ENVIRONMENTAL
COMPLIANCE CONSULTANCY






ECC-99-353-REP-06-D

ENVIRONMENTAL MANAGEMENT PLAN

AMENDMENT TO THE NAMZINC REFINERY TO INCREASE OUTPUT PRODUCTION TO 300 000 TONNES PER ANNUM OF REFINED ZINC METAL,

!KARAS REGION, NAMIBIA

PREPARED FOR

skorpion zinc

October 2021

TITLE AND APPROVAL PAGE

Project Name:	Amendment to the Namzinc Refinery to increase output production to 300 000 tonnes per annum of refined zinc metal, !Karas Region, Namibia
Client Name:	Skorpion Zinc (Namzinc) (Pty) Ltd
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ABBREVIATIONS AND DEFINITIONS

ABBREVIATIONS	DESCRIPTION
ECC	Environmental Compliance Consultancy
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
ESIA	Environmental and Social Impact Assessment
Ha	Hectare
HSE	Health, Safety and Environment
NO_x	Nitrogen Oxides
PAF	Potentially Acid Forming
pH	Unit of Measure for Acidity or Alkalinity in Water
PM	Particulate Matter
SOP	Standard Operating Procedures
SO_x	Sulphur Oxides
STP	Sewerage Treatment Plant
TSF	Tailings Storage Facility

1 INTRODUCTION

1.1 PROJECT BACKGROUND

Environmental Compliance Consultancy (ECC) has compiled this Environmental Management Plan (EMP) in terms of the Environmental Management Act, 2007 on behalf of Skorpion Zinc (Namzinc) (Pty) Ltd (herein referred to as the proponent or Namzinc). This EMP is in support of the request for an amendment of the existing EMP for the Namzinc Refinery to increase output production to 300 000 tonnes per annum (tpa) of refined zinc metal.

The Skorpion Zinc mine and Refinery, which is a green field development, is the 8th largest zinc mine in the world producing Special High Grade (SHG) zinc of 99.995% purity. However, the mining activities at the Mining Licence (ML) 108 have a limited lifespan and thus the mine proposed to expand its operation, through the processing of zinc sulphide concentrates in addition to the zinc oxides at the Namzinc Refinery.

The mine was placed under Care and Maintenance in May 2020 following slope failures in the open pit. This was deemed to have an economic impact on both the Rosh Pinah community and the Namibian economy as a whole. To prolong the life of the Skorpion Zinc facilities and to reduce the economic and social impacts of full-scale closure of the site, the Company is working on a project to convert the existing facility into a zinc sulphide concentrate treatment plant. The conversion and modification to the Skorpion Zinc (Namzinc) Refinery will enable the treatment of zinc sulphide (ZnS) concentrate that will be transported from their sister company Black Mountain Mining (Pty) Ltd, Gamsberg Mine, Northern Cape, South Africa.

Namzinc intends to expand the Skorpion refinery's capacity to produce 300 000 tpa of refined zinc metal at the approved Namzinc Refinery as part of the conversion project. The request for the amendment is to enable the processing of 620 000 tpa of zinc sulphide concentrates that will produce 300 000 tpa. This is an increase in production from the 150 000 tpa of refined zinc metal, as previously granted and approved under the 2015 environmental clearance certificate. The proposed infrastructure modifications on the refinery will remain within the mine's accessory works permit area.

The Namzinc Refinery is located approximately 100 km north-east of Oranjemund and 20km north-west of Rosh Pinah and is within the Tsau //Khaeb (formally known as the Sperrgebiet) National Park, in the !Karas Region (refer to Figure 1 for the project location).

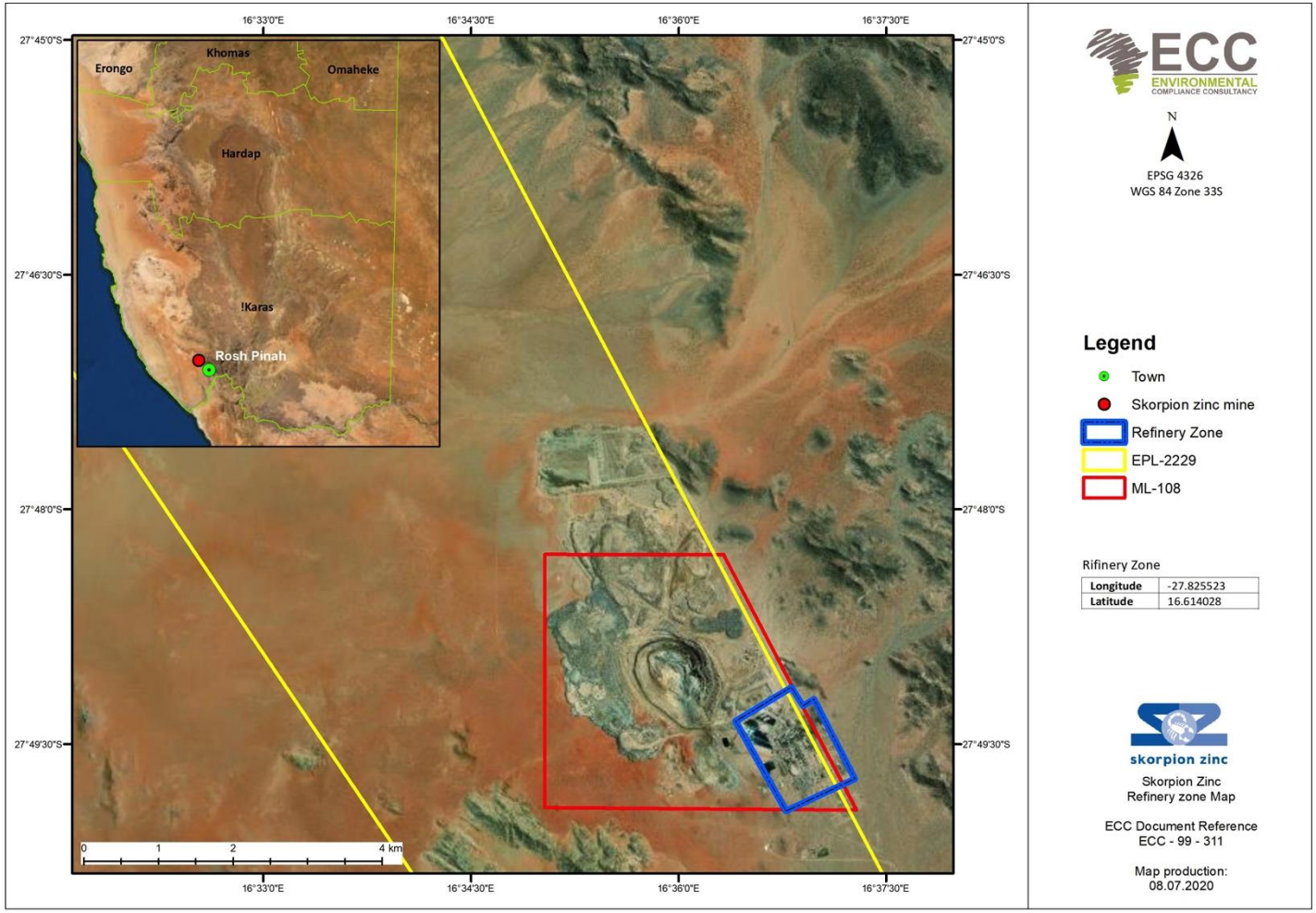

FIGURE 1 – A SATELITE IMAGE INDICATING THE LOCAL SETTING OF THE NAMZINC REFINERY

1.2 Environmental Regulatory Requirements

An environmental clearance certificate is required for any activity listed as per Government Notice No 29 of 2012 of the EMA. The proponent holds several environmental clearance certificates for the project that includes the listed activities as detailed in the regulations. The proposed amendment does not trigger any new listed activities for the operations of the Namzinc Refinery.

This report presents the EMP and has been undertaken in terms of the requirements of the Environmental Management Act, 2007 and its Regulations.

