMATION		
TITLE	Environmental and Social Management Plan (ESMP) for the Proposed Construction and Operation of a Solar PV Plant Including Access Roads, Battery Energy Storage and Overhead Transmission Lines to Support Green Hydrogen and Ammonia Production	
ECC APPLICATION REFERENCE NUMBER	APP-004844	
LOCATION	3 GW Solar PV Facility located on 5,300 ha of farmland in portion 3 of farm Bloemhof 109 in the Namib Desert, approximately 20 km south-east of the mining town of Arandis, in the Erongo Region of western central Namibia. Site GPS coordinates: 22°27'27.38"S; 15°13'46.02"E	
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ACRONYMS AND ABBREVIATIONS

ABBREVIATION	MEANING
5 Capitals	5 Capitals Environmental and Management Consulting
BESS	Battery Energy Storage Systems
ECC	Environmental Clearance Certificate
ECO	Environmental Compliance Officer
EHO	Environmental Health Officer
EMA	Environmental Management Act
EP	Equator Principles
EPC	Engineering Procurement Contractor
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GRN	Government of Namibia
GW	Gigawatt
H_2	Hydrogen
H_20	Water (Hydrogen and Oxygen molecules)
IEA	International Energy Agency
MEFT	Ministry of Environment, Forestry, and Tourism
Mt	Million Tonnes
NO_2	Nitrogen Dioxide
O_2	Oxygen
OTL	Overhead Transmission Line
PM10	Particulate Matter 10 Micrometers or Less
PV	Photovoltaic
SANS	South African National Standards
SEP	Stakeholder Engagement Plan
SO2	Sulphur Dioxide
TEC	Tortoise Environmental Consultants
VOC	Volatile Organic Compounds
WHO	World Health Organization
WBG	World Bank Group
zMWB	Zhero Molecules Walvis Bay

EXECUTIVE SUMMARY

Zhero is developing a multi-gigawatt (GW) green ammonia project called the zhero Molecules Walvis Bay (zMWB) project just outside the Namib Naukluft Park in the Erongo Region of Namibia. The Project will manufacture green ammonia through a process called electrolysis, which uses electricity to split water (H_2O) into hydrogen (H_2) and oxygen (O_2). The by-product is considered 'green' due to the fact that the electricity utilised in the electrolysis process is generated from a renewable energy source, for the purpose of this project, the renewable energy source is the 3 GW Solar PV facility which will serve to ensure that the ammonia produced is carbon-free and sustainable.

In line with national permitting and international financing requirements, the zMWB Project has been split into three packages as outlined below,

- Solar PV Site and Overhead Transmission Line (OHTL)
- Desalination Plant and Pipelines
- Green Hydrogen and Ammonia Plant

The Solar PV Site, the subject of this Environmental and Social Management Plan (ESMP) report, consists of the following project components:

- 3 GW Solar PV panel array
- Construction / upgrade of new and existing access roads and associated servitude(s)
- Approximately 110 km OHTL to the green hydrogen and ammonia plant and the associated servitude(s)
- Substation and transformers
- Battery Energy Storage System (BESS)

The Solar PV Site is strategically located in a semi-desert area with high solar radiation and minimal biodiversity as well as being situated near key towns like Walvis Bay, the biggest port in the country. The project will contribute to regional and national economic growth through job creation and promoting socio-economic development. However, the project requires careful management of potential environmental and social impacts to prevent adverse impact on the environment.

As part of the national and international regulatory requirements, an Environmental and Social Impact Assessment (ESIA) was conducted. It is recommended that this ESMP is read alongside the ESIA. The ESIA has successfully identified, assessed, and addressed the potential environmental and social impacts associated with the proposed development. The comprehensive studies conducted during the ESIA phase, including assessments of air quality, noise and vibration, soils, surface water and groundwater, terrestrial ecology and avifauna, landscape and visual, waste and wastewater, heritage and archaeology, socio-economic, community health, safety and security, and labour and working conditions impacts, have provided a comprehensive scope of the receiving environment and further informed the environmental and socio-economic impacts and benefits of the project. It is deduced that the benefits of the proposed development outweigh the minimal impacts pre-identified. The project's proximity to the Gaingu Conservancy land and the Namib Naukluft Park has been accounted for, and measures have been proposed to mitigate any impacts on biodiversity and local communities in line with the mitigation hierarchy.

Key recommendations for the project include ongoing environmental monitoring, waste management, and adherence to a robust ESMP. These measures will help ensure that the Project mitigates impacts on the receiving environment while maximizing the positive benefits. Therefore, it is recommended that the approving authority grant approval for the project and issue the Environmental Clearance Certificate (ECC). Furthermore, to ensure compliance, the approving authority is advised to conduct periodic environmental inspections throughout the Project's lifecycle.

In conclusion, the Solar PV Site, inclusive of the previously mentioned components, of the zMWB project is envisioned to make a significant contribution to Namibia's economic development and to the world's green energy transition.

1 INTRODUCTION

1.1 Zhero Molecules Walvis Bay Project Overview

Zhero is developing a multi-gigawatt (GW) green ammonia project called the zhero Molecules Walvis Bay (zMWB) project just outside the Namib Naukluft Park in the Erongo Region of Namibia. The Project will manufacture green ammonia through a process called electrolysis, which uses electricity to split water (H_2O) into hydrogen (H_2) and oxygen (O_2). The by-product is considered 'green' due to the fact that the electricity utilised in the electrolysis process is generated from a renewable energy source, for the purpose of this project, the renewable energy source is the 3 GW Solar PV facility which will serve to ensure that the ammonia produced is carbon-free and sustainable.

A schematic of the zMWB Project layout is depicted in the following figure, with the scope of this ESMP highlighted.

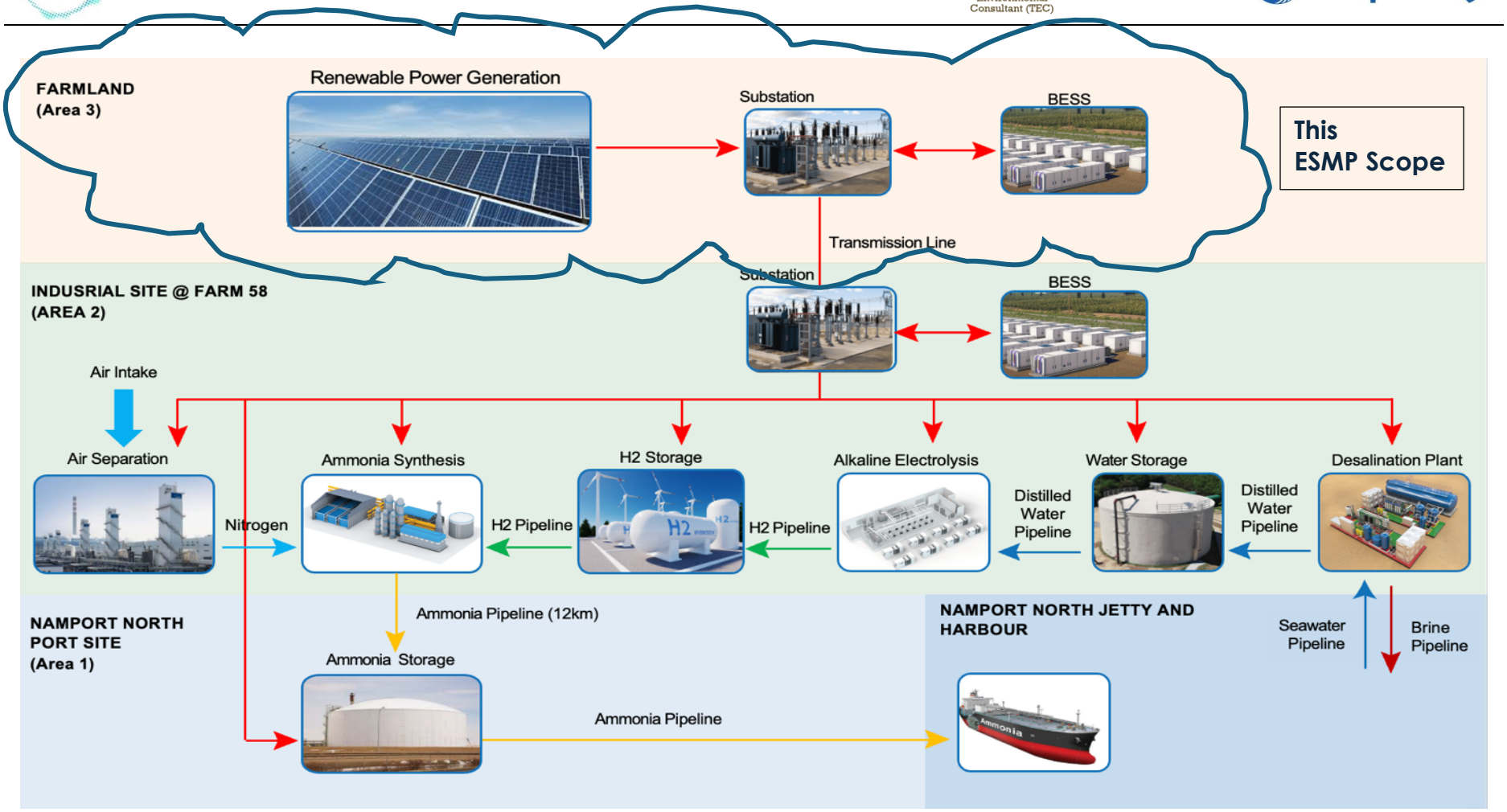

Figure 1-1 zMWB Project Schematic

1.2 Scope of this ESMP

In line with national permitting and international financing requirements, the zMWB Project has been split into three packages as outlined below,

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The Solar PV Site, the subject of this ESMP report, consists of the following project components:

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- Substation and transformers
- Battery Energy Storage System (BESS)

Overall, the Solar PV Site project will involve the following activities;

- Sourcing and transportation of construction materials
- Construction of access roads / upgrade to existing access roads
- Construction of base camps for construction workers
- Transportation of commuting workers
- Digging and trenching
- Concrete Batching
- Installation of PV Solar Panels and inverters
- Construction of substations
- Erection of transmission poles
- Installation of transmission lines
- Construction of Battery Energy Storage Systems (BESS)
- Construction of Offices and O&M buildings.

2 REGULATORY FRAMEWORK

2.1 National Regulations, Guidelines, and Standards

The Namibian Environmental Management Act provides the foundation for managing environmental resources and guiding sustainable development practices. For the green hydrogen project, compliance with this act is essential, particularly in the context of conducting Environmental Impact Assessments (EIA) and the related Environmental and Social Management Plan (ESMP). These assessments are crucial for identifying, assessing, and mitigating potential environmental impacts associated with the project, ensuring that all activities align with Namibia's environmental protection goals.

2.2 Legal and Institutional Framework

2.2.1 Namibia's Institutional Framework

The following ministries, government agencies and institutions have key responsibilities for managing and monitoring of environmental and social aspects and concerns of the Project:

Environmental Management Act, 2007 (Act No. 7 of 2007) and its regulations (2012), including the Environmental Impact Assessment Regulation, 2007 (No. 30 of 2011)

The Act aims to promote sustainable management of the environment and the use of natural resources. The Act provides for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters. The Act requires certain activities to obtain an environmental clearance certificate prior to Project development.

The Act states that an Environmental Impact Assessment (EIA) should be undertaken and submitted as part of the environmental clearance certificate application process.

The MEFT is responsible for the protection and management of Namibia's natural environment. The Department of Environmental Affairs, under the MEFT, is responsible for the administration of the EIA process.

The act provides a list of activities that may not be undertaken without and Environmental Clearance Certificate (ECC).

The following outlines the relevant activities requiring an EIA for the Project.

Table 2-1 Environmental Impact Assessment Regulation 2012 GRN Gazette No. 4878

Activity	Applicability to the Project
1. Energy Generation, Transmission and Storage Activities 1. The construction of facilities for - (a) the generation of electricity; (b) the transmission and supply of electricity;	The project will entail construction of solar facility to generate electricity, Battery Energy Storage System and transmission lines
5. Land Use and Development Activities 5.1 The rezoning of land from - (c) agricultural use to industrial use; and (d) use for nature conservation or zoned open space to any other land use.	The land is gazetted as farmland. A leasehold application has been done in accordance with the local statutory requirement.

MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM

Namibia does not have a dedicated environmental regulator. Instead, environmental oversight and regulation fall under the jurisdiction of the Ministry of Environment, Forestry and Tourism (MEFT). This ministry is responsible for the formulation, coordination, and implementation of policies and programs aimed at environmental protection and sustainable development. The absence of an independent environmental regulator means that the Ministry directly handles activities such as environmental impact assessments, biodiversity conservation, and forestry management. The ministry is organized into various directorates and divisions, each with specific functions. The directories relevant to the Project include:

- Directorate of Environmental Affairs (DEA): Manages environmental policy, regulation, and enforcement. Focuses on sustainable development, environmental impact assessments (EIAs), and biodiversity conservation. The directory includes three main divisions, namely, Environmental Management, Pollution Control and Waste Management and Biodiversity and Protected Areas Management
- Directorate of Forestry: Oversees Forest conservation, sustainable forest management, afforestation programs, and the management of forest resources. The directory includes three main divisions, namely, Forest Management and Utilization, Community Forestry, and Forest Protection and Research.
- Directorate of Wildlife and National Parks: Responsible for wildlife conservation, management of national parks, and overseeing anti-poaching

initiatives. The directory includes three main divisions, namely, Wildlife Protection Services, National Parks Management and Human-Wildlife Conflict Management.

MINISTRY OF MINES AND ENERGY

The Ministry of Mines and Energy (MME) in Namibia is structured into six directorates, including the Directorate of Energy, which ensures a sustainable and affordable energy supply to support national socio-economic development. The Directorate implements energy policies, enforces compliance with energy legislation (such as the Electricity Act of 2007), and research renewable energy sources. It comprises three divisions:

- **Electricity Division**: Focuses on national electricity programs, including rural electrification and power generation projects, and oversees electricity supply industry restructuring.
- **Renewable Energy Division**: Implements renewable energy and energy efficiency programs, facilitates energy access for off-grid institutions, and promotes research, investment, and public awareness in the energy sector.
- **Energy Planning and Research Division**: Conducts research and compiles statistics on energy generation, distribution, and renewable resource development to inform policy decisions.

The MME is the Competent Authority for Environmental Clearance Certificate (ECC) applications related to power generation, with the Directorate of Energy providing recommendations as part of the Environmental Impact Assessment (EIA) process to the Ministry of Environment, Forestry and Tourism (MEFT), which makes the final decision.

MINISTRY OF AGRICULTURE, WATER AND LAND REFORM

The Ministry of Agriculture, Water and Land Reform (MAWLR) in Namibia is responsible for overseeing the sustainable management and development of the country's agricultural, water, and land resources. Its primary role is to ensure food security, promote agricultural development, manage water resources, and oversee land reform processes to support socio-economic growth and equitable resource distribution.

MINISTRY OF FISHERIES AND MARINE RESOURCES

The Ministry is mandated to sustainably manage the living aquatic resources and to promote the aquaculture sector. The Directorate of Resource Management under the Ministry is mandated to conduct research to determine the status of the stocks and providing specific advice on the sustainable management of Namibia's living marine resources and ecosystem and promoting public awareness.

National Heritage Council of Namibia

The Ministry of Education, Arts and Culture in Namibia is responsible for managing the education system, promoting cultural diversity, and preserving the nation's heritage.

The National Heritage Council (NHC) of Namibia operates under the Ministry and is specifically tasked with the protection, conservation, and management of Namibia's cultural and natural heritage. Among its roles, NHC:

- Identifies, conserves, and manages Namibia's national heritage sites, including historical buildings, archaeological sites, and natural landmarks.
- Ensures that these sites are preserved and maintained in accordance with national and international heritage conservation standards.

Ministry of Works and Transport

The Ministry of Works and Transport in Namibia is responsible for the development, maintenance, and regulation of the country's infrastructure and transportation systems. Its primary roles include overseeing the construction and maintenance of public buildings, roads, and other infrastructure, ensuring the safety and efficiency of the transportation network (including road, rail, air, and maritime transport), and implementing policies related to public works and transport.

Green Hydrogen Council

The Green Hydrogen Council (GHC) in Namibia is an advisory body established to oversee the development and implementation of the country's green hydrogen initiatives. The GHC's primary role is to guide the government on policies, strategies, and projects related to the production and use of green hydrogen, a clean energy source produced using renewable energy. The council works to position Namibia as a leader in green hydrogen production, leveraging the country's abundant solar and wind resources. It also fosters collaboration between the government, industry stakeholders, and international partners to promote sustainable energy solutions and drive economic growth through green hydrogen investments.

