

1. Environmental Management Plan (EMP)

This is the phase where excavations and earthworks will be done and then engineering services such as water, electricity, sewerage, roads will be installed in Matutura Proper, Swakopmund followed by construction of Erongo Red substations, residential, general residential, general business and local business properties.

1.1. Construction Phase EMP

The mitigations measures proposed herein must be implemented and managed continuously during the construction phase.

Aspects and hazards	Impacts	Mitigation/Management Action measures (objectives and targets)	Responsible Party
Aesthetics	<ul style="list-style-type: none"> Land pollution 	<ul style="list-style-type: none"> The site shall be kept visually and aesthetically pleasing, especially in and around the Contractor camp. The HSEO shall regularly inspect the site to ensure that it is neat and clean. Where required the Contractor camp shall be screened by the Contractor to ensure that there is no unacceptable visual intrusion in the area of the site. Screening can be done by use of shade cloth or corrugated fencing. 	Principal contractor Contractors HSE Officers
Archaeology and heritage	<ul style="list-style-type: none"> Destruction of Archaeological sites. 	<ul style="list-style-type: none"> If any artifact on site is uncovered, work in the immediate vicinity shall be stopped immediately. Should any archaeological sites be uncovered during construction, their existence shall be reported to the National Heritage Council immediately. The position of any known sites shall be shown on the final design plans. Such areas shall be marked as no go areas. 	Principal contractor Contractors HSE Officers

		<ul style="list-style-type: none"> • Artifacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. • The permit shall be obtained from the National Heritage Council by a reputed Archaeologist. 	
Site Establishment and sanitation	<ul style="list-style-type: none"> • Soil pollution • Water pollution 	<ul style="list-style-type: none"> • Site establishment shall take place in an orderly manner and all required amenities shall be installed at Camp sites before the main workforce move onto site. • The Construction camp shall have the necessary ablution facilities with chemical toilets at commencement of construction activities. • The Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate sanitary activities be allowed other than in supplied facilities. • Ablution facilities shall be within 100m from workplaces but not closer than 50m from any natural water bodies. • There should be enough toilets available to accommodate the workforce (minimum requirement 1: 20 workers). • Toilets shall be serviced regularly • The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at the Municipal landfill • The disposal of waste shall be in accordance with all relevant legislation. • Under no circumstances may solid waste be burnt on site. 	Principal contractor Contractors HSE Officers
Fauna and Flora	<ul style="list-style-type: none"> • Intentional or unintentional killing of fauna on site. • Unnecessary removal of flora. 	<ul style="list-style-type: none"> • The areas to be developed are inhibited by few woody shrubs of the Dollar bush and the hardy shrub Ink/Pencil bush and there are no trees • The only species of fauna found in the areas to be developed are lizards and birds 	Principal contractor Contractors HSE Officers

		<ul style="list-style-type: none"> • Special care should be taken not to damage or remove any such species unless absolutely necessary. • Permits for removal must be obtained should such species be affected. • All shrubs and bush not interfering with the operation of the developments shall be left undisturbed, clearly marked and indicated on the site plan. • The contractor must ensure that no faunal species are disturbed, trapped or killed during the construction phase. • The Contractor and their employees shall not bring any domesticated animals onto the site. • The Contractor shall ensure that the work site be kept clean, tidy and free of rubbish that would attract animals. 	
Occupational Health and Safety	<ul style="list-style-type: none"> • Health and Safety of employees on site 	<ul style="list-style-type: none"> • The construction phase is expected to present the most challenges from a health and safety point of view. • A clear operating plan should be in place to guide the health and safety requirements during the construction phase. • This plan should guide construction staff in terms of their responsibilities in terms of health and safety during the construction phase. • It should be ensured that construction activities are conducted in such a manner that it does not increase the risk of injury or fatalities of construction staff and that the appropriate measures are in place to prevent any incidents and accidents 	Contractors HSE Officers
Clearing and Grubbing	<ul style="list-style-type: none"> • Topsoil • Flora 	<ul style="list-style-type: none"> • The extent of all construction site footprints will be minimised and limited to existing and / or already disturbed areas wherever possible. • The areas needing to be cleared and the degree of clearing required will be determined and demarcated in consultation with the HSEO before clearing begins. 	Principal contractor Contractors HSE Officers

		<ul style="list-style-type: none"> • The Contractor shall at all times carefully consider what machinery is appropriate to the task while minimising the extent of environmental damage. • Topsoil shall be cleared of woody vegetation, and specifically exotic vegetation, before ripping and removing. • The topsoil is regarded as the top 300 mm of the soil profile • Topsoil is to be handled twice only – once during clearing and stockpiling & once during rehabilitation • Soil stockpiles shall not be higher than 2.5m or stored for a period longer than one year. • The slopes of soil stockpiles shall not be steeper than 1 vertical to 2.5 horizontal. • No vehicles shall be allowed access onto the stockpiles after they have been placed. • Stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation. • The Contractor shall apply soil conservation measures to the stockpiles to prevent erosion. This can include the use of erosion control fabric. • If at any stage of the clearing operations archaeological artefacts are unearthed or identified, the National Heritage Council must be contacted immediately to conduct a thorough scientific investigation of the finds. 	
Prevention of disease	<ul style="list-style-type: none"> • Health of workers 	<ul style="list-style-type: none"> • The Contractor shall take all the necessary precautions against the spreading of disease such as Covid-19, flu, TB, etc. • All employees that come onsite must obey Covid-19 protocols and measures must be put in place. • This can then be used as evidence in court should any claims be instituted against Developers and or their Contractors. 	Contractors HSE Officers

