

Upgrade of Railway Line Between Kranzberg Station and Tsumeb Station



ENVIRONMENTAL MANAGEMENT PLAN (CONSTRUCTION PHASE)

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Prepared For:



**Ministry of Works
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1. INTRODUCTION

1.1. OVERVIEW

The Government of Namibia, represented by the Ministry of Works & Transport (MWT) is engaged in a process towards the upgrade of the section of existing railway line located between Kranzberg Station and Tsumeb Station to improve safety and travel times and meet minimum SADC railway standards.

Windhoek Consulting Engineers (WCE), a multi-disciplinary engineering consulting firm, was appointed by MWT to perform engineering, procurement, and construction management of the project. **Consulting Services Africa (CSA) was appointed as a sub-consultant to WCE to perform an environmental assessment and prepare the necessary documents to apply for an Environmental Clearance Certificate.**

The section of the railway line to be upgraded has an approximate length of 392km, and passes through the towns and settlement of: Omaruru, Kalkfeld, Otjiwarongo, Otavi and Tsumeb.



Figure 1. Project Area

The entire 392km railway project site has been receiving maintenance for the past five (5) years. The work is being performed by D & M Rail Construction; and the Project Engineer is WCE. The rail, ballast and sleepers for this section had not been replaced for decades, and posed serious safety and maintenance problems.

The planned scope of works for repair and upgrade of the railway line includes the following:

- Replacement of any remaining old rails, sleepers and ballast that have not been replaced by the current maintenance activities;
- Repair, widening or construction of new railway embankment / formation, where required;
- Upgrade of all rail sections to SADC-standard rail for the entire 392km project limits;
- Repair or upgrade of the existing bridges and culverts, and addition of new culverts, if necessary;
- Minor re-alignments of the railway where there are sharp curves. The re-alignments will occur fully within the existing railway reserve.

All of the above work will occur within the existing railway servitude.

In terms of Namibia's Environmental Assessment Policy of 1995, the Environmental Management Act No. 7 of 2007 (Section 27(2)(a)), Government Notice No. 29 of 2012, and the Government Notice No. 30 of 2012 (EIA Regulations), the proposed railway upgrade project matches two "Listed Activities", which necessitate an application for Environmental Clearance (see Section 1.3 below).

1.2 Objectives of the EMP

The objectives of the EMP are to:

- Promote sustainable development by encouraging conservation and mitigation of negative impacts to the natural and social environments;
- Inform the Contractor, Contractor's Designated Environmental Officer, Engineer, Engineer's Representative (ER), Independent Environmental Control Officer, and MWT about their roles and responsibilities regarding environmental management in the project;
- Accurately describe the scope of work to be performed, and where it is to occur, so that no misunderstandings occur during construction that would result in unforeseen environmental impacts;
- Identify specific actions to be taken by the Contractor to prevent or minimise negative impacts to the natural and social environments;
- Identify laws, regulations and standards that are applicable to the environmental management of this project;
- Establish the procedures, fines and penalties that could be applied by the ER when the Contractor does not comply with the EMP.

2. LEGISLATIVE FRAMEWORK

Table 1 below provides a summary of some of the legislation and policies that are relevant to the proposed development.

Table 1. Relevant legislation and policy guidelines

	Applicable legislation	Article/Section/Number of activity
1	The Constitution of the Republic of Namibia (1990)	Article 95 (1).
2	Environmental Management Act, Act No. 7 of 2007	Section 27 (2) (a, b and c).
3	Government Notice No. 29 (Listed Activities)	Sections 10.1(c), 9.5, 8.8 & 8.1
4	Environmental Assessment Policy, 1995	Entire document
5	Water Resources Management Act No 11 of 2013	The entire document
8	Atmospheric Pollution Prevention Ordinance 11 of 1976	Sections 4, 10, 12, 23 and 32
9	TransNamib Internal policies and Operational Procedures	All relevant documents
10	Minerals (Prospecting and Mining) Act 33 of 1992 and as amended	Entire Act
11	Nature Conservation Ordinance 4 of 1975 and as amended	Sections 14, 18, 20 and 24
12	National Heritage Act No. 27 of 2004	Sections 46 and 55
13	Local Authorities Act No. 23 of 1992) and its amendments	Entire Act
15	Public and Environmental Health Act No. 1 of 2015	Entire Act
16	International Treaties and Conventions such as on: CITES, IUCN, Biodiversity and Desertification.	