Ministry of Labour, Industrial Relations and Employment Creation

The Ministry of Labour, Industrial Relations and Employment Creation in Namibia is responsible for promoting fair labour practices, fostering harmonious industrial relations, and facilitating employment creation. The ministry's key roles include developing and enforcing labour laws and regulations, ensuring safe and equitable working conditions, and protecting workers'

rights. It also oversees the resolution of labour disputes, the registration of trade unions and employer organizations, and the implementation of national employment policies. Additionally, the ministry plays a vital role in addressing unemployment through various programs and initiatives aimed at job creation and skills development, contributing to the country's socio-economic development.

Namibia Ports Authority

Namibia Ports Authority (Namport). Established in 1994, Namport is responsible for the operation and development of the country's ports, including the major ports of Walvis Bay and Lüderitz. Their role includes facilitating maritime trade, ensuring port efficiency, and managing port infrastructure and services.

Itemized below is a compilation of legal and regulatory frameworks related to the Project industry, environmental protection, and social/land issues.

2.2.2 National Laws, Regulations on Environmental, Social Protection and Land Issues

Public Health Act No. 36 of 1919

This Act includes provisions related to public health and air quality, particularly concerning nuisances and pollutants that may harm human health. This Act addresses management of waste to prevent health hazards. Local authorities are responsible for implementing waste management practices under this Act. This Act also addresses various aspects of sanitation, disease control, and the regulation of activities that may affect community health. It includes provisions for the establishment and enforcement of health and safety standards in public spaces and facilities.

Water Act No. 54 of 1956

This Act prevents pollution and promotes the sustainable utilization of the resource. To protect these resources, this act requires that permits are obtained when activities involve the following: Discharge of contaminated into water sources such as pipe, sewer, canal, sea outfall and Disposal of water in a manner that may cause detrimental impact on the water resources.

Soil Conservation Act No. 76 of 1969

This Act focuses on the prevention of soil erosion and the conservation of soil quality. It provides guidelines for soil management practices to prevent degradation and maintain soil health. Namibia does not have specific national standards for soil quality. However, general guidelines and best practices for soil conservation and management are provided under the Soil Conservation Act.

Hazardous Substances Ordinance No. 14 of 1974

This Ordinance provides for the control of toxic substances and can be applied in conjunction with the Atmospheric Pollution Prevention Ordinance, No. 11 of 1976.

This applies to the manufacture, sale, use, disposal, and dumping of hazardous substances, as well as their import and export.

Nature Conservation Ordinance No. 4 of 1975

This Ordinance provides for the conservation of wildlife and the protection of species and habitats. It includes provisions for establishing protected areas and regulating activities that may affect terrestrial and avian species.

Atmospheric Pollution Prevention Ordinance No. 11 of 1976

This Ordinance provides for the prevention of air pollution and the regulation of emissions from industrial sources and waste management activities such as incineration. The Ordinance requires permits for activities that may result in significant emissions and sets out provisions for the monitoring and control of air pollution.

National Ordinance Act No.4 of 1975 and the Amendment of 1996

The Act relates to the conservation of nature and pristine environments through the establishment of national parks and nature reserves.

Constitution of the Republic of Namibia of 1990

The constitution defines the country's position in relation to sustainable development and environmental management.

The constitution refers that the state shall actively promote and maintain the welfare of the people by adopting policies aimed at the following:

"Maintenance of ecosystems, essential ecological processes and biological diversity of Namibia, and the utilisation of living, natural resources on a sustainable basis for the benefit of all Namibians, both present, and future."

Article 100 stipulates that ''Land, water and natural resources below and above the surface of the land and in the continental shelf and within the territorial waters and the exclusive economic zone of Namibia shall belong to the State if they are not otherwise lawfully owned''. This defines the Government position in requiring licences for activities within these operational areas and facilitate control over them.

This is the supreme law of Namibia and provides for the protection of fundamental human rights and freedoms. It includes provisions on equality, non-discrimination, and the protection of human dignity.

Territorial Sea and Exclusive Economic Zone Act No.3 of 1990

To determine and define the territorial sea, internal waters, exclusive economic zone and continental shelf of Namibia and activities associated herewith.

The continental shelf is defined as State land and the Exclusive Economic Zone (EEZ) extends to 200 nautical miles (~370.4 km offshore).

Labour Act No. 6 of 1992

The Ministry of Labour, Industrial Relations and Employment is aimed at ensuring harmonious labour relations through promoting social justice, occupational health and safety and enhanced labour market services for the benefit of all Namibians. The ministry ensures effective implementation of the Act.

The Regional Councils Act No. 22 of 1992

The Act provides for the establishment of the Namibian Ports Authority to undertake the management and control of ports and lighthouses in Namibia, and the provisions of facilities and services related thereto. The Act gives provisions for licence to undertake activities in any port (including entry to a port).

Road Traffic and Transport Act No. 22 of 1999

This Act provides for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, and the control and regulation of road transport across

Namibia's borders. Vehicles supplying goods and services to the project during construction and operation will have to comply with the requirements of the Act.

Marine Resources Act No. 27 of 2000

This Act governs the conservation and sustainable use of marine resources, including the protection of marine ecosystems and biodiversity. It provides for the regulation of activities that may impact marine environments, such as fishing, mining, and discharge of substances.

Forestry Act No. 12 of 2001

This Act regulates the management and conservation of forests and forest resources. It includes provisions to protect habitats that are critical for terrestrial and bird species.

National Heritage Act 27 of 2004

The Act provides the primary legal framework for the protection and management of Namibia's cultural heritage. It covers archaeological sites, monuments, historical buildings, and other cultural assets. It establishes procedures for the declaration of heritage sites, the preservation of cultural artifacts, and the conduct of archaeological research.

Labour Act No. 11 of 2007

This Act regulates employment relations in Namibia, including terms and conditions of employment, occupational health and safety, and protection of workers' rights. The Act aims to promote fair labour practices, decent work, and social protection for workers.

Environmental Management Act, 2007 (Act No. 7 of 2007) and its Regulations (2012), Including the Environmental Impact Assessment Regulation, 2007 (No. 30 of 2011)

The Act aims to promote sustainable management of the environment and the use of natural resources. The Act requires certain activities to obtain an environmental clearance certificate prior to Project development.

The Act states that an Environmental Impact Assessment (EIA) should be undertaken and submitted as part of the environmental clearance certificate application process.

The MEFT is responsible for the protection and management of Namibia's natural environment. The Department of Environmental Affairs, under the MEFT, is responsible for the administration of the EIA process.

Disaster Risk Management Act No. 10 of 2012

This Act provides the framework for disaster risk management in Namibia, including preparedness, response, and recovery measures. It includes specific requirements for managing health and safety risks in industrial and construction activities. These regulations mandate the establishment of safety protocols, emergency response plans, and regular safety drills to protect workers and communities.

Water Resources Management Act No. 11 of 2013

This Act addresses the management, protection, and use of water resources in Namibia. It includes provisions for the protection of both surface water and groundwater quality and establishes standards and monitoring requirements to prevent pollution and ensure sustainable use.

Child Care and Protection Act No. 3 of 2015

This aims to safeguard the rights and welfare of children in Namibia.

The Occupational Safety and Health Act No. 11 of 2007

This promotes the Safety and Health of employees at the workplace.

Regulations Related to the Health and Safety of Employees at Work. Reg No. 156 promote the Safety and Health of employees at the workplace.

2.2.3 International and Regional Agreements and Conventions

The following table represents the International and Regional Agreements and Conventions accepted in Namibia for regulating relevant environmental and social related issues and concerns.

Table 2-2 Relevant International Conventions for the Project

International Convention	Year Signed/Ratified/Accepted/ Acceded
International Labour Organization (Fundamental)	
C029 - Forced Labour Convention, 1930	2000
C087 - Freedom of Association and Protection of the Right to Organise Convention, 1948	1995
C098 - Right to Organise and Collective Bargaining Convention, 1949	1995
C100 - Equal Remuneration Convention, 1951	2010
C105 - Abolition of Forced Labour Convention, 1957	2000

INTERNATIONAL CONVENTION	YEAR SIGNED/RATIFIED/ACCEPTED/ ACCEDED
C111 - Discrimination (Employment and Occupation) Convention, 1958	2001
C138 - Minimum Age Convention, 1973 Minimum age specified: 16 years	2000
C182 - Worst Forms of Child Labour Convention, 1999	2000
POLLUTION PREVENTION	
Stockholm Convention Protecting Human Health and the Environment from Persistent Organic Pollutants (POPs), 2004	Acceded in 2005
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposals, 1992	Acceded in 1995
Kyoto Protocol to the United Nations (UN) Framework Convention on Climate Change, 2016	Acceded in 2003
UN Convention on the Protection of the Ozone Layer (Vienna Convention), 1988	Acceded in 1993
Montreal Protocol on Substances that Deplete the Ozone Layer, 1987 Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, 2016	Acceded in 1993 Accepted in 2019
United Nations Framework Convention on Climate Change, 1992	Acceded in 1993
United Nations Law of the Sea Convention (UNCLOS), 1982	Ratified in 1983
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 2004	Ratified in 2005
BIODIVERSITY PROTECTION	
RAMSAR Convention	2005
UNESCO Convention on Wetlands of International Importance especially as Waterfowl Habitat	1995
UN Convention on Biological Diversity, 1992	Ratified in 1997
Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, 1996	Ratified in 1997
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973	Reservation 2019
CULTURAL HERITAGE	
Convention for the Safeguarding of the Intangible Cultural Heritage, Paris, 2003	Ratified in 2007
Convention concerning the Protection of the World Cultural and Natural Heritage, Paris 1972	Accepted in 2000

INTERNATIONAL CONVENTION	YEAR SIGNED/RATIFIED/ACCEPTED/ ACCEDED
HUMAN RIGHTS	
UN Convention on the Elimination of All Forms of Discrimination against Women, 1981	Acceded in 1992
UN Convention against Torture and Other Cruel, Inhuman or degrading treatment or punishment, 1987	Acceded in 1994
UN International Covenant on Economic, Social and Cultural Rights, 1976	Acceded in 1994
UN Convention on the Rights of the Child / Protocol Faculty in connection with the participation of children in armed conflicts, 2000	Ratified in 2002
UN Convention on the Elimination of All Forms of Racial Discrimination, 1966	Acceded in 1982
UN Convention on the Rights of Persons with Disabilities, 2006	Ratified in 2007
UN International Covenant on Civil and Political Rights, 1966	Acceded in 1994
Convention on the rights of the child, 1990	Ratified in 1990

2.3 Lender Requirements

Zhero will pursue an amount of project finance from financial institutions who either:

- Have their own internal Environmental & Social (E&S) investment policies/guidelines;
- Are members of the collective environmental and social agreements such as the Equator Principles; or
- Align their E&S policies and guidelines with other established guidelines (such as the IFC Performance Standards).

At this stage it is understood that IFC are being considered for finance (amongst others), and in addition, the Project is required to align with Equator Principles (EP) and World Bank Group (WBG) EHS guidelines. EP IV establishes the minimum E&S standards to be adopted by Equator Principles Financial Institutions EPFIs as those from IFC Performance Standards, the WBG EHS Guidelines and/or the relevant host country laws, regulations, and permits that pertain to environmental and social issues.

As such, the applicable lender policies and requirements are outlined below sections. In addition to that, the following guidelines will be followed:

- BirdLife International's Solar Energy Guidance; and

- Relevant international treaties to which the investments' country of operations are signatory such as the UN Declaration on the Rights of Indigenous Peoples, International Covenant on Economic, Cultural and Social Rights and relevant International Labour Organisation (ILO) Core Labour Standards Conventions.

2.3.1 Equator Principles IV

The Equator Principles (EP) is a risk assessment framework used by financial institutions to determine, assess and manage the environmental and social risk in Projects financing. Currently, 138 financial institutions in more than thirty-five countries have officially adopted the EPs.

The Equator Principles were updated in 2006 (EPII), 2013 (EPIII) and a further update EP IV became effective from October 1st, 2020.

Equator Principles Financial Institutions (EPFIs) implement ten (10) EP through their internal environmental and social risk management policies, procedures, and standards in order to comply with the EP.

Related to projects, EP IV necessitates compliance with the IFC Performance Standards and World Bank Group EHS Guidelines.

2.3.2 IFC

The IFC Performance Standards (PS) are a key component of the IFC's Sustainability Framework and are directed towards clients (i.e., party responsible for implementing and operating the project that is being financed), providing guidance on how to identify risks and impacts. The IFC PS are designed to help avoid, mitigate, and manage risks and impacts throughout the life of a project as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities.

The IFC PS (2012) are listed below:

- PS1: Assessment and Management of Environmental and Social Risks and Impacts
- PS2: Labour and Working Conditions
- Including International Labour Organisation (ILO) Conventions
- PS3: Resource Efficiency and Pollution Prevention
- PS4: Community Health, Safety, and Security

- PS5: Land Acquisition and Involuntary Resettlement
- PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- PS7: Indigenous Peoples
- PS8: Cultural Heritage

In addition to IFC PSs, the following guidelines will be followed:

- IFC Good Practice Handbook on the Use of Security Forces: Assessing and Managing Risks and Impacts (2017)
- IFC Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets, 2007.
- IFC publication: Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants, 2015.
- IFC/EBRD Workers' Accommodation: Processes and Standards, 2009.
- IFC Good Practice Handbook to Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets, 2013.
- Addressing Gender-Based Violence and Harassment: Emerging Good Practice for the Private Sector (July, 2 020)

2.3.3 WBG Guidelines

In terms of specific guidelines to control environmental externalities (e.g., wastewater quality etc.), EHS guidelines have been set out by IFC and WBG to provide general guidelines for its members when involved in a project or when providing financial support to a project. These guidelines contain general and industry-specific examples of Good International Industry Practice (GIIP). The following IFC EHS Guidelines are relevant to this project:

- General EHS Guidelines, Environmental:
  - Air Emissions and Ambient Air Quality;
  - Energy Conservation;
  - Wastewater and Ambient Water Quality;
  - Water Conservation;
  - Hazardous Materials Management;
  - Waste Management;
  - Noise; and,
  - Contaminated Land.
- General EHS Guidelines, Occupational Health & Safety:

- General Facility Design and Operation;
- Communication and Training;
- Physical Hazards;
- Chemical Hazards;
- Radiological Hazards;
- Personal Protective Equipment (PPE);
- Special Hazard Environment; and,
- Monitoring.

- Community Health & Safety:
  - Water Quality and Availability;
  - Structural Safety of Project Infrastructure;
  - Life and Fire Safety;
  - Traffic Safety;
  - Transport of Hazardous Materials;
  - Disease prevention; and,
  - Emergency Preparedness and Response
- Construction and Decommissioning
  - Environment
  - Occupational Health and Safety
  - Community Health and Safety
- Industry Sector Guidelines:
  - Electric Power Transmission and Distribution (2007).

2.4 Applicable Environmental Standards

Applicable standards required for Project compliance are included in the respective environmental aspect sections of this report. This includes national standards and those expected from the lenders.

2.5 The Environmental Assessment Practitioner (EAP)

Zhero appointed an international company, 5 Capitals Environmental and Management Consulting (5 Capitals), and a local company; Tortoise Environmental Consultants (TEC), the EAP, to conduct the Environmental Social Impact Assessments for the project, as well as other associated documentation, such as this ESMP.

3 APPROACH TO THE ESIA

The Ministry of Environment Forestry and Tourism (MEFT) is responsible for the protection and management of Namibia's natural environment. The Department of Environmental Affairs, under the MEFT, is responsible for the administration of the EIA process. In consultation with the MEFT, it was advised that for ease of reporting in line with National permitting and international financing requirements, the ESIAs were split into the packages as outlined in Section 1.2

The key deliverables of the ESIA process are:

- Environmental and Social Scoping Report;
- Environmental & Social Impact Assessment Report, including specialist studies;
- Environmental and Social Management Plan (ESMP); and
- zMWB Stakeholder Engagement Plan (SEP).

The purpose of the Environmental & Social Impact Assessment Report is to identify and assess the key environmental and social issues and impacts on sensitive receptors pre-identified for the project inclusive of project induced environmental and social impacts by ensuring that mitigation measures are adequately addressed. The purpose of this ESMP is to consolidate and integrate the mitigation measures identified and proposed for the project.

3.1 ESIA Studies

The Environmental and Social Impact Assessment (ESIA) for the Solar PV Site and Overhead Transmission Line has been successfully completed in full compliance with both local and international regulatory frameworks and best practices. The assessment provides a detailed and comprehensive description of the project activities, including engagement with relevant stakeholders providing them with an opportunity to voice their concerns and inputs. Furthermore, it incorporates an extensive range of studies, as outlined in the table below, which facilitated a thorough process of impact identification and evaluation for the receiving environment proposed for development. This rigorous analysis has enabled the identification and compilation of targeted mitigation measures aimed at managing any potential social and environmental impacts associated with the project development.

The studies undertaken during the ESIA phase are outlined in the following table. The studies informed the sensitivity of the receiving environment, its ability to support the project and the feasibility of the development.