		<ul style="list-style-type: none"> • The workforce shall also be sensitised to the effects of sexually transmitted diseases, especially HIV/AIDS. • General health issues shall be brought under the attention of the site staff and condoms shall be supplied on site. 	
Site Buildings / Construction Camp	<ul style="list-style-type: none"> • Visual pollution • Aesthetics • Injury to workers and damage to property 	<ul style="list-style-type: none"> • The planning and design for the Construction Camp must ensure that there is minimal impact on the environment. • The Construction Camp will be placed within an existing disturbed area as far as possible. • The Construction Camp site will be identified by the Contractor in consultation with the HSEO, and negotiated by the Site Manager with the Town Planner of the Municipality of Swakopmund • All site buildings to be of a container or prefabricated type. No permanent structures will be permitted. • With the decommissioning of the structures all compacted platforms and slab foundations must be ripped and removed. • All buildings will be soundly built and will not pose a danger to personnel. • No fires are allowed outside the Construction Camp. • Adequate and well maintained fire fighting equipment according to the fire hazard strategies must be maintained on site during the construction period (at least two all purpose 12.5 kg extinguishers). • Welding, gas cutting or cutting of metal will only be permitted in a protected area inside the Construction Camp. • The Contractor shall be liable for any costs related to extinguishing fires started by the Contractor's representatives / employees. • Additional penalties for infringements will also be imposed by the HSEO or Site Manager. 	Principal contractor Contractors HSE Officers

Storm water management	<ul style="list-style-type: none"> • Hydrology and Storm water • Downstream siltation • Erosion 	<ul style="list-style-type: none"> • It is expected that storm water will be adequately managed during the construction phase. • Storm water will either be directed to the storm water drains or allowed to be absorbed into the soil through the assistance of the gravel distributed especially on the soil surface of the area where infrastructure is located. 	Principal contractor Contractors HSE Officers
Natural Drainages	<ul style="list-style-type: none"> • Blocking and diversion of natural Watercourses • Downstream siltation • Erosion 	<ul style="list-style-type: none"> • Under no circumstances shall the contractor interfere with any watercourses in the vicinity of the site. • Should deviation of such watercourses be required as part of the contract design specification, the specifications shall be adhered to strictly. • The HSEO shall ensure that all watercourses are adequately protected to prevent downstream siltation due to erosion on site • Rubble from the construction process shall be removed from site and may under no circumstances be dumped into any natural drainage channels. • The normal flow of runoff water must not be impeded, as this will enhance erosion 	Principal contractor Contractors HSE Officers
Groundwater	<ul style="list-style-type: none"> • Groundwater pollution 	<ul style="list-style-type: none"> • No impacts are expected on the groundwater of the area during the operational phase as there is no groundwater sources • Containment of waste water will be put in place and to prevent runoff 	Contractors HSE Officers
Access roads to the site	<ul style="list-style-type: none"> • Impacts on traffic movement • Nuisance traffic • Congestion 	<ul style="list-style-type: none"> • Planning of access routes to the site for construction purposes shall be done in conjunction between the Developers, Contractors and the Municipality of Swakopmund. • During construction, use should be made of existing access routes to construction areas where possible. 	Developers Principal contractor Contractors HSE Officers

		<ul style="list-style-type: none"> • Construct approved vehicle turning areas, avoiding selected ecological sensitive areas or species, and have turning area routes approved by the HSEO. • All agreements reached should be documented and no verbal agreements should be made. • Continual use of dirt access roads by heavy machinery and increased transport loads means they will have to be carefully monitored and regularly graded as soon as potholes or rutting occurs. • The Contractor shall properly mark all access roads. • Roads not to be used shall be marked with a "NO ENTRY " sign • Temporary access roads must be rehabilitated after usage 	
Initial Earthworks and Platforms	<ul style="list-style-type: none"> • Erosion • Soil pollution 	<ul style="list-style-type: none"> • The construction platform for the Contractor's camp, as well as the platform for the materials storage area must be appropriately planned. • The Contractor shall take appropriate and active measures to prevent erosion resulting from his own works, operations and activities as well as stormwater control measures to the satisfaction of the HSEO or Site Manager. • Restoration costs will be for the contractor's account, should these measures not be reasonably implemented. 	Principal contractor Contractors HSE Officers
Excavations, backfilling and trenching	<ul style="list-style-type: none"> • Dust liberation • Injuries and fatalities • Damage to mobile equipment • Natural resource depletion 	<ul style="list-style-type: none"> • Where at all possible, excavations must not stand open longer than 2 days, and should preferably be opened and closed on the same day. • They should not be permitted to stand open longer than a week under any circumstances. Excavations must be marked with tape to clearly demarcate the area and warn against access. • Excavations must not be undertaken until such time that all required materials / services etc. are available on-site, to 	Principal contractor Contractors HSE Officers

		<p>facilitate immediate laying of such services or the construction of subsurface infrastructure.</p> <ul style="list-style-type: none"> • Any such excavations should ideally be undertaken within the confines of an established construction site - i.e. a site that is either protected with a peripheral fence, or a site that has a regular / continual human presence. Failing this, regular daily inspections are essential. • Removed soil is to be used to backfill areas where required (i.e. such as existing and unrehabilitated gravel pits). • Excavated material is to be stockpiled along the trench within the working servitude, unless otherwise authorised. • Deficiency of backfill material will not be made up by excavation within the protected area. • Where backfill material is deficient, it must be made up by importation from an approved borrow pit area. • Excess sand and soil resulting from levelling activities of the work area should be stored in low heaps either on the access road or already disturbed area. • Excess topsoil is to be spread evenly over the area in a manner that blends in with the natural topography. • Once heavy machinery has cleared the bulk of these material stockpiles, the disturbed areas should be levelled and cleared of any foreign material. 	
Sand mining	<ul style="list-style-type: none"> • Resource depletion • Visual pollution 	<ul style="list-style-type: none"> • No sand mining will be allowed on the remaining extensions to be serviced • All sand required for construction activities must be procured from offsite licenses companies in around Swakopmund 	HSE Officer
Vehicle Parking Area	<ul style="list-style-type: none"> • Congestion • Soil pollution 	<ul style="list-style-type: none"> • All vehicles and plant will be allocated a dedicated parking area in the camp site. • No storage of plant and vehicles will be allowed outside of the designated area. 	Contractors HSE Officers