3. ROLES AND RESPONSIBILITIES

The implementation, monitoring and enforcement of the EMP will involve the following parties:

- 1) The Proponent, which is the Ministry of Works and Transport (MWT);
- 2) The Engineer, which is WCE;
- 3) The Engineer's Representative (ER), which is the person who represents the Engineer on site and is responsible for construction supervision;
- 4) The Independent Environmental Control Officer (IECO), which is someone independent of the Contractor who has been appointed by the Proponent to monitor the Contractor's compliance with the EMP;
- 5) The Contractor, which is to be determined;
- 6) The Designated Environmental Officer (DEO), which is a person who works for the Contractor and is the designated one responsible for ensuring the Contractor's compliance with the EMP.

3.1 Proponent

The Proponent, MoWT, will review reports regarding the implementation of the EMP, and make payments to the Contractor, Engineer and IECO based on satisfactory performance, including satisfactory implementation of the EMP. MWT can also give formal warnings and impose fines and penalties on the Contractor when the Contractor neglects to implement the EMP satisfactorily.

3.2 Engineer's Representative

The primary responsibilities of the ER are to perform construction supervision, contract administration, and communicate formally with the Contractor on behalf of MWT on all performance and contractual issues. Since the IECO will only make monthly site visits to monitor the Contractor's compliance with the EMP, the ER will also be responsible for monitoring the Contractor's EMP-related performance on a daily basis.

The following are the general EMP-related responsibilities of the ER:

- Familiarity with all aspects of the EMP;
- Daily monitoring of the Contractor regarding compliance with the EMP;
- Communicate to the Contractor, verbally and in writing, regarding any matters of non-compliance, fines and penalties;
- Assist in the undertaking of damage assessments where incidents, accidents and serious infringements have occurred;

- Inspect and approve any areas that have been rehabilitated by the Contractor;
- Review EMP-related complaints received and issue instructions to the Contractor, as necessary;
- Maintain a record of complaints from the public and communicate the complaints to the Contractor;
- Enforce temporary work stoppages where serious environmental, social, or health & safety infringements and non-compliances have occurred.

3.3 Independent Environmental Control Officer

MWT will appoint an IECO who will visit and inspect the construction site on a monthly basis. The IECO will perform environmental audits of the Contractor's operations and participate in the monthly site meetings, providing his/her input on EMP-related issues. The IECO will prepare a monthly environmental audit report which will be provided to the Contractor, ER and MWT. The IECO will make recommendations to the ER regarding corrective actions to be taken by the Contractor, penalties and fines, etc. which will be issued to the Contractor by the ER.

The following are the general responsibilities of the IECO:

- Familiarity with all aspects of the EMP;
- Review the credentials of the Contractor's proposed DEO and make a recommendation to MWT and the ER regarding whether the proposed DEO should be approved;
- Perform monthly environmental audits to inspect the site and determine whether the Contractor's operations are in compliance with the EMP;
- Participate in monthly site meetings with the MWT, ER and Contractor;
- Prepare a monthly environmental audit report to communicate findings of site inspection to the MWT, ER, and Contractor;
- Make recommendations to the ER and MWT regarding the way forward on any matters of non-compliance, including recommendations for fines and penalties;
- Undertake damage assessments where incidents, accidents and serious infringements have occurred.

3.4 Designated Environmental Officer

A candidate for DEO is proposed by the Contractor prior to construction and can be changed during construction. The DEO's experience and qualifications are reviewed and approved by the ER on behalf of the MWT. The DEO is responsible for overseeing the

implementation of the EMP on behalf of the Contractor, and for communicating on EMP-related issues. A DEO must be on site at all times during construction.