Table 3-1 Baseline Studies undertaken during ESIA

SITE SURVEYS	STUDY DESCRIPTION
Air Quality	A site visit and desktop assessment were undertaken. Ambient air quality monitoring survey was conducted using diffusion tubes at two locations within the project site over four weeks. Results align with expectations and within both national and international limits.
Noise and Vibration	A site visit was undertaken A noise monitoring survey was undertaken at four locations for one hour within the project footprint and nearby receptors Results are within the national and international limits.
Terrestrial Ecology & Avifauna	Reptile and Mammal Surveys undertaken by Angela Curtis and Stretch Combrink Avifauna surveys were conducted by John Paterson and Mark Boorman Botany surveys were conducted by Warren McCleland
Archaeology & Cultural Heritage	A desktop assessment and site survey were undertaken.
Landscape & Visual	A site survey and desktop assessment were undertaken.
Socioeconomics	A site visit and desktop assessment were undertaken utilising secondary information.

Overall, the Environmental and Social Impact Assessment (ESIA) was successfully completed, marking a significant milestone in the overall project's planning and development process. The assessment adhered to the highest standards of environmental and social responsibility, ensuring that all potential impacts were identified, evaluated, and addressed in a comprehensive manner.

3.2 Stakeholder Engagement and Public Participation

Section 21 of the EIA regulations requires that the undertaking of an Environmental Impact Assessment (EIA) follow a robust and comprehensive stakeholder consultation. This is an important process, because it gives members of the Interested and Affected Parties (I&APs) an opportunity to comment or raise concerns that may affect the socio-economic or general environment because of the project.

Section 21 (c) stipulates that Environmental Clearance Certificate (ECC) applications should be advertised once a week for two consecutive weeks in two newspapers that are widely circulated in Namibia. The ECC Application was advertised as per the following table.

Table 3-2 Newspaper Advert Dates

NEWSPAPER	ADVERT	DATE ADVERTISED
The Namibian	1st	30th January 2025
	2nd	6th February 2025
New Era	1st	30th January 2025
	2nd	6th February 2025
The Namib Times	1st	31st January 2025
	2nd	7th February 2025

Section 21 (a) requires that a notice board be placed at the project site to inform public about the project and the application of ECC. A Site Notice at the project site was placed at the entrance gate of camp 12 and Farm Bloemhof as well as the entrances of the venues for public meeting.

In compliance with Section 21 (5, 6) public meetings be held in Arandis and Swakopmund to inform the public about the project and the subsequent submission of the Environmental Clearance Certificate (ECC) application to the Environmental Commissioner.

Refer to the comprehensive stakeholder engagement report for a full outline of public participation events.

4 ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN

4.1 Scope of the Document

The EIA Regulation stipulates specific requirements for the submission of key documents to the relevant competent authority. According to Section 7 (2) a and b, a Scoping Report and a Management Plan must be submitted. Additionally, Section 1 (e) of the EIA Regulation defines a 'Management Plan' as "a plan that describes how activities that may have significant environmental effects are to be mitigated, controlled, and monitored."

The Regulation further specifies that Management Plans should include, at a minimum, the following elements:

- Information on any proposed management, mitigation, protection, or remedial measures to be implemented to address the identified environmental effects. This should include specific objectives related to the rehabilitation of the environment and the eventual closure of the project.
- Measures to rehabilitate the environment affected by the project or specified activity to its natural or predetermined state, or to a land use that aligns with the generally accepted principles of sustainable development. These measures must be as practicable as possible and aim to restore the affected areas in a responsible manner.
- A clear description of how the applicant intends to modify, remedy, control, or cease any action, activity, or process that may cause pollution or environmental degradation. This includes strategies for addressing the root causes of pollution and degradation, as well as measures for mitigating the migration of pollutants.

In line with these regulatory requirements, this document serves as the Environmental and Social Management Plan, developed in line with the ESIA process.

4.2 Purpose the ESMP

The Environmental and Social Management Plan (ESMP) is designed as a comprehensive risk management strategy that provides a framework and set of guidelines to be followed by the

project developer during the construction, operational and decommissioning[2] phases of the project. Its primary aim is to mitigate potential environmental threats throughout the project's lifecycle in line with the mitigation hierarchy. The ESMP outlines clear roles and responsibilities to various parties involved and establishes a robust monitoring framework to ensure effective implementation of mitigation measures.

The ESMP consolidates project impacts and proposed management actions as assessed and proposed in the ESIA, the plan further provides a concise outline on how the environmental and social impacts of the project will be managed throughout the project lifetime to ensure compliance to the highest standards of environmental protection and sustainability throughout its lifecycle.

As an adaptive document, the ESMP is subject to change based on evolving environmental conditions or new statutory requirements. This flexibility allows for the inclusion of addendums and adjustments whenever new information is discovered that necessitates the introduction of additional mitigation measures. Additionally, the plan can be revised to address unforeseen impacts that were not initially identified during the project's design phase. Therefore, ESMP should be reviewed and updated as required, particularly upon the renewal of the Environmental Clearance Certificate, which is issued for a period of three years. This ensures that the plan remains aligned with the latest regulatory standards and environmental considerations throughout the life of the project.

4.3 Compliance to ESMP

The ESMP is a legally binding document in accordance with the provisions set forth by the EMA. It is crucial that all parties involved in the project, including the project company, contractors, and sub-contractors fully comply with the requirements outlined in this document. Adherence to the ESMP is compulsory, as it serves to ensure that the project operates in an environmentally responsible and sustainable manner.

Given the legal obligations associated with the ESMP, it is crucial that all personnel involved in the project, regardless of their role, are thoroughly informed about the contents of this

[2] It is to be noted that impacts and mitigation measures outlined in this ESMP pertain primarily to the project construction, and operation phases. The proposed Project is envisioned to have an operational lifetime of 25 years. It therefore is not possible to accurately assess decommissioning impacts, as the technology, receptors, and baseline environment at that time cannot be predicted. A decommissioning plan will be required prior to decommissioning and will be issued to the relevant parties.

plan. This includes ensuring that all personnel understand their responsibilities, the mitigation measures in place, and the potential environmental impacts associated with their work. Proper training and awareness programs should be conducted to facilitate this understanding.

4.4 Roles and Responsibilities

4.4.1 The Project Company

The overall responsibility for the successful implementation of the ESMP lies with the Project Company in collaboration with the Engineering Procurement and Construction (EPC) Contractor (during construction) and the Operations and Maintenance (O&M) Company (during operation). These parties are tasked with ensuring that the ESMP is adhered to throughout the project lifecycle.

The Project Company is specifically responsible for appointing the EPC Contractor and O&M Company and key personnel who will oversee the implementation of the ESMP. Additionally, it is the Project Company's responsibility to ensure that all employees, contractors, and relevant stakeholders are thoroughly familiar with the ESMP and its requirements.

To achieve this, the Project Company will need to take the following actions:

- Induction and Training: Conduct an induction session for all site employees and contractors to ensure they are adequately informed about the ESMP and fully understand their roles and responsibilities concerning its implementation.
- Incident Reporting and Problem Resolution: Establish a clear procedure for reporting environmental incidents and resolving any related issues promptly.
- Compliance Monitoring: Maintain comprehensive records of compliance and non-compliance with the ESMP. These records must be readily available for review by the competent authorities.
- Environmental Auditing: Ensure that bi-annual environmental audits are carried out. These audits will serve as an essential tool for monitoring environmental performance and ensuring that mitigation measures are being followed appropriately.
- ESMP Updates and ECC Renewal: Regularly update the ESMP as needed, especially in response to any significant changes in project scope, regulations, or environmental conditions. Furthermore, the Project Company is responsible for initiating the renewal process of the Environmental Clearance Certificate (ECC) upon its expiration, ensuring that all necessary documentation is submitted in a timely manner.

4.4.2 Site Manager

The Site Manager (SM) serves as the representative of the Project Company on-site and holds a critical role in the day-to-day environmental oversight of the project, ensuring that all activities align with the ESMP's objectives, facilitating communication between stakeholders, and taking corrective actions as necessary to maintain environmental compliance. This includes supervising the implementation of mitigation measures, monitoring environmental performance, and addressing any potential environmental concerns that may arise during the project lifecycle.

As the primary point of contact for all on-site environmental matters, the SM must ensure that all personnel on site are aware of their environmental responsibilities and adhere to the prescribed guidelines. This involves regular briefings, updates, and continuous monitoring to ensure that environmental standards are upheld consistently throughout the project's construction and operational phases.

4.4.3 Employees and Contractors

It is the responsibility of all employees and contractors to fully adhere to the provisions outlined in this ESMP throughout the project. This includes following all prescribed mitigation measures, ensuring that activities are carried out in an environmentally responsible manner, and taking proactive steps to minimize any adverse environmental impacts.

4.4.4 Environmental Compliance Officer

Compliance with the ESMP is enforced by the Environmental Inspector, as mandated by the EMA. The Environmental Compliance Officer (ECO), who represents the Ministry of Environment, Forestry, and Tourism (MEFT), plays a critical role in overseeing environmental inspections and ensuring that the project adheres to the provisions of the ESMP. The ECO is responsible for monitoring the project's activities, identifying any potential environmental non-compliance, and ensuring that corrective measures are implemented in a timely and effective manner.

In some instances, an alternative approach may be taken, and the Ministry of Health may designate an Environmental Health Officer (EHO) to monitor and ensure compliance with the ESMP during the construction phase. The EHO would focus on environmental health aspects, ensuring that the project meets health-related environmental standards, including the proper

management of waste, sanitation, and other factors that could affect public health and the surrounding community.

Both the ECO and, when applicable, the EHO are essential to maintaining ongoing oversight of the project's environmental performance. They ensure that any potential risks or issues related to environmental protection are promptly addressed, thus safeguarding compliance with all regulatory requirements and environmental best practices.

The ESMP tables represent a structured framework for managing and monitoring the socio-environmental aspects of the project. These tables help to implement a systematic mitigation approach that ensures appropriate measures, responsibilities, and timelines are established to address and mitigate potential environmental impacts effectively.

Roles and Responsibilities of relevant personnel are summarized in the table below

Table 4-1 Key Roles and Responsibility Table

ROLE	RESPONSIBILITY
Project Company	Overall responsibility for ESMP implementation, ensuring compliance and monitoring.
Site Manager	Daily supervision of site activities, ensuring environmental protection measures are adhered to.
Environmental Compliance Officer (ECO)	Monitoring, inspections, ensuring compliance with environmental standards.
EPC Contractor, O&M Company, all employees and contractors	Implementing mitigation measures, adhering to environmental guidelines, reporting issues.
Environmental Health Officer (EHO)	Ensuring compliance with health-related environmental regulations.
Ministry of Environment, Forestry and Tourism (MEFT)	Providing oversight and guidance on environmental compliance.
Ministry of Health and Social Services	Ensuring environmental health standards are followed.
Other regulatory Authorities	Ensuring the project activities align with their mandate

5 MITIGATION, MANAGEMENT MEASURES AND MONITORING PLANS

The mitigation measures as outlined in this section are systematically structured to address specific social and biophysical environmental issues that are anticipated throughout the project cycle. For a comprehensive understanding of the broader context and parameters assessed, this ESMP should be read in conjunction with the project ESIA as it outlines the impact assessment methodology, as well as provides the comprehensive baseline, and it serves as a foundational document that informs the development of the mitigation strategies outlined in this ESMP.

5.1 Air Quality

While no significant air quality impacts are expected from the project, baseline ambient air quality surveys were conducted to provide an indication of the current air quality in the project area. These surveys monitored key parameters to assess compliance with local ambient air quality standards, including Nitrogen Dioxide (NO2), Ozone (O), Sulphur Dioxide (SO2), and Volatile Organic Compounds (VOC). The ambient air quality analysis results were found to be fully compliant with the applicable local and WHO standards at both sampling locations.

5.1.1 Impact Significance, Mitigation Measures and Residual Impacts

Dust, particularly windblown dust from natural sources, is a major contributor to elevated PM10 concentrations in the area. Additionally, construction phase activities will generate dust and gaseous emissions, and vehicle-entrained dust from unpaved roads will play a significant role in the generation of dust, as trucks transport materials to, from, and on-site.

During operation, air quality impacts are limited and were scoped out of a detailed assessment.

The magnitude, significance, mitigation measures and residual air quality impacts are provided in the following table.

Table 5-1 Air Quality Impact Significance, Mitigation Measures and Residual Impacts

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
Construction						
Construction Dust	**Negligible Negative**	Communities along the B2 Trans-Kalahari Highway	**Low**	**Negligible**	• Keep construction worksite and roads clean and tidy and free from loose/friable materials. • Where practical, compact the ground in areas that are heavily used by vehicles and machinery • Limit or suspend earthworks during extreme weather conditions (e.g. strong winds). • Implement dust control facilities (e.g. windbreaks, temporary barriers, netting screens, fences or plastic sheets) to contain dust emissions from earthworks and stockpiled soil. • Water spraying of open or unpaved ground areas such as temporary facilities areas and access roads around the site, will be done as frequent as necessary to minimize dust generation. • All vehicles within construction areas onsite shall adhere to a speed limit of: (i) 30km/h at the main access road; (ii) 20 km/h within the project area; and (iii) 10km/h within working areas. Appropriate speed limit signage shall be provided at such construction areas. • Ensure periodic washing of vehicles in order to remove any dusty material in a dedicated area. • All trucks transporting aggregates, debris, and fine materials must be appropriately covered at all times through the use of tarpaulin or equivalent. • Proper management of stockpiles and excavated material through appropriate enclosures and covers. This entails that it is of appropriate size to ensure entire coverage of the stockpile/excavated material, durable, able to withstand exposure to weather conditions (heat, rain, and strong winds in particular). • Adequate supplies of disposable dust masks shall be provided. Workers shall use them during strong winds or when conditions of worksite and work activities (e.g. earthworks) require their use (such conditions will be determined and identified by the EPC Contractor	**Negligible**
	Minor Negative	Hylron Construction and Operational Workforce Project Construction workers	**Medium**	**Negligible**		**Negligible**

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
					E&S Manager). • Doors and windows of portable offices shall be kept sealed or closed to minimize if not totally prevent dust accumulation indoors. • Arrange site layout in a way that machineries and dust causing activities are located as far as possible from offices. • Visual dust monitoring will be undertaken daily and documented in an Internal Visual Dust Register.	
Gaseous Emissions	**Negligible Negative**	Communities along the B2 Trans-Kalahari Highway	**Low**	**Negligible**	• Ensure that generators are located in an appropriate area as far as possible from offices. • Ensure that vehicles and trucks comply with the limits for exhaust emissions. This will be through: (i) ensuring all vehicles and trucks are equipped with a catalytic convertor; (ii) ensuring that all vehicles and trucks utilized onsite are properly licensed for operation with relevant authorities which in turn are expected to undertake inspections before issuing such licenses • Develop a regular inspection and scheduled maintenance program for vehicles, machinery, and equipment to be used throughout the construction phase for early detection of issues and to avoid unnecessary pollutant emissions. Smoke belching equipment shall be taken out of service for appropriate repair and will be prohibited for entering the site if not properly serviced. • Turn off any equipment, machine or vehicle not in use. • A suitable respirator (cartridge type air purifying respirator) should be made available in certain cases.	**Negligible**
		Hylron Construction and Operational Workforce Project Construction workers	**Low**	**Negligible**		**Negligible**

5.1.2 Monitoring Requirements

Table 5-2 Air Quality Monitoring Requirements

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION	RESPONSIBILITY
CONSTRUCTION				
Emissions from engines and plant.	Vehicle Emissions	Pre-site authorisation checks on vehicle status and health, including associated emissions.	All non-road vehicles and engines	EPC Contractor
		Visual assessment of emissions (e.g. black smoke) to be undertaken on a daily basis while vehicles and equipment are in use and annual inspection of vehicles.		
Sanitary Facilities & Hazardous Material Storage Areas	Odour & VOCs	Daily visual and olfactory observations – as part of maintenance and inspection checks (for hygiene, safety and appropriate storage/containment).	All sanitary facilities available within the laydown areas, sub-contractor camps and work fields. All hazardous material, chemical and fuel storage areas.	
Construction Dust	Visual observations This will identify the need for water spraying or further monitoring.	Daily visual observations, as part of HSE walkdowns.	Across the site.	
	TSP, PM_{10} and $PM_{2.5}$	Upon receipt of complaints, if any	At least two locations, e.g., active construction area and receptor.	

5.2 Noise and Vibration

The proposed Project site does not have any significant noise sources. It is expected that noise at the Solar PV site is primarily influenced by the noise of wind and general day-to-day activity from the mining activities from nearby mines (activities include blasting, crushers, earth moving machinery, haul trucks, etc.). From the noise monitoring results, the noise levels indicate that there are no significant sources of noise. All recorded noise levels are within the most stringent SANS 10103: 2008 limit of 45 dB(A), although, it is noted that this limit is for residential areas and therefore does not directly apply.