<p>Construction Rubble Disposal</p>	<ul style="list-style-type: none"> • Land pollution • Soil pollution • Compaction of soil by rubble • Air pollution • Injury to workers and the public 	<ul style="list-style-type: none"> • The Contractor shall dispose of all excess material on site in an appropriate manner and then removal to the Municipal landfill • All packaging material shall be removed from site and disposed off and not burned on site. • No material shall be left on site that may harm man or animals. • Broken, damaged and unused spares such as glass, nuts, bolts and washers shall be picked up and removed from site. • Surplus concrete may not be dumped indiscriminately on site, but shall be disposed of in designated areas as agreed with the Municipality of Swakopmund • Concrete trucks shall not be washed on site after depositing concrete into foundations. • Any spilled concrete shall be cleaned up immediately. 	<p>Principal contractor Contractors HSE Officers</p>
<p>Stockpiling, handling and storage of building materials</p>	<ul style="list-style-type: none"> • Land pollution • Visual pollution • Soil pollution 	<ul style="list-style-type: none"> • Stockpiles and storage yards will be demarcated in areas already disturbed or where they will cause minimal disturbance. • Clearly indicate which activities are to take place in which areas within the site e.g. the mixing of cement, stockpiling of materials etc. Limit these activities to single sites only. • This may not always be possible for example for heaps of topsoil, but should definitely be the case for other building materials. • Stockpiles of expensive materials such as cement bags should be such that they can easily be removed from the site over weekends or during rainy weather. • Specific sites should be allocated for construction waste e.g. empty cement bags, discarded planks, etc. • A low temporary fence may be erected around such a site in order to contain the waste and assist the effective removal thereof from the site. 	<p>Principal contractor Contractors HSE Officers</p>

		<ul style="list-style-type: none"> • Used cement bags will be placed in wind and spill proof containers as soon as they are empty. The Contractor will not allow closed, open or empty bags to lie around the site. • The Contractor will ensure that all operations that involve the use of cement and concrete are carefully controlled • Concrete mixing may only take place in the construction camp or in agreed specific areas on site. • Concrete may not be mixed directly on the ground. No mixed concrete may be deposited directly onto the ground prior to placing. A board or other suitable platform / surface is to be provided onto which the mixed concrete can be deposited whilst it waits placing • All visible remains of excess concrete will be deposited in a designated area awaiting removal to the Municipal landfill site. 	
Service Area / Wash Bay and storage areas	<ul style="list-style-type: none"> • Impact on soil 	<ul style="list-style-type: none"> • All vehicle and plant shall be well maintained to ensure that there are no oil or fuel leakages. • All maintenance and repair work will be carried out at the main construction camp within an area designated for this purpose, equipped with necessary pollution containment measures. • Drip trays will be utilised during servicing • The Contractor may only change oil or lubricant at agreed and designated locations, except if there is a breakdown or emergency repair, and then any accidental spillages must be cleaned up / removed immediately. • Drainage from the service area will be channelled into a sump or oil-skimming tank, where it shall be treated to remove old hydrocarbons. • Drainage from the wash bay platform will firstly be channelled into a skimming tank before being released by drain to a sedimentation pond. 	Principal contractor Contractors HSE Officers

		<ul style="list-style-type: none"> • Soil contaminated by oil, fuel or chemicals shall be removed and disposed of at a registered Hazardous Waste Disposal Site in Walvisbay or rehabilitated in-situ. • The Contractor shall educate workers on the appropriate methods for workshop maintenance and fuel points to prevent fuel and oil being washed out of containment areas. • Toxins and oil must be recovered from the system at least once a week, and if necessitated more regularly should the HSEO require it. • Toxins and oil recovered must be stored in sealed drums on a covered, bunded area and removed from site either for recycling or disposal at the Walvisbay Hazardous Waste Disposal Site. • All spillage of oil onto concrete surfaces shall be controlled by the use of an accepted absorbent material or saw dust. • Fuels required during construction must be stored in a central depot at the construction camp. This storage area should be located on a slab and be contained within a bund capable of containing at least the volume of one of the containers. • Temporary fuel storage tanks and transfer areas also need to be located on an impervious surface adequately bunded to contain accidental spills. Appropriate run-off containment measures must be in place. 	
Claims for damages	<ul style="list-style-type: none"> • Theft • Reputational damage • Negative publicity 	<ul style="list-style-type: none"> • The HSEO shall keep a photographic record of any damage to areas outside the demarcated site area. • The date, time of damage, type of damage and reason for the damage shall be recorded in full to ensure the responsible party is held liable. • All claims for compensation emanating from damage should be directed to the HSEO for appraisal. • The Contractor shall be held liable for all unnecessary damage to the environment. 	Contractors HSE Officers

		<ul style="list-style-type: none"> • A register shall be kept of all complaints from the community. • All claims shall be handled immediately to ensure timeous rectification / payment by the responsible party. 	
Public Safety	<ul style="list-style-type: none"> • Theft of equipment on site • Injury and fatalities 	<ul style="list-style-type: none"> • Access to the construction site should be strictly controlled by a security company. • Trespassing on private / commercial properties adjoining the site is forbidden 	Contractors HSE Officers
Dust pollution	<ul style="list-style-type: none"> • Land pollution 	<ul style="list-style-type: none"> • The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring Communities • Watering of access roads is recommended, as access roads are normally the greatest cause of dust pollution. • Speed limits can also be installed, especially on private dirt roads leading to the site. • Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor 	Contractors HSE Officers
Air Pollution	<ul style="list-style-type: none"> • Coughs, wheezing and shortness of breath. • Cardiovascular and respiratory diseases. • Lung cancer. • Strokes. • Exacerbation of asthma. 	<ul style="list-style-type: none"> • Reduce the unnecessary idling of diesel engine exhausts of plant and other vehicles • Wear appropriate PPE, such as the correct type of respiratory protective equipment (RPE) depending on the task. • Reduce exposure to dusts and fibres, such as silica, as well as the fumes and gases emitted by vehicles and machinery explains • Never burn waste materials. • Use low sulphur diesel to power equipment and vehicles • Improve existing equipment by using particulate filters and catalyst converters. • Use water sprays or sprinklers to control some types of dust and stop it spreading. • Use an on-tool extraction to control some types of dust. 	Contractors HSE Officers