1.3 Purpose and Scope of this Report

This EMP provides a logical framework, mitigation measures and management strategies for the processing activities associated with the proposed refinery extension, in this way ensuring that the potential environmental and social impacts are curbed and minimised as far as is practically possible, and that statutory and other legal obligations are adhered to and fulfilled. Outlined in the EMP are the protocols, procedures, roles and responsibilities to ensure the management arrangements are effectively and appropriately implemented.

The EMP forms an appendix to the ESIA amendment and is based on the findings of the assessment; therefore, the ESIA should be referred to for further information on the proposed project, assessment methodology, applicable legislation, and assessment findings.

This EMP is a live document and will be reviewed at predetermined intervals, and/or updated when the scope of work alters, or when further data/information is added. All personnel working on the mine will be legally required to comply with the requirements set out in this EMP.

The scope of this EMP includes all activities associated with the refinery undertaking.

1.4 Management of this EMP

Namzinc will hold the environmental clearance certificate for the proposed project and will be responsible for the implementation and management of this EMP. Before the construction and processing activities commence, this EMP will be reviewed, amended as required and approved ready for implementation. The implementation and management of this EMP, and thus the monitoring of compliance, will be undertaken through daily duties and activities, as well as monthly inspections.

1.5 Limitations, Uncertainties, and Assumptions related to this EMP

This EMP does not include measures for compliance with statutory occupational health and safety requirements. This will be provided in the safety management plan to be developed by Namzinc.

Where there is any conflict between the provisions of this EMP and any business partner's obligations under their respective agreements, including statutory requirements (such as licences, project approval conditions, permits, standards, guidelines, and relevant laws), the agreement should be amended, and statutory requirements are to take precedence.

The information contained in this EMP has been based on the project description as provided in the ESIA report. Where the design or construction methods is different, this EMP may require updating and potential further assessment may be undertaken.

1.6 ENVIRONMENTAL CONSULTANCY

ECC, a Namibian consultancy (registration number Close Corporation2013/11401), has prepared this report and impact assessment on behalf of the proponent. ECC operates exclusively in the environmental, social, health and safety fields for clients across Southern Africa, in both the public and private sectors. ECC is independent of the proponent and has no vested or financial interest in the proposed project, except for fair remuneration for professional services rendered.

All compliance and regulatory requirements regarding this report should be forwarded by email or posted to the following address:

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2 ENVIRONMENTAL MANAGEMENT FRAMEWORK

This EMP provides measures, guidelines, and procedures for managing and mitigating potential environmental impacts. It also indicates monitoring and reporting guidelines and sets responsibilities for those carrying out management and mitigation measures.

2.1 OBJECTIVES AND TARGETS

Environmental objectives and targets have been developed to such an extent that construction and operation activities can minimise potential impacts on the environment, as far as is reasonably practicable.

Environmental objectives for the project are as follows:

- Zero pollution incidents;
- Minimal vegetation clearing and earthworks;
- Minimal impact on regional groundwater users;
- Protect local flora and fauna, and
- Use natural resources effectively and efficiently.

2.2 ORGANISATIONAL STRUCTURE, ROLES AND RESPONSIBILITIES

Namzinc will provide a project team to oversee and undertake the construction and operation activities, which will be composed of Namzinc's personnel and business partners. The proponent will ensure the effective management and implementation of this EMP throughout the project.

Namzinc will be responsible for:

- Ensuring that all members of the project team, including business partners, comply with the procedures set out in this EMP;
- Ensuring that all persons are provided with sufficient training, supervision, and instruction to fulfil this requirement;
- Ensuring that any persons allocated specific environmental responsibilities are notified of their appointment and confirm that their responsibilities are clearly understood; and
- Business partners will be responsible for ensuring and demonstrating that all personnel employed by them are compliant with this EMP, and meet the responsibilities listed above.

Table 1 lists the roles and responsibilities allocated to different management levels in the company and specific personnel.

TABLE 1 – ROLES AND RESPONSIBILITIES RELATED TO THIS EMP

ROLE	RESPONSIBILITY & DUTIES
Proponent	– Overall responsibility for the implementation and management of this EMP; – Ensure the environmental policy is communicated to all personnel throughout the proposed project and ensure that employees, business partners and visitors understand and adhere to the EMP; – Responsible for providing the required resources (including financial and technical) to complete the required tasks; – May appoint a project manager and a site manager (or nominated supervisor), to who they may delegate tasks and responsibilities within the mandate of the proponent; and – Ensure that all employees, business partners and visitors are inducted on environmental measures.
Site Manager (or nominated supervisor)	– Responsible for ensuring compliance with this EMP including overseeing all day-to-day activities during the duration of the project, including routine and non-routine maintenance works, as well as decommissioning tasks; – Ensure adequate resources are made available for implementation of this EMP; – Responsible for the management, maintenance and revisions of this EMP; – Ensure all personnel are aware of the commitments made in this EMP and any other relevant regulatory requirements applicable to the project; – Ensure all employees and business partners participate in a site induction process prior to commencing work on the project; – Maintain the community issues and concern register, and keep records of complaints; – Ensure that best environmental practice is undertaken throughout the duration of the project; and – Report any non-compliance or incidents to the regulatory authority. – Ensure that all employees, business partners and visitors to the site are conversant with the requirements of this EMP, relevant to their roles on site and adhere to this EMP at all times; – Provide environmental awareness / management training and site inductions for all employees, business partners and visitors; – Monitor daily operations and ensure adherence by personnel to the EMP; – Receive, respond to and record complaints; and – Report any non-compliance or incidents to the proponent.
Employees (and business partners and visitors where applicable)	– Responsible for being compliant with this EMP throughout the project; – Adhere to this EMP at all times; – Ensure attendance of project inductions; – Ensure appropriate briefings for certain activities have been provided and are fully understood; and – Report any operations and conditions that deviate from the EMP or any non-compliant issues or incidents to the site manager and proponent.

2.3 BUSINESS PARTNERS

Any business partners hired during the construction and operational phases and ancillary works, will be compliant with this EMP and will be responsible for the following:

- Undertaking activities in accordance with this EMP as well as relevant policies, procedures, management plans, statutory requirements, and contract requirements;
- Implementing appropriate environmental and safety management measures;
- Reporting of environmental issues, including actual or potential environmental incidents and hazards, to the Environmental Manager, Site Manager and/ nominated supervisor; and
- Taking appropriate corrective or remedial action to address all environmental hazards and incidents reported by employees and business partners.

2.4 EMPLOYMENT

Namzinc and all business partners will comply with the requirements of the Republic of Namibia Regulations for Labour, Health and Safety, and any amendments to these regulations. The following will be complied with:

- In liaison with local government and community authorities, Namzinc will ensure that local people have access to information about job opportunities and are considered first for any employment positions;
- The number of job opportunities will be made known, together with the associated skills and qualifications;
- The maximum length of time the job is likely to last for will be indicated;
- Foreign employees with no proof of permanent legal residence will not be hired; and
- Every effort will be made to recruit from the group of unemployed people living in the surrounding area.

2.5 REGISTER OF ENVIRONMENTAL RISKS AND ISSUES

An environmental review of the proposed project has been completed to identify all the commitments and agreements made within the amendment ESIA report. A list of environmental commitments and risks has been produced, which details deliverables including measures identified for the prevention of pollution or damage to the environment during the construction and operational phases.

Table 2 provides a list of environmental risks and issues, as well as associated mitigation (as derived from the ESIA) and monitoring measures, and the roles responsible for compliance. It will be subject to regular review by the proponent and updated when necessary. The proponent will use this register to undertake monthly inspections (see next section) to ensure the project is compliant with this EMP.

TABLE 2 – DESCRIPTION OF THE REGISTER OF ENVIRONMENTAL RISKS FOR TABLE 3

ROLE	RESPONSIBILITY & DUTIES
Receptor	Ecological receptors includes any living organisms other than humans, the habitat which supports such organisms, or natural resources which could be adversely affected by environmental contaminations resulting by a release at or migration from a site.
Potential Impact	The positive and negative effects that may occur to the receiving environment
Mitigation	Refers to minimizing or avoiding the described impacts, as well reducing risk of loss from the occurrence of any undesirable event.
Monitoring requirement	Requirement (i.e. standard operating procedures) that help mitigate and address all the foreseeable and unforeseeable environmental and social impacts of proposed projects thus closing the gap created by condition setting, predicted impacts and impacts that actually occur.
Responsibility	The state or fact of being responsible, answerable, or accountable for something within one's power, control, or management.