5.2.1 Impact Significance, Mitigation Measures and Residual Impacts

Construction activities for the Project will result in temporary and short duration increases in noise and vibration levels. The spatial extent of construction noise will typically be local and largely limited to within the immediate surroundings of the works. The duration of the impact will be short considering individual noise emission events relative to the lifespan of the project.

Operation of the PV facility will not generate significant noise. Noise impacts from vehicles used for maintenance activities are not expected to be major sources of noise. Noise from the tracker system, operation of cleaning robots and transformers are negligible as the associated noise impacts will not be discernible outside of the development site. In cases where panels are faulty or damaged, they will be disassembled and transported off site, this will result in the generation of limited, isolated noise that will also be **insignificant**.

The operation of the onsite substation, BESS and the overhead powerline is envisioned to result in the generation of localised noise that is anticipated to be within the ambits of the development footprint. It is further reiterated that noise impacts due to the operation of the Project is anticipated to be **insignificant** due to the isolation of the proposed Solar PV site development footprint, as well as the distance of human receptors. Cumulative noise impacts from the Project and the Hylron are also not expected.

Table 5-3 Noise and Vibration Impact Significance, Mitigation Measures and Residual Impacts

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
Construction						
Construction Noise	**Minor Negative**	Hylron workforce	**Low**	**Minor**	• Limit machinery and vehicle movements to defined work area and designated access and roads. • Select construction equipment based on GIIP. • Locate fixed and mobile plants (e.g. generators) with consideration of nearby sensitive receptors. • Place project components with consideration of nearby sensitive receptors during the design and pre-construction phase. • Select and use the quietest machinery and equipment that can economically undertake the work wherever possible. • Operators of construction machinery and equipment will be informed of the potential noise problems and of techniques to minimize noise emission through a continuous process of training and inspection. • Use well-maintained mufflers and noise suppressants for high noise generating equipment and machinery where applicable, such as compressors, electric motors, machines, etc. • Develop a regular inspection and scheduled maintenance program for vehicles, machinery, and equipment to be used throughout the construction phase for early detection of issue to avoid unnecessary elevated noise levels. Upon detecting any vehicle or machinery that emits unacceptable amount of noise will be ordered for removal from work until it is repaired. • Turn off any equipment, machine or vehicle not in use. • Ensure that all vehicles and machinery used through the execution of the project are properly licensed. • In the event of a noise complaint noise monitoring will be carried out at the relevant receptor, by an approved third-party entity. Monitors shall be located approximately 1.5m above the ground and no closer than 3m to any reflecting surface (e.g. wall). Monitoring reports will be maintained onsite.	**Negligible**
	Negligible Negative	Nearby Mines	**Low**	**Negligible**		**Negligible**
		Nearby Farmsteads	**Low**	**Negligible**		**Negligible**
		Project Construction Workers	**Low**	**Negligible**		**Negligible**

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
					• In areas where noise levels may exceed 85 Decibels (dB) (e.g. excavation and grinding activities and/or workers exposed to excessive noise generating equipment and machinery), noise monitoring shall be undertaken for at least 10 mins during peak activities. If 85 dB (LAeq) is exceeded, appropriate hearing protection shall be provided to all workers – this will be based on noise levels and location but can include ear plugs, semi-insert ear plugs, ear protection or earmuffs. It must be ensured that such hearing protection is worn by all affected personnel at all times. Ear plugs or earmuff shall have a Noise Reduction Rating (NRR) of at least 20 to 30 Decibels. Results will be compared against allowable national limits as well as limits included within the IFC General EHS Guidelines. • Safety signs must be installed in areas where noise is expected to be greater than 85 dB to require the use of appropriate Personal Protective Equipment (PPE) (i.e. hearing protection).	

5.2.2 Monitoring Requirements

Table 5-4 Noise and Vibration Monitoring Requirements

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION	RESPONSIBILITY
CONSTRUCTION				
Daytime Construction noise	Leq(A), L90(A), Lmax,	Once a week, 1-hour monitoring duration	Hylron Facility	EPC Contractor

In the event of a recorded exceedance during noise monitoring or upon receipt of complaints/grievances related to noise.

5.3 Geology, Soils, Surface Water, And Groundwater

The ESIA provides a detailed overview of site specific geology, soils, surface water and groundwater.

5.3.1 Impact Significance, Mitigation Measures and Residual Impacts

The Project's construction phase will entail excavation, backfilling and grading operations in order to prepare the PV array field and the locations of control buildings, substation and powerline pylons. The presence of heavy loads, construction equipment and vehicles, and compaction activities can lead to soil compaction within the construction footprint and access road alignments. The proposed OHTL and one of the access roads will traverse across the Swakop river, therefore construction vehicles will cross the river during the construction phase.

The utilisation of the same boreholes or boreholes in close proximity to one another may impose potential negative impacts on the groundwater resources at Bloemhof but it is not anticipated that it will spread beyond the borders of the farm and affect other users.

The project operation activities will have extremely limited interaction and impact on soils, surface water and groundwater and therefore impacts are not anticipated.

Table 5-5 Geology, Soils, Surface Water and Groundwater Impact Significance, Mitigation Measures and Residual Impacts

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
Construction						
Land Degradation, Erosion and Compaction	**Moderate Negative**	Soil	**Low**	**Minor**	• Salvage and store topsoil and subsoil before areas are excavated, with topsoil stripped and stockpiled separately. • Segregate excavated soils into stockpiles dependent on material type and provide erosion control while stockpiled as per requirements identified below. Stockpile heights should not exceed 2 m. • On completion of earthworks, backfill material in the same stratigraphic sequence. • Re-stabilize existing eroded tracks and restore vegetation cover as needed. • Do not collect firewood from the site. • Drainage infrastructure will be constructed during dry periods to reduce erosion risk and the potential for sediment movement downstream. • Vehicles should be confined to demarcated roadways at all times. To extent possible, minimize activities during wet conditions. When activities must occur in wet conditions, control storm water by using measures identified below to impede storm water flow and prevent erosion.	**Negligible**
Alteration of Groundwater Level and Availability	**Moderate Negative**	Groundwater	**Medium**	**Moderate**	• The extraction of groundwater should be minimized to the extent possible. • Any groundwater abstraction should be conducted in line with permit requirements.	**Minor**
Accidental Spills and Leaks	**Minor Negative**	Soil	**Low**	**Negligible**	• Ensure proper PPE is worn; to include at a minimum: gloves, safety shoes, and safety googles • Prompt and effective action be initiated to stop the spillage/leakage and its pollution at source. • Contain the spillage and prevent it from reaching sensitive areas by using the absorbent materials in the available spill kit • After the spillage or leakage has been contained, the contaminated material and the absorbent material should be placed within the disposal bags available in the spill kit and properly enclosed with tape or twist ties.	**Negligible**
		Groundwater	**Medium**	**Minor**		**Negligible**

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
		Surface Water	**Medium**	**Minor**	Disposal bag shall be removed and treated as hazardous waste. • Make sure that the used spill kits are replaced with new ones and that enough absorbing materials are available for future potential environmental accidents. • If the situation cannot be controlled, refer to Emergency Preparedness and Response Plan for additional details on handling of the incident. • Hazardous materials and wastes should be stored in accordance with GIIP, namely impermeable flooring, bunds, shade, etc. to ensure that leaks to the soil and groundwater do not occur. • Provide concrete bunding (or other suitable impervious barrier) for fuel storage and transfer on site. The bunding should be bigger than the fuel storage tank/s to allow a bit of working space around tank/s (e.g. 20% bigger than the tank/s). Use of sheeting to prevent soil contamination (e.g. during vehicle servicing). • Concrete slabs or other suitable impervious layer should be installed at each point where hazardous materials are handled. • The fuel tanks should stand on a concrete slab or other suitable surface to prevent the leakage of contaminants into the soil. • All vehicles and machinery should be fitted with oil drip trays to prevent oil dripping to the ground.	**Negligible**

5.3.2 Monitoring Requirements

Table 5-5 Geology, Soils, Surface Water and Groundwater Monitoring Requirements

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION	RESPONSIBILITY
Construction				
Soil, surface water and groundwater quality	Visible spills & leaks of hydrocarbons and other potentially hazardous or chemicals	Daily during construction as part of the daily walkdown	The entire project area during construction	EPC Contractor
Soil integrity	Visible erosion features	Daily during construction as part of the daily walkdown	Soil stockpiling areas (where applicable) and disturbed sites	
Operation				
Soil, surface water and groundwater quality	Visible spills and leaks of chemicals/ waste	Daily during operations	Storage and maintenance areas	O&M Company

5.4 Terrestrial Ecology and Avifauna

The assessment of impacts upon terrestrial ecology is required with due consideration to national requirements and IFC Performance Standard 6 which establishes requirements for protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources.

It is important to have a comprehensive understanding of the land-based ecosystems inclusive of fauna and flora and, the interactions between them and their environment. The terrestrial ecology study ensured that the project identified and assessed the project's potential impacts on biodiversity and ecosystem function and services to minimizes harm to the natural environment and enhance biodiversity conservation.

The project is located north of the Namib Naukluft Park, a vast and ecologically significant protected area that is renowned for its unique biodiversity and high levels of endemism. The Namib Naukluft Park's unique ecosystems are characterized by plain desert landscapes, sand dunes and rocky outcrops that support a variety of plant and animal species adapted to the harsh conditions of the desert environment. Among the most famous and distinctive plants within the park is *Welwitschia mirabilis*, an ancient plant species that has become an iconic symbol of the Namib Desert. The proximity of the project necessitated special attention to the regulatory and conservation guidelines to ensure that the park's ecology is safeguarded.

Specialist, site-specific botany, reptile, mammal and avifauna surveys were conducted by regional ecologists in order to inform a comprehensive baseline.

5.4.1 Impact Significance, Mitigation Measures and Residual Impacts

The magnitude, significance, mitigation measures and residual air quality impacts are provided in the following table.

Table 5-6 Terrestrial Ecology and Avifauna Impact Significance, Mitigation Measures and Residual Impacts

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
Construction						
Loss of Habitat and Flora	**Moderate**	Habitats and Flora	**Low**	**Minor**	• Construction effort shall be limited to the Project boundaries. • All construction activities will be restricted to demarcated construction zones within the project site and designated access roads. • Construction vehicles will utilise designated access routes. • Excavated soil will be stockpiled and preserved within dedicated sites to enable its reuse in backfilling excavations and landscaping as part of site rehabilitation post the completion of construction works. • Any identified notable ecological species will be reported to the Environmental and Social Manager. • Cleared areas no longer required for construction activities will be rehabilitated to re-establish vegetation.	**Negligible**
Direct Mortality of Fauna	**Moderate**	Terrestrial Fauna	**Low**	**Minor**	• Construction effort shall be limited to the Project boundaries. • Strict speed controls which will be enforced by EPC HSE and Security teams, an example of how this can be enforced is by use of speed gun. Exceedances will be reported and recorded as per the observation and corrective actions data recorded at site. • Ban against driving outside of delineated access roads and restricting driving and machinery operation to daylight hours, to the extent possible. There may be situations in which this is required for example emergency situations or critical path activities. • Site clearance for delineated construction zones within the project sites will be progressed in a unidirectional manner, to facilitate the successful self-dispersion of various resident fauna, including burrowing mammalian and reptilian species. • Removal of any road-kill carcasses immediately upon observation to at least 10 meters away from the access roads.	**Negligible**

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
					• The collection, harvesting or hunting of any plants or animals is strictly prohibited. A 'no tolerance' policy will be adopted. • Should any animals get trapped or be harmed in any way, the Environmental and Social Manager must be informed. • Fencing around the Project site will be designed to allow small mammals and fauna to pass safely underneath the area.	
Disturbance	**Minor**	Terrestrial Fauna	**Low**	**Minor**	• Stated mitigation measures for air, noise, soils, surface and groundwater will be implemented (refer to relevant chapters of this report). • Strict speed controls which will be enforced by EPC HSE and Security teams. Exceedances will be reported and recorded as per the observation and corrective actions data recorded at site. • Ban against driving outside of delineated access roads and restricting driving and machinery operation to daylight hours, to the extent possible. • Site clearance for delineated construction zones within the project sites will be progressed in a unidirectional manner, to facilitate the successful self-dispersion of various resident fauna, including burrowing mammalian and reptilian species. • Work will be carried out in such a manner as to reduce disturbance as far as practicable, for example, acoustic covers on machine engines to remain closed at all times (as applicable). • Construction lighting spill will be managed to ensure excessive lighting and light spill is minimised. Lighting will be fit for purpose and duration of lighting to be controlled and minimized as much as possible. • Lights where possible will be shielded to prevent skyglow, spill and glare. • Construction vehicles will utilise designated access routes. • Any identified notable ecological species will be reported to the Environmental and Social Manager. • Fencing around the Project site will be designed to allow small	**Negligible**

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
					mammals and fauna to pass safely underneath the area.	
Poaching	**Minor**	Terrestrial Fauna	**Low**	**Minor**	• Strict controls forbidding the gathering, poaching or otherwise disturbance of any flora or fauna on site, this will also be included in the induction training. • A no tolerance approach will be adopted. This will be enforced by the HSE team of the Project Company and EPC Contractor. • Staff training such as toolbox talks on the importance of ecosystem integrity, especially focused on species of importance.	**Negligible**
		Avifauna	**High**	**Minor**		
Introduction of Invasive Species	**Moderate**	Habitats and Flora	**Low**	**Minor**	• Construction effort shall be limited to the Project boundaries. • Excavated soil will be stockpiled and preserved within dedicated sites to enable its reuse in backfilling excavations and landscaping as part of site rehabilitation post the completion of construction works. • Plant and machinery will require an HSE certificate of inspection, issued by the EPC, before coming onto site and this will include necessary cleaning / washing to reduce risks of importing invasive species in mud or soil. • Any soil imports will be taken from local quarry or borrow pit as close to the site as reasonably practical to avoid risk of foreign seeds and invasive species. • Invasive species surveys will be carried out during and after construction.	**Negligible**
		Terrestrial Fauna	**Low**	**Minor**		**Negligible**
Operation						

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
Disturbance	**Negligible**	Terrestrial Fauna	**Low**	**Negligible**	• Restriction of animal movement and entrapment • Stated mitigation measures for air, noise, soils, surface and groundwater will be implemented (refer to relevant chapters of this report) • Work will be carried out in such a manner as to keep any disturbance from noise to a minimum. • Acoustic covers on machine engines to remain closed at all times (as applicable). • Where practical, electrically powered plant will be preferred to mechanically powered alternatives. • Where possible li ghting spill will be managed to ensure excessive lighting and light spill is minimised. • Vehicles will utilise designated access routes. • Any identified notable ecological species will be reported to the Environmental and Social Manager. • Fencing around the Project site will be designed to allow small mammals and fauna to pass safely underneath the area during operations.	**Negligible**
OHTL Collisions / Electrocution	**Moderate**	Avifauna	**High**	**Moderate**	• Designing the OHTLs to minimise bird strike by implementing International Best Practice regarding provision of bird diverters such as spiral markers, coloured balls, and flappers, on transmission lines to make them more visible to birds. These devices can significantly reduce collision rates. • Line Marking: Use high-visibility markers on the wires, especially in areas with high bird traffic, to increase the lines' visibility and help birds avoid them • Consideration of perching sites for large birds such as raptors (insulator spacing etc).	**Minor**

5.4.2 Monitoring Requirements

Table 5-7 Terrestrial Ecology and Avifauna Monitoring Requirements

Monitoring	Parameter	Frequency & Durations	Monitoring Location	Responsibility
Construction				
Construction limits	Construction activity is to be limited to within demarcated areas within the Project boundary and access roads	During formal site walkdown as part of HSE inspections. General observations during day-to-day activities	Throughout the site.	EPC Contractor
Ecological chance find / mortality	Fauna mortality / injury / collision with construction equipment / vehicle			
Operation				
Bird collisions / ecological chance find.	Avifauna mortality / injury / collision with PV panels and OHTL	During formal site walkdown as part of HSE inspections. General observations during day-to-day activities	Throughout the site and OHTL	O&M Company

5.5 Landscape and Visual Amenity

The Solar PV site is primarily homogenous desert habitat without any notable features of interest or landscape characteristics. The only feature of interest in the wider area is the presence of rocky ridges which are located outside of the Project boundaries. Based on site visits, review of satellite imagery, and consultations, it has been determined that the Project will not result in significant landscape character and visual amenity impacts during either construction or operation.

The development of the transmission line will traverse through the Namib-Naukluft Park. the area the transmission crosses is relatively degraded with visible tracks everywhere and multiple transmission lines traversing through the area, due to this, the significance of landscape and visual impacts of the powerline are considered low.

With regards to mitigation and management of landscape and visual impacts, there are limits to what can be done besides implementing good housekeeping practices and keeping within Project boundaries. Any grievances will be managed on a case-by-case basis.