		<ul style="list-style-type: none"> • Source local materials to avoid the need for them to be transported from far 	
Separation Tanks	<ul style="list-style-type: none"> • Water pollution 	<ul style="list-style-type: none"> • The Contractor shall provide grease and oil separation tanks (if required) at all areas where oil spillage or collection will occur, i.e. workshops, oil storage, vehicle wash areas and fuel points. • The Contractor shall provide a method for oil recovery. • Recovered oil shall be collected in weather-proof drums for recycling or disposed of at a registered Waste Disposal site. These drums will be stored on site only on a covered, bunded area. • The Contractor will test effluent discharged from any oil skimming tanks for conformance with relevant effluent standards if requested to do so by the HSEO when pollution is suspected. 	Contractors HSE Officers
Littering	<ul style="list-style-type: none"> • Land pollution • Visual pollution 	<ul style="list-style-type: none"> • Littering by the employees of Contractors shall not be allowed under any circumstances. • The HSEO shall monitor the neatness of the work sites as well as the Contractor campsite 	Contractors HSE Officers
Solid Waste Management	<ul style="list-style-type: none"> • Visual pollution • Attracting scavengers 	<ul style="list-style-type: none"> • An adequate number of 'scavenger proof' refuse bins must be provided at the construction sites and at the construction camps. • These bins must be provided with lids and an external closing mechanism to prevent their contents blowing out and must be scavenger-proof to prevent dogs and other animals that may be attracted to the waste. • The Contractor will ensure that all personnel immediately deposit waste in the waste bins provided. • All refuse and solid waste generated at all work sites will be stored in appropriate scavenger proof containment vessels at the relevant site and removed to the main construction 	Contractors HSE Officers

		<p>camp, where the waste will be sorted and stored within a fenced waste storage area.</p> <ul style="list-style-type: none"> • All waste must be transported in an appropriate manner • The Contactor may not dispose of any waste and / or construction debris by burning, or by burying. • Discard all construction waste at the Municipality of Swakopmund /Rent-a-Drum registered waste management facility / landfill site, particularly those wastes or products that could impact on surface or groundwater quality by leaching into or coming into contact with water. • The contractor will maintain ‘good housekeeping’ practises as to ensure that all work sites and construction camp are kept tidy and litter free. 	
Liqued Waste Management	<ul style="list-style-type: none"> • Soil pollution • Land pollution • Health • Erosion 	<ul style="list-style-type: none"> • The Contractor must take reasonable precautions to prevent the pollution of the ground and / or water resources on and adjacent to the site as a result of their activities • The Contractor may discharge ‘clean’ silt laden water overland and allow this water to filter into the ground. However, he must ensure that he does not cause erosion as a result of any overland discharge • No natural watercourse is to be used for the cleaning of tools or any other apparatus. This includes for purposes of bathing, or the washing of clothes etc • All washing operations will take place off-site at a location where wastewater can be disposed of in an acceptable manner. • Trucks delivering concrete may not be washed on site. • No spills may be hosed down into a storm water drain or sewer, or into the surrounding natural environment. • Adequate ablution facilities are to be provided at each construction site, conveniently located near to work areas to avoid localised pollution from camp sewerage. 	Contractors HSE Officers

		<ul style="list-style-type: none"> • All soil contaminated, for example by leaking machines, refuelling spills etc. is to be excavated to the depth of contaminant penetration, placed in 200 litre drums and removed to an appropriate landfill site. 	
Hazardous waste and materials	<ul style="list-style-type: none"> • Soil pollution • Health 	<ul style="list-style-type: none"> • Compliance to local, national and international legislation and management practices with regard to the storage, transport, use and disposal of fuel, chemicals, harmful and hazardous substances and materials will be enforced. • Fuel, chemical, harmful and hazardous waste throughout the site must be stored in appropriate, well maintained containers. • Any accidental chemical / fuel spills to be cleaned up immediately. • Storage of all hazardous material is to be safe, tamper proof and under strict control. • Emergency procedures for dealing with spills or releases of solvents and fuel must be put in place. • The training and education of all personnel on site who will be handling the material about its proper use, handling and disposal must be put in place. 	Contractors HSE Officers
Noise Pollution	<ul style="list-style-type: none"> • Noise pollution • Local residents experience varying levels of stress, • Sleep disturbance or high blood pressure. • Workers gradual hearing loss 	<ul style="list-style-type: none"> • Use quiet power tools and equipment to manage noise pollution. • Where possible, use modern construction equipment that has been designed specifically to produce less noise. • The Contractor shall ensure that noise levels remain within acceptable limits. This applies especially after working hours and during the night • Schedule work during sociable hours rather than when residents are likely to be sleeping. For example, between 8h00 Am to 17h00 on weekdays and half days on Saturdays. • Also notify local residents of the working hours and keep them updated on the project. 	Contractors HSE Officers

