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THE ENVIRONMENTAL MANAGEMENT PLAN FOR THE OPERATION AND MAINTENANCE OF ANIXAS POWER STATION IN ERONGO REGION



THE DOCUMENT IS PREPARED BY NAMPOWER'S SHEW SECTION. MARCH 2023

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1 LIST OF TERMS, ACRONYMS AND ABBREVIATIONS

EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act no 7 of 2007
EMS	Emission Monitoring System
EMP	Environmental Management Plan
HFO	Heavy Fuel Oil
HIV/AIDS syndrome	Human immunodeficiency virus/ acquired immunodeficiency
LFO	Light Fuel Oil
MW	Megawatts
MET	Ministry of Environment and Tourism
OEMP	Operational Environmental Management plan
SHEW	Safety, Health, Environment and Wellness

2 INTRODUCTION

ANIXAS is a 22.5MW diesel power station situated adjacent to the existing Paratus Power Station in Walvis bay. It provides an emergency standby electrical capacity of 22.5 MW to the national grid. The construction of Anixas Power Station commenced in December 2009 and was commissioned on 03 November 2011. The power station generate electricity on emergency basis when there is a shortage on supply from other sources.

The Anixas Power Station is located within the Walvis Bay Industrial area. Walvis Bay is situated in the Erongo region of Namibia, adjacent to the Atlantic Ocean, with the Swakop River to the north and the Namib Desert to the east. To the south are 12 600 hectares of internationally significant Ramsar wetlands, known as the Walvis Bay Lagoon. The lagoon is the scenic feature of Walvis Bay. It is one of the most important wetlands of southern Africa and is the hibernation area for thousands of migratory birds. See the locality map shown in figure 1.

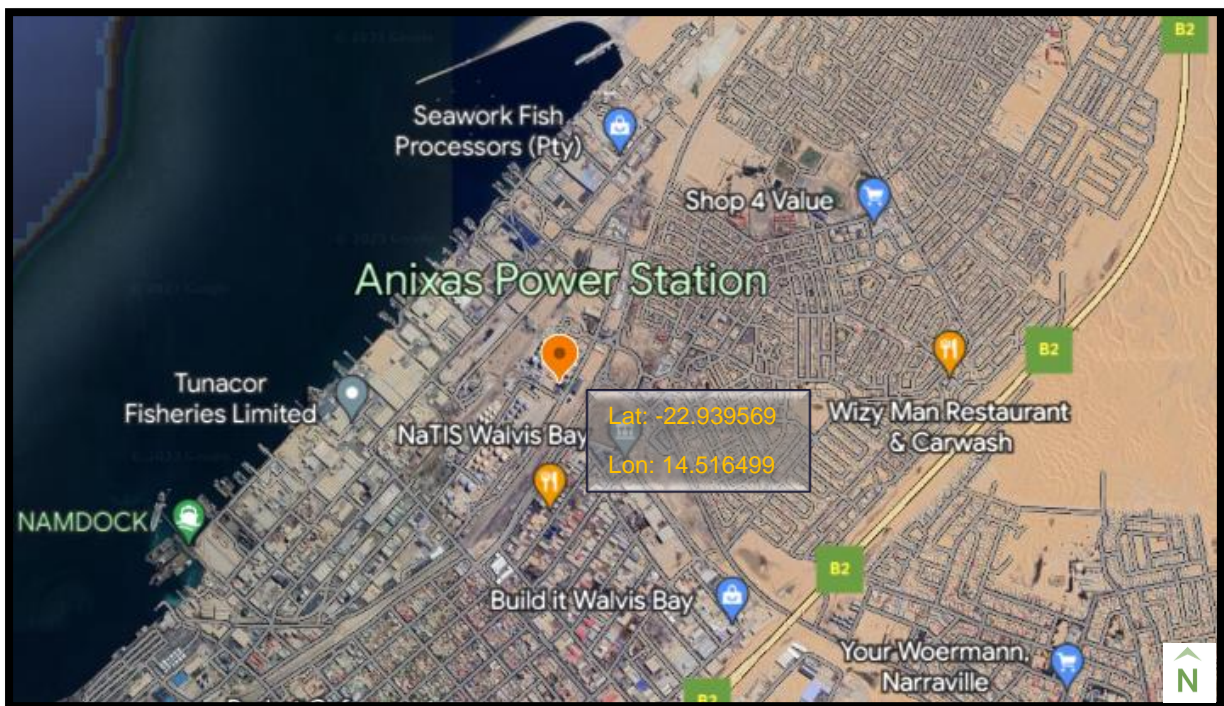


Figure 1: Locality map for Anixas Power Station

3 OBJECTIVES AND SCOPE OF THIS ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The purpose of this environmental management plan is to provide specific environmental guidance for the operation phase for Anixas diesel powered station, and is intended to manage and mitigate operational activities so that preventable environmental impacts do not occur. The Operational Environmental Management Plan (OEMP) further aim at ensuring continuous improvement of environmental performance and reducing negative impacts.