With regards to glint and glare, solar PV systems are constructed of dark, light-absorbing materials designing to maximise light adsorption and to minimise reflection. Studies show that modern PV panels reflect as little as 2% of incoming sunlight and this is similar to water, and less than soil or wood shingles (Massachusetts Department of Energy Resources, 2015). It is also important to consider the shading effects from the neighbouring rows of panels, which reduces any glare hazard, as well as the movement of the solar panels in which the panel positions are optimised to move to capture the maximum energy potential.

Of more concern for glint and glare impacts, are concentrated solar polar (CSP) projects, which use mirrors to focus sunlight onto a smaller area and convert the focused sunlight into heat using a heat transfer fluid. However, this Project does not utilise this technology.

The view towards the project development site from dwellings within the Arandis community are blocked by the present ridges, it is also imperative to note that the project is located a significant distance away from sensitive receptors and dwellings. Impact is envisioned to be minimal and insignificant. Therefore, impacts resulting from glint and glare are not expected and are not considered further. Any grievances during the lifespan of the development will

be managed on a case-by-case basis. In the event that impacts are reported, mitigation measures can be implemented such as screening with vegetation.

Potential glint and glare impacts on aircraft and airports are often documented. The South African Civil Aviation Authority states that glint and glare assessments are required when the solar development is situated in close proximity to an aerodrome; under the approach or take-off climb obstacle limitation surfaces, and within 3 km of the aerodrome. US Federal Aviation Policy states that a solar development will not automatically receive an objection on glint grounds if low intensity glint is visible to pilots on final approach. The final approach path is defined as 2 miles from 50 feet above the landing threshold using a standard 3-degree glide path. The proposed Solar PV facility development area is located approximately 80 km away from the Walvis Bay International Airport and 20km away from the Arandis airport; therefore, it is determined that it will pose no impact to the airport. Nevertheless, consultations with the airport will be conducted.

5.6 Solid Waste and Wastewater Management

Construction activities such as site preparation, civil works, electrical and mechanical works, materials delivery (particularly the PV panels and BESS packaging) will generate construction, domestic and hazardous waste streams in both solid and liquid form.

It is envisioned that the primary solid waste associated with the construction phase will consist mainly of wooden pallets, cardboard packaging and plastic straps. The onsite disposal of solid waste will be categorized by material types where disposal bins will be clearly denoted, the recycling of materials will be enforced and promoted as much as possible.

The following are the key components of wastewater anticipated during the Project construction:

- Domestic sewage (sanitary wastewater) from toilets;
- Concrete washout; and
- Equipment washing.

The construction site will have on-site temporary sanitation facilities for construction workers, expected to be toilets, basins and ablution facilities with collection septic tanks.

The operation phase will generate minimal amounts of waste, primarily arising from domestic wastes from the operational workforce, and limited amounts of waste from maintenance activities for PV panels, transformers and day-to-day maintenance activities of administration and control facilities.

There may be the need to replace some of the PV panels during operation, due to damage (potentially arising from storm events or other damage during operations and maintenance) or malfunction. PV panels possess inherent value and therefore material recovery, and recycling will be a priority.

5.6.1 Impact Significance, Mitigation Measures and Residual Impacts

Table 5-8 Solid Waste and Wastewater Management Impact Significance, Mitigation Measures and Residual Impacts

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
Construction						
Generation of solid waste during construction	**Moderate Negative**	Existing Waste Management Infrastructure	**High**	**Moderate**	• A project specific construction stage Waste Management Plan will be prepared prior to commencement of works. • Collection of waste to its final disposal location will be through a waste collector. The waste collector will be responsible for project waste management and act as a waste contractor and transport the waste to recycling/recovery and /or final disposal facilities. • Prior to the start of construction works, there will be coordination with waste receiving facilities to ensure sufficient capacity is available for receiving construction wastes. • The EPC contractor will promote and implement a hierarchy of controls in managing waste which will include prevention, reuse, recycling, recovery and disposal in order of most preferred to least preferred option. • Domestic solid wastes to be segregated and identified from the other waste streams into separate waste containers/skips clearly to facilitate recycling. • Waste containers/skips will be clearly labelled and placed in designated waste storage locations. Labels will be waterproof, securely attached, and written in English and other languages as required. • Waste containers will have lids in order to mitigate wind dispersed waste. • For litter (food waste, domestic waste), an adequate number of covered bins will be strategically placed throughout the site at locations where construction workers and staff consume food. These will be regularly collected and taken to the main waste storage area. • Food waste will be stored within a sealed metal or plastic skip or bin to prevent pests from gaining access. • Ongoing housekeeping training will be provided to all staff on the importance of the need to avoid littering.	**Minor**

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
Generation of hazardous wastes and wastewater during construction	**Negligible Negative**	Existing Waste Management Infrastructure	**High**	**Minor**	• Hazardous waste collection will be determined on a case-by-case basis. • Hazardous waste will be stored in the designated hazardous waste storage area. • For liquid hazardous wastes, all liquid bins and containers will be leak-proof and sealed. In addition, secondary containment will be implemented to prevent any hazardous liquid escaping – e.g. to soil/ground. Secondary containment must be provided with a capacity of 110% of the largest storage bin/container or 25% of the total storage capacity. • All Hazardous waste must be labelled and a waste manifest completed when arranging collection and safe disposal. • All hazardous waste collection vehicles must be supplied with a spill kit. • Develop and maintain a hazardous waste inventory to document and track hazardous waste generated, segregated, reused and consignments. • Segregate and identify hazardous waste from the other waste streams into separate signed and labelled waste containers/skips. • Store hazardous waste in allocated impervious hard standing areas in sealed containers stored with impermeable bases, sufficient containment and separation capacity, sun/rain shelter, separate drainage system, good ventilation and equipped with spill kits & spill response procedures. This area will be placed away from any sources of ignition. • The hazardous waste storage area will be constructed away from the drainage system. • Provide training and ready information on chemical compatibility to employees in order to ensure wastes are appropriately handled and stored. • Sanitary wastewater tanks to be properly maintained and inspected to ensure tanks do not overflow. • Site inspections will be carried out regularly by the EPC contractor to ensure that all wastewater generated is properly managed, and no leakages or spill occur. In the event of a spill or overflow, immediate action will be taken per spill containment procedures and clean up procedures.	**Negligible**
Operation						
Operational waste generation	**Negligible Negative**	Existing Waste Management Infrastructure	**High**	**Minor**	• Prior to the start of operation of the plant, the O&M Company will coordinate with the local municipality and waste receiving facilities to ensure sufficient capacity is available for receiving the plant's waste.	**Negligible**

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
					• The O&M Company will identify waste management companies who can accept and handle PV panel waste with a focus on material recovery and recycling. • Domestic solid wastes to be segregated and identified from the other waste streams into separate waste containers/skips clearly to facilitate recycling. • Waste containers/skips will be clearly labelled and placed in designated waste storage locations. Labels will be waterproof, securely attached, and written in English and other languages, as required. • For litter (food waste, domestic waste), an adequate number of covered bins will be strategically placed throughout the site at locations where operational staff consume food. These will be regularly collected and taken to the main waste storage area. • Food waste will be stored within a sealed metal or plastic skip or bin, to prevent pests from gaining access. • Completed waste manifests will be maintained to show the chain of custody of the waste generated on-site, its transportation and treatment/disposal. All records will be maintained on-site. • Sanitary wastewater will be collected by a contractor and taken to a wastewater treatment plant. • Develop and maintain a hazardous waste inventory to document and track hazardous wastes generated, segregated, reused and consignments. • Segregate and identify hazardous waste from the other waste streams into separate waste containers/skips signed and labelled. • Store hazardous waste in allocated impervious hard standing areas in sealed containers stored with impermeable bases, sufficient containment and separation capacity, sun/rain shelter, separate drainage system, good ventilation and equipped with spill kits & spill response procedures. This area will be placed away from any sources of ignition. • Waste containers will be marked with appropriate warning labels to accurately describe their contents and detailed safety precautions. Labels will be waterproof, securely attached, and written in English and other languages as required. Wherever possible, chemicals will be kept in their original container.	

5.6.2 Monitoring Requirements

Table 5-8 Waste Management Monitoring Requirement

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION	RESPONSIBILITY
Construction				
Strain on existing public waste management facilities during construction	Number of grievances from waste management service providers and/ or affected communities and commercial/ industrial establishments with regards to disruption of waste management services	Monthly	Public waste management utility offices	EPC Contractor
	Number of waste consignments exported out of the project area without regulatory permits.	Monthly	Project offices	
	All waste generated and removed from the project site	Continuous throughout construction	Project offices	
Inspect and monitor proper handling and storing of waste materials	Check storage areas containment and control procedures as per CESMP.	Daily (during site walkdowns)	Storage areas at the site	EPC Contractor
Inspect and monitor third party waste contractors and disposal facilities	Ensuring engaged contractors, their vehicles and waste management facilities have applicable registrations/licenses at time of procurement	At procurement and annually thereafter	Contractors, transport vehicles and waste management facilities	EPC Contractor
Operation				
Strain on resident public waste management facilities during operation	Number of grievances from waste management service providers and/ or affected communities and commercial/ industrial establishments with regards to disruption of waste	Monthly	Public waste management utility offices	O&M Company

	management services			
	All waste generated and removed from the project site	Continuous throughout construction	Project offices	
Inspect and monitor proper handling and storing of waste materials	Check storage areas containment and control procedures as per ESMP.	Daily (during site walkdowns)	Storage areas at the site	O&M Company
Inspect and monitor third party waste contractors and disposal facilities	Ensuring engaged contractors, their vehicles and waste management facilities have applicable registrations/licenses at time of procurement	At procurement and annually thereafter	Contractors, transport vehicles and waste management facilities	O&M Company

5.7 Archaeology and Cultural Heritage

Archaeological remains in Namibia are protected under the National Heritage Act (27 of 2004) which covers archaeological sites, monuments, historical buildings, and other cultural assets. It establishes procedures for the declaration of heritage sites, the preservation of cultural artifacts, and the conduct of archaeological research.

Adopted by General Conference of UNESCO on 16 November 1972, the World Heritage Convention aims to identify, protect, and preserve world cultural and natural heritage sites. It seeks to ensure that these sites are safeguarded for future generations, promoting international cooperation in the conservation and management of such heritage. Namibia is a signatory to this convention, henceforth, the Namibian Government has committed to the protection of cultural and heritage through the National Heritage Act Section 46 of the act "prohibits the locating, removal, damage, alteration or excavation of heritage sites or remains[3]".

5.7.1 Impact Significance, Mitigation Measures and Residual Impacts

A field survey was carried out on 27th – 28th July 2024 and 15th – 18th January 2025, to identify, describe, and document any archaeological or heritage features within the Solar PV project site (Area 3) and its surrounding environment.

Of heritage value, a suspected grave was observed located approximately 166 m outside of the development boundary. The suspected grave is considered a sensitive archaeological resource due to the likelihood of partial disturbance or destruction due to its proximity to the development

Overall, it is deduced that the overall sensitivity of cultural heritage and archeological resources of the Project is low.

[3] defined in the Act as "any remains of human habitation or occupation that are 50 or more years old found on or beneath the surface" without a heritage permit.

Table 5-9 Archaeological and Cultural Heritage Impact Significance, Mitigation Measures and Residual Impacts - Construction Phase

Potential Impact	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
Disruption to known archaeological features	**Moderate Negative**	Grave Site	High	**Moderate**	• The stone cairns and suspected grave should be clearly marked and avoided during construction. • A buffer zone should be established to prevent accidental disturbance. • In the case that the suspected grave is confirmed, it should be treated as a protected burial site and avoided at all costs. • The suspected grave located to be cordoned off during the construction phase, using steel posts (fence droppers) and high visibility barrier mesh (this material to be removed following construction to reduce visibility of the sites). • Within the OHTL servitude, the project footprint should be kept at a minimal, to limit the possibility of encountering chance finds. • All existing and new vehicle tracks should be diverted away from the suspected grave. The proponent, in consultation with the local community members should fence off the grave, should it be confirmed that it is a grave.	**Negligible**
Damage to cultural heritage sites and undocumented archaeological sites	**Moderate Negative**	Loss of local Archaeological significance	High	**Minor**	• Implement the chance find procedure protocol • Halt all excavation and construction activities should any archaeological remains be uncovered during the construction phase. • Newly discovered archaeological sites or features should be reported to the relevant heritage authorities, such as the National Heritage Council. • All construction personnel and staff should undergo cultural heritage awareness training • Construction activities should be limited to the project footprint to minimise impacts.	**Negligible**

5.7.2 Monitoring Requirement

Table 5-10 Cultural Heritage Monitoring Requirements – Construction

MONITORING	PARAMETER	PROJECT PHASE	FREQUENCY & DURATIONS
Cultural Preservation	Preservation of the suspected grave near project footprint	Construction	Ongoing

5.8 Socioeconomics

The economic and demographic landscape of the Erongo Region was assessed, with a primary focus on the three key towns: Arandis, Swakopmund, and Walvis Bay. The assessment highlighted opportunities for growth and development, as well as the holistic impact of the green hydrogen project both regionally and nationally including infrastructure development, local economic development and inclusivity, employment opportunities etc.

Moreover, in addition to the significant economic benefits, the potential negative impact has been assessed in the ESIA.

5.8.1 Impact Significance, Mitigation Measures and Residual Impacts

To ensure the project's socio-economic sustainability, the impacts, significance, mitigation measures, and residual impacts on the socio-economic environment are summarized in the following table.

Table 5-11 Socio-Economics Impact Significance, Mitigation Measures and Residual Impacts - Construction and Operational Phases.

Potential Impact	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
Access Restriction for Local Access Routes	**Minor Negative**	Local communities and road users	High	**Minor**	• The EPC Contractor will prepare a Traffic and Transportation Management Plan • Any road blockages or diversions will be communicated to nearby receptors such as the mines, Hylron and farms.	**Negligible**
Employment Opportunities and Economics	**Minor Positive**	Employment Market and Local Businesses and Communities	Medium	**Positive**	• An employment/recruitment management plan will be prepared and implemented. This plan will include clear targets for employment under EPC and its sub-contractors. • The EPC Contractor will seek to employ local workers including women. This will be done in consultation with the local administration and community leaders in the communities near the Project site. • The EPC Contractor will give priority to the local people while employing unskilled and semiskilled labor forces from the Project area. • The EPC Contractors' HR Policy will be prepared to ensure consistency in line with local labour laws and international ILO and UN conventions. The EPC Contractor is to ensure that this is applied as an overarching policy for all sub-contractor company HR policy as part of their contractual arrangements. • EPC Contractor is to consult the local community during the recruitment process in order to consider equitable job opportunity distribution among the locals to avoid conflict between the local people • The EPC Contractor will provide equal employment opportunities to women and preferences will be given to local women for unskilled and semi-skilled labour positions.	**Positive**
Training and dissemination of construction skills as part of on-the-job Training	**Minor Positive**	Welfare of Local Population	High	**Positive**	• All Project workers (including labour service drivers) will receive induction training at the Project, as well as vocational specific training for on-site construction works. • All workers will receive training on health and safety, as well as environmental and social awareness. • Toolbox talks will be conducted before work on each day to ensure workers are reminded of key topics including community health, safety, & security	**Positive**

Potential Impact	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
					and social aspects. • Cultural awareness training will be provided for all foreign workers (immigrant workers) and those coming from other regions, if any.	
Purchase of construction materials and food resources locally	**Minor Positive**	Local/Regional Economy	Medium	**Positive**	• The EPC Contractor will purchase goods and materials from the local/regional economy where possible and available. • The EPC Contractor will purchase some of the food products such as meat, milk from the local suppliers. • The EPC Contractor will provide the workers with food or giving them transportation to larger towns where they can buy food and non-food items. • Establish market network between the Project workers and the local people in consultation with the community leaders.	**Positive**
Disproportionate impacts on vulnerable groups	**Minor Negative**	Vulnerable groups & women	High	**Minor**	• The Environmental and Social Manager (or any other appointed responsible for the social subject, such as Community Liaison Officer (CLO)) will regularly undertake informal meetings, including with women focus groups & vulnerable groups, to ensure that ongoing stakeholder engagement is gender inclusive. • The Project Company will ensure that the EPC Contractor employs a female within the social experts who will support the E&S Manager/CLO in addressing potential Gender based violence and harassment issues. • Implementation of mitigation and management measures provided under Chapter 13 in line with Community Health and Safety and Chapter 14 Labour & Working Conditions.	**Negligible**
Disruption of Local Custom	**Minor Negative**	Welfare of Local Communities	Medium	**Minor**	• EPC Contractor to provide adequate training to the non-local workers in the Project, especially in terms of interaction with the local community members. • Allow local residents to report concerns associated with loss of cultural values through the grievance mechanism. • The EPC Contractor and its sub-contractor will develop and implement a Code of Conduct. This will include an overview of culturally and religious appropriate measures and etiquette to bear in mind.	**Negligible**

Potential Impact	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
					• The Code of Conduct will also guide staff interaction with local communities. It will ensure workers and non-locals' behaviour is managed suitably to minimise upset in local community through anti-social behaviours • The EPC Contractor will provide adequate training (cultural sensitization training) to the non-local workers in the Project. • EPC Contractor will adopt a zero-tolerance policy towards unacceptable workforce behaviors towards females or any community members i.e., sexual harassment or violence. • The grievance mechanism will be made available to the local communities i.e., community members can make verbal or written complaints at the Project security gate or request to speak to the E&S Manager/CLOs.	
Operation						
Employment Opportunities	**Minor Positive**	Employment Market	Medium	**Positive**	• The Project Company's recruitment policy will ensure a preference for employing workers from the local population especially women where appropriately skilled workers are available locally (or if unskilled positions are available). • O&M Company's HR Policy will be prepared to ensure consistency with the Project Company Environmental & Social Management System Implementation Manual which will ensure compliance with local labour laws and international ILO and UN conventions. • Workers will be encouraged to develop their careers and may be provided with opportunities to attend training courses and other career development processes.	**Positive**
Training and Dissemination of Skills	**Minor Positive**	Operational Workforce	Medium	**Positive**	• Training plans to be developed and implemented to facilitate career development and advancement within the local workforce.	**Positive**

5.8.2 Monitoring Requirement

Table 5-12 Socioeconomic Monitoring Requirements – Construction and Operation

MONITORING	PARAMETER	PROJECT PHASE	FREQUENCY & DURATIONS
Local Employment	Number of persons employed from the communities near the Project site	Construction and Operational	Ongoing
Third Party Grievances	Number of the issues concerning socio-economic factors or land use/ownership	Project Lifespan	Ongoing

5.9 Community Health, Safety, and Security

Community health and safety is a critical component of the project, and it is essential to ensure the health and safety of community throughout the project's lifecycle. To help ensure the community's health and safety, the project has incorporated a robust health and safety management system, including policies, procedures, and responsibilities, which encompass a range of measures aimed at identifying and mitigating potential hazards.