		<ul style="list-style-type: none"> • Put acoustic (movable noise) barriers in place to manage the levels of noise pollution. • Machinery and vehicle silencer units are to be maintained in good working order. • Offending machinery and / or vehicles will be banned from use on site until they have been repaired. • Switch off plant when it's not in use. • Ensure employees wear the correct PPE when required to reduce the risk of hearing loss due to excessive noise. 	
Water pollution	<ul style="list-style-type: none"> • Spread of Infectious diseases, like cholera, typhoid fever and other diseases gastroenteritis, diarrhea, vomiting, skin and kidney problems • Clogging of water filters and contamination of drinking water. • High cost to purify drinking water 	<ul style="list-style-type: none"> • Monitor and improve your management and disposal of site waste. Make sure all waste is correctly dealt with to stop it from spreading. • Keep materials such as sand or cement secure. • Materials must be located where there isn't a risk of them being washed into waterways or drains. • Cover up all drains to prevent waste from ending up in the water. • Keep the roads and footpaths to the sites clean at all times. This will prevent silt and other pollutants from running off into any bodies of water. • Properly collect and treat any wastewater being produced. 	Contractors HSE Officers
Fire prevention	<ul style="list-style-type: none"> • Poor maintenance of firebreak might lead to fires spreading 	<ul style="list-style-type: none"> • No open fires shall be allowed on site under any circumstance or started as a result of activities on site. • Gas and liquid fuel may not be stored in the same storage area. • No open fires for heating or cooking will be permitted on site, unless otherwise agreed and then only in designated areas. • The Contractor shall have operational suitable, tested and approved fire-fighting equipment available on site at all times at site offices, kitchen areas, workshop areas, material stores and any other areas. 	Contractors HSE Officers

Erosion Control	<ul style="list-style-type: none"> • Dust liberation • Foundations subsidence • Visual pollution 	<ul style="list-style-type: none"> • The Contractor shall protect all areas susceptible to erosion and shall take measures, to the approval of the HSEO. • The Contractor shall not allow erosion to develop on a large scale before effecting repairs and all erosion damage shall be repaired as soon as possible. • Where required, cut-off trenches can be installed to divert substantial runoff • During construction, areas susceptible to erosion must be protected by installing temporary or permanent drainage works and energy dispersion mechanisms and prevent erosion. 	Contractors HSE Officers
Interaction with Affected Parties	<ul style="list-style-type: none"> • Relations with next door neighbours • Health and safety of next door neighbours 	<ul style="list-style-type: none"> • The success of any project depends mainly on the good relations with the Municipality of Swakopmund and its Communities. • It is therefore required that the HSEO and the Contractor establish good relations with all the affected parties in the immediate vicinity of all construction activities. • All negotiations for any reason shall be between the HSEO, the affected parties and the Contractor. • NO verbal agreements shall be made. All agreements shall be recorded in writing and all parties shall co-sign the documentation. • The affected parties shall always be kept informed about any changes to the construction programme should they be involved. • If the HSEO is not on site the Contractor should keep the affected parties informed. • The contact numbers of the Contractor and the HSEO shall be made available to the affected parties. • This will ensure open channels of communication and prompt response to queries and claims. 	Contractors HSE Officers

		<ul style="list-style-type: none"> All contact with the affected parties shall be courteous at all times. The rights of the affected parties shall be respected at all times 	
Infrastructure	<ul style="list-style-type: none"> Nuisance to communities Inconveniencing next door neighbours 	<ul style="list-style-type: none"> No interruptions other than those negotiated shall be allowed to any essential services. Damage to infrastructure shall not be tolerated and any damage shall be rectified immediately by the Contractor. A record of any damage and remedial actions shall be kept on site. All existing private access roads used for construction purposes, shall be maintained at all times to ensure that the local people have free access to and from their properties. Speed limits shall be enforced in such areas and all drivers shall be sensitized to this effect. Any possible disruptions to essential services must be kept to a minimum and should be well advertised and communicated to the Municipality of Swakopmund and surrounding Communities. 	Contractors HSE Officers
Traffic impacts	<ul style="list-style-type: none"> Injured or fatalities as a result of being struck by moving plant vehicles or their loads striking people, particularly when reversing vehicles striking services and obstructions manufacturers instructions for safe use being disregarded inadequate training of drivers and signallers; and 	<ul style="list-style-type: none"> Drivers of the construction and operational vehicles should be in possession of valid and appropriate driving licenses Planning and managing vehicle operations on construction sites Organise construction sites so that vehicles and pedestrians using site routes can move around safely. The routes need to be suitable for the persons or vehicles using them, in suitable positions and sufficient in number and size Provision and maintenance of safe workplaces, safe vehicles, safe drivers and safe work practices. Drivers must not be allowed to operate vehicles and machinery while impaired due to medication, alcohol, drugs and medical conditions. 	Contractors HSE Officers

	<ul style="list-style-type: none"> • unsafe loading and transportation of materials on vehicles. • Obstruction of adjacent roads • Increased heavy mobile equipment traffic in neighbourhood • lost productivity, • added project costs, and • bad public relations with the surrounding communities. 	<ul style="list-style-type: none"> • Selecting and maintaining vehicles; and implementing safe driving and working practices. • Provide car and van parking for the workforce and visitors away from the work area; • Control entry to the work area; and • Plan storage areas so that delivery vehicles do not have to cross the site. • Employers should take steps to make sure that all workers are fit and competent to operate the vehicles, machines and attachments they use on site • The need for vehicles to reverse should be avoided where possible as reversing is a major cause of fatal accidents. • Install turning circles so that vehicles can turn without reversing. • Safe loading, hauling and offloading zones must be identified onsite. • Make sure that all drivers and pedestrians know and understand the routes and traffic rules on site. Use standard road signs where appropriate • Provide induction training for drivers, workers and visitors and send instructions out to visitors before their visit. • Install aids for drivers, plant and vehicle marshalls, lighting and pedestrians on site should wear high-visibility clothing 	
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1.2.Operational Phase EMP

In case the Municipality of Swakopmund finds that changes to the Project, the Project site or Adverse Impacts of the Project warrant revisions to this EMP, Construction Phase EMP, or Operational Phase EMP as the case may be, then the Municipality of Swakopmund may require the Developers to prepare and submit a revised EMP, Construction Phase EMP, or Operational Phase EMP, as the case may be to the Municipality of Swakopmund for review and approval.