The following are the general responsibilities of the DEO:

- Fully implement the conditions stipulated in the Authorisation and Record of Decision issued by Environmental Commissioner/Directorate of Environmental Affairs (DEA) and any other competent regulatory body having authority over the project or the activities concerned;
- Fully implement the EMP and ensure compliance throughout the duration of construction;
- Perform training and awareness raising exercises for the construction staff to ensure they are well informed about measures to be taken regarding environmental management and health & safety.
- On a daily basis, inspect the construction site and Contractor's camp, and monitor the activities of the Contractor's and Sub-Contractors' staff, to ensure that they are all complying with the EMP and relevant environmental and health & safety regulations;
- Serve as the Contractor's communicator on all EMP-related issues;
- Notify the ER and IECO immediately in the event of any accident or infringements of the EMP and ensure appropriate remedial action is taken;
- Notify the ER and IECO at least 10 working days in advance of any activity that may have significant environmental impacts, so that planned mitigatory measures may be reviewed and approved well in advance.
- Ensure compliance by all of the Contractor's and Sub-Contractors' staff with designated "No-Go" areas;
- Inform the ER and IECO of any plans to rehabilitate areas affected by construction activities, so that the planned measures may be reviewed and approved well in advance.
- Prepare and submit a monthly report to the ER and IECO concerning environmental management and health & safety measures implemented, as well as any issues to be noted. The report should include content on: any training or awareness-raising sessions performed; the status of training received by all staff including Sub-Contractors' staff; and descriptions of any issues or incidents concerning environmental management or health & safety, and what the Contractor has done to address the issues and incidents.

4. KEY ISSUES OF THE EMP

The following are key issues of the EMP that require attention by the Contractor and the Contractor's DEO, as well as by Sub-Contractors, suppliers, the ER, the IECO and the MWT.

4.1 Documents and Record Keeping

The Contractor shall maintain a copy of the EMP on site throughout the duration of construction. The Contractor, under the DEO's leadership, shall maintain records on site throughout the duration of construction of the following:

- Significant incidents (e.g. spills, impacts, health and safety) as well as actions taken;
- A register of public complaints in which all complaints are recorded, as well as descriptions of remedial actions taken by the Contractor;
- Records of staff attending and the content presented at all training and awareness raising sessions, such as the induction course, induction rehearse course, and daily toolbox talks;
- A list of all hazardous materials stored on site, with material safety data sheets (MSDS) provided for each.

4.2 Environmental Training and Awareness

4.2.1 Induction Course

The Contractor, under the leadership of the Contractor's DEO and Health & Safety Officer, shall conduct an induction course for all of the Contractor's and Sub-Contractors' staff prior to those staff commencing their work activities on site. The induction course shall cover important environmental and health & safety issues and responsibilities, including but not limited to the following:

- Awareness about the environmental sensitivity of the surrounding environment;
- Clear instructions about No-Go areas. No work is to be performed outside of the existing railway servitude, and no vehicles or persons are to travel outside of existing roads, access roads, railway servitude or the Contractor's camp;
- Awareness about national heritage sites in the vicinity of the project site;
- No trapping, poisoning or shooting of animals is allowed;
- No removal or disturbance of vegetation or the land area outside of the existing railway servitude and minimisation of disturbance of vegetation within the servitude wherever possible;

- Information regarding all wayleave conditions (see section 4.4 below);
- Instructions on proper handling of hazardous materials;
- Instructions on proper storage of materials and machinery;
- Health & safety instruction, including the importance of wearing personal protective equipment (PPE)
- Instructions about only using designated toilet, washing and eating facilities and areas;
- Information about HIV/AIDS, sexually transmitted diseases (STDs), tuberculosis and preventative measures;
- Information about the availability of free condoms to all staff at the Contractor's Camp;

All staff should receive an induction refresher course on a quarterly basis.

4.2.2 Toolbox Talks

The Contractor, under the leadership of the Contractor's DEO and Health & Safety Officer, shall incorporate pertinent environmental, health & safety topics into the Contractor's daily toolbox talks. The toolbox topics could include reminders of topics covered in the induction course or new topics, such as: reminders about the importance of staying within the existing railway servitude, and only traveling on existing roads and access roads; reminders about the proper handling of hazardous materials; reminders about only using designated toilet, washing and eating facilities and areas; information about HIV/AIDS and STDs; etc.