New social dynamics could contribute to the spread of diseases such as HIV/AIDS, as well as other social ills such as child labour, sexual exploitation, and gender-based violence. Additionally, the influx of non-locals may result in increased demand and pressure on public infrastructure, including existing roads, water supply, waste management, heating, transportation, electricity, religious facilities, and recreational and health facilities.

The operation of the Project is associated with various risks that could potentially impact public safety in the absence of the required control measures. While such impacts are unlikely to occur, they may include risks such as fires or other unplanned events.

Given the predominantly passive nature of the Solar PV and the expansive geographical scope of the location, it is improbable that such effects would extend beyond the project site. However, should these events spread beyond the project's boundaries, it may require the involvement of relevant authorities / agencies to help manage and mitigate the impacts.

5.9.1 Impact Significance, Mitigation Measures and Residual Impacts

The impacts, significance, mitigation measures, and residual impacts are summarized in the following table.

Table 5-13 Community Health, Safety and Security Mitigation & Management Measures – Construction Phase

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
Workers Influx, Community Health and Crime	**All Impacts** • Development and implementation of an Influx Management Plan which will be aligned with the Local Recruitment Plan, Security Management Plan, Gender Management Plan, Worker Code of Conduct, Local Content Plan and relevant Accommodation Management Plans. • Local communities and other stakeholders will be provided with information on how to access the GRM in accordance with the SEP. **Crime & Poaching** • The collection, harvesting or hunting of any plants or animals is strictly prohibited. A 'no tolerance' policy will be adopted. • A no-poaching, hunting or harvesting clause will be included in the workers code of conduct and if caught will be considered a dismissible offense and will be handed over to the authorities for prosecution. **Health Risks** • Development and implementation of a Community Health, Safety and Security Management Plan. • The potential for exposure to communicable diseases as a result from project activities will be avoided or minimized. **Social Risks** • All workers will be provided with the Worker Code of Conduct in a language understandable to them. • Where practical, prioritisation of the recruitment of local workforce for both skilled and unskilled positions. • Workers will be provided with mandatory cultural sensitisation training programmes regarding engagement with local communities. • The EPC Contractor will provide recreational facilities within accommodation areas to minimise the need for workers to use local community facilities. • The EPC Contractor will provide induction training to the workforce with regards to the rules within the accommodation facility and introduce the neighbourhood (including the location of closest health centre/clinic etc.) to the workforce. • The EPC Contractor will inform all workers about the Project policies on GBVH/SEA/SH, and in case any incident happens, workers will be informed which communication channel should be followed and how to report the

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	incident. • The EPC Contractor will hire workers through registered recruitment agencies in order to discourage spontaneous influx of workers. • The worker accommodation camp will include waste and wastewater disposal system (including sufficient septic tanks). • EPC Contractor will undertake campaigns and awareness training on sexually transmitted illnesses to workers and local communities, including access to testing facilities, prevention etc. (in a culturally appropriate manner). • EPC Contractor will adopt a zero-tolerance policy towards unacceptable workforce behaviour towards females or any community member. • EPC Contractor will provide regular substance abuse prevention and management programs. • During the construction phase, staff will have access to medical professionals and suitable medical facilities, which will aim to prevent the spread of diseases internally and externally. Site personnel will only be cleared for work after with a medical fitness certificate from an authorized medical centre. • Regular and sporadic site checks with regards to substance abuse will be conducted at accommodation camps whilst respecting workers' freedom of movement rights. **Traffic and Transportation** <u>Impacts on the Public Road:</u> • A Traffic & Transportation study will be conducted before the transportation of Project related material, equipment and machinery, including panels to site. This study will provide the current situation of the roads to be used and an assessment of transportation routes beginning from the supplier to project area. It will include the minimum requirements for the vehicles and the drivers. All required process for permits and traffic rules based on the travelling country. <u>Increased vehicle flow on highway:</u> • The Traffic & Transportation study will assess the requirements for upgrades to be made to highway & local road infrastructure to enable safe transportation of HGVs. • A Traffic & Transportation Management Plan will be developed by the EPC Contractor. The plan will be prepared in accordance with IFC General EHS Guideline, outline how Project equipment and materials will be delivered to the site and outline how construction traffic will be managed to limit impacts upon communities, farmers, project

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	personnel, and other road users. • The plan will include information on the designated access routes, speed limits, waiting, parking areas and map out accident and traffic hotspots for access vehicles etc. <u>Safety of Residents of Nearby Communities and Road Users:</u> • GPS monitoring will be embedded in Project vehicles. • Speed limits will be strictly enforced by the Security and HSE teams. • Consumption of alcohol and drugs on site will be strictly prohibited. • Smoking will be allowed in designated areas on site • Design road construction and surface quality to accommodate the vehicles, machinery, and equipment in use. • Provide appropriate lighting for roads and pedestrian walkways to ensure good visibility. • Install physical barriers between walkways and traffic routes to segregate pedestrians from vehicles as much as possible. • Display suitable warning signs to inform pedestrians of any risks. • Assign responsible persons to manage pedestrians when vehicles need to cross walkways. • Locate offices, welfare facilities, and areas of frequent pedestrian activity away from primary site traffic routes. • Provide appropriate protection and signalling for overhead cables near traffic routes. Consult with the EPC Contractor E&S Manager or electrical engineer if necessary before operating equipment in the vicinity of overhead power lines. • Ensure protection is provided to permanent or temporary structures, such as scaffolds, that could be damaged by vehicle impacts. • Properly barricade open trenches and excavated pits with warning signs in the project's designated languages. Install barriers at appropriate intervals using suitable materials. • Use banksmen and flaggers onsite as required for traffic activities. • Install directional signage in consultation with the Local Road Traffic Authority to direct construction traffic and warn other motorists. • Establish traffic management controls in consultation with relevant stakeholders. • Ensure compliance with regulatory and legislative requirements for traffic management controls.

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	• All vehicles will be inspected monthly. **Local Economy** • Where possible, the Project Company and EPC Contractor will ensure an appropriate mix of locally and non-locally procured goods to allow local project benefits while reducing the risk of crowding and price hikes for local consumers. • The Project will manage expectations with regards to purchasing of goods and services from local businesses. The Project commitments on local content for provision of good and service will help to ensure the opportunities and benefits are feasible. • Special consideration will be provided for female-headed households in employment and delivery of other services to the Project. • The EPC Contractor will provide project workforce (expatriate & migrants) with awareness training on including income/finance management.

Risks of Retaliation	• Measures in line with the IFC Good Practice Note for The Private Sector: Addressing the Risks of Retaliation Against Project Stakeholders will be incorporated into the Project grievance mechanism, into E&S training and into the ESMP to allow safe avenues and reporting channels for stakeholders, including local communities and the Project workforce. These include:
	  • Making a commitment to zero tolerance of forms of retaliation
	  • Identifying, assessing and monitoring reprisal risk factors such as Restricted civil society activity in the country, challenges to freedom of press etc.
	  • Raising awareness and building staff capacity on reprisal risk, this is particularly important since staff have direct and ongoing engagement with project stakeholders
	  • Communicating and engaging with stakeholders on zero-tolerance commitment
	  • Adopting an open, transparent, and inclusive approach with stakeholders
	  • Addressing risks to participants during consultation processes
	  • Enhancing consultations with project stakeholders where reprisal risks are significant
	  • Accounting for retaliation risks in the project grievance mechanism
	  • Having protocols for incident response and proactive resolution in place
	  • Protecting the confidentiality of complainant identity and information

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	• Ensure meetings with communities and state authorities are conducted separately. No private or official security forces shall be present in community or NGO meetings. For any potential safety concerns raised by the community or NGO members, the Project Company will assess these concerns in advance to devise alternative engagement avenues in order to minimise these risks. • Ensure there is an anonymous grievance reporting channel for those who would like to remain in anonymity. This channel should have password protection protocols in place accessed by only designated personnel. • Project Company to always keep confidentiality of the information provided by community members and not to share anything without their written consent provided. EU GDPR guidelines to be followed. • Right to privacy shall be respected and all personal data, confidential feedback should be managed in line with the Project's Human Rights Policy, international requirements of the Lenders.
Public/Community Safety	• The EPC Contractor will prepare and implement a Community Health & Safety Management Plan which will include measures to avoid or limit risks to, and impacts on health, safety and security of the community during the construction phase of the Project. • The employees (including the drivers) during the construction phase will undergo a Code of Conduct training to ensure smooth coordination with the neighbouring community. • Risks to public safety will be appropriately addressed and prepared for in the construction phase 'Emergency Preparedness and Response Plan' and training. The plan will include the appropriate procedure to respond to any such incidents, as well as site specific contact details and details of external agencies who may be required. • Project induction training will include a section on code of conduct when engaging with local community members. This will include an overview of culturally appropriate measures and etiquette to bear in mind. • IProject construction area will be cordoned off during the construction phase with a perimeter fence. • The Project will be fenced during early/ enabling works stage. • Smoking will be prohibited at chemical, fuel storage and flammable material storage areas. • Appropriate mechanisms for emergency control (e.g. well-equipped firefighting equipment) will be placed at suitable positions around the site.
Public/Community Security	• The Project Company will employ its own security staff who will provide 24/7 security control across the Project site and dedicated security staff at gatehouses. • The EPC Contractor will prepare a "Security & Human Rights Management Plan" consistent with its Security Risk

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	Assessment. • Security arrangements should be guided by UN Code of Conduct for Law Enforcement officials, UN Basic Principles on the Use of Force and the Voluntary Principles on Security and Human Rights. • The site-based security will likely not be armed, but this will be based on a security risk assessment. • Security guards will be equipped with a utility belt which will include a short baton (for protection), radio, torch, water and minimal first aid and utility pouch. • All security guards will be provided with a standard uniform (including a name identification tag) as well as suitable safety footwear to undertake their responsibilities. • All security guards will be provided with a properly shaded rest area that is able to provide shelter from sun, wind, and rain. Such facilities will be adequately cooled or heated depending on environmental conditions and will be equipped at a minimum with the following: (i) tables, (ii) chairs, • All vehicles entering the site will require pre-approved clearance and will need to be registered. Project security will record all instances of incoming vehicles. • CCTV will be installed at key locations around the site and at gatehouses. • Appropriate lighting will be provided at gatehouses for security personnel to prevent unauthorised access and during the construction activities during night shifts (if any). • Project personnel will only be provided access to the construction site with valid ID cards and permits to work in line with HSE requirements. • People trying to gain unauthorised access to the site without appropriate permits and PPE will not be permitted or will be removed from site if identified and an investigation carried out on how they were able to access the site and corrective action taken. • EPC Contractor will record all security incidents on the Project. • The security personnel will be regularly trained on human rights and GBVH/SEA/SH code of conduct including how to handle grievances related to GBVH/SEA/SH from the community. • Trespassing on neighbouring properties (by workers) will be prohibited and the appropriate disciplinary action will be taken in the event of transgression.

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
Impacts on vulnerable communities/ groups	• Prioritisation of vulnerable groups in construction phase job opportunities. • Consultations and project information will be provided in areas that are easily accessible to vulnerable groups. • Timing of consultation meetings will consider the time these groups are available. • The Project Company and EPC Contractor will provide alternative means of communication and access to information for those without access to digital platforms. • Information will be provided and disclosed in local language • EPC Contractor will adopt a zero-tolerance policy towards unacceptable workforce behaviour towards any community members including vulnerable groups. • The Project Company and EPC Contractor will disclose their zero-tolerance policy on retaliation and GBVH against affected people and will ensure these are implemented carefully with a specific focus on vulnerable groups.
Vulnerable Groups – GBVH, SEA & SH	• Project Company will develop a GBVH reporting procedure and train its Project staff, EPC Contractor and the sub-contractors. • Project Company and EPC Contractor will assign and train focal point staff to deal with GBVH related incidents. • Training and awareness campaigns will be undertaken to raise awareness of both project personnel and community members including women on GBVH issues. Information will also be provided on how to report and deal with any GBVH/SEA/SH related cases and the services that will be made available to offer support to any of the victims. • The Project Company and the EPC Contractor will conduct a GBVH/SEA/SH risk assessment in consultation with relevant stakeholders including women leaders and those working with young adolescent girls and boys. This will also include the identification of potential interventions and risk mitigation measures. • The EPC Contractor will develop and implement a Project specific Gender Management Plan detailing the list of unacceptable behaviour among workers, provisions for reporting, sanctions for perpetrators and available resources & support systems for the victims in accordance with lenders and Namibia requirements. • Awareness training will be mandatory for all Project workers regarding the GBVH/SE/SH risks and the workers responsibilities and the legal consequences of being a perpetrator. • Approach towards GBVH/SEA/SH prevention, mitigation and response will be survivor-centred and ensure confidentiality, dignity and respect to them. • The Project staff will be trained on how to preserve the safety of the women, girls, boys when interviewing them and

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	collecting information about their experiences on GBVH/SEA/SH. • The project will provide essential services for survivors such as access to counselling services, support groups, legal support etc. at no cost to them. • All determined cases of GBVH/SEA/SH will be referred to relevant legal entities in the Project area for further investigation and prosecution. • The Project grievance mechanism will be made available to project workers and community members and will ensure that survivors' information is confidential and kept anonymous. • All cases relating to GBVH/SEA/SH will be documented and closed with a satisfied solution. • The EPC Contractor will prepare and implement a Gender Management Plan which will put necessary protocols and mechanisms to address the risks of GBVH/SEA/SH and how to address any allegations that may arise in accordance with the World Bank Good Practice Note on Addressing SEA/SH in Investment Project Financing involving Major Civil Works (February 2020).
Grievance Mechanism	• The project will implement an appropriate system to allow external parties to raise grievances in regard to the Project. • The Grievance Mechanism will be clearly defined, transparent and accessible to identified stakeholders. • EPC Contractor will appoint a community liaison officer preferably from the local community who will maintain communication with the local leaders and community members. • A second line of confidential reporting shall be made available for sensitive topics including GBVH, retaliation, harassment separate from the project complaint mechanism.
Human Rights Policy	In addition to adhering to the national human rights requirements, a project-specific human rights policy will be developed. The policy will be in line with the UN Guiding Principles on Business and Human Rights. The statement policy will underscore the definition and prohibition of various forms of forced labour, child labour, GBVH, and human trafficking. Practices constituting forced labour (e.g., deceptive recruitment, confiscation of personal belongings, withholding of accrued pay and illegitimate overtime requirements) will be strictly proscribed. The Human Rights policy will: • Be aligned with the requirements of National Human Rights Policy and its associated policies and documents; • Be approved at the most senior level of the Project Company / EPC Contractor. • Informed by relevant internal and external expertise.