The requirements for the daily management and execution of the Matutura Proper development are stated in this section to ensure that.

- Work is managed with minimal disturbance and creation of nuisance to surrounding natural and human environment.
- Employees and visitors to the sites do not interfere and negatively impact on the environment and next-door neighbours and the conservation and restoration of this must be prioritised.
- A positive HSE culture must be instilled and always practiced by Developers, their contractors and employees when working and engaging with the surrounding communities.
- Monitoring will be done through random site inspection

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party
Environmental Health and Safety	<ul style="list-style-type: none"> • Environmental pollution 	<ul style="list-style-type: none"> • A health & safety and environmental management training session(s) prior to commencing work on site shall be conducted for all staff members and sub-Contractors. • A follow up session(s) shall be conducted as needed to ensure all staff members and sub-Contractors have received training. 	Contractors HSEO
Covid-19	<ul style="list-style-type: none"> • Community transmissions • Absenteeism • Employees isolation • Site shutdown 	<ul style="list-style-type: none"> • Site entrance checks with body scanners • Anyone with an abnormally high temperature of 38°C is not allowed onsite • Provision of sanitiser onsite and at site entrances • All staff to be encouraged to always mask up when interacting with other employees (where required and in compliance with current Covid-19 Regulations) • Any employee with COVID-19 related symptoms is to be isolated with immediate effect, removed from site and 	Contractors HSEO

		<p>reported to the Swakopmund State Hospital Health Authority</p> <ul style="list-style-type: none"> • Tracing of close contact to commence and all close contacts informed and requested to leave site and get tested. 	
Lack of enforcement	<ul style="list-style-type: none"> • Manpower support 	<ul style="list-style-type: none"> • Employ qualified and competent teams and manpower to implement all the practical environmental conservation measures as proposed in this EMP. • Manage the programme i.e., coordinating with an environmental consultant • Implement necessary prevention or best practice method in the event of poor environmental quality. 	Principal contractor Contractors HSEO
Waste generation	<ul style="list-style-type: none"> • Dumping of contaminated soil, cleared vegetation, rubble, domestic waste and stockpiles. 	<ul style="list-style-type: none"> • Stockpiles should be stored and/or disposed in accordance with the relevant policies and guidelines. • Ensure that no excavated soil, refuse or building rubble generated on site are placed, dumped or deposited on adjacent/surrounding properties or land. • Wind and animal proof bins must be provided at demarcated areas. Waste must be disposed of at a licensed waste disposal site. • Ensure that hydrocarbon contaminated soil is bio-remediated before being disposed of at appropriate sites. • No littering or dumping of solid waste of any description is permitted on the site. All litter especially plastics and other materials capable of being dispersed by the wind and constituting hazard to public livelihoods' activities should be collected daily, properly stored before disposed of at an approved dumping site. • Construction waste should be recycled whenever possible, in accordance with the waste management plan. 	Principal contractor Contractors HSEO

		<ul style="list-style-type: none"> • Domestic wastewater should be collected into appropriate sewage tanks and treated with appropriate chemicals before discharge at licenced solid waste sites. • Toilets should be provided to male and female staff members at a ratio of 1:20. • No burning of refuse shall be allowed. 	
Positioning of security lights	<ul style="list-style-type: none"> • Light pollution 	<ul style="list-style-type: none"> • Placement of security lights should be directed to glow in a downward direction to avoid light pollution and glare onto nearby communities and properties. • Perimeter lighting area should also be placed in a downward facing manner and motion activated to prevent glare at night. • No flood lights should be allowed to be installed at the contractor's camps for the purposes of illuminating the sites at night. 	Principal contractor Contractors HSEO
Visual impact	<ul style="list-style-type: none"> • Adjustment of terrestrial habitat 	<ul style="list-style-type: none"> • Morning Take 5 talks to be made routine and all employees must be given and undergo induction. • Always determine the route of activities beforehand and restrict all activities to demarcated areas. • Reinstate and rehabilitate where necessary during construction activities. 	Principal contractor Contractors HSEO
Sewerage management	<ul style="list-style-type: none"> • Attraction of pests • Offensive odours • Visual pollution • Nuisance to neighbours • Community complaints 	<ul style="list-style-type: none"> • Only portable flush toilets equipped with French drains/septic tanks will be erected at construction sites. • No foreign object may be flushed down the toilets to prevent damage and maintain integrity of the sewer system and maintain a healthy environment 	Principal contractor Contractors HSEO
Solid waste management	<ul style="list-style-type: none"> • Environmental pollution • Littering 	<ul style="list-style-type: none"> • Implement waste segregation strategies onsite 	Principal contractor Contractors

		<ul style="list-style-type: none"> Promote positive waste management practices i.e. reduce, reuse, and recycle, and only the remaining waste must be sent to landfill. Minimise and eliminate the careless release of waste products into the receiving environment. Waste removal for offsite disposal such as to the landfill should be through licensed waste removal contractors such as Rent-a-Drum 	HSEO
Construction equipment	<ul style="list-style-type: none"> Visual impact Loss of aesthetic value 	<ul style="list-style-type: none"> Only key and required mobile equipment and machinery needed must be kept on site in and on the construction site in an orderly fashion. 	Principal contractor Contractors HSEO
Noise generation from construction equipment and machinery	<ul style="list-style-type: none"> Noise pollution to employees, surrounding area and next-door neighbours 	<ul style="list-style-type: none"> Near source employees must be provided with appropriate personal protective clothing and equipment such as earplugs and earmuffs where required. The movement and operation of heavy mobile equipment and machines will be restricted to daytime operational hours only. 	Principal contractor Contractors HSEO
Dust liberation	<ul style="list-style-type: none"> Dust generation from construction and excavation activities exposure to land and next-door neighbours 	<ul style="list-style-type: none"> All personnel working in dusty areas and or around heavy mobile equipment will be provided with dust masks Dust spraying methods to be implemented for high volume or frequently used roads and surfaces to be excavated in especially those near boundaries to suppress dust liberation. 	Principal contractor Contractors HSEO
Dust liberation and storm runoff on excavated land and open trenches	<ul style="list-style-type: none"> Soil erosion Dust liberation Downstream siltation 	<ul style="list-style-type: none"> Excavation, handling and transporting of layer materials must be minimised under high wind conditions. Dust suppression measures may be required, such as sprinkling the construction site with water to suppress the dust. Dust protection masks must be provided to all staff members working in dust polluted environment. 	Principal contractor Contractors HSEO