4.3 Liaison with Local Authorities and Land Owners

The ER shall stay in regular contact throughout the construction period with all local authorities and land owners along the project limits. The ER will communicate with local authorities and land owners to keep them abreast of the progress of the construction activities, and to let them know when and where construction activities are planned to occur. Through this regular communication, the authorities and land owners will know when to expect the Contractor to be working in their respective areas.

4.4 Way of Leave Agreements

Prior to construction, the Engineer on behalf of the MWT will co-ordinate Way of Leave agreements with all relevant authorities, and will obtain their respective way of leave conditions which must be adhered to by the Contractor. The relevant authorities with

whom the Engineer may need to communicate include, but are not limited to, the following:

- TransNamib
- NamWater
- NamPower
- Erongo RED
- CENORED
- NORED
- Roads Authority
- Telecom
- MTC
- Local Authorities (Omaruru, Otjiwarongo, Otavi, Tsumeb, Erongo Regional Council, Otjozondjupa Regional Council, and Oshikoto Regional Council)

4.5 Hiring of Local Labour

It is recommended that the Contractor, where possible, hire unskilled labourers from all of the local towns and settlement located along the project limits, and not just from one town. This will help maximise the local economic development benefit of the construction activities. The Contractor should consult with the Ministry of Labour regarding their local hiring activities.

4.6 Working Hours

The Contractor will be restricted to working between the hours of 06h30 – 18h30 during Summer and 07h00 – 17h30 during Winter, Monday to Saturday. The Contractor shall not work on Sunday or public holidays.

Any variations to the above must be reviewed and approved in advance by the ER and MWT – and by the local authorities if the work is to occur in, or near to, urban areas. Such variations must comply with the Labour Act and any other relevant legislation.

4.7 Contractor's Camp and Storage Facilities for Machinery, Equipment and Materials

4.7.1 Location of Contractor's Camp

If the Contractor requires a camp(s) to be established on a neighbouring property(ies), it is the Contractor's responsibility to communicate with land owners and find a land owner(s) who agrees to the camp being established on their property. The camp shall have a clearly delineated boundary, so that employees stay within the agreed upon camp space.

It is preferred though that the Contractor be able to perform the construction activities without the need to establish a camp on adjacent private property. And, as highlighted during the public consultation process for the Environmental Scoping Report, the adjacent land owners much prefer that construction workers are transported to site daily rather than live in temporary construction camps where the risks for fires and poaching are increased.

4.7.2 Employee Facilities

If the Contractor establishes a camp(s) on site, he/she shall provide a designated dining area with cooking facilities, tables, chairs, trash bins and washing facilities. Shaded eating facilities shall also be provided within the servitude for dining and break times.

Cooking facilities shall be located a safe distance from fuel storage areas. Fires shall only be permitted in designated, safe areas within the Contractor's camp.

The camp shall include toilets at a minimum ratio of 1 toilet per 15 workers, for both male and female employees. The toilets must be maintained in a clean, hygienic condition, and stocked with toilet paper. The toilets should not be located in depressed areas. The toilets must be secured to the ground. The waste cannot under any circumstances be discharged into the environment. Hand washing facilities must be provided near to the toilets. Toilets and hand washing facilities must also be provided in the railway servitude near construction activities, as per above requirements.

Enclosed sleeping areas with beds and adequate bedding, as well as adequate privacy, must be provided at the camp for all employees.

Security guards shall be provided by the Contractor to look after the employees' personal property and facilities, as well as the other areas of the Contractor's camp.

4.7.3 Solid Waste Management

If the Contractor establishes a camp(s) on site, scavenger-proof waste bins shall be provided throughout the camp, at the following locations (but limited to these locations): ablution area, dining area, sleeping area, office area, workshop area, storage and laydown areas, and at camp entrances / exits.

A waste storage container shall be provided at the camp into which the bins are dumped regularly. The waste storage container shall be emptied on a weekly basis or as needed.

Under no circumstances can solid waste be burned, dumped or buried at the camp or anywhere within the railway servitude. All solid waste is to be transported to a permitted landfill facility.

4.7.4 Equipment Storage and Maintenance

Drip trays shall be provided for all vehicles and plant and checked daily. Any vehicles and plant that have leaking lubricants, fuels or other hazardous fluids shall be repaired or removed from the site.