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	• Stipulate the human rights expectations of personnel, sub-contractors and other suppliers directly linked to the construction of the Project. • Be publicly available and communicated internally and to the relevant stakeholders. • Be reflected in the other policies and procedures to embed it throughout their construction phase activities.

Table 5-14 Community Health, Safety and Security Mitigation & Management Measures – Operational Phase

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
Public/Community Safety	• All risks to public safety will be appropriately addressed and prepared for in the operational phase 'Emergency Preparedness and Response Plan' and training. • The plan will include the appropriate procedure to respond to any such incidents, as well as site specific contact details and details of external agencies who may be required. • During the operational phase, employees will undergo a Code of Conduct training to ensure smooth coordination with the neighboring community. • Appropriate mechanisms for emergency control (e.g. firefighting equipment) will be placed at suitable positions around the site. • Sexual harassment or violence in and out of the Project site will not be tolerated and the O&M Company will work with local community leaders and government officials to ensure that any complaints are addressed in accordance with the law. • O&M Company will provide advice training/inductions on exposure to disease including preventative measures.
Crime & Poaching	• The collection, harvesting or hunting of any plants or animals is strictly prohibited. A 'no tolerance' policy will be adopted. • A no-poaching, hunting or harvesting clause will be included in the workers code of conduct and if caught will be considered a dismissible offense and will be handed over to the authorities for prosecution.

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
Risks of Retaliation	• Refer to the mitigation measures as outlined in the construction phase impact assessment for this impact.
Public/Community Security	• The Project Company will employ its own security staff who will provide 24/7 security control across the Project site and dedicated security staff at gatehouses. • The O&M Company will prepare a "Security and Human Rights Management Plan" consistent with its Security Risk Assessment. • Security arrangements will be guided by UN Code of Conduct for Law Enforcement officials, UN Basic Principles on the Use of Force and the Voluntary Principles on Security and Human Rights. • The site-based security will likely not be armed, but this will be based on a security risk assessment. • Security guards will be equipped with a utility belt which will include a short baton (for protection), radio, torch, water and minimal first aid and utility pouch. • All security guards will be provided with a standard uniform (including a name identification tag) as well as suitable safety footwear to undertake their responsibilities. • All security guards will be provided with a properly shaded rest area that is able to provide shelter from sun, wind, and rain. Such facilities will be adequately cooled or heated depending on environmental conditions and will be equipped at a minimum with the following: (i) tables, (ii) chairs, (iii) devices for boiling water; (iv) devices for heating food. • All vehicles entering the site will require pre-approved clearance and will need to be registered. Project security will record all instances of incoming vehicles. • CCTV will be installed at key locations around the site and at gatehouses. • Appropriate lighting will be provided at gatehouses for security personnel to prevent unauthorised access and during the construction activities during night shifts (if any). • Project personnel will only be provided access to the construction site with valid ID cards and permits to work in line with HSE requirements. • People trying to gain unauthorised access to the site without appropriate permits and PPE will not be permitted or will be removed from site if identified and an investigation carried out on how they were able to access the site and corrective action taken. • The O&M Company will record all security incidents on the Project.

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	• The security personnel will be regularly trained on human rights and GBVH/SEA/SH code of conduct including how to handle grievances related to GBVH/SEA/SH from the community. • Trespassing on neighbouring properties (by workers) will be prohibited and the appropriate disciplinary action will be taken in the event of transgression.
GBVH, SEA and SH	• The Project Company and the O&M Company will conduct a GBVH/SEA/SH risk assessment in consultation with relevant stakeholders including women leaders and those working with young adolescent girls and boys. This will also include the identification of potential interventions and risk mitigation measures. • The O&M Company will prepare and implement a GBVH/SEA & SH Prevention and Response Action Plan which will put necessary protocols and mechanisms to address the risks of SEA/SH and how to address any allegations that may arise in accordance with the World Bank Good Practice Note on Addressing SEA/SH in Investment Project Financing involving Major Civil Works[4]. • Awareness training will be mandatory for all Project workers regarding the GBVH/SEA/SH risks and the workers responsibilities and the legal consequences of being a perpetrator. • Training will be provided to GBVH focal point on the risks of GBVH/SEA/SH and information provided on how to deal with any GBVH/SEA/SH related cases. • The O&M Company will communicate the Gender Management Plan with community members and training will provide to the community members on the risks of GBVH/SEA/SH. Information will be provided on how to report and deal with any GBVH/SEA/SH related cases and the services that will be made available to offer support to any of the victims. • Approach towards GBVH/SEA/SH prevention, mitigation and response will be survivor centered and ensure confidentiality, dignity and respect to them. • The Project staff will be trained on how to preserve the safety of the people when interviewing them and collecting information about their experiences on GBVH/SEA/SH. • The Project will provide essential services for survivors such as access to counselling services, support groups, legal support etc. at no cost to them. • All determined cases of GBVH/SEA/SH will be referred to relevant legal entities in the Project area for further

[4] Good practice Note on Addressing Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) in Investment Project Financing involving Major Civil Works (Second Edition, The World Bank)

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	investigation and prosecution. • The project grievance mechanism will be made available to project workers and community members and will ensure that survivors' information is confidential and kept anonymous. • All cases relating to GBVH/SEA/SH will be documented and closed. • The O&M Company will develop and implement a Project specific Gender Management Plan. This Plan will detail the list of unacceptable behaviour among workers, provisions for reporting, sanctions for perpetrators and available resources & support systems for the victims in accordance with Lender requirements.
Grievance Mechanism	• The O&M Company will implement an appropriate system to allow external parties to raise grievances about the Project. • The Grievance Mechanism will be clearly defined, transparent and accessible to identified stakeholders. • The grievance mechanism will be confidential and provide referral and support system for any workers reporting cases of GBVH.
Human Rights Policy	• In addition to adhering to the national human rights requirements, the O&M Company will develop a human rights policy. The policy will be in line with the UN Guiding Principles on Business and Human Rights[5] and it will: • Be approved at the most senior level of the O&M Company. • Informed by relevant internal and external expertise. • Stipulate the O&M Company's human rights expectations of personnel, and suppliers directly linked to the operational phase of the project. • Be publicly available and communicated internally and to the relevant stakeholders. • Be reflected in the other policies and procedures to embed it throughout the operational phase activities.

[5] UNHR Guiding Principles on Business and Human Rights, 2021

5.9.2 Monitoring Requirements

Table 5-15 Community Health, Safety and Security Monitoring Measures

INDICATOR	SOURCE OF INFORMATION	FREQUENCY CONSTRUCTION /OPERATION
Security incidences at the project site	Security/HSE personnel	Ongoing
SEA/SH grievances, including time taken to handle grievance	Number of grievances handled and how many cases are referred to legal entities for redress.	Ongoing
Number of influx related grievances received	Grievance Management System	Quarterly / bi-yearly
Number of grievances closed out, average time for grievance processing and close out and trends, grievance topics	Grievance Management System	Quarterly / bi-yearly
Record of any conflict between community members since project inception and influx (related to the Project or project parties). Including any cases relating to employment, sexual harassment.	Complaints filed by community members or Project workers and number of worker sensitization and awareness campaigns undertaken.	Ongoing
Record of any communicable diseases on site that could pose a risk to the local communities	Project site clinic and HSE personnel	Ongoing

5.10 Labour and Working Conditions

It is critical that workers are treated fairly, work in safe environments, and are protected from exploitative practices. Labour Act No. 11 of 2007 regulates employment relations in Namibia, including terms and conditions of employment, occupational health and safety, and protection of workers' rights. The Act aims to promote fair labour practices, decent work, and social protection for workers. The EPC Contractor will compile labour management frameworks in line with lender standards and the National Labour Act of 2007.

The EPC Contractor will provide accommodation facilities to the Project workforce, and it is noted that there will be requirements for workers to be accommodated in alignment with the benchmarks outlined in the IFC & EBRD Workers Accommodation: Processes & Standards (2009).

To guarantee workers' health and safety, the project has incorporated a robust health and safety management system,

To guarantee sustainable working conditions, the project will adhere to International Labour Organization (ILO) and national labour policies incorporating a range of measures aimed at identifying and mitigating potential risks of exploitation, child labour, forced labour, or discrimination in hiring practices.

5.10.1 Impact Significance, Mitigation Measures and Residual Impacts

To create a positive work environment that supports both the economic development goals of the project and the well-being of the workers, the mitigations measure to be implemented are provided in the following table.

Table 5-16 Labour and Working Conditions Mitigation & Management Measures – Construction

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
All Impacts	• The Project Company and EPC Contractor will ensure that the following plans/policies are prepared and implemented. • Occupational Health and Safety Plan (Construction Phase) • Emergency Preparedness and Response Plan • Labour and Working Conditions Management Plan • Human Resource Policies & Procedures • Worker Accommodation Management Plan • Worker's Grievance Mechanism Procedure • Hazardous Material and Waste Management Plan • Security & Human Rights Management Plan • Gender Management Plan • Worker Code of Conduct
Occupational Health and Safety	• Workers will be provided with a safe and healthy work environment, taking into account inherent risks and specific classes of hazards associated with the project. • PPE will be provided to all workers and workers will be required to use the PPE in a proper and timely manner. Training will be provided on site related risks and importance of PPE. • The EPC Contractor will implement and maintain an OHS management system taking into account specific risks associated with the project. • The EPC Contractor will provide the occupational health and safety training to all workers including refresher training. • The EPC Contractor will be responsible for ensuring that all affiliated sub-contractors comply with the OHS management system. The OHS management system will be in-line with recognised international good practice and as a minimum, this plan will include: • Means of identifying and minimising, so far as reasonably practicable, the causes of potential H&S hazards to workers. • Provision of preventive and protective measures, including modification, substitution, or elimination of hazardous

Potential Impact	Mitigation and Management Measures
	conditions or substances. • Provision of appropriate equipment to minimise risks and requiring and enforcing its use. • Training of workers, and provision of appropriate incentives for them to use and comply with H&S procedures and protective equipment. • Documentation and reporting of occupational accidents, diseases and incidents. • Emergency prevention, preparedness and response arrangements • The EPC Contractor will conduct regular (planned and unplanned) inspections of their sub-contractors to ensure project activities are in line with occupational health and safety requirements.
Forced Labour	• The Project Company and EPC Contractor will develop a Project-specific Human Rights/ Forced Labour policy statement (that may be incorporated into an overarching HR/E&S Policy). The statement will underscore the definition and prohibition of various forms of forced labour and human trafficking. Practices constituting forced labour (e.g. deceptive recruitment, confiscation of personal belongings, withholding of accrued pay and illegitimate overtime requirements) will be strictly proscribed. • The Project Company and EPC Contractor will implement a zero-tolerance policy for forced labour incidents. • The Project Company and EPC Contractor will not employ forced labour, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements. • The EPC Contractor will ensure that its Human Resources Department follows the Recruitment Plan and related procedures for the employment of project workers on fair, voluntary and mutually agreed employment terms. • The EPC Contractor will only engage recruitment agencies that have demonstrable processes in place to avoid child or forced labour. • The EPC Contractor will undertake periodic labour management inspections and audits of its sub-contractors. Where direct observations, audited records or third-party reports raise reasonable doubt as to the presence of forced labour within the EPC Contractor's sub-contracted workforce, the EPC Contractor will perform a dedicated audit to identify non-compliance. if any non-compliance is found, immediate remedial action will be taken, and a close-out report will be submitted to the EPC Contractor.
Lack of Worker Representation &	• Human Resource Policies will include the ability of workers to join a Trade Union; as well as ensure collective

Potential Impact	Mitigation and Management Measures
Restrictions on Trade Unions	bargaining rights of workers. • Trade unions will be permitted to function freely subject only to limitations that are in line with the Namibian Labour Code and the International Human Right standards.
Compulsory Overtime, Excessive Hours & Job Security	• The EPC Contractor will document and communicate to all workers their working conditions and terms of employment including their entitlement to wages, hours of work, overtime arrangements and overtime compensation, and any benefits (such as leave for illness, maternity/paternity, or holiday). • The workers will be informed and understand the nature of their contracts, duration, wages, benefits, leave days and other conditions of work offered will, overall, be comparable to those offered by equivalent employers in the relevant region of that country/region and sector concerned. • The wages paid to all the workers (skilled and unskilled) will be enough to guarantee a living wage for all the workers (i.e. adequate food, clothing and housing). • Workers will be provided equal remuneration for work of equal value. • Workers will receive their pay on time and in full for ordinary and overtime hours, as well as paid leave. • Wages will be paid regularly based on the agreed pay-day and adequate notice provided where exceptional circumstances necessitate change in the regular pay day. • Where required, workers will be provided with the option of flexible work schedule in order to manage personal obligations while adequately fulfilling their employment duties.

Provision of Inadequate Accommodation Facilities/Places	• Worker accommodation areas will be managed in accordance with the IFC Workers' Accommodation: Processes and Standards.
	• A Worker Accommodation Plan will be developed and implemented by EPC Contractor.
	• During the time workers spend in the workers' accommodation, project workers should encourage to enjoy their fundamental human rights and freedom of association in particular. Workers' accommodation arrangements should not restrict workers' rights and freedoms.
	• Housing standards should include special attention to following (but limited):
	• minimum space allocated per person (floor area; cubic volume; or size and number of rooms)
	  ◦ supply of safe water in the workers' dwelling in such quantities as to provide for all personal and household uses
	  ◦ adequate sewage and garbage disposal systems appropriate protection against heat, cold, damp, noise,

Potential Impact	Mitigation and Management Measures
	fire, and disease-carrying animals, and, in particular, insects • adequate sanitary and washing facilities, ventilation, cooking and storage facilities and natural and artificial lighting • a minimum degree of privacy both between individual persons against undue disturbance by external factors • Where accommodations are provided for single workers or workers separated from their families, additional housing standards should be considered: • a separate bed for each worker • separate gender accommodation • adequate sanitary conveniences • common dining rooms, canteens, rest and recreation rooms and health facilities, where not otherwise available in the community. • The EPC Contractor will audit their and the sub-contractors' welfare conditions (including standards of apartments/accommodation, recruitment practices, gender risks related practices, sanitary and hygienic conditions, canteen area etc.) of the Project to ensure that project requirement are in place.
Gender Risk - Gender Based Violence and Harassment	• The workers will be provided with information regarding worker code of conduct in local languages as part of their employment contract which will include provisions for reporting, investigations, termination and disciplinary action against those who perpetrate gender violence and harassment. • Project Company will develop a "GBVH policy" (or it can be part of the overarching E&S Policy) and disclose it to the EPC Contractor and its employees. • The EPC Contractor will develop and implement a Project specific GBVH Policy, or agree to align with the Project Company policy. • The EPC Contractor will conduct mandatory regular training and awareness raising for the workforce about gender-based violence and harassment towards local community members and their colleagues especially women and the availability of a grievance mechanism to report any GBVH/SEA/SH cases. • Training will be provided to GBVH focal point on the risks of GBVH/SEA/SH and information provided on how to deal with any GBVH/SEA/SH related cases. • The workers will be made aware of the laws and regulations that make sexual harassment and gender-based

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	violence a punishable offence which is prosecuted. • Ensure inclusion of a balanced representation of women on the health, safety and environmental team who will be easily relatable and approachable to female workers. • The Project personnel in charge of receiving GBVH/SEA/SH grievances will be provided with appropriate training on how to handle complaints. It is recommended that the personnel including training staff are trained in coordination with any GBVH organisations working in the Project area where available. • Female workers will be included in the grievance redress committee to help female workers and host community female members raise their grievances. • The Project Company and EPC Contractor will work to identify a suitable labour pool locally in order to minimize the need for bringing large number of workers from other regions or countries. This could also help the EPC Contractor in cutting cost associated with provision of accommodation facilities if the majority of the workers are sourced locally. • Provision of opportunities for the workers to regularly return to their families who may be located far from the Project site. • The Project Company and EPC Contractor will provide opportunities for workers to have access to entertainment opportunities • The Project Company and EPC Contractor will allow submission and investigation of anonymous sexual harassment complaints by workers and host community members and protect the confidentiality of the complainants. • The Project Company and EPC Contractor will work in close coordination with the local authorities in investigating any complaints relating to gender violence and harassment in the host communities where it relates to Project workers.
Gender Risk - GBVH/SEA/SH in Accommodation Facilities	• The Project Company and EPC Contractor will provide safe, secure and separate accommodation facilities/housing and sanitary facilities for the male and female workers (lockable sanitary facilities will be

Potential Impact	Mitigation and Management Measures
	mandatory for women). • Worker accommodation areas will be managed in accordance with the IFC Workers' Accommodation: Processes and Standards6.
Gender Risk - Wage discrimination based on Gender	• The Project Company and EPC Contractor to provide access to recruitment opportunities for women based on their qualifications. • The Project Company and EPC Contractor will implement an equal wage policy for women employees, and this policy will regularly be monitored. • Women will be provided equal remuneration as their male counterparts for work of equal value.
Gender Risk- Discrimination based on employment benefits & Guarantees	• The EPC Contractor will include the benefits and guarantees for both men and women in the HR policy with a clear commitment to non-discrimination during the recruitment process. • EPC Contractor to improve employment opportunities by developing guidelines to ensure that discrimination against women on the basis of their marital or reproductive status is avoided. • The EPC Contractor will implement a zero-tolerance process for discrimination against women.
Grievance Mechanism	• All project workers will have access to a grievance mechanism in accordance with the Project SEP in order to make any complaints during the construction phase. • The Project Company and EPC Contractor will develop and implement a project-specific Workers' Grievance Management Procedure. • In accordance with the Project SEP, all grievances will be recorded in a form of register. • All grievances will be investigated and close-out in a timely manner. • Female workers will be included in the grievance redress committee to help female workers and host community female members raise their grievances. • A second line of confidential reporting shall be made available for sensitive topics including GBVH, retaliation, harassment separate from the project complaint mechanism.
Human Rights Policy	• In addition to adhering to the national human rights requirements, EPC Contractor will develop a human rights policy. The policy will be in line with the UN Guiding Principles on Business and Human Rights and will:

6 Workers' accommodation: process and standard (A guidance note by IFC and EBRD)

Potential Impact	Mitigation and Management Measures
	• Be approved at the most senior level of the company. • Informed by relevant internal and external expertise. • Stipulate the EPC's human rights expectations of personnel, local communities, sub-contractors and other suppliers directly linked to the construction of the project. • Be publicly available and communicated internally and to the relevant stakeholders. • Be reflected in the other policies and procedures to embed it throughout their construction phase activities.