TABLE 3 – A LIST OF ENVIRONMENTAL RISKS AND ISSUES, AS WELL AS ASSOCIATED MITIGATION AND MONITORING MEASURES

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
Employee health and safety	– Refinery's operation management	– A Standard Operation Plan and operation coordinator be developed and appointed for the proposed project; – Ensure that the evaluation of long-term operation requirements is incorporated into the sites' technical plans and planning process; – Ensure that all refinery operators are trained in refinery hazard identification; – Ensure that the operation requirements are incorporated into shift plans and work plans; and – Ensure that the site develops a quality assurance program for all areas of operation	– Standard operation inspections (Weekly, Monthly, Quarterly)	– Site Manager (or nominated supervisor)
	– Potential fire incident/ occurrences	– Develop a Fire Control Plan through the process of risk assessment; – Ensure warning posters are placed all over the plant to make staff aware of the types of fire risks; – Clearly mark high fire risk areas with appropriate signage indicating type of fire risk; – Develop a Maintenance System to prevent the deterioration of equipment condition and performance; – Ensure no incompatible material are stored in the refinery; – Outline the restriction and use of cellphones in the plant, clearly indicate and ensure that cellphones are not allowed in the electrowinning plant, as it is a fire risk area of the plant. – Design and control flammable substances use and storage; – Ensure that the control of hot work through a hot work permit system is in place specifically for refinery operations; – Ensure the refinery's on site operators receive training to be able to identify and provide first response to fire emergencies; – Ensure that the site has an operation and maintenance procedure for fire	– HSE Audits and inspections as per audit and inspection schedule.	– Site Manager (or nominated supervisor)

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
		control; – Ensure that the design requirements for the refinery's equipment factor in fire suppression; – Ensure that the site has specific design requirements for fixed mechanical, electrical and compressor installations; – If associated infrastructure is required for refinery's operations such as workshops, lunchrooms, toilets and refuge chambers ensure these are planned and requirement designed for purpose.		
	– Potential corrosion risks to metal infrastructure	– Potential corrosion risks to metal infrastructure may possibly occur as a result of acid mist released from the electrowinning plant, if the fluid chambers are not covered.	– HSE Audits and inspections as per audit and inspection schedule.	– Site Manager (or nominated supervisor)
Surface water	– Discharges of chemicals to surface water from processing activities; – Water infused effluent from site runoff	– Ensure correct chemical use and clean-up procedures are in place and followed; – Ensure chemical spills are cleaned up immediately; and – prevent spills from entering the open water systems; – Storage facilities for chemicals need to be contained within containment facilities such as a bund wall able to contain 110% of the storage volume.	– Surface water monitoring (Monthly)	– Site Manager (or nominated supervisor)
Groundwater	– Contamination of groundwater from refinery operations including hydrocarbons and processing chemicals. – Potential seepage through tailings from sediment loading and leaching of acidity,	– Ensure correct chemical use and practices are in place and followed; – Bulk fuel should be stored in designated areas; and – Refuelling of and equipment working at the face will be done in a controlled manner following standard refuelling procedures. – Consider diversion structures when necessary to collect and direct runoff and seepage to treatment and/or settling ponds; and – Ensure the dewatering (thickening) of tailings prior to disposal, which enables more process water to be recycled to reduce losses and operational demand, while reducing the amount of water stored in the TSF.	– Groundwater monitoring (Quarterly)	– Site Manager (or nominated supervisor)

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	resulting in the impact to groundwater quality			
	– Potential runoff of seepage from the solid waste site as a result of additional solid waste being disposed of on-site	– Ensure the solid waste landfill is managed in accordance with site procedures and the landfill is covered and rehabilitated as required; and – Reduce the volume of material entering the landfill by continuing to implement the reduce, reuse, and recycle principle installed on site.	– Waste volume monitoring (monthly); and – Groundwater monitoring (Quarterly)	– Site Manager (or nominated supervisor)
– Socio-economic	– Creation of 1000 jobs during project construction/development	– Ensure that local residents get first opportunity to apply for positions were applicable; and – Redeployment of redundant staff from closing processing operations at Namzinc.		– Site Manager (or nominated supervisor)
	– Maintaining of 1400 jobs during the refinery's operation phase and some new job creation	– Ensure that local residents get first opportunity to apply for positions were applicable; and – Redeployment of redundant staff from closing processing operations at Namzinc.		– Site Manager (or nominated supervisor)
	– Influx of business partner (employees and families) stimulating the local economy through	– Engage with the local and regional government to ensure development plans cater for influx; and – Ensure local spend of finding address development needs to cater for influx where applicable.		– Site Manager (or nominated supervisor)

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	increase spends			
– **Air quality**	– Deterioration in air quality from sulphur dioxide; – particulate matter, including particulate matter less than or equal to 10 microns in size (PM10) and particulate matter less than or equal to 2.5 microns in size (PM2.5); – certain heavy metal compounds; – and dust deposition) from the refinery operations – Gas emissions from the refinery's could contribute to offensive odours –	– Ensure mechanical equipment is maintained and serviced to ensure particulate matter is reduced; and – Ensure ventilation systems are providing fresh air to working headings and the refinery workings are exhausted after each blast. – Sulphur dioxide and particulate matter are the principal air contaminants generated during roasting of the concentrates, implement gas monitoring procedures as part of the daily operations of the refinery's operation; – Maintain speed limit when operating vehicles on site; – Ensure that air pollution control equipment is adequately sized, designed, constructed, operated, and maintained to contain and control pollutant releases to ambient air from all plant processes; and – Identify potential sources of fugitive emissions and prevent or control emissions through the use of appropriate mitigative measures. These sources may include unpaved roads, storage piles, material conveyance systems, waste disposal piles, and leaks from processes and buildings. – Enclose conveyors and transfer points where necessary, implement Leak Detection and Repair programs, covering of major stockpiles, spray coating of smaller and temporary stockpiles, and paving of ground surfaces. – Practice air emission prevention and control systems, taking into account local conditions and best practice ambient air quality objectives, standards, criteria and guidelines.	– Ambient Air Quality Monitoring (continuous); and Personnel exposure monitoring as per monitoring schedule.	– Site Manager (or nominated supervisor)
– **Resource use**	– Inefficient use of water resources	– Use water effectively and efficiently by following the reduce-recycle-reuse approach; and – Record volumes of water supply and usage; – Demarcate areas where acid mist is present identifying the correct PPE required for use in these areas.	– Daily observations; and Site water balance	– Site Manager (or nominated supervisor)
	– Inefficient electricity	– Consider the use of the photovoltaic solar plant for electricity supply; and	Track energy	– Site Manager

RECEPTORS	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	use increasing carbon footprint	– Use energy efficient electrical equipment and for the lighting of the refinery. – Keep track and measure electricity consumption	usage (monthly).	(or nominated supervisor)

3 ENVIRONMENTAL MANAGEMENT PRINCIPLES

3.1 CONTINUAL IMPROVEMENT

The Namzinc Management Team is responsible for reviewing and updating this EMP, which will be supported by the monthly reports from the Namzinc Refinery. As part of this review process, the monthly reports will be reviewed, identifying any trends or significant areas of concern, as well as measures implemented to manage / resolve environmental or social issues. Compliance and legislative changes will be reviewed, and lessons learnt will be captured. The EMP will be amended as required, and follow up training, awareness or updates will be provided.

Ongoing hazard identification through the review of the EMP and supporting management plans and SOPs will ensure environmental impacts are avoided or minimised to as low as reasonably practicable as part of the continuous improvement of the EMS.

3.2 BEST PRACTICE

The best practice management measures that will be complied with across site are listed in Table 3.