A properly bunded wash bay shall be installed and approved by the IECO and monitored by the IECO and ER. The washing of vehicles and plant shall be kept to a minimum. Only environmentally friendly, low phosphate, low nitrate, low foaming detergents will be allowed and must be approved by the IECO prior to use.

4.7.5 Material Storage

All construction materials will be stored within the existing railway servitude. All storage areas are to be maintained in a neat and tidy state.

Stockpiles of construction materials shall have a minimum stockpile base width while maintaining natural, stable stockpile side slopes.

The material stockpiles shall not pose a safety risk in any way for persons or vehicles moving in their vicinity.

Hazardous substances shall be stored in secondary containers. As previously stated, material safety data sheets shall be available on site at all times.

A weatherproof, impervious container / skip shall be provided for the temporary storage of hazardous waste. The container / skip shall only be disposed of at a landfill that is licensed to receive hazardous waste. The Contractor shall provide the ER with a copy of the Certificate of Disposal after each disposal of the container / skip.

4.7.6 Fuel Storage and Re-fuelling

Fuel will typically be delivered to site in a suitably sized fuel storage tanks. The Contractor must ensure that fuel tanks are in good condition without leaks. Fuel tanks must be located on an impermeable, bunded slab or equivalent. The storage volume of the bunded area must be 30% greater than the volume of the storage tank (or combined volume of storage tanks). The tank(s) shall be inspected daily for leaks. A leaking tank must be repaired immediately, or replaced immediately.

The Contractor must provide adequate fire suppression equipment wherever fuel is being stored or machinery and equipment is being fuelled.

4.8 Concrete Batching

Concrete batching shall be performed on an impermeable surface that is properly bunded. The concrete batching area shall be located at least 25m away from any water course. If concrete trucks are employed, care must be taken to ensure the concrete is not poured onto the ground. Any spillage must be cleaned immediately.

4.9 Emergency Situations

The Contractor shall ensure that his employees are adequately trained to effectively and safely manage emergency situations involving spillages or leaks of hazardous or damaging materials, and fires. In addition to understanding the procedures to be followed, the Contractor must ensure that appropriate PPE is provided for such situations, as well as the equipment required for effective clean-ups and fire suppression. Such equipment must be available within quick access of where the risks for spillages or fires could occur.

4.10 Dust Control

The Contractor shall minimise the generation of dust from transport and construction activities. If needed, construction and transport activities should be temporarily stopped during high wind conditions.

4.11 Noise Control

Noise impacts will be minimised by the limit of working hours. As previously stated the Contractor's allowable working hours are the following, unless otherwise approved by the ER:

Between 06h30 – 18h30 during Summer and 07h00 – 17h30 during Winter, Monday to Saturday. No construction work on Sunday or public holidays.

4.12 Transport of Construction Materials and Machinery to and from the Railway Servitude

It is important that no roads or tracks are constructed or inadvertently created for the purposes of this project. Only the existing service road within the servitude and existing

roads to the railway servitude will be utilised by construction-related vehicles and machinery.

If significant construction traffic is expected outside of the railway servitude, then the Engineer will prepare a construction traffic plan that will be included in the construction tender documents.

4.13 Construction-Related Waste

The existing rails and old steel sleepers that are replaced will be transported from site to the nearest station or siding where they will be neatly stored until being auctioned later. This is the current practice of TransNamib.

Old ballast that is replaced will be worked into the railway embankment where it was located. This will improve the stability of the embankment and will reduce the potential for soil erosion.

All other construction-related waste will be transported and disposed of off-site in a permitted landfill facility.

4.14 No-Go Areas

Any area located outside of the railway servitude, Contractor's camp(s), or existing access roads will be considered as No-Go area for vehicles, materials and employees.

If for whatever reason the Contractor believes it is necessary to venture into a No-Go area, then the ER and IECO must first be notified. The IECO must then notify MET and potentially affected land owners to review the situation and obtain approval or denial. Furthermore, a biodiversity specialist may need to be hired to study the specific site to be disturbed and the potential environmental impacts of such disturbance. This situation is not anticipated, however, based on the limited nature of the scope of work.