		<ul style="list-style-type: none"> • All vehicles' speeds should be controlled to reduced dust production; hence appropriate road signs should be placed to control the traffic speed. • Excavated and disturbed land should be contoured and landscaped after construction activities. • Artificial drainage systems should be erected where natural drainage systems have been cut off, interrupted to rerouted. 	
Occupational Health and HIV and AIDS	<ul style="list-style-type: none"> • Prevalence of HIV might increase due to the developments. • The immigration of mainly single persons to the construction site presents a perfect opportunity for sex workers and for local community members to engage in unsafe, sex-for-cash sexual relations. 	<ul style="list-style-type: none"> • HIV/AIDS awareness and prevention, and general hygiene training programmes should be developed and implemented before any construction commences. • The main target group is the staff members, but the public may also be encouraged to attend. • Follow up awareness raising, and education should be conducted at least every six months. 	Principal contractor Contractors HSEO
General Nuisance of the Construction Activities	<ul style="list-style-type: none"> • Aesthetics and inconvenience caused to persons trying to access/exit the construction site, or other general nuisances arising from the construction activities. 	<ul style="list-style-type: none"> • Contractors should always maintain housekeeping and tidiness on site. • Site camps will be properly fenced, and no domestic animals are allowed on site. • Contractors must ensure that all excavations are rehabilitated at the end of construction to reduce unwanted aesthetic impacts. • Contractors should always keep "an open-door policy" towards the local community. This will encourage cooperation and strengthen relationships. 	Principal contractor Contractors HSEO

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party
Traffic impacts	<ul style="list-style-type: none"> • Disruption to traffic flow in the immediate surrounds 	<ul style="list-style-type: none"> • - Set up appropriate vehicle movement signage on local roads/intersections surrounding the project site to direct traffic flow in a safe manner. • - Whenever feasible, construction vehicles should avoid leaving the site at peak traffic periods (07:00 to 08:30 AM, 12:00PM to 14:00PM and (17:30PM to 18:30 PM). • - Construction vehicles should not be allowed to park off site, except in dedicated parking spaces (off site) as may be agreed upon between the proponent and the local authority. • - All necessary reflective and lighting signs should be placed on project and construction vehicles to maximize visibility and reduce potential accidents that may have occurred • otherwise. 	Principal contractor Contractors
Noise	<ul style="list-style-type: none"> • Noise pollution due to heavy-duty equipment and machinery on site. • Disturbance of the residents and staff members' exposure to noise in the vicinity of the construction area 	<ul style="list-style-type: none"> • Ensure engines of construction machinery are fitted with mufflers. • Equipment and machinery operators should be equipped with ear protection equipment. • Operations should be strictly between 07H00 to 17H00. 	Principal contractor Contractors

	will have to be considered during construction.		
Safety and Security	<ul style="list-style-type: none"> • Earthmoving equipment used on site may increase the possibility of injuries to both staff members and the public. • The presence of equipment and materials not securely stored may encourage theft. 	<ul style="list-style-type: none"> • The Contractor must ensure that all staff members are briefed daily about the potential risks of injuries on site. • All staff members shall receive health and safety training prior to working on any construction work. • Flammable materials (e.g., fuel for construction vehicles) should be stored as far as possible from sensitive receptors. • Storage of hazardous materials and substances shall be strictly in accordance with the appropriate risk and fire prevention standards. • Material Safety Data Sheets (MSDS's) for all chemicals and any hazardous substance used on site should be always readily available on site. • The Contractor is urged to ensure that adequate emergency facilities, including first aid kits, are available on site. • Adequate traffic and safety signs must be placed at the construction site to warn and inform all stakeholders about the construction and traffic conditions. • The Contractor must adhere to all relevant laws, regulations, guidelines and policies with regards to labour aspects, health and safety standards. 	Principal contractor Contractors
Protection of Biodiversity and Cultural Heritage	<ul style="list-style-type: none"> • Motorised disturbances that could threaten biodiversity, ecosystems functions and services and cultural heritage. 	<ul style="list-style-type: none"> • Site Management Plans depicting preferred site for construction camps, permanent way for materials collection and storage, etc. need to be developed by the Contractor with the assistance of the project engineer. • These plans need to be documented, reviewed, updated, and implemented prior to the commencement of work at any location. 	Principal contractor Contractors