TABLE 4 – A LIST OF ENVIRONMENTAL BEST PRACTICE MEASURES TO BE IMPLEMENTED AT NAMZINC

ENVIRONMENTAL ASPECT	BEST PRACTICE REQUIREMENT
Pollution Prevention Control	– Plant and equipment to be maintained and serviced regularly; – Refuelling at designated locations; – Spill kits available where the risk of loss of containment is identified; – Bunds to be at least 110% containment of the total storage volume; and – Good housekeeping.
Solid Waste Management	– Good housekeeping (no littering); – Designated waste collection areas around site and one central location; – Bins labelled; – Waste to be separated and kept clean and tidy; and – Waste bins emptied on regular basis.
Ground Contamination	– Refuelling will be undertaken in designated areas with spill kits available; – Chemical management enforced on site; and – Good housekeeping.
Storage of Fuels, Oils, Chemicals and other hazardous liquids	– Storage tanks will be suitable and labelled for the liquid being stored; – Bunds to be at least 110% containment of the total storage volume of the container(s); and – Daily inspections of tanks.
Energy Efficiency	– Plant and equipment to be maintained and serviced regularly; and – Turn off plant and equipment when not in use.
Air Quality	– Maintenance of roads; – Turn off plant and equipment when not in use; and – Plant and equipment to be maintained and serviced regularly.

3.3 Environmental Monitoring

A monitoring and evaluation program will be used in line with internal HSE standards to evaluate environmental performance and promote continual improvement. Monitoring also supports environmental management on site to evaluate how effective the environmental management has been, over an extended period of time. An environmental monitoring schedule is in place for the Namzinc operations and the refinery processing aspects will be added to it.

The Site Manager or nominated supervisor will be responsible for the environmental monitoring program across site. The monitoring program comprises:

- Air quality monitoring;
- Noise and vibration monitoring;
- Water monitoring (volume for water balance purposes and quality) (e.g. surface water, groundwater and discharge water);
- Biodiversity monitoring (e.g. fauna, vegetation); and
- Meteorological monitoring (e.g. rainfall and evaporation).

The Environmental Officer is tasked with conducting the monitoring within the Namzinc site with the support of the Site Manager.

3.4 Environmental Objectives and Targets

The following Namzinc site environmental objectives and targets have been developed in order for activities on the site to minimise potential impacts on the environment as far as reasonably practicable. They form a foundation in developing specific objectives for Namzinc's operation.

- Zero pollution incidents;
- Sustainable resource use;
- Application of the waste management hierarchy;
- Sustainable use of water;
- Responsible disposal of waste;
- Minimise aerial discharges and dust being generated;
- Minimise noise levels; and
- Protect and enhance biodiversity.

Procedures for monitoring site activities against these environmental objectives are in place at Namzinc and will be adapted to accommodate the refinery's operations.

In addition, each year, annual targets or Key Performance Indicators (KPIs) will be set in accordance with the company wide objectives. These KPIs will be captured in the Annual Report and the site's Sustainability Report. All employees will work towards these objectives and targets.

3.5 DOCUMENT CONTROL

Internal HSE performance standards are in place at Namzinc and sets out requirements to ensure that necessary documentation, records, data and information exist to support the functionality and effectiveness of the mine.

Monitoring results are entered into an electronic database as soon as results are available, and at no less than one monthly interval, allowing:

- Data presentation in tabular format,
- Time-series graphs with comparison abilities,
- Statistical analysis (minimum, maximum, average, percentile values) in tabular format,
- Graphical presentation of statistics,
- Linear trend determination,
- Performance analysis in tabular format,
- Presentation of data, statistics and performance on diagrams and maps, and
- Comparison and compliance to best practice guidelines such as to the South African Water Quality Guidelines and any other given objectives.

All environmental records are to be maintained on the site's SharePoint and is made accessible and available to all Head Of Departments. All records, reports and documents are maintained in accordance with the site's document control procedure.

4 COMMUNICATION AND TRAINING

In order to ensure potential risks and impacts are minimised it is vital that personnel are appropriately informed and trained in implementing the necessary mitigation measures. It is also important that regular communication is maintained with stakeholders, employees and different levels of site management to make all aware of potential impacts and how to manage it. This section sets out the framework for communication and training in relation to the EMP.

4.1 COMMUNICATION

During development and construction of the refinery's section as well as the eventual production phase, the Project Manager and / or Processing Manager will communicate site-wide environmental issues to the project team through the following means (as and when required):

- Environmental site induction that sets out the requirements in relation to this EMP;
- Ensuring audits and inspections are undertaken regularly on a risk-based schedule;
- Toolbox talks, including instruction on incident response procedures;
- Deliver project-specific environmental briefings where required;
- Ensure all personnel have access to the EMP; and
- Ensure operators of key activities and environmentally sensitive operations are briefed and understand their requirements.

This EMP will be distributed to the management team, including any business partners and other personnel working on the site, to ensure that all personnel are aware of the environmental responsibilities of Namzinc. Key activities and environmentally sensitive operations will be clearly communicated to employees and business partners.

During the construction and operational activities, communications among the management team members will include discussions of any complaints received and actions needed to resolve them; any non-conformances reported during inspections and/or audits; and any achievements related to objectives or targets.

4.2 ENVIRONMENTAL EMERGENCY AND RESPONSE

An emergency is any abnormal event, which demands immediate attention. It is any unplanned event, which results in the temporary loss of management control at site, but where functional resources can manage the response. An Emergency Response plan document is in place at Namzinc and manages the response in relation to emergencies including environmental emergencies.

Table 4 lists the emergency response numbers to be called at Namzinc.

TABLE 5 – A LIST OF EMERGENCY CONTACT DETAILS FOR NAMZINC

TOWN	EMERGENCY CONTACT	POLICE / FIRE	AMBULANCE
Rosh Pinah	-	+264(0) 63 274 597	+264 (63) 274 911 / +264 (63) 274 918 / +264 81 161 8734
Namzinc (Pty) Ltd	Mr. Tshiningayamwe Eliakim ETshiningayamwe@vedantaresources.co.na 063 2712381		

For large-scale spills and other significant environmental incidents, the fire services should be contacted as required and the office of the Ministry of Environment, Forestry and Tourism (MEFT) informed of the incident (telephone +264 61 284 2111). All correspondence with MET should be undertaken by the General Manager.

For the clean-up of smaller spills, the relevant Material Safety Data Sheet (MSDS) should be consulted to determine the appropriate clean-up procedure. Basic spill response training will be provided as part of the site environmental induction, spill response equipment, including relevant MSDS copies, will be provided in areas where potentially environmentally hazardous chemicals may be used.

4.3 COMPLAINTS HANDLING AND RECORDING

Internal performance standards of Namzinc dictates that all incidents, near misses, complaints or concerns from members of the local community or other stakeholders will be reported in a timely and factual manner; accurately classified; effectively investigated; corrected and prevented from recurring through implementation of additional or more effective controls.

Any complaints received verbally by any personnel on site will be recorded by the receiver, including the name and contact details of the complainant, date and time of the complaint, and the nature of the complaint. The information will be given to the proponent, who is overall responsible for the management of complaints and will provide a written response to the complainant. The proponent will inform the relevant site managers of issues, concerns or complaints. The site manager must maintain a complaints register that details the name of the complainant, date and time of the complaint, the action taken to resolve the issues and date of complaint handover.

The workforce will be informed about the complaints register, its location and the person responsible, to whom to refer residents or the general public who wish to lodge a complaint. The complainant will be informed in writing of the results of the investigation and action to be taken to rectify or address the matter(s). Where no action is taken, the reasons why will be recorded in the register and communicated.

The complaints register will be kept for the duration of the project and will be available for government or public review upon request.

4.4 TRAINING AND AWARENESS

All personnel working in the refinery operation will be competent to perform tasks that have the potential to cause an environmental impact. Competence is defined in terms of appropriate education, training, and experience.

4.4.1 SITE INDUCTION

All personnel involved in the refinery processing operations will be inducted to the site with a specific environmental and social awareness training, including health and safety issues. The environmental and social awareness training will ensure that personnel is familiar with the principles of this EMP, the environment and social aspects and impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures. The OHS Manager will ensure a register of completed training is maintained.