If by accident a No-Go area is ventured into by the Contractor, then the Contractor must immediately inform the ER and IECO about such incursion and disturbance. The IECO must then notify MET and the relevant land owner(s), and the No-Go area must be inspected for potential impacts and damage, and the way forward determined.

4.15 Existing Utility Crossings

The Environmental Practitioner met with NamWater to learn about locations where there are NamWater pipelines within the railway servitude. The following locations were identified:

- 1) A pipeline runs parallel to the railway between Kranzberg Station and point south of Omaruru, but it is not clear on maps available whether the pipeline is located within the railway servitude.
- 2) A pipeline runs parallel to the railway and within the servitude for approximately 8km, beginning just south of Kalkfeld and running northward. At the north end of Kalkfeld, near the township settlement, the pipeline crosses under the railway via a culvert and exits the servitude.
- 3) A pipeline crosses under the railway where the road from Otjiwarongo to Outjo crosses the railway line.
- 4) There is a pipeline that crosses under the railway where the BI highway intersects the railway the Otavi area.

Note that there may be additional municipal-owned water pipelines that are located within the servitude.

The Environmental Practitioner contacted NamPower, Erongo RED, CENORED and NORED but did not receive feedback regarding transmission or distribution lines that are located within the servitude or cross the railway line. The contractor, D & M Rail Construction, that has been performing maintenance work on the railway indicated that there are electrical lines that cross the railway servitude at at least two locations, but potentially at more locations. There is a line that crosses the railway between Otavi and Tsumeb, and another that crosses just south of Otjiwarongo.

The above information is in no way meant to serve for engineering or construction purposes. It is the responsibility of the engineer and contractor to learn about the details of all utilities located within or near the servitude that could potentially be impacted by construction activities.

4.16 National Heritage Sites

There is only one national heritage site identified on the website of the National Heritage Council which is located within one kilometre of the railway. It is site number 014/1951, *Footprints of Dinosaurs*. Using the google earth satellite image on the NHC's website, it was determined that the site is approximately 500m to the southeast of the railway. The site is located in Kalkfeld. *Footprints of Dinosaurs* is a popular tourist destination. There is no reason whatsoever for the Contractor to come into contact with the site.

4.17 Rehabilitation of Railway Servitude and Contractor's Camp Sites

As previously explained, the upgrading of the railway line will take place within the existing railway servitude, and the transport of materials and machinery to the site will

only occur on the railway line itself, the service road within the servitude, and on existing roadways.

Although significant disturbance within the railway servitude is not anticipated, if there are areas that are disturbed, they will be rehabilitated once construction activities in those areas have been completed. Similarly, it is not anticipated that the Contractor will need to establish a camp facility outside of the servitude; however, if a camp(s) is necessary, the disturbed land area should be thoroughly cleaned after the camp has been removed.

It is recommended that the Engineer and IECO take photographs of the railway servitude and of any camp locations before the contractor has disturbed those areas. The photographs will assist the IECO and ER to specify how the land should be rehabilitated later. Typical rehabilitation work includes removal of all stray rubbish, and raking and levelling the disturbed ground to a smooth surface condition.

4.18 Removal of potentially unsafe vegetation, termite hills and meerkat holes, and repair of an excavated portion of the railway embankment

During the Environmental Practitioner's 2-day inspection of the railway line, a few potential safety issues were noted.

- 1) In many sections, grass and other vegetation have grown very close to the railway line. This represents a fire hazard, since the locomotives sometimes generate sparks. Vegetation should be cleared at least 3m from the edge of the ballast on both sides of the railway line.

There are also locations where the branches of shrubs and trees have grown too close to the railway line, posing a safety hazard to the train conductor if he/she places their arm outside of the locomotive. These branches must be removed.



Figure 2. Vegetation that has grown too close to the railway line

- 2) In some locations, there are termite hills that are located too close to the railway line and should be removed to ensure they neither pose a safety risk to the train operators nor destabilize the railway embankment. Termite hills located within 2m of the edge of the ballast on both sides of the railway line should be removed.