This EMP has the following objectives:

- To outline mitigation measures which are required to be implemented for the operation phase of the power station in order to minimise the extent of environmental impacts, and to manage environmental impacts associated with the project.
- To ensure that the operation activities associated with the power station do not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced.
- To ensure that all relevant legislation is complied with during the operation of the power station
- To identify key personnel who will be responsible for the implementation of the measures and outline functions and responsibilities
- To propose mechanisms for monitoring compliance, and preventing long term or permanent environmental degradation
- To ensure that the concerns and complaints of Interested and Affected Parties (I&APs) with regards to the operational activities are addressed effectively and timely.
- Ensure compliance to legislative requirements.

4 POLICY AND LEGISLATIVE FRAMEWORK

Table 1 below outlines the legislative requirements which are applicable to the operation of the Anixas Power Station. All the operational activities of the power station should be in line with legislations outlined below.

	<ul style="list-style-type: none"> • All other applicable sections 	<p>process should be adhered to during the generation of information for this document</p>
Labour Act no 11 of 2007	<ul style="list-style-type: none"> • Section 3 • Section 4 • Section 9 • Section 39 - 42 	<ul style="list-style-type: none"> • Children under the age of 16 may not be employed • Forced labor may not be used during any construction activities • Basic conditions of employment, as stipulated by the law, must be met • The employer shall ensure the health and safety of all employees and non-employees on site. Employees must fulfil their duties in order to ensure their own health and safety and that of other employees and persons. Employees may leave the work site if reasonable measures to protect their health are not taken.
	<ul style="list-style-type: none"> • Section 39 – 42 • All other applicable sections 	<ul style="list-style-type: none"> • The employer shall ensure the health and safety of all employees and non-employees on site. Employees must fulfil their duties in order to ensure their own health and safety and that of other employees and persons. Employees may leave the work site if reasonable measures to protect their health are not taken.
Electricity Act no 4 of 2007	<ul style="list-style-type: none"> • Section 33 • All other applicable sections 	<ul style="list-style-type: none"> • Installations used for the provision of electricity should be operated with due compliance with the requirements of laws relating to health, safety and environmental standards. Therefore – any company involved within the Electricity Supply Industry must adhere to the laws covering the previously

		<p>stated aspects or stand to lose their licenses to operate.</p>
<p>Water Act no 54 of 1956</p>	<ul style="list-style-type: none"> • Section 21 and 22 • Section 23 • All other applicable sections 	<ul style="list-style-type: none"> • Conditions in terms of the disposal and management of effluent are to be adhered to • Any person causing pollution to a water source shall be guilty of an offence
<p>Public and Environmental Health Act no 1 of 2015</p>	<ul style="list-style-type: none"> • Section 52 • Section 53 • All other applicable sections 	<ul style="list-style-type: none"> • A person generating waste must ensure that the waste generated is kept and stored under conditions that causes no harm to human health or damage to the environment. • Waste must only be disposed of at a waste disposal site, including an incinerator approved by the local authority concerned.
<p>Water Resources Management Act no 24 of 2013</p>	<ul style="list-style-type: none"> • Section 89 • All other applicable sections 	<ul style="list-style-type: none"> • The owner or occupier or other person in control of land where an incident that causes or is likely to cause a water resource to be polluted must take all reasonable measures to contain and minimize the effects of the incident; and to clean up polluted areas and remedy the effects of the incident.
<p>Hazardous Substances Ordinance 14 of 1974</p>	<ul style="list-style-type: none"> • Section 27 • All other sections applicable to different activities. 	<ul style="list-style-type: none"> • To provide for the control of substances which may cause injury or ill-health to or death of human beings, by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; • To provide for the division of such substances into groups in relation to the degree of danger;

		<ul style="list-style-type: none"> To provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances;
Petroleum Products And Energy Act, 1990 Petroleum Products Regulations (2000) Mines and Energy	<ul style="list-style-type: none"> Applicable sections 	<ul style="list-style-type: none"> The Power Station must have consumer Installation Certificate from the Ministry of Mines and Energy.

5 ROLES AND RESPONSIBILITIES

It is the responsibility of the Anixas Power Station management to ensure that all the environmental management actions are carried out effectively and timeously. It is important to note that the successful implementation of the EMP is, however dependent on clearly defined roles and responsibilities by several stakeholders. Below are the key employees that are responsible for the management of environmental and social issues during the operation of the power station:

The Power Station Superintendent shall ensure that:

- Environmental requirements are adequately covered in any external service providers contracts.
- Corrective actions are identified for non-compliances
- Appropriate records and information regarding compliance with environmental requirements are maintained.
- That the power station remains in compliance with the requirements of this EMP, through regular communication and monitoring.
- Ensure that the concerns and complaints of Interested and Affected Parties (I&APs) with regards to the operational activities are addressed effectively and timely.

Project Manager shall ensure that:

- Is responsible for the enforcement of the EMP.
- To ensure that SHE requirements are included in the tender documents sent to the

contractors.

- Must ensure that the contractor remains in compliance with the requirements of this EMP.

The NamPower SHEW Section shall ensure that:

- Ensure that all requirements with regards to this EMP are fulfilled.
- Assist the Power station Manager in ensuring the station remains in compliance with this EMP.
- Provide SHEW inductions for the external service providers and awareness training for the employees
- Organize and implement monitoring and audit functions, in consultation with the Power station Manager.
- Audit the implementation of this EMP by the power station.
- Advise the power station employee on actions or issues impacting on the environment and provide appropriate recommendations to address these matters.

6 OPERATIONAL PHASE ACTIVITIES, MANAGEMENT AND MITIGATION MEASURES

The table below summarises the activities which are undertaken as part of the operation of the power station as well as the aspects and impacts associated with these activities.

Table 2: Description of the activities related to the operation of Anixas Power Station.

Activity	Description	Associated aspects and impacts
Fuel and Lubrication Oil Delivery	Fuel (HFO - heavy fuel oil and LFO - light fuel oil) and lubricating oil are delivered to the power station via road transport. Fuel (both HFO and LFO) of approximately 35 000 litres is delivered per truck. Lubricating oil in quantities of 4000	Aspects: Petroleum product spills, Hazardous waste generation Impacts: Soil and water contamination, Increase in landfill space

	litres in 210 litres drums are also delivered to the power station.	
Storage of fuel (bulk storage tank and tank farm)	The fuel is stored in bulk tank with a capacity of 2 million litres for HFO and 60 000 litres for LFO. Fuel level inspections are conducted every week to determine the amount fuel in the tanks.	Aspects: Petroleum product spills, Hazardous waste generation Impacts: Soil and water contamination, Increase in landfill space
Fuel treatment (heavy fuel and lubrication oil)	Fuel is treated through series of stages of heating, filtration and pressurizing to meet the engine specifications for combustion. Lubrication oil is filtered and undergo secondary treatment via separators to remove water and impurities in order to enhance its quality.	Aspects: Petroleum product spills, Hazardous waste generation Impacts: Increase in landfill space, Soil and water contamination,
Water treatment	Water is treated through the reverse osmosis process to remove impurities in order to protect various equipment against water damage through oxidation and corrosion.	Aspects: Hazardous waste generation, Waste water discharge Impacts: Groundwater contamination, soil contamination, increase in landfill space
Air intake treatment (oil bath filters)	Air is cleaned through rotational air – maze filters rotating through an oil bath.	Aspects: Hazardous waste generation, petroleum product spills, reuse of oil Impacts: Increase in landfill space, reduction in natural resource use (because oil is re-used)

Operating engines and auxiliaries (Power generation)	On start – up, diesel generators are started with LFO, and on 10% load, switch over to HFO. Emissions are continuously monitored for particulate matters, sulfur dioxide and oxides of nitrogen through a build – in emission monitoring system (EMS) during operation.	Aspects: Air Emissions, use of natural resources (water and fuel), noise, petroleum product spills, hazardous waste generation. Impacts: contribution to greenhouse gases, air pollution, impact on human health, natural resource depletion, increase in landfill space
Planned and unplanned maintenance of equipment (Electrical and Mechanical)	This involve the maintenance both planned and unplanned on various equipment at the power station.	Aspects: Waste generation, petroleum product spills Impacts: Increase in landfill space
Workshop and administrative Activities	The electrical and mechanical workshop at the power station provide support through inspection and maintenance of various power station equipment.	Impacts: Waste generation Aspects: increase in landfill space
General construction	This refer to any construction work that may be conducted at the power station.	Impacts: Waste generation, air emissions, use of natural resources (water and fuel), Aspects: Increase in landfill space, air pollution, impact on human health, natural resource depletion

7 MANAGEMENT AND MITIGATION MEASURES

In order to ensure that the potential impacts are eliminated and/or minimised, it is necessary to ensure that the various activities related to the operation of the power station are adequately managed and monitored. Table 3 below outlines mitigation measures as well as objectives to be achieved. Each mitigation measure is also tied to a responsible person.

Table 3: Proposed mitigation measures for the operational phase

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
Social - Creation of jobs, Indirect impacts on the economy, Increase in security of supply	To promote socio economic developments	No management measures required as this have positive impacts.	<ul style="list-style-type: none"> ▪ Power Station superintendent
Environmental Awareness	Minimise the occurrence of environmental impact on the work and surrounding area.	<ul style="list-style-type: none"> ▪ All staff to receive environmental awareness training and refresher environmental awareness training to be available when required. ▪ The SHE representative shall erect and maintain information posters at key locations on site. ▪ All staff are to be made aware of their individual roles and responsibilities in achieving compliance with the EMP. 	<ul style="list-style-type: none"> ▪ SHEW ▪ Power Station superintendent ▪ Project Manager

<p>Petroleum product spills</p>	<p>Ensure that the petroleum product spills are prevented and if not, the impacts are minimised.</p>	<ul style="list-style-type: none"> ▪ All service providers delivering fuel to site should receive induction prior to entering site. ▪ The fuel truck driver should be licensed to transport dangerous goods. ▪ Spill kits must be available onsite ▪ Employees must receive training on spill response ▪ In an event of a spill , contaminated soil must be collected in containers and stored in a central location and disposed of at an approved hazardous waste dumpsite. ▪ All tanks must have secondary containment that can contain 110% of the total volume. ▪ Regular maintenance on of suction, delivery pipes and connector. ▪ Regular visual inspection of the bund walls. ▪ Thickness and/or integrity test to be done on fuel tanks 	<ul style="list-style-type: none"> ▪ Operating superintendent ▪ Power Station superintendent ▪ Fuel supplier
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		<ul style="list-style-type: none"> NamPower Chemical Spill Response procedure to be implemented. 	
Air Emissions	Minimise the impact of air emissions on the environment.	<ul style="list-style-type: none"> Air emissions must be monitored. The use of low sulphur content fuel must be promoted. 60m exhaust stack has been installed to disperse the gases at high level to reduce ground level concentration. Regular maintenance of diesel engines. Proof of maintenance must be kept on site for inspection and audit purposes. Comply to manufacturer's specifications and requirements Periodic servicing of vehicle. Proof must be kept on site for inspection and audit purposes. Records of fuel consumption must sent to SHEW on Monthly basis. 	<ul style="list-style-type: none"> Power Station Superintendent SHEW
Use of Natural resources	To ensure that the resources are used	<ul style="list-style-type: none"> The closed circuit water system is in place. The system must be maintained. 	<ul style="list-style-type: none"> Power Station Superintendent

	<p>sustainably in order to prevent resource depletion.</p>	<ul style="list-style-type: none"> ▪ Awareness on water and power saving measures ▪ water and power saving measures must be implemented. ▪ Maintenance on taps and pipes. Corrective action shall be taken immediately should there be any leaking tap or pipe. ▪ Verify water meter readings on a monthly basis. Records must be shared with SHEW. 	<ul style="list-style-type: none"> ▪ Operating Superintendent ▪ SHEW
<p>General and Hazardous waste Management</p>	<p>To avoid ,manage and mitigate potential impacts on the environment caused by incorrect storage, handling and general disposal of general and hazardous solid waste.</p>	<ul style="list-style-type: none"> ▪ Sufficient ,covered waste collection bins shall be available onsite. ▪ Waste shall be segregated into separate bins and clearly marked for each waste type. ▪ Staff shall be trained in waste management. ▪ Bins shall be emptied regularly. ▪ General waste shall be disposed of at recognised and registered waste disposal sites/recycling companies. 	<ul style="list-style-type: none"> ▪ Power Station Superintendent ▪ Operating Superintendent

		<ul style="list-style-type: none"> ▪ Hazardous waste shall be disposed of at a registered hazardous waste disposal site. ▪ Recyclable waste must be segregated at source and be collected by licensed recycling companies. ▪ Safe disposal certificates should kept onsite and a copy should be emailed to SHEW. ▪ Compliance to Walvis Bay Municipality: Solid and Hazardous Waste Management Regulations: Local Authorities, 1992. 	
<p>Hazardous Substances</p>	<p>Minimise the risk of impact to the environment through safe storage, handling use and disposal of hazardous substances</p>	<ul style="list-style-type: none"> ▪ Drip trays must be available to contain accidental spills. ▪ Machinery must be periodically maintained to prevent oil leaks/spills in check. Proof must be kept on site for inspection and audit purposes. ▪ All hazardous substance will be stored in suitable containers as defined in the method statement or Material safety data sheet (MSDS). 	<ul style="list-style-type: none"> ▪ Power Station Superintendent ▪ Operating Superintendent

		<ul style="list-style-type: none">▪ Containers should be clearly marked to indicate contents, quantities and safety requirements.▪ Use and /or storage of materials, fuels and chemicals which could potentially leak into the ground must be controlled in a manner that prevents such occurrences.▪ All fuel storage tanks should be bunded. The bunded area must be of sufficient capacity to contain a spill/leak from stored containers, 110% of the total volume.▪ Consumer Installation Certificate for the storage of fuel should be obtained from Ministry of Mines and Energy.▪ Ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers.▪ Adequate firefighting equipment shall be made available at all hazardous storage areas.	
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		<ul style="list-style-type: none"> No smoking shall be allowed within the vicinity of the hazardous storage area. 	
Noise emissions		<ul style="list-style-type: none"> Periodic Noise monitoring must be conducted. Should the noise exceed permissible limits, an investigation must be conducted to determine the cause and implement remedial and preventative measures. 	<ul style="list-style-type: none"> Power Station Superintendent Operating Superintendent SHEW
Emergency procedure	Enable a rapid and effective response to all types of environmental, Safety and health emergencies.	<ul style="list-style-type: none"> Emergency numbers to be readily posted on a notice board on site. An Emergency procedure must be in place and be implemented. Training on emergency procedure must be given to employees 	<ul style="list-style-type: none"> Power Station Superintendent SHEW
Prevention of disease	To minimize the spread of HIV/AIDS	<ul style="list-style-type: none"> HIV/AIDS Support programs must be provided to employees. Awareness on HIV/AIDS to be conducted on various topics related to HIV/AIDS. Employees to be encouraged to do voluntary HIV testing. HIV results to be kept confidential. 	<ul style="list-style-type: none"> Power Station Superintendent SHEW

8 REPORTING, MONITORING AND AUDITING

Environmental monitoring, inspection and audits must be conducted during the operation phase of the power station. The environmental monitoring and audits conducted at the power station will cover all management procedures, the requirements of this plan, ISO 14001 standard, and will be carried out by the NamPower SHEW section. Monitoring, inspection and audit reports detailing the monitoring and audit results shall be prepared by the SHEW section and communicated to the power station management. Records of monitoring, inspection and auditing report shall be kept on site and will be made available during inspection and audits.

9 NON-COMPLIANCE PROCEDURES DURING OPERATION

The power Superintendent shall ensure that the employees and external service providers comply with the requirements outlined in this EMP. In the event of non-compliance the following recommended process shall be followed:

- Non-compliances will be identified during inspections or audits carried out by the SHEW Section and reported to the Power station Manager for corrective actions.
- The Power Station Superintendent shall notify the station employees about the non-compliance
- Corrective and preventative actions must be implemented on an agreed timeframe
- Progress report on the implementation of the corrective and preventative actions must be send to SHEW.
- Follow – up inspections shall be conducted to assess whether the corrective and preventative actions were implemented effectively

10 RECORD KEEPING

Record keeping is important for the effective functioning and implementation of an EMP. A record keeping system must be established to ensure adequate control of updating and readily availability of all documents required for the effective functioning and implementation of the EMP. EMP documentation must be kept in both the hard copy and electronic format for safe keeping. These must include but not limited to:

- A copy of an EMP
- EMP implementation activities;

- Induction and training records;
- Monitoring reports;
- Audit and Inspection reports

11 CONCLUSION

All management measures and legal requirements outlined in this EMP should be implemented in order to ensure environmental compliance by all parties undertaking the operational activities. This will ensure that potential negative impacts are identified, avoided or mitigated and positive impacts are enhanced. It is unlikely that the operation and maintenance of the power station will have significant environmental and social repercussions and it is therefore recommended that clearance for the project be issued.