The site induction should include, but is not limited to the following:

- A general site-specific induction that outlines:
  - What is meant by “environment” and the EMP;
  - Why the environment needs to be protected and conserved;
  - How processing activities can have impact on the environment; and
  - What can be done to mitigate against impacts.
- The inductee’s role and responsibilities concerning implementing the EMP;
- The site’s environmental rules;
- Details of how to deal with, and who to contact should any environmental problems occur;
- The potential consequences of non-compliance with this EMP and relevant statutory requirements; and
- The roles of responsible people for the project.

5 INCIDENT REPORTING

Namzinc has an accident and incident reporting system that covers all applicable statutory requirements. The section below sets out the minimum requirements for incident reporting.

5.1 Minor Incident or "Near Miss"

Any incident or "near miss" involving Namzinc, a nominated representative, any employee, or business partner or any third party's personnel, property, plant or equipment, must be:

1) Orally reported to the site manager or the nominated representative:
    a. Immediately and without delay;
    b. Regardless of whether or not injury to personnel has occurred; and / or
    c. Property or equipment has been damaged.
2) Written up and handed to the site manager or the nominated representative by the end of the shift. The written report should:
    a. State all known facts and conditions at the time of the incident; and
    b. Include a preliminary assessment of the most likely potential consequences of the incident under the current circumstances.

5.2 Serious Incident

For any serious incident involving a fatality, or permanent disability and / or major environmental impact, the incident scene must be left untouched until witnessed by a representative of the Police. This requirement does not preclude immediate first aid being administered and the location being made safe.

5.3 Incident Report and Close Out

The site manager must investigate the cause of all work accidents and significant incidents and must provide the results of the investigation and recommendations on how to prevent a recurrence of such incidents. A formal root-cause investigation process should be followed, which should involve the Environmental Manager.

6 COMPLIANCE AND ENFORCEMENT

6.1 Environmental Inspections and Compliance Monitoring

Inspections and audits of the site will be managed and undertaken by the Site Manager, Environmental Manager and Environmental Officer, to check that the standards and procedures set out in this EMP are being complied with and pollution control measures are in place and working correctly. All equipment will be inspected to ensure it is operating as per specification; no damage has been caused, and no leaks or spills have occurred. Any non-conformance will be recorded, including the following details:

- A brief description of non-conformance;
- The reason for the non-conformance;
- The responsible party;
- The result (consequence); and
- The corrective action taken and any necessary follow up measures required.

6.2 Water Permits and Licence

The Water Act (1956) governs the use of water resources in Namibia and is the enforceable piece of legislation for water related matters. The Water Resources Management Act (2013), passed but pending regulations (not enforced), provides an improved framework for managing water resources based on the principles of integrated water resource management. While not enforced, it is considered best practice to adhere to its stipulations while ensuring compliance with the Water Act of 1956 at the same time. Should the proponent need to abstract water, an abstraction permit application should be submitted to the Ministry of Agriculture, Water and Land Reform (MAWLR).

6.2.1 Wastewater Discharge Permit

In the event that the operations produce wastewater, a permit must be obtained from the MAWLR, Department of Water Affairs. Since Namzinc is an operational site, all permits related to wastewater are in place and being maintained as relevant. Wastewater discharge permits should be renewed every five years.

6.3 Non- Compliance

Where it has been identified that works are not compliant with this EMP, the proponent will employ corrective actions to ensure that the works return to being compliant as soon as possible. In instances where the requirements of the EMP are not upheld, a non-conformance and corrective action notice will be produced. The notice will be generated during the inspections and

the site manager will be responsible for ensuring a corrective action plan is established and implemented to address the identified shortcoming.

A non-compliance event / situation is considered if, for example:

- There is evidence of a contravention of this EMP and associated indicators or objectives;
- The site manager and / or business partner has failed to comply with corrective or other instructions issued by the Environmental Manager or qualified authority, or
- The site manager and / or business partner fails to respond to complaints from the public.

6.4 Disciplinary Action

This EMP is a legally binding document and non-compliance with it will result in disciplinary action being taken against the perpetrator/s. Such action may take the form of (but is not limited to):

- Fines / penalties;
- Legal action;
- Monetary penalties imposed by Namzinc on the business partner;
- Withdrawal of licence/s, and
- Suspension of work.

The disciplinary action will be determined according to the nature and extent of the transgression / non-compliance, and penalties are to be weighed against the severity of the incident.

7 SURFACE AND GROUNDWATER MANAGEMENT PLAN

Chemical and waste spills must be contained so as not to contaminate groundwater and surface water channels. Any contact with groundwater must be treated with exceptional care and reported immediately, so as to minimize the potential for contamination of an aquifer. It is important to limit the potential for wastewater seepage to groundwater.

This Surface and Groundwater Management Plan outlines appropriate surface and groundwater water management measures, monitoring programs and reporting procedures to be implemented.

7.1 OBJECTIVES

A Surface and Groundwater Management Plan should be prepared to minimise potential impacts on surface and groundwater resulting from the processing activities. It is important to report any contact with or contamination of groundwater to the Environmental Manager or site manager as soon as possible.

7.2 SURFACE AND GROUNDWATER MANAGEMENT MEASURES

The surface and groundwater management measures are designed to reduce and prevent pollution of water resources. The refinery's operation activities that could potentially impact on natural surface water and groundwater quality include:

- Chemical spills;
- Refuelling;
- Seepage of wastewater into groundwater; and
- Seepage from Tailings Storage Facility (TSF).

The following requirements are to be met to ensure that groundwater is not contaminated:

- Fuel/oil and chemicals must be safely stored and removed;
- Ensuring PAF material is managed to reduce ARD generation; and
- Any contact with surface or groundwater must be treated with exceptional care and reported immediately, so as to minimize the potential for contamination of an aquifer.

Table 5 lists mitigation measures for impacts on water.

TABLE 6 – A LIST OF WATER QUALITY MITIGATION MEASURES

Aspect	Mitigation Measure	Responsibility
Pollution control measures	Visual monitoring and photographic record of any surface and/or groundwater intersected.	Environmental Officer
	Visual monitoring during rainfall events for runoff of polluted water.	Environmental Officer
	Vehicles and machinery are to be regularly serviced to minimise oil and fuel leaks.	Site Manager
	Good housekeeping will be maintained and chemicals, and fuel must be stored securely to prevent any accidental spills on the EPL site.	Site Manager
Sewage	If portable chemical toilet facilities will be hired for onsite use during the construction phase, the supplier/partners will manage any sewerage generated.	Site Manager

7.3 Surface and Groundwater Quality Monitoring Program

Namzinc shall ensure a water monitoring program is in place and implemented through the refinery's procedures and operational framework.

8 WASTE MANAGEMENT PLAN

8.1 INTRODUCTION

The activities at the Namzinc Refinery will generate both solid and liquid waste. The potential types of solid waste generated at the facility are typical for domestic home operations, site residues and hazardous waste. All solid waste will be disposed of at the developed Namzinc landfill site; waste incinerator, and tailings storage facility (TSF).
Liquid wastes include used lubricants, sewage and contaminated water. Sewage will be disposed of at the sewage treatment plant. Lubricants will be recycled as far as possible and contaminated water will be stored in the pollution control dams for re-use.

8.2 OBJECTIVES

This Waste Management Plan has been prepared to ensure the proper storage, transport, treatment and disposal of waste and where possible will follow the waste hierarchy, which encourages waste avoidance and waste reduction followed by reuse, recycling and reclamation, before waste treatment and waste disposal.

8.3 SOLID WASTE

Namzinc has a recycling system in place whereby it is reducing its impacts associated with solid waste generation on the environment. Where possible, Namzinc will implement measures to reduce, reuse and recycle waste generated as part of the operations of the facility.