Figure 3. A termite hill that is located too close to the railway line

- 3) In some locations, meerkats of dug holes into the embankment area, which potentially poses the risk of destabilising the embankment. TransNamib and the Contractor should utilise a non-toxic and non-lethal method to chase away the meerkats from living right next to, or under, the railway embankment.
- 4) In the Otavi area, there is a location where people have illegally excavated soil adjacent to the embankment. Any areas such as this should be repaired by TransNamib and/or the Contractor.



Figure 4. Illegal soil excavation adjacent to the railway embankment

5. MITIGATION MEASURES

Table 2. Table of Mitigation Measures

Aspect & Background		Proposed Mitigation Measures	Responsible Party
Documentation Control and Record Keeping	It is important that the EMP is available on site for reference, and that records are maintained and available for review by the IECO and ER.	<ul style="list-style-type: none"> • Maintain a copy of the EMP on site throughout the duration of the construction • Maintain and make available on-site records of: <ul style="list-style-type: none"> – Significant incidents (spillages, fires, environmental damage, injuries, etc.) – Register of public complaints – Details on training and awareness raising sessions performed – List of hazardous materials and a Material Safety Data Sheet (MSDS) for each material 	DEO / Contractor
Awareness and knowledge about environmental management and health & safety precautions and procedures	Environmental management and health & safety will improve if the workforces of the Contractor and Sub-Contractors are educated about risks and best practices.	<ul style="list-style-type: none"> • Perform Induction Training sessions as discussed in section 4.2.1 • Perform Induction Rehearser Training on a quarterly basis as discussed in section 4.2.1 • Incorporate awareness raising regarding environmental management and health & safety into the daily toolbox discussions as discussed in section 4.2.2 	DEO / Contractor
Liaison with local authorities and land owners	Communicate regularly with local authorities and land owners regarding the progress and location of ongoing construction activities	<ul style="list-style-type: none"> • Contact local authorities and adjacent land owners on a regular basis (monthly, or more frequently if needed) to inform them about where the Contractor is currently working and when it can be expected that s/he will be working in their respective area. 	ER
Approval from relevant authorities	Apply for Ways of Leave with all relevant authorities and obtain their details and conditions regarding construction	<ul style="list-style-type: none"> • Prior to construction, apply to all relevant authorities for Ways of Leave and obtain each authority's conditions on construction activities. Refer to section 4.4. 	Engineer
Hiring of local labourers	Improve benefits to local communities through the hiring of local labourers during construction	<ul style="list-style-type: none"> • Hire unskilled labourers from all towns located along the project limits, if feasible 	Contractor

Aspect & Background		Proposed Mitigation Measures	Responsible Party
Contractor's camp	If the Contractor requires a camp(s), it must be carefully planned and must adequately cater for the employees who will live there, and the materials, vehicles and machinery to be stored there.	<ul style="list-style-type: none"> • Contractor to communicate with nearby landowners and come to an agreement regarding the payment and rental terms for the establishment of a camp where employees will live and where materials, vehicles and plant will be stored. • The Contractor's camp(s) shall provide humane, hygienic, safe and environmentally sound facilities for the employees living there, as described in section 4.7 • The Contractor's camp(s) shall provide safe and environmentally sound facilities for storage of vehicles, plant, materials and fuel; and there shall be adequate health and safety equipment available at the camp at all times. Refer to sections 4.7 and 4.9 for details. 	Contractor / DEO
Proper concrete batching	It is important to minimise accidental spillages during concrete batching and the delivery of wet concrete to the construction site.	<ul style="list-style-type: none"> • Concrete batching shall be performed on an impermeable surface that is properly bunded, and should be performed at least 25m from any water courses. See section 4.8. • Any spillages from a concrete truck must be cleaned up immediately. 	Contractor / DEO
Dust control	It is important to minimise dust pollution during construction.	<ul style="list-style-type: none"> • If needed, construction and transport activities should be temporarily stopped during high wind conditions. • Dust suppression by means of watercart 	Contractor / DEO
Noise control	It is important to minimise noise pollution during construction.	<ul style="list-style-type: none"> • Noise will be mitigated through the enforcement of reasonable working hours, which shall be between: 06h30 – 18h30 during Summer and 07h00 – 17h30 during Winter, Monday to Saturday. No construction work on Sunday or public holidays. • The ER must approve in advance any variations to the above working hours and days. 	Contractor / DEO