		<ul style="list-style-type: none"> • There are no structures of cultural heritage observed during assessments. • The projects resident engineer and the Contractors should regularly communicate with relevant local authorities to identify cultural heritage sites if found during excavations and, construction should immediately be stopped, and relevant authorities should be informed. • Construction works can only resume with written approval from the relevant authorities the Heritage Council. • No water should be abstracted from any source without specific written approval from relevant authorities. • To minimise land degradation, no off-road driving is allowed except on demarcated access and hauling roads. • The confines of the site, especially haul and access roads shall be clearly marked and signposted by the Contractors at the direction of the HSEO. • All necessary measures should be implemented to minimise fauna displacement and flora destruction. • No fires are always allowed on site. • Soils from areas infested with invasive flora should not be hauled from those specific areas. The risk of such species dispersing and displacing natural vegetation is very high, thus the HSEO should be always consulted to ensure that invasive plants are not accidentally dispersed. • Any person or institution or company not complying with these specifications are liable to fines and penalties as indicated in relevant contracts conditions, relevant laws, and regulations. 	
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Job creation, Skills development and business opportunities	<ul style="list-style-type: none"> Positive socio-economic impacts and spinoffs 	<ul style="list-style-type: none"> Semi-skilled and unskilled jobs should target local community members. Prioritise local employment and spend in local business where reasonably possible Enhance the use of local labour and local skills as far as reasonably possible. Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible. 	Principal contractor Contractors
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1.3. Closure and rehabilitation Phase EMP

The operational phase is followed by the closure and rehabilitation phase of a project. This is also a site-specific plan drawn up to ensure that appropriate environmental management practices are put in place during the finalisation of these Matutura developments and to put in place remediation measures of works.

Closure and rehabilitation phase.

- Provide site specific and fit for purpose mitigation measures to finalise construction works, site clean-up, remediation of contaminated sites, waste and construction rubble removal and restoration activities of areas not going to be built-up.
- Reduce and eradicate any long-term liability issues related to the different extensions to the developers and to the Municipality of Swakopmund.

The mitigation measures and activities should commence during the construction and operational phase and be finalised at closure and completion of construction activities.

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party
Soil erosion	<ul style="list-style-type: none"> Erosion of site 	<ul style="list-style-type: none"> All topsoil removed during the land servicing and excavations of foundations must be conserved and used in the rehabilitation and close out phase. No topsoil may be sold. This soil must be kept safe from erosion 	Contractors HSEO

		<ul style="list-style-type: none"> • Stockpile area will be covered with gravel during construction operations to prevent erosion. • Gravel will be removed on completion of construction. The topsoil will be used as a defensive wall for the stockpile pad and ramp, to protect the area from prevailing winds and rainwater erosion. • Topsoil and vegetation from the ramp must be used to create a defensive wall along the perimeter of the ramp and stockpile area. The pile should be used as windbreaks to shield the ramp and stockpile area from the prevailing winds. • Stockpiles should be stabilised by securing with nets or other suitable sheeting material. • The stockpile pad will be re-shaped to remove any steep embankments during the final rehabilitation and closure phase. • After rehabilitation is complete, no topsoil shall be left over 	
Rehabilitation of access roads and surrounding site	<ul style="list-style-type: none"> • Visual pollution 	<ul style="list-style-type: none"> • Any access road or portions thereof, constructed by the developers shall be removed and or rehabilitated to the satisfaction of the HSEO. Gravel will be removed • Any gate or fence erected by the developers which is not required by the landowner, shall be removed and the land restored to the pre-construction state 	Contractors HSEO
Removal of construction equipment, vehicles, machinery and infrastructure	<ul style="list-style-type: none"> • Visual pollution • Nuisance Infrastructure 	<ul style="list-style-type: none"> • All construction equipment/vehicles and machinery should be removed immediately from the site at the end of defects liability period. • The removed materials should be transported and kept in safe place for use by the owners and Contractors in other works. • The area should be cleaned and all domestic wastes, debris/waste metals, grease and oils must be cleaned up and disposed of in a manner approved by competent authorities • There must be a removal of all portable toilets, bins, machinery and other equipment on site as according to relevant legislation 	Principal contractor Contractors HSEO
Monitoring	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Monthly HSEO inspections will take place during construction and during rehabilitation to ensure that objectives are being met. 	Principal contractor

			Contractors HSEO
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1.4. Implementation of the EMP

All construction activities will be carried out in compliance with the relevant legal requirements. No significant impacts are anticipated for the activities that have been identified and management and mitigation measures are in place for potential risks.

This EMP.

- Has been prepared pursuant to identified aspects and hazards involved in land servicing and housing construction activities and developers, their contractors and employees will be required to comply and will be a contractual requirement

1.5. Location of the Environmental Management Plan

The HSEO should ensure that a copy of this EMP is always available on site. This includes any EMP, or other document used to guide the overall management of environmental, health and safety aspects of the entire land servicing and construction developments.

The following are also examples of documents to be kept on site:

- Site Diary
- I & AP Complaints register.
- Environmental incidents register.
- Non-conformance Reports.
- Method Statements.
- Material Safety Data Sheets (MSDS).
- Written Corrective Action Instructions.
- Safe disposal certificate for all types of waste disposed of.
- Health, Safety and Environmental Training Records.
- Notification of Emergencies and Incidents.
- Copies of monthly reports
- Minutes of site meeting including discussions on environmental issues

1.6. Compliance Assessment

The HSEO should ensure that the requirements contained in this EMP are complied with. Clear records of compliance issues and/or the compliance status with this EMP should be kept for assessment either as part of any environmental audits or performance assessments conducted for the land servicing and construction developments.

Should any issues of non-compliance be identified, these should be rectified immediately, or a clear action plan compiled to ensure that the issues are addressed as quickly as possible.

1.7. Conclusion

This EMP has a long-term objective to ensure that:

- Environmental management considerations are implemented from the design phase of the project.
- Contractors can and shall include any costs of compliance with this EMP into the tender prices.
- Precautions against environmental damage and claims arising from such damage are taken timeously.
- The completion date of the various contracts is not delayed due to environmental problems with the landowner, communities or Regulatory Authorities arising during the project execution.

This EMP is legally binding because it will form part of the contract between the Municipality of Swakopmund, developers and any contractor or staff member.

It is crucial for all recommendations made in this EMP to be appropriately implemented on site during the land servicing, construction and operation of Matutura Proper. Compliance monitoring by an appropriately qualified HSEO will serve as a means of verifying the degree to which the EMP is being implemented on site.