Waste will be controlled through prevention and mitigation measures as follows:

- Site design implemented will keep waste rock generation to a minimum;
- Strata control during processing of ore to be strict to ensure the minimum tailings being generated;
- Encapsulating PAF material in the TSF;
- Reduce, reuse and recycle where possible;
- Storage of domestic waste on site may result in the attraction of unwanted scavengers and should be disposed of as per the sites waste management system and protocol, and
- Correct storage and disposal of hydrocarbon and chemical contaminated solids.

8.4 LIQUID WASTE

All contaminated water will be captured in pollution control structures such as dams, ponds and tanks on-site and re-used in the processing plant and refinery. Sewage will be disposed of at the sewage treatment plant. Waste oil will be collected by a certified oil recycling company.

8.5 WASTE MITIGATION MEASURES

Table 6 lists waste mitigation measures for Namzinc.

TABLE 7 – A LIST OF WASTE MITIGATION MEASURES

Aspect	Mitigation Measure	Responsibility
Environmental contamination from liquid waste	Hydrocarbon and chemical contaminated solids must be stored correctly and disposed of or recycled by registered companies.	Environmental Manager
	Waste disposal certificates must be kept and be available on request.	Environmental Manager
	Construction and maintenance of pollution control sites and silt traps.	Site Manager
	Operation and maintenance of the sewage treatment works to keep it in good order.	Resident Engineer
Littering and environmental contamination from waste	All litter on and around the site must be picked up and placed in the bins provided. Provision of adequate number of waste bins and skips.	All staff
	The site should always be kept tidy and free of litter. All domestic and general waste produced on a daily basis should be cleaned and contained daily.	All staff
	No waste will be burned or buried anywhere accept at the incinerator or the landfill site	All staff
Site residue	PAF Material to be encapsulated as per the on-site procedure.	Site Manager
	Tailings to be disposed to the TSF and strata control managed to ensure minimum tailings being generated.	Site Manager

8.6 WASTE DISPOSAL MONITORING

Waste volumes being generated will be recoded and tracked to ensure overall waste reduction targets are met. Certificates proving the safe disposal of waste from a permitted waste disposal site must be obtained and kept on record.

9 SPILL MANAGEMENT PLAN

9.1 INTRODUCTION

The uncontrolled release of fuels, lubricants and other chemicals has the potential to result in the contamination of soil, groundwater and surface water, which may lead to serious environmental harm. On this basis, the storage and use of fuels or other chemicals must be managed to minimise the risk of a release, and measures must be in place to promptly address impacts should a release occur.

9.2 OBJECTIVES

This Spill Management Plan has been prepared to minimise the potential for the uncontrolled release of fuels, oils and other chemicals. Preventative measures to minimise the potential for a spill are listed. Should a spill occur, this plan provides guidance for Namzinc on the appropriate spill response measures.

9.3 SPILL PREVENTION MEASURES

The following management measures are to be implemented by Namzinc:

- Spill kits are to be made available throughout the site. The kits are to include, as a minimum, the following items:
    - Absorbent materials;
    - Chemical resistant shovels;
    - Heavy-duty chemical resistant plastic bags;
    - Protective clothing (e.g. gloves, respirators, goggles, etc.);
- Drip trays and movable spillage capture equipment to be used where appropriate;
- All machines to be subjected to preventative maintenance of hydraulic hoses, oil pumps and fittings to reduce the risk of spillage during operation;
- Major servicing of equipment will be undertaken in appropriately equipped workshops;
- Provision of adequate and frequent training on spill management, spill response and refuelling must be provided to all on-site staff;
- Fuels, lubricants and chemicals are to be stored within appropriately sized, impermeable bunds or trays with a capacity not less than 110% of the total volume of products stored;
- All fuel and chemical storage and handling equipment (including transfer hoses, etc.) will be well maintained;
- Storage and handling of fuels and chemicals will be in compliance with relevant legislation and regulations;
- No refuelling is to take place within 50 metres of groundwater boreholes, surface water or streams; and
- MSDS are to be kept for each chemical used on site. These must be easily accessible to all personnel.

9.4 Spill Response Measures

The primary concern, in the event of any spill, is the health and safety of any residents and staff in the vicinity. Of secondary, but highly significant, importance, is the protection of water sources, and then soil and vegetation.

The following points therefore apply to all areas on the site:

- Assess the situation for potential hazards;
- Do not come into contact with the spilled substance until it has been characterised and necessary PPE is provided;
- Isolate the area as required; and
- Notify the site manager or safety, health and environmental coordinator.

The following measures are to be implemented in response to a spill:

- Spills are to be stopped at source as soon as possible (e.g. close valve, plug holes or turn container upright);
- Spilt material is to be contained to the smallest area possible using a combination of absorbent material, earthen bunds or other containment methods;
- Spilt material is to be recovered as soon as possible using appropriate equipment. In most cases, it will be necessary to excavate the underlying soils until clean soils are encountered;
- All contaminated materials recovered subsequent to a spill, including soils, absorbent pads and sawdust, are to be disposed to appropriate facilities;
- The site manager or Environmental Manager are to be informed as soon as possible in the event of a spill; and
- A written Incident Report must be submitted to the manager.

Table 7 lists spill mitigation measures for the site.

TABLE 8 – A LIST OF SPILL MITIGATION MEASURES

ASPECT	MITIGATION MEASURE	RESPONSIBILITY
Stored Hazardous Chemicals	Hazardous chemicals are to be stored in bunded areas.	Site manager
	Hazardous chemicals (such as fuels) are to be handled over areas provided with impervious surfaces.	Site manager
	Spills of hazardous chemicals are to be contained and cleaned-up to ensure protection of the environment.	All staff
	All the necessary PPE required for the safe handling and use of petrochemicals, oils and acids will be provided to, and used or worn by, the on-site staff.	All staff
Machinery and Equipment	Major servicing of equipment will be undertaken in appropriately equipped workshops.	Site Manager
	For small repairs and required maintenance activities all	Site Manager

Maintenance	reasonable precautions to avoid oil and fuel spills must be taken (e.g. spill trays, impervious sheets).	
	Vehicles and machinery are to be regularly serviced to minimise oil and fuel leaks.	Site Manager
	All the necessary PPE required for maintenance activities must be issued to staff whose duty it is to manage and maintain the machinery and equipment.	Site manager

9.5 Spill Reporting

All major petroleum product spills should be reported to the Ministry of Mines and Energy (MME) on Form PP/11 titled “Reporting of major petroleum product spill”.

10 AIR QUALITY MANAGEMENT PLAN

10.1 INTRODUCTION

This Air Quality Management Plan describes the strategies and procedures that will be implemented to ensure that the health and amenity of employees and nearby sensitive receptors are protected from elevated concentrations of airborne dust and other gaseous emissions (e.g. oxides of nitrogen; nitrogen dioxide, particulate matter; sulphur dioxide and carbon monoxide). Typically, the gases present in a refinery site include carbon monoxide, sulphur dioxide and nitrogen dioxide. In cases where generators and other machinery are used, there will be some release of exhaust fumes that will impact the immediate vicinity but will be of short duration.

10.2 OBJECTIVES

This Air Quality Management Plan has been prepared to prevent deterioration of air quality and to minimise the potential for emitted dust and airborne pollutants. Preventative measures are listed below.

10.3 AIR QUALITY MANAGEMENT PROCEDURES

Activities that may potentially emit dust and airborne pollutants during the operations include the following:

- Vehicle movements; and
- Machinery operations (such as roasters in the refinery).

Namzinc will minimise the potential for dust generation and the emission of airborne pollutants by undertaking the following management measures, as required:

- Vehicle movements will be restricted to sealed roads as far as possible;
- Appropriate speed limits will be set and enforced;
- Dust suppression on all dirt roads with high traffic loads;
- Ground disturbance will be minimised as far as practical;
- Vehicles and machinery will be maintained so as to limit exhaust fume emissions; and
- Recommendation as per the AQIA report shall be conisder during the stages construction, operation and decommissioning of the proposed refinery modification project.

Table 8 lists mitigation measures to ensure low impacts on air.