Aspect & Background		Proposed Mitigation Measures	Responsible Party
Protection of sensitive land areas and habitats	It is important to minimise the disturbance of the project on land areas and habitats.	<ul style="list-style-type: none"> • No new access or service roads or tracks will be constructed or inadvertently created for the purposes of this project. Only the railway, the service road located inside the servitude, and existing roads outside of the servitude will be utilised by construction-related vehicles and machinery. • If significant traffic is anticipated to occur outside of the servitude, the Engineer will prepare a construction traffic plan that is to be included in the construction tender documents. • Any areas located outside of the railway servitude, Contractor's camp(s), or existing access roads will be considered as No-Go areas for vehicles, materials and employees. Refer to section 4.13 for more details. 	Contractor / DEO
Existing utilities	It is important the Contractor in no way damages existing utilities and infrastructure located within or adjacent to the railway servitude.	<ul style="list-style-type: none"> • Details about the locations and conditions for working near water lines, electrical lines, and other utilities and infrastructure should be obtained by the Engineer and Contractor from NamWater, the local authorities, NamPower, Erongo RED, CENORED, NORED, MTC, Telecom and the Roads Authority. Way of Leave agreements are to be initiated and managed by the Engineer. 	Engineer, ER & Contractor
Vegetation control	It is important that vegetation is controlled within the railway servitude to reduce fire and safety risks	<ul style="list-style-type: none"> • Remove any vegetation that is located within 3m of the edge of the ballast. • Remove any tree branches or shrubs that are located within 3m of the edge of the ballast. 	Contractor
Embankment stability	It is important that termite hills, meerkat holes, animal burrows, or illegal excavation of soil that may impair the stability of the railway embankment are removed and/or repaired.	<ul style="list-style-type: none"> • Remove any termite hills located within 2m of the edge of the ballast. • Chase away using non-toxic and non-lethal methods any meerkats that have dug holes in the railway embankment or within 2m of the edge of the ballast. • Repair any holes in the embankment that have been caused by animals or illegal soil excavation. 	Contractor

6. PENALTIES

The Contractor, under the leadership of the DEO, shall ensure that all employees of the Contractor, sub-contractors, and suppliers are familiar with, understand, and adhere to this EMP. Failure by any employee of the Contractor, sub-contractors, or suppliers to comply with the EMP shall be considered sufficient cause for the ER to instruct the Contractor to have the relevant employee removed from the site. MWT may also order the Contractor to suspend part or all of the works if there is non-compliance with the EMP. Such suspension shall be lifted only when the offending procedure or requirement is corrected and/or if required remedial measures are put in place.

Penalties for the incidents described below will be imposed by the ER on the Contractor and/or his/her sub-contractors and suppliers after consultation with the IECO.

Table 3. Penalties

No.	Type of Incident	Penalty Amount
1	Any employees, vehicle, machinery, etc. related to the Contractor's activities operating outside the designated project boundaries or within the No-Go areas.	N\$4,000
2	Damage to indigenous vegetation located outside the railway servitude and limits of the Contractor's camp	The cost of restoration plus N\$5,000
3	Damage to national heritage monument sites	Up to a maximum of N\$100,000 per incident
4	Damage to fauna	Up to a maximum of N\$4,000 per incident
5	Oil, grease, fuel or hazardous fluid spills	The cost of the clean-up operation plus N\$3,000
6	Inappropriate methods of refuelling that cause spillages	N\$2,000
7	Litter on site	N\$1,000
8	Disposal of waste other than described in the EMP and approved by the IECO or ER	N\$5,000
9	Employees not making use of toilet facilities provided on site	N\$1,000

For each subsequent similar offense, the penalty may be doubled in value, at the discretion of the ER, to a maximum value of N\$10,000, with the exception of No. 3 for damage to a national heritage monument.

The ER shall judge what constitutes a transgression of the terms of the EMP, and will consult with the IECO on such matters.

7. CONCLUSION

The EMP is a basic tool to reduce the magnitude and frequency of environmental impacts, and provides a means by which the Contractor's environmental performance may be monitored.

Any conditions of the Authorisation received from the Competent Authority should be incorporated and implemented by the Contractor to complement this EMP.