Table 5-17 Workers' Condition & Occupational Health and Safety Mitigation Measures – Operational Phase

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
All Impacts	The Project Company & O&M Company will ensure that the following plans/procedures/policies are prepared and implemented: • Occupational Health and Safety Plan • Emergency Preparedness and Response Plan • Stakeholder Engagement Plan (including implementation of the Grievance Mechanism) (*Note: Being prepared in parallel to ESIA stage for the Project, to be implemented by the Project Company, EPC Contractor and O&M Company)* • Operational Labour Code of Conduct • Grievance Mechanism Procedure • Human Resources Policies & Procedures (including recruitment matters) • Inspection, Audit Plan and Procedure (including health & safety & security, labour inspections, forced labour, child labour, recruitments process, gender risks related practices, • Hazardous Material and Waste Management Plan • Security & Human Rights Management Plan • Gender Management Plan
Occupational Health and Safety	• Workers will be provided with a safe and healthy work environment, taking into account inherent risks and specific classes of hazards associated with the project. • The O&M Company will implement and maintain an OHS management system specific to the operational phase taking into account specific risks associated with the project, legal requirements and duty of care. • Personnel Protective Equipment (PPE) and chemical-resistant clothing (to avoid exposure of skin or eyes to corrosive and/or polluted solids, liquids, gases or vapours) will be provided to all workers and ensure the workers are using proper and timely manner. • The O&M Company will ensure that adequately rated equipment such as hoisting/lifting equipment, tool bags and power tools are given to O&M personnel. • The O&M Company will be responsible for ensuring that all affiliated sub-contractors comply with the OHS

Potential Impact	Mitigation and Management Measures
	management system. The OHS management system will be in-line with recognised international best practice and as a minimum, this plan will include: • Means of identifying and minimising, so far as reasonably practicable, the causes of potential H&S hazards to workers. • Provision of preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances. • Provision of appropriate equipment to minimise risks, and requiring and enforcing its use. • Training of workers, and provision of appropriate incentives for them to use and comply with H&S procedures and protective equipment. • Documentation and reporting of occupational accidents, diseases and incidents. • Emergency prevention, preparedness and response measures
Forced Labour	• The O&M Company will not employ forced labour, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements. • The O&M Company will not make employment decisions on the basis of personal characteristics, such as gender, race, nationality, ethnic origin, religion or belief, disability, age or sexual orientation, unrelated to inherent job requirements. • Employment relationship will be on the principle of equal opportunity and fair treatment and will not discriminate with respect to any aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment including provisions for maternity/paternity leave, accommodation, access to training, promotion, termination of employment or retirement, and discipline.
Child Labour	• The O&M Company will develop a "Child Labour Policy" (or policy statement) (that may be incorporated into an overarching HR/E&S Policy. The Policy will underscore the definition and prohibition of child labour and hazardous child labour, taking into account both national regulations and binding international standards (e.g., standards of the IFC, ILO and UNHCHR). • The O&M Company will implement a zero-tolerance policy for child labour incidents. • The O&M Company will comply with all relevant national laws, lenders requirements and ILO provisions related

Potential Impact	Mitigation and Management Measures
	to the employment of minors. • The Project Company will conduct periodic labour audits of the O&M Company.
Wages, working hours, right to rest, benefits, and retrenchment	• Wages, benefits, leave days and other conditions of work offered will, overall, be comparable to those offered by equivalent employers in the relevant region of that country/region and sector concerned. The wages to all the workers including to any unskilled workers will be enough to constitute for a living wage.
Gender Risk- Gender Based Violence and Harassment	• The operational workers will be provided with information regarding worker code of conduct in local languages as part of their employment contract which will include provisions for reporting GBVH (either in person or anonymously), investigation procedure, termination and disciplinary action against those who perpetrate gender violence and harassment. • The O&M Company will develop and implement a Project specific GBVH Policy statement detailing the list of unacceptable behaviour among workers, provisions for reporting, sanctions for perpetrators and available resources & support systems for the victims in accordance with lenders and national requirements. • The O&M Company will conduct mandatory regular training and awareness raising for the workforce about gender-based violence and harassment towards local community members and colleagues. • The workers will be made aware of the laws and regulations that make sexual harassment and gender-based violence a punishable offence which is prosecuted. • The O&M Company will allow submission and investigation of anonymous sexual harassment complaints by workers and host community members and protect the confidentiality of the complainants. • The O&M Company will work in close coordination with the local authorities in investigating any complaints relating to gender violence and harassment in the host communities where it relates to Project workers. • The O&M's HR policy will include GBVH policy statement applicable to all employees and sub-contractors.
Grievance Mechanism	• The O&M Company will develop and implement a project-specific Operator Workers' Grievance Management Procedure. • Operator workers will be provided with access to the grievance mechanism in line with the project specific SEP. • In accordance with the Project SEP, all grievances will be recorded in a form of register. • All grievances will be investigated and close-out in a timely manner. • A second line of confidential reporting shall be made available for sensitive topics including GBVH, retaliation, harassment separate from the project complaint mechanism.

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES

Human Rights Policy	• In addition to adhering to the national human rights requirements, the Project Company / the O&M Company will develop a human rights policy. The policy will be in line with the UN Guiding Principles on Business and Human Rights and will be:
	  ◦ Be approved at the most senior level of the company.
	  ◦ Informed by relevant internal and external expertise.
	  ◦ Stipulate the O&M's human rights expectations of personnel, local communities and other suppliers directly linked to the operational phase of the Project.
	  ◦ Be publicly available and communicated internally and to the relevant stakeholders.
	  ◦ Be reflected in the other policies and procedures to embed it throughout the operational phase activities.

5.10.2 Monitoring Requirement

Table 5-18 Labour and Working Conditions Key Monitoring indicators

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATIONS
Construction & Operations			
Worker Contracts & HR	Records of contracts, payments, receipt of benefits, leave entitlements, retrenchment etc.	On-going	For all Project workers (direct staff) and oversight of sub-contractor staff dedicated to the project
Women employed in the Project	Number of women employed in the project including their rank and renumeration compared to men occupying the same positions.	On-going	For all female Project personnel including those employed by the sub-contractors.
Worker Welfare	Sanitation Facilities, Office Spaces, Welfare and Rest Areas	On-going	At all such facilities on-site
Labour and Living Conditions	Inspection/internal audit of worker accommodation facilities vs. IFC & EBRD standards	Monthly	All accommodation facilities provided to direct and full time sub-contracted labour.

6 CONCLUSIONS AND RECOMMENDATIONS

The ESIA prepared for the proposed Solar PV Site, consisted of the following project components:

- 3 GW Solar PV panel array
- Construction / upgrade of new and existing access roads and associated servitude(s)
- Approximately 110 km OHTL to the green hydrogen and ammonia plant and the associated servitude(s)
- Substation and transformers
- Battery Energy Storage System (BESS)

The project ESIA has successfully identified, assessed, and addressed the potential environmental and social impacts associated with the proposed development. The comprehensive studies conducted during the ESIA phase, including assessments of air quality, noise and vibration, soils, surface water and groundwater, terrestrial ecology and avifauna, landscape and visual, waste and wastewater, heritage and archaeology, socio-economic, community health, safety and security, and labour and working conditions impacts, have provided a comprehensive scope of the receiving environment and further informed the environmental and socio-economic impacts and benefits of the project. It is deduced that the benefits of the proposed development outweigh the minimal impacts pre-identified. The project's proximity to the Gaingu Conservancy land and the Namib Naukluft Park has been accounted for, and measures have been proposed to mitigate any impacts on biodiversity and local communities in line with the mitigation hierarchy. These are summarised in this ESMP.

The proposed mitigation strategies have been identified and will be implemented in the applicable phases of project development, via the implementation of this ESMP, to ensure minimal environmental degradation and social disturbance by fostering sustainable development in the Erongo region and the broader national economy, while minimizing impacts on the environment.

6.1.1 Recommendations

To ensure that the project results in minimal environmental and social impacts, it is recommended that the below outlined measures are implement as follows:

- Implement the monitoring of environmental indicators (such as noise and ecological chance find) as outlined within the ESIA and this ESMP throughout the project's lifecycle and undertake phased environmental audits and reporting to monitor the effectiveness of mitigation measures.
- Engage with local communities to ensure their concerns are addressed, particularly regarding health, safety, and social dynamics.
- Implement a strict waste management protocol for solid, liquid and hazardous waste. Ensure that all waste is properly segregated, stored, and disposed of in compliance with national and international environmental standards. This includes managing wastewater through approved septic tanks and hazardous waste through appropriate landfills.
- Given the potential increase in traffic due to the influx of workers, implement a traffic management plan to avoid congestion and ensure smooth access for residents.
- All employees, contractors, and stakeholders should undergo phased training on environmental and social responsibility, to ensure full compliance with the ESIA and the ESMP. It is suggested that training is to be undertaken prior to starting work, then timeously phased throughout project development phases.
- Maintain close collaboration with local authorities, environmental compliance officers, and relevant agencies to ensure the effective implementation of the ESMP and to address any unforeseen issues.

6.1.2 Regulator Recommendations

Based on the findings of the ESIA and the developed mitigation measures, as detailed in this ESMP, it is recommended that the approving authority issue the Environmental Clearance Certificate (ECC) for the project. Moreover, the approving authority is advised to conduct periodic environmental inspections throughout the project's lifecycle to ensure ongoing compliance with the conditions outlined in the ECC, monitor the effectiveness of mitigation measures, and support the long-term environmental sustainability of the project. Furthermore, periodic oversight will help identify any emerging issues early, enabling timely corrective actions to be taken and ensuring that the project continues to meet regulatory standards and best practices for environmental protection.

7 REFERENCES

BirdLife. 2011. Meeting Europe's Renewable Energy Targets in Harmony with Nature

Climate Change Knowledge Portal. Country Profile. Namibia

Erongo Regional Council, 2015. Constituencies. [online] Available at: https://www.erc.com.na/maps/constituencies/ [Accessed 3 January 2025].

Erongo District Council, 2022. Erongo Regional Profile. [online] https://projekt-firmengruppe.de/uploads/media/Erongo_Reg_Profile.pdf [Accessed 3 January 2025].

Freedom House, 2024. Freedom in the World 2024: Namibia. [online]. https://freedomhouse.org/country/namibia/freedom-world/2024 [Accessed 30 January 2025].

Hathcock, C. 2018. Literature review on impacts to avian species from solar energy collection and suggested mitigations

https://ebird.org/home accessed 16 January 2024

https://www.iucnredlist.org/ accessed 16 February, 2024

International Finance Corporation, 2020. Addressing Gender-Based Violence and Harassment (GBVH) in the Private Sector. [online] https://www.ifc.org/content/dam/ifc/doc/mgrt/execsummary-addressinggbvh.pdf. [Accessed 8 January 2025].

International Working Group for Indigenous Affairs, 2024. Namibia. [online] https://iwgia.org/en/namibia.html. [Accessed 10 January 2025].

Kasimbazi, L. 2017. Land tenure and rights for improved land management and sustainable development. [online] https://www.unccd.int/sites/default/files/2018-06/5.%20Land%2BTenure%2Band%2BRights_E_Kasimbazi.pdf. [Accessed 10 January 2025].

Learn, J. TWS2021: Limited Evidence Birds Confuse Solar Panels with Lakes (online) available at: https://wildlife.org/tws2021-limited-evidence-birds-confuse-solar-panels-with-lakes/ [accessed on 01/02/2024]

Liebenberg-Enslin, Hanlie, von Oertzen, Detlof, & Mwananawa, Norwel. (2020). Dust and Radon Levels on the West Coast of Namibia - what did we learn?. Clean Air Journal, 30(1), 1. https://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S2410-972X2020000100013

Ministry of Environment, Forestry and Tourism, 2014. Guidelines for management of conservancies and Standard Operating Procedures. [online] https://www.meft.gov.na/files/files/Guidelines%20for%20Management%20of%20Conservancies%20and%20SOPs.pdf [Accessed 7 January 2025].

Namibia Statistics Agency, 2023. Population and Housing Census: 2022.

Namibia Statistics Agency, 2023. Population and Housing Census: Main Report. [online] https://nsa.org.na/events/2023-phc-main-report/ [Accessed 3 January 2025].

Namibia Statistics Agency, 2023. Population and Housing Census: 2023.

Namibian Association of CBNRM Support Organisations, 2025. Registered communal conservancies: #Gaingu Conservancy. [online] https://www.nacso.org.na/conservancies/gaingu [Accessed 3 January 2025].

Namibia Vulnerability Assessment Committee, 2023. Namibia 2022/23 Vulnerability Assessment and Analysis (VAA) Findings. [online] https://www.nafsan.org/wp-content/uploads/2023/11/Namibia-2022-23-Vulnerability-Assessment.pdf. [Accessed 10 January 2025].

New Era Live, 2023. Poor hygiene is still a concern. [online] Available at: https://neweralive.na/poor-hygiene-still-a-concern-2/. [Accessed 8 January 2025].

Permanent Mission of the Republic of Namibia to the United Nations, 2018. [online] Statement By H.E. Mr. Neville Gertze Ambassador & Permanent Representative Before The Third Committee Of The 73rd Session Of The United Nations General Assembly On Agenda Item 71: Rights Of Indigenous Peoples. https://www.un.int/namibia/sites/www.un.int/files/Namibia/Statements/national_statement_on_indigenous_people_ga_73_oct_2018.pdf. [Accessed 17 January 2025].

SANS 10103:2008 'The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication'.

Shimuageni, A., 2023. 2023 Namibia Population and Housing Census Release of Main Results. [online] https://nsa.org.na/wp-content/uploads/2024/10/2023-PHC-Main-Report-

Presentation-for-the-Launch-30-Oct-2024-Final-as-at-30-Oct-2024.pdf. [Accessed 3 January 2025].

The World Bank Group. 2021. Climate Risk Profile: Namibia. https://climateknowledgeportal.worldbank.org/sites/default/files/country-profiles/15931-WB_Namibia%20Country%20Profile-WEB.pdf

WHO Namibia, 2023. Biennium report: 2022/2023. [online] https://www.afro.who.int/countries/namibia/publication/who-namibia-biennium-report-2022-2023. [Accessed 8 January 2025].

WHO, 2024. Namibia: Health data overview for the Republic of Namibia. [online] https://data.who.int/countries/516. [Accessed 30 February 2025].

World Bank, 2024. The World Bank in Namibia. [online] https://www.worldbank.org/en/country/namibia/overview. [Accessed 8 January 2025].

World Bank, 2024. Namibia Gender Landscape. [online] https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099143107022240413/idu1e9ae68f91b4f9144ef1ba6415d0d6ce32d7a. [Accessed 10 January 2025].

Trading Economics, 2024. Namibia GDP per Capita. [online] https://tradingeconomics.com/namibia/gdp-per-capita#:~:text=The%20Gross%20Domestic%20Product%20per,percent%20of%20the%20world's%20average. [Accessed 3 January 2025].

United Nations Namibia, 2022. Namibia Gender Statistics Assessment. [online] https://africa.unwomen.org/en/digital-library/publications/2023/06/namibia-national-gender-statistics-assessment. Accessed 10 January 2025].

UNAIDS, 2025. Namibia: 2023 Country Factsheet. HIV/AIDS Estimates. [online] https://www.unaids.org/en/regionscountries/countries/namibia. [Accessed 30 January 2025].