TABLE 9 – A LIST OF AIR QUALITY MITIGATION MEASURES

ASPECT	MITIGATION MEASURE	RESPONSIBILITY
Dust and fumes	Vehicles must adhere to speed limits so as to avoid producing excessive dust.	Site Manager Machine Operators
	Vehicles and machinery are to be regularly serviced	Site Manager

	according to the manufacturers' specifications and kept in good working order so as to minimise exhaust emissions.	
	Minimise the use of diesel-powered machines refinery.	Site Manager

10.4 Air Quality Monitoring Program

Visual monitoring of the refinery operational activities can ensure the minimum discharge of airborne dust and other emissions according to the Air Quality Management Plan. Set monitoring stations will measure particulate matter and fallout dust.

10.5 Odours and Noise Impacts

The sensitive receptors are those in proximity to the site which might be the nearby community, plants and animals. Activities related to the refinery's construction and operations have the potential to generate nuisance odours and noise that can impact the quality of life for the nearby community; however, this potential impact is minimal and unlikely due to the distance between the Namzinc site and nearest receptor.

Notwithstanding the above point, the proponent should continue to ensure potential odours and noise sources are mitigated through measures such as:

- Ensure communication/ notices are sent out to nearby receptors during noise generating activities;
- Ensure appropriate measures are put in place to rectify odours and noise complaints, should they occur; and
- Procedures for receiving complaints from nearby land users or residents to be in place and mitigation measures to be implemented.

Occupational noise is managed through the health and safety management plan and track staff exposure.

11 IMPLEMENTATION OF THE EMP

This Environmental Management Plan:

A. Has been prepared according to a contract with Namzinc;
B. Has been prepared based on information provided to ECC up to September 2021;
C. Is for the sole use of the proponent, for the sole purpose of an EMP;
D. Must not be used (1) by any person other than the proponent or (2) for a purpose other than an EMP, and
E. Must not be copied without the prior written permission of ECC.

APPENDIX A - APPLICATION FOR A WASTEWATER DISCHARGE LICENCE

DEPARTMENT OF WATER AFFAIRS & FORESTRY

FAX:	(061) 208 7160	PRIVATE BAG 13184
TEL:	(061) 208 7111	WINDHOEK
REFERENCE NO: ……..		NAMIBIA

APPLICATION FOR A WASTEWATER DISCHARGE LICENCE, IN TERMS OF PART XIV OF THE WATER RESOURCES MANAGEMENT ACT, 2004

(Act No. 24 of 2004 - as published in the Government Gazette of the Republic of Namibia, No. 3357, of 23 December 2004, Government Notice No. 284)

A. GENERAL INSTRUCTIONS

1. Applications must be submitted in duplicate to:

   The Permanent Secretary
   Attn.: Law Administration
   Ministry of Agriculture, Water and Forestry
   Private Bag 13184
   WINDHOEK

2. Application Fee (to accompany this document): N$_____

3. The various sections have to be completed as follows:
   - **Section B & C** - All applicants
   - **Section D** - Complete only the part relevant to technology employed in your works.
   - **Section E** - All applicants (compulsory!)

4. Only the relevant Sections that have been filled in need to be submitted with this application.

5. A separate application needs to be filled in for each different plant/works.

NAME OF TREATMENT PLANT/WORKS: _____

PLACE: _____ **GPS Coordinates:** _____
(e.g. town, settlement)

1

B. GENERAL INFORMATION

1. Name of applicant: _____

2. Address - Contact Person: _____
   - Postal: _____
   - Physical: _____
   - Tel No.: _____
   - Fax No.: _____
   - E-mail: _____

3. Region in which plant is situated: _____

4. Constituency in which plant falls: _____

5. Type of establishment:
   (e.g. school, town, industry) _____

6. Source of water supply:
   (e.g. borehole, river, sea) _____

7. Total water consumption: _____ m^3/day ADWF*

   (*ADWF = Average Dry Weather Flow) _____ m^3/day ADWF*

   - Consumption based on the average usage over a 12-month period. _____ m^3/day ADWF*
   - List different sources separately _____ m^3/day ADWF*

8. Application:

   - Prepared by: Name : _____ Position: _____

     (e.g. Consultant) Signature: _____ Date: _____

   - Responsible Executive: Name : _____ Position: _____

     Signature: _____ Date: _____

2

C. TECHNICAL DETAILS - GENERAL

Answers to the following information must be contained in this application either from the questionnaire or as an attachment thereto (see also details in Appendix A):

NAME OF TREATMENT PLANT/WORKS: _____

1. Type of effluent (please also refer to Section D for classifications): _____

2. Site of works:

2.1 Submit a site plan indicating the exact location (or intended location) of the works. This plan should indicate (as a minimum):

2.1.1 General location of the works with regards to settlements, main roads, boreholes, rivers etc.

2.1.2 Layout plan of property showing all existing and proposed water pipes and effluent and drainage lines in distinctive colours.

2.1.3 Topographical plan/area photograph/contour plans showing the property and effluent treatment plant in relation to residential areas, rivers, pans, dams, lakes and boreholes.

2.1.4 Contour plans indicating the exact location of the effluent treatment works and point of discharge of final effluent in relation to watercourses that drain the area.

2.1.5 Give the following information:

2.1.5.1 Distance to nearest inhabitants: _____m

2.1.5.2 Distance to nearest water abstraction point (e.g. river, borehole): _____m

2.1.5.3 Distance to nearest watercourse (e.g. dry river) and specify: _____m

2.1.5.4 Wind direction (main/normal) _____

2.2 Submit overall details of works:

2.2.1 Type of effluent treatment system and a brief description of its method of operation. (If domestic effluents are dealt with by the local authority please enclose a letter from the authority confirming this agreement).

2.2.2 Flow diagram/mass balances to show the present average quantities of incoming water, recycled water, final outflow, seepage and evaporation losses (all in m^3/day).

2.2.3 Layout orientation drawing indicating all major treatment units and fence around works.

2.2.4 Complete flow diagram and key design parameters to include:

2.2.4.1 Dimensions and design capacities of each unit process;

2.2.4.2 Process Flow Diagram(s) and major instrumentation employed, e.g. water meters;

2.2.4.3 Loadings on the system (e.g. hydraulic, COD, BOD, nitrogen, phosphate);

2.2.5 Indicate allowances that have been made for future expansion and increased loads (if any).

2.2.6 Methods of sludge disposal or recirculation.

2.2.7 Disinfection of the final effluent (indicate dosing type, method, retention period and optimum disinfectant level in final effluent).

3. Monitoring boreholes for monitoring groundwater pollution over time must be available within 500 m of the point of final effluent discharge.

4. Please note: Additional information is required for new treatment plants (e.g. an environmental impact assessment) - details can be obtained from the Department of Water Affairs and Forestry.

5. All relevant information must be included with this application. **It is a criminal offence to deliberately withhold vital information relevant to this application.** Where applicants are found to be in contravention with this requirement, they may/will be prosecuted.

3

D. TECHNICAL DETAILS - SPECIFIC

Applicants should only complete sections relevant to their specific effluent (please tick relevant box):

☐	D-1: Domestic Effluent - Includes wastewater collected in towns (excluding industrial effluent!), villages, schools, lodges, administration buildings.
☐	D-2: Industrial Effluent - Includes wastewater generated by any industry, factory, etc.
☐	D-3: Mining Effluent - Includes wastewater accumulated or collected due to mining operations (e.g. Acid mine wastewater)
☐	D-4: Combination/mix of various effluents (list major effluent streams on page 11)

Final Effluent Reuse

The pressure on Namibia's existing fresh-water supplies can, to a great extent, be eased by the sensible reuse of effluents for a variety of purposes including dust control, agriculture and industrial processes. Therefore, reuse of effluent after suitable treatment is encouraged.

The allowable reuse of an effluent is dependent upon its quality as well as many local circumstances and hence each application in this category needs careful and individual scrutiny, which should be undertaken by a specialist in this field and must be supported by an environmental impact assessment study.

A separate licence for effluent reuse is required and more details in this regards can be obtained from the Department of Water Affairs and Forestry.

D-2. INDUSTRIAL EFFLUENTS

Plant Name: .....

2.1	Describe industry and major activities resulting in effluent generation		
2.2	Capacity / Flowrates :		
	Design - Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
	Actual (if in operation) - Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
	If ponds are employed, state total surface area		m^2
2.3	List only major contaminants (also attach full analysis of typical effluent sample)		
2.4	Type of treatment employed (give short overview of process):		
2.5	List major treatment chemicals* employed in the unit process(es):		
2.6	Final effluent quality after treatment (put envisaged final quality for a new plant):		
2.7	Sludge generation:		
	- Volume generated		m^3/d
	- Mass		kg/d (dry solid)
	- Method of disposal		
	- Place of disposal		
	- Major constituents		
	- If sludge ponds, state frequency of cleaning		
2.8	Do you employ cleaner production principles (CPP)? Yes/No If "yes", elaborate:		
2.9	Is the following documentation included (give reason if not)? ▪ Water (and waste) management plan: Yes/No ▪ Decommissioning plan: Yes/No		

* For the chemicals employed, proper mass balances should be included that show chemical usage, movement and discharge within the factory/process(es). All safety aspects related to handling, storage and disposal of chemicals on site must be followed at all times.

D-4. COMBINATION OF VARIOUS EFFLUENTS

Plant Name: .....

4.1	Describe major activities resulting in effluent generation (e.g. type of industry):				
4.2	Capacity / Flowrates of different streams (major only)	1	2	3	
	Type (e.g. domestic, industrial, mining, others)				
	Design - Average daily flow				m^3/d
	- Peak hourly flow				m^3/h
	Actual (if in operation) - Average daily flow				m^3/d
	- Peak hourly flow				m^3/h
4.3	List only major contaminants (also attach full analysis of typical effluent sample)				
4.4	Type of treatment employed (give short overview of process)				
4.5	List major treatment chemicals employed in the unit process(es):				
4.6	Final effluent quality after treatment (put envisaged final quality for a new plant)				
4.7	Sludge generation:				
	- Volume generated				m^3/d
	- Mass				kg/d (dry solid)
	- Method of disposal				
	- Place of disposal				
	- Major constituents				
	- If sludge ponds, state frequency of cleaning				

11

E. FINAL EFFLUENT DISPOSAL

1.4.1	Where is the final effluent discharged to? (E.g. French drain, pumped out by Local Authority, dry river course, perennial river, etc.)	
1.4.2	IF soakaway, state: - Type of soil - Suitability/porosity of soil - Size of soakaway area - Include topography and plan of soakaway area	
1.4.3	Is there any post-treatment applied? (e.g. disinfection, filtration)	
1.4.4	Is the final effluent re-used? (Yes/No)	
	If "Yes", complete:	
	- Do you have a reuse licence?	
	- Amount of water that will be re-used:	m^3/d
	- For what application:	
	- Type of irrigation used (if applicable):	
	- What crops are grown:	
	- Area of land that will be irrigated:	ha
1.4.5	Name (if any) downstream users (downstream of discharge point).	
1.4.6	Past records of complaints or objections by people living close to works:	

Reuse:
A reuse licence is required – details can be obtained from the Department of Water Affairs and Forestry.

Irrigation:

The crops allowed to be irrigated are dependent upon effluent quality (details will be supplied on request by the Department of Water Affairs and Forestry).

APPENDIX B - REPORTING OF MAJOR PETROLEUM PRODUCT SPILL FORM PP/11

64 Government Gazette 23 June 2000 No. 2357

FORM PP/11

MINISTRY OF MINES AND ENERGY

PETROLEUM PRODUCTS AND ENERGY ACT, 1990
PETROLEUM PRODUCTS REGULATIONS (2000)

REPORTING OF MAJOR PETROLEUM PRODUCT SPILL

(Regulation 49(1))

(Please note that where form is completed by hand it must be completed in capital letters)

1. Name of licence/certificate-holder/person .....
.....
*(*Delete whichever is not applicable)*

2. Postal address .....
.....

3. Physical address .....
.....

4. Telephone Number (including code) .....

5. Facsimile Number (including code) .....

6. Licence/certificate* number and date of issue, if applicable .....
.....
*(*Delete whichever is not applicable)*

7. Date of petroleum product spill .....

8. Location of petroleum product spill .....
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9. Reasons for petroleum product spill .....
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10. Type of petroleum product involved in petroleum product spill .....
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11. Quantity of the petroleum product spill .....
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12. Indicate whether the petroleum product has or will have any negative effect on the environment and the safety and health of person or the property of persons .....
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13. Provide full details of all remedial actions taken to minimise risks associated with petroleum product spills and all cleaning-up operations taken in connection therewith .....
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DECLARATION

I, ……,
hereby declare that the information submitted by me in this application is true and correct.

…… . …… ……
Signature *Place* *Date*

APPENDIX C - TEMPLATE FOR MONITORING

INSPECTION DATE: _____

INSPECTION COMPLETED BY: _____

SUMMARY OF ACTIVITIES OCCURRING:

_____

_____

_____

_____

Ref No.	Item	Requirements	Responsibility	Compliant	Notes / Action Taken / Corrective Action Required
1	Noise	– Is the facility avoiding noise generating activities at night? – Is scheduling of works to avoid disturbance between the hours of 22pm and 5 am in place? – Are Saturday operational periods from 8 am – 12 noon, when near residential areas? – Are procedures for receiving complaints from nearby land users or residents in place and mitigation measures implemented should operations generate excessive noise?	– SHE Representative	Yes☐ No☐ N/A☐	
2	Operations of mechanical equipment and engines	– Are regular checks of all equipment conducted routinely? – Are equipment services up to date? – Are spill kits and/or drip trays available?	– SHE Representative, and – General Manager	Yes☐ No☐ N/A☐	

Ref No.	Item	Requirements	Responsibility	Compliant	Notes / Action Taken / Corrective Action Required
3	Production and effluent discharge	– Is the domestic and industrial effluent discharged off into approved systems? – If not, are regular water quality samples taken to ensure the treated wastewater complies to the prescribed general standards as set out in the Water Resources Management Act, 2004 (Act No. 24 of 2004)?	– SHE Representative, and – General Manager	Yes☐ No☐ N/A☐	
4	Solid waste generation	– Has the waste management plan and the application of the waste management hierarchy implemented? – Are suitable collection points in place for waste collection at the factory? – Is waste collected regularly and transported correctly? – Is hazardous waste such as waste oil/lubricant stored in a hazardous waste storage area and disposed of by accredited hazardous waste handlers such as Rent A Drum?	– SHE Representative, and – General Manager	Yes☐ No☐ N/A☐	
5	Lighting	– Are energy-efficient light bulbs installed? – Is unnecessary lighting avoided where possible? – Are lights switched off at night?	– SHE Representative, and – General Manager	Yes☐ No☐ N/A☐	
7	Air Emissions	– Are the dust extractors cleaned regularly? – Are vehicles serviced regularly to reduce emissions? – Is there dust monitoring system in place?	– SHE Representative	Yes☐ No☐ N/A☐	
8	PPE	– Are personnel wearing the correct PPE? – Is PPE in good condition? – Are there any complaints on the health of workers	– SHE Representative	Yes☐ No☐ N/A	

APPENDIX D - COMPLAINTS REGISTER TEMPLATE

NAME	CONTACT DETAILS	DATE AND LOCATION OF COMPLIANT	NATURE OF COMPLIANT	ACTION TAKEN TO RESOLVE	NOMINATED PERSON TO RESOLVE ISSUE *(Signature)*	DATE OF RESOLUTION/ CLOSED OUT COMPLAINT

APPENDIX E - MONTHLY INTERNAL COMPLIANCE CERTIFICATE

FOR THE PERIOD …… TO ……

MANAGEMENT REPRESENTATIVE:	SIGN:
SHE Representative:	SIGN:

Date of Submission: _____

Key activities on site during the month: _____

NON-CONFORMANCE:

Area of activity: _____

Reason: _____

Responsible party:
Results:

Correction action taken:	

Intended follow-up:	

GOOD PERFORMANCE:

Description of activity or action in which the area/person went beyond compliance towards responsible care for the environment:

ADDITIONAL COMMENTS:

