# DEVELOPMENT OF AN ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM (ESMS) IMPLEMENTATION MANUAL FOR CFM, AND AN ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR THE OPERATION AND MAINTENANCE OF LOCOMOTIVES

## ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN FOR THE OPERATION AND MAINTENANCE OF LOCOMOTIVES

**AUGUST 2023**

**Prepared for:**

*Portos e Caminhos de Ferro de Moçambique EP (CFM)*

**Prepared by:**

*Consultec – Consultores Associados, Lda.*

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| | |
|---|---|
| AfDB | African Development Bank |
| AIDS | Acquired Immune Deficiency Syndrome |
| BOD | Biological Oxygen Demand |
| CEF | Community Engagement Framework |
| CFM | Mozambique Ports and Railways (*Caminhos de Ferro de Moçambique*) |
| CLO | Community Liaison Officer |
| CO | Carbon Monoxide |
| $CO_2$ | Carbon Dioxide |
| CoC | Code of Conduct |
| COD | Chemical Oxygen Demand |
| dB | Decibel |
| DE | Executive Directorates (*Direcção Executiva*) |
| DF | Railway Directorate (*Direcção Ferroviária*) |
| DTC | Direct targeted communication |
| E&S | Environmental & Social |
| EHS | Environmental, Health and Safety |
| EHS | Environment, Health and Safety |
| EIA | Environmental Impact Assessment |
| ERP | Emergency Response Plan |
| ESGM | Environmental and Social Governance Manager |
| ESIA | Environmental and Social Impact Assessment |
| ESMP | Environmental and Social Management Plan |
| ESMS | Environmental and Social Management System |
| GBV | Gender Based Violence |
| GHG | Greenhouse Gas |
| GRM | Grievance Redress Mechanism |
| HIV | Human Immunodeficiency Virus |
| IFC | International Finance Corporation |
| ISO | International Organization for Standardization |

| | |
|---|---|
| ISS | Integrated Safeguard System |
| LDAR | Leak Detection and Repair |
| LPG | Liquified Petroleum Gas |
| MS | Method Statements |
| MTA | Ministry of Land and Environment (*Ministério da Terra e Ambiente*) |
| $NO_x$ | Nitrogen Oxides |
| $O_3$ | Ozone |
| OHS | Occupational Health and Safety |
| OS | Operational Standard (OS) |
| $PM_{10}$ | Particulate matter with 10 micrometres or less in diameter |
| $PM_{2,5}$ | Particulate matter 2.5 micrometers or less in diameter |
| PPE | Personal Protection Equipment |
| PS | Performance Standard (IFC) |
| PTC | Positive Train Control |
| Qx | Quarter (1, 2, 3 and 4) (from year) |
| SDept | Signalization Department (*Departamento de Sinalização*) |
| SEAH | Sexual Exploitation, Abuse and Sexual Harassment |
| $SO_2$ | Sulphur Dioxide |
| SOG | General Workshop Services (*Serviço de Oficinas Gerais*) |
| SOP | Standard Operating Procedures |
| STD | Sexually-Transmitted Disease |
| STF | Railway Transport Services (*Serviço de Transporte Ferroviário*) |
| STP | Passenger Transport Services (*Serviço de Transporte de Passgeiros*) |
| SVO | Track and Construction Services (*Serviço de Via e Obras*) |
| TSP | Total Suspended Particles |
| TSS | Total Suspended Solids |
| UGSQMA | Safety, Quality and Environmental Management Unit (*Unidade de Gestão da Segurança, Qualidade e Meio Ambiente*) |
| VOC | Volatile Organic Compounds |
| VOX | Volatile Organic Halogens |

| | |
|---|---|
| WB | World Bank |
| WBG | World Bank Group |
| WHO | World Health Organization |

# 1 Introduction

## 1.1 CFM Background

Mozambique Ports and Railways (CFM) is a legally constituted State-owned Company responsible for the operation of Ports and Railways and ensuring mobility and circulation needs are assured.

A major restructuring process was successfully concluded by the Mozambique Railways Company resulting from reforms implemented in recent decades. This resulted in the transformation of a State-Owned Company into a Public Company through Decree 40/94 of September 13th.

This new organizational and functional structure prioritizes quality and improvement in management. It is lighter, more agile, with access and availability of Information and Communication Technologies (ICT) which positively contributes to the achievement of their business plan.

CFM's mission is to develop the rail and port system to render it modern, efficient, competitive and market oriented. CFM intents to become a company of reference and the best logical option through the quality of its services.

At a company level, CFM's objectives are to:

- Promote and develop rail and port infra-structure;
- Operate the rail and port system, promoting logistic activities and the transport of goods and passengers; and
- Maximize the rationalization of its assets by increasing their returns.

The company is administratively subdivided into three regional executive Directorates: North (CFM-Norte), Central (CFM-Centro) and South (CFM-Sul).

CFM Centralized or Support Services, reporting directly to the Management Board, act as a link between the directorates and other functional areas to ensure coordination and development of activities related to organizational support and centralized management of financial processes, procurement, human resources, operational security, and the environment.

The following chart displays the organizational structure of CFM and its regional Executive Directorates:

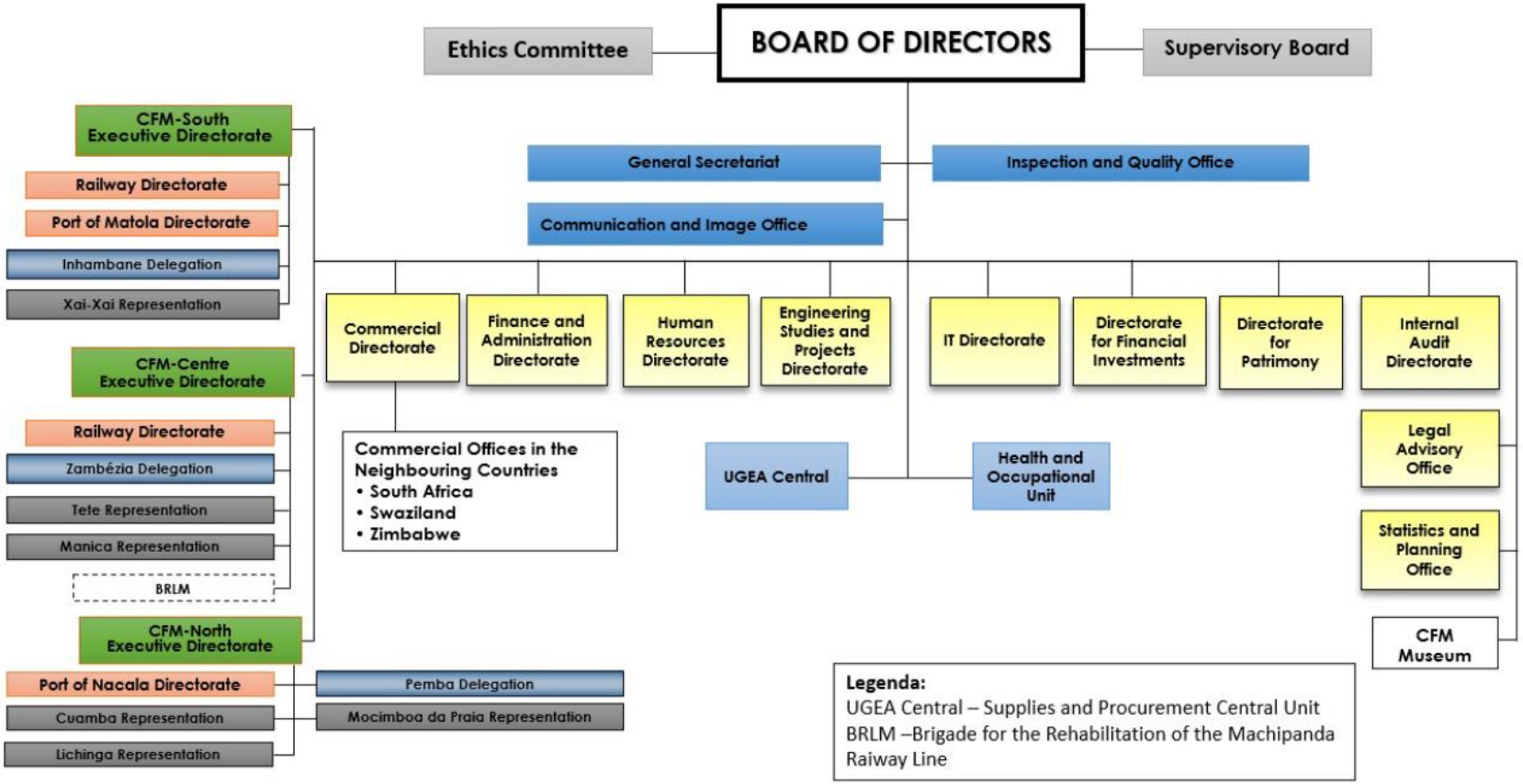



**Figure 1-1 – CFM organizational chart**

In the context of the above-mentioned restructuring process, and after the concession of the port and railway activities in the Central and Northern systems, CFM is currently responsible for the operation of fuel terminals (all ports), cereals and aluminium (in the Port of Maputo), as well as the Southern Railway System, which includes the Ressano Garcia, Limpopo, Goba and Salamanga branches, which, by Governmental decision and as per CFM's recommendation, are not subject to concessions.

CFM-Centro is currently responsible for the operations of Maritime Services - Fuel Terminals, Coal Terminal and Pier 8 (TCC-8), as well as the Central Railway System which includes Machipanda, Sena, Marromeu and Vila Nova de Fronteira branches.

CFM-Sul is one of the Executive Directorates (DE) of CFM which is responsible for managing railway and real estate assets located in the provinces of Inhambane, Gaza, and Maputo.

## 1.2 Consultant Team

This consultancy is being managed by Consultec, a Mozambican company based in Maputo and registered as an Environmental Consultant with the Ministry of Land and Environment (MTA). The Consultant's relevant contact details are provided below.

**Table 1-1 – Consultec Contacts**

| | | |
|---|---|---|
| CONSULTEC Consultores Associados, Lda | **Environmental Consultant** | **Consultec - Consultores Associados, Lda** |
| | Address | Rua Tenente General Oswaldo Tazama, 169 Maputo. |
| | Person of contact | Marta Henriques |
| | Contact number | + 258 21 491 555 |
| | E-mail | mhenriques@consultec.co.mz |

Table 1-2 below indicates Consultec's team.

**Table 1-2 – Environmental team and their roles**

| Name | Role |
|---|---|
| Vera Ribeiro | Team Leader/ESIA Expert |
| Tânia Diniz | Team Leader Assistant |
| Nuno Silva | Team Leader Assistant |
| Rafael Noronha | Social Scientist |
| António Romão | E&S Management Specialist and Quality Control |
| Marta Henriques | Specialist in Waste and Risk Analysis |
| Miguel Barra | Noise & Air Quality Specialist |
| Ana Lobo | Health, Safety, Quality and Environmental Management Specialist |

## 1.3 Purpose

This report presents the Environmental and Social Management Plan (ESMP) for the maintenance and operation of locomotives. The purpose of the ESMP is to provide comprehensive guidance and measures to identify, assess, and mitigate environmental and social risks associated with locomotive maintenance and operation activities, as well as to provide institutional measures required to prevent, minimize, mitigate, or compensate adverse environmental and social impacts, or to enhance the project beneficial impacts. The ESMP also aims to bring the project into compliance with applicable national environmental and social legal requirements and the African Development Bank (AfDB) safeguard policies and procedures.

## 1.4 Scope

The primary objective of this report is to define an Environmental and Social Management Plan for the operation and maintenance of locomotives and associated plans (e.g., Waste Management Programme, Biodiversity Management Programme, Health and Safety Management Programme, Grievance Mechanism, etc.), according to relevant environmental national legislation and considering the requirements of the African Development Bank (AfDB) and other applicable conventions and treaties ratified by Mozambique.

From the wide range of railway activities performed by CFM, the present ESMP applies exclusively to operation and maintenance of locomotives[1]. Other related activities, such as rail track operation and maintenance (including the track right-of-way), are out of scope of the present assignment.

In terms of the spatial scope, current CFM-managed railways operations are performed in the southern system, that is on Ressano Garcia, Limpopo, Goba and Salamanga branches, as well as the central system which includes the Machipanda and Sena lines and their respective branches, and associated support facilities (maintenance workshops, fuelling stations).

## 1.5 ESMP Structure

The ESMP is structured as follows:

1. Introduction
2. Project Description
3. Applicable Requirements
4. Potential Environmental and Social Impacts
5. Roles and Responsibilities

[1] Locomotives provide the power to move a number of connected passenger or freight (cargo) railroad cars, and this unit is collectively known as a “train”. In environmental terms, the impacts of the operation of locomotives *per se,* are difficult (and not meaningful) to segregate from “train” operation, so the assessment and resulting ESMP has looked into train operation (including maintenance) as a whole.

6. Environmental and Social Management and Programmes
7. Grievance Mechanism
8. Monitoring and Reporting
9. ESMP Implementation Schedule and Budget

# 2 Project Description

CFM is seeking financial support from the African Development Bank (AfDB) to acquire locomotives. Initial screening procedure categorized the project as having to prepare a comprehensive Environmental and Social Management Plan (ESMP) to conclude the approval process. Therefore, the present ESMP applies exclusively to operation and maintenance of locomotives[2].

The company is administratively subdivided into three regional executive Directorates: North (CFM-Norte), Central (CFM-Centro) and South (CFM-Sul). However, current CFM-managed railway operations are limited to the South and Centre systems, where the South and Centre Executive Directorates are responsible for the management of railway and real estate assets located in the provinces of Inhambane, Gaza and Maputo, and Sofala, Manica, Tete and Zambezia delegations respectively. The only railway system under concession is CFM Norte..

CFM-Sul consists of two operative directorates: the railway directorate and the port directorate, along with several support areas known as Central or Support Services.

The Railway Directorate (DF) is responsible for managing the approximately 772 km of railway lines (**Figure** 2-1):

- Limpopo Line with a length of 522 km (connecting to Zimbabwe);
  - Maragra Branch with 7km
  - Xinavave Branch with 15 km
- Ressano Garcia Line with a length of 88 km (connecting to Republic of South Africa)
- Goba Line with a length of 69 km (connecting to Eswatini), including the Salamanga Branch with a length of 61 km.

[2] Locomotives provide the power to move a number of connected passenger or freight (cargo) railroad cars, and this unit is collectively known as a “train”. In environmental terms, the impacts of the operation of locomotives *per se,* are difficult (and not meaningful) to segregate from “train” operation, so the assessment and resulting ESMP has looked into train operation (including maintenance) as a whole.

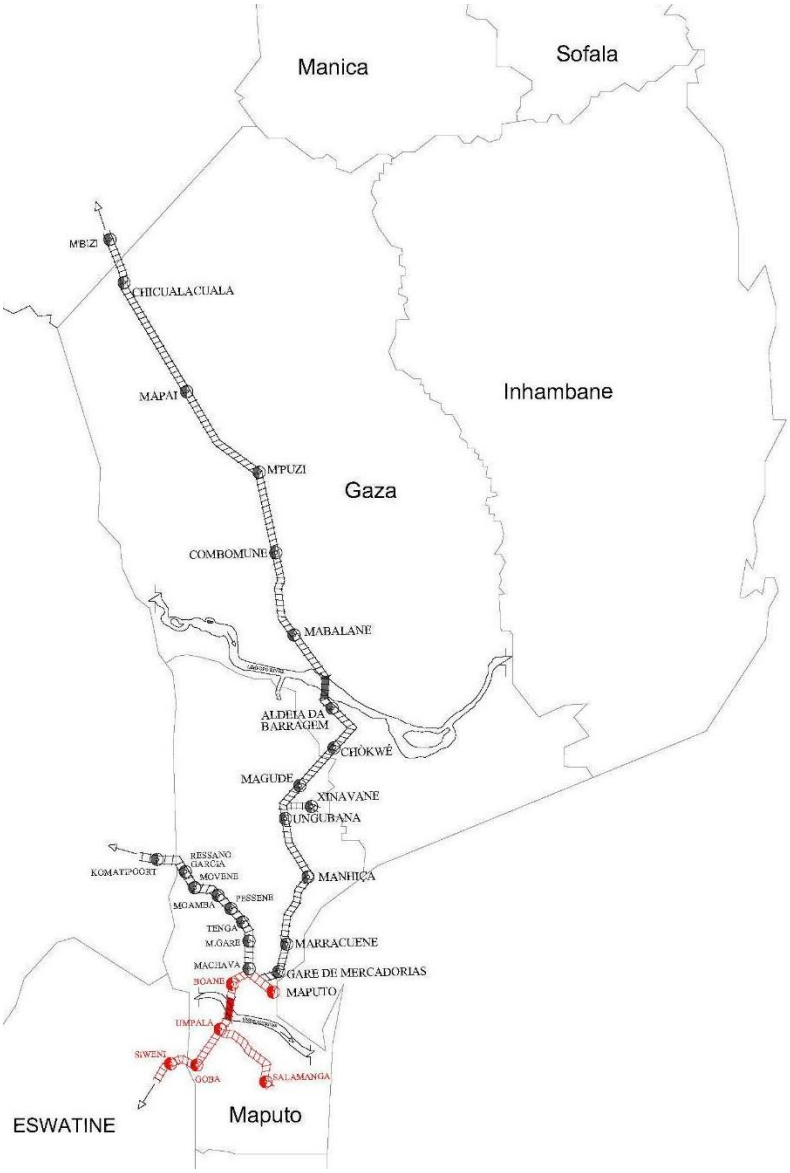
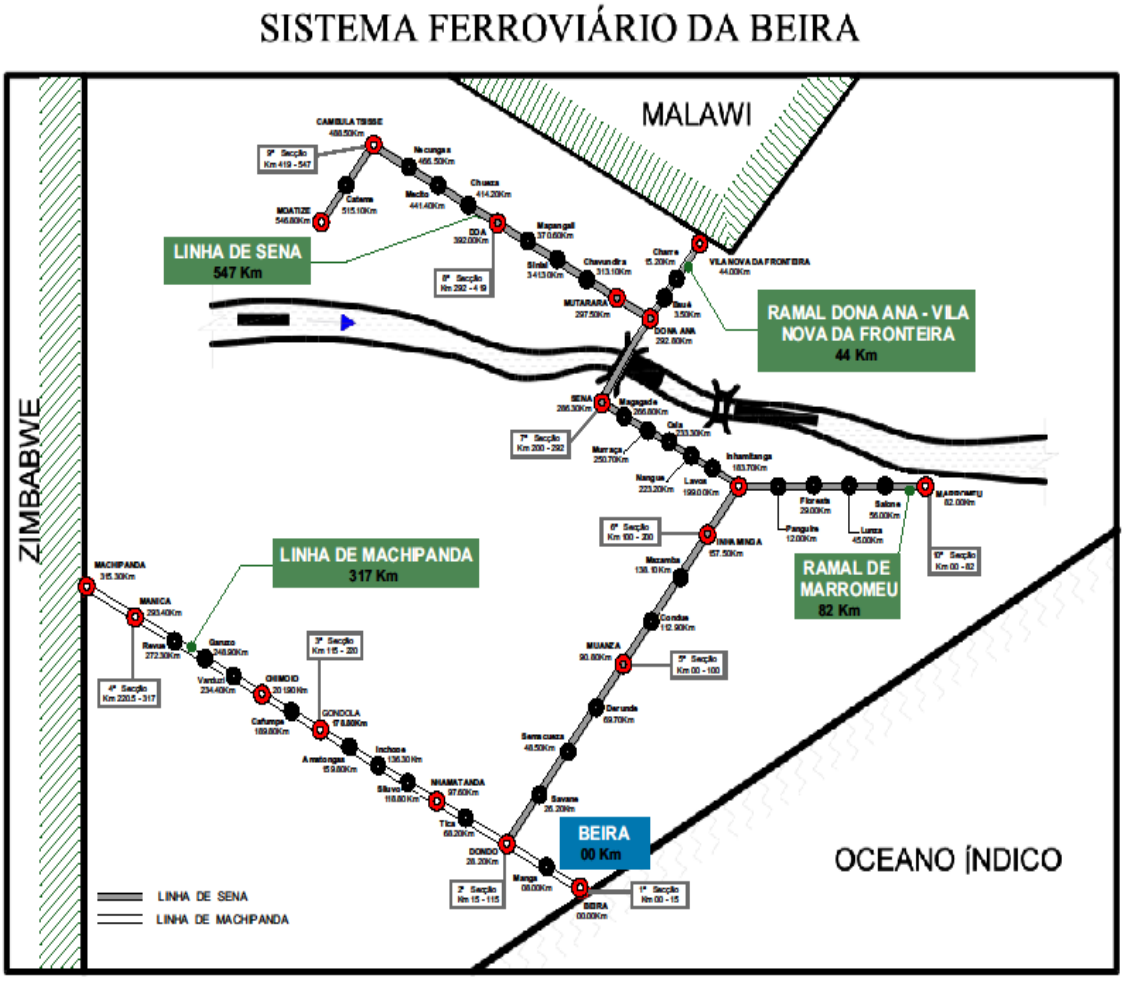



**Figure 2-1 – Southern system railway**

CFM-Centro comprises an Operations Directorate, a Fuel Terminal and a Coal Terminal (coal handling-Pier 8), as well as various support areas called Central or Support Services.

The Railway Directorate (DF) is responsible for managing 996.7 km of railway line (Fig.2-2):

- Machipanda line with 317.7 km of extension (connecting to the Republic of Zimbabwe)
- Sena line with 547 km
- Marromeu Branch with 88 km
- Branch from Dona Ana to Vila Nova da Fronteira with 44 Km (Connection with the Republic of Malawi)




**Source: CFM**

**Figure 2-2 – Centre system railway**

The CFM (all three regional systems and the headquarters) have a total of 6,407 employees, of which 2,773 are from CFM-Sul, CFM-Centro with 2,794 and CFM-Norte with 438 employees.

The operational tasks related to rolling stock encompass a comprehensive range of activities associated with the movement of locomotives and railcars along a track section. This includes both passenger and freight transportation, as well as the loading and unloading of cargo at stations, and refuelling of locomotives.

Maintenance of locomotives involves two main categories: routine servicing and extensive mechanical maintenance. Routine maintenance tasks encompass activities such as changing lubricating oils, conducting mechanical safety inspections, washing the exteriors of locomotives and wagons, and cleaning the interiors of rail tankers. On the other hand, extensive mechanical maintenance involves more complex tasks like replacing rolling and engine components, performing engine overhauls, conducting mechanical tests and adjustments, and other similar tasks. This type of maintenance may also entail activities like parts machining, welding, cleaning (including degreasing), and other processes typically carried out in metal mechanics workshops.

During major maintenance periods, passenger and cargo wagons might also undergo cleaning and painting, including touch-up painting, to ensure their upkeep.

CFM-Sul has 29 operational diesel-powered locomotives on the rail system.

Each passenger train consists of an average of 08 (eight) to 15 (fifteen) cars with an average capacity from 88 and 110 passengers per car and 704 to 1924 per train, depending on the locomotive series. Around 100 passenger trains circulate weekly in the network, considering both directions. Maintenance takes place on a dedicated workshop in Maputo, next to the central station, that has capacity for 6 locomotives at the same time.

Refuelling takes place on a specific area of this workshop (*Sector Posto Diesel*). There are 2 tanks with 600m$^3$ each.

Aside from fuel, other commonly used materials in maintenance are: transmission and engine oils, grease and other lubricants, solvents, degreasers, rust treatment products, paint.

CFM-Centro has 22 diesel locomotives operating on the railway system. Each passenger train is composed on average of 08 (eight) to 20 (twenty) carriages with an average capacity of 88 to 150 passengers per carriage and 1,704 per train. About 18 passenger trains run weekly on the network considering both directions.

There are also cargo trains, transporting mining products, containers, coal, fuel, sugar, sulphur, molasses and others.

The maintenance at CFM-Centro is done in the running Maintenance Sector (Diesel Station) in Sofala (Beira), next to the General Workshops that have the capacity to maintain three locomotives simultaneously. The supply is made in a specific area in the Traction Tank under the responsibility of Total Energy. There are two tanks with 130 m$^3$ each.

The covered area of the workshop has a dedicated drainage system, equipped with an oil-water separator. The resulting “clean” water is released into the stormwater system and released into the sea. The separated oily waste is collected into a tank and managed by a licensed waste contactor.

Most wastes from railway operations are generated as a result of maintenance and refurbishment of locomotives and rolling stock. These wastes include solids from mechanical cleaning of rail cars; paint chips and sandblast grit; waste paint; spent solvent and solvent sludges (from painting and cleaning); sludge from cleaning and wastewater treatment; waste oil, hydraulic fluid, and other petroleum-based fluids; petroleum-contaminated solids (e.g., oil filters and saturated spill absorbent material); spent coolant; metal filings and scrap; spent locomotive and signal batteries; and spent brake shoes.

Both CFM-Sul and CFM-Centro have tanks of used oils on site, which are in the enclosure of the Maintenance Sector on a paved surface, impermeable but not covered. Access is restricted, and the hazardous waste is managed by a specialized and licensed company and taken to the landfills of Mavoco (Maputo) and Munhava (Beira) respectively.

There is no waste segregation apart from the used oils.

In the CFM-Sul and CFM-Centro there is a metal forge in the workshop for producing replacement parts. Mineral coal is used as fuel.

Firefighting gear is available onsite and there is an emergency plan in force. A medical post and an ambulance are available. Safety and first aid training is provided to workers. A safety briefing is given to workers at the start of the working day.

# 3 Applicable Requirements

As stated above, the ESMP was developed according to national environmental and social requirements, as well as AfDB guidelines, as briefly described below.

## 3.1 National Legal Framework

National legislation of relevance to the Project are briefly outlined below:

***Environmental Assessment***

- National Environmental Policy – Resolution No. 5/95 of December 6th;
- Environmental Law – Law No. 20/97 of October 1st;
- Regulation on the Environmental Impact Assessment Process – Decree No. 54/2015 of December 31st;
- Regulation on the Environmental Audit Process – Decrees No. 25/2011 of June 15 th;
- Regulation for Environmental Inspections – Decree No. 11/2006 of June 15 th;
- General Guidelines for Environmental Impact Studies – Ministerial Diploma No. 129/2006 of July 19 th;
- Guidelines for Public Participation Process of the EIA Process – Ministerial Diploma No. 130/2006 of July 19th;

***Pollution and Waste Management***

- Regulation for Environmental Quality Standards and Effluent Emission, Decree 18/2004, June 2nd (as amended by Decree 67/2010, October 31st);
- Regulation on the Management of Substances that Deplete the Ozone Layer – Decree 24/2008 of July 1st;
- Banning of import, export, production, commercialization, and transit of Ozone-Depleting Substances – Resolution No.78/2009, of December 22nd;
- Regulation on Urban Solid Waste Management, Decree 94/2014, December 31st;
- Regulation on Hazardous Waste Management Decree 83/2014 December 31st;
- Regulation on Biomedical Waste Management, Decree No. 8/2003 of February 18th;
- Regulation for the Prevention of Pollution and Protection of the Marine and Coastal, Environment Decree No. 45/2006 of November 30th.

***Biodiversity***

- Forest and Wildlife Law, Law 10/99, of 7 July, and its Regulation, Decree 12/2002, of 6 June;
- Biodiversity Conservation Law (Law 16/2014, of 20 June, as amended by Law 5/2017, of 11 May), and its regulation, Decree 89/2017, of 29 December - regulates the National System of Protected Areas and establishes basic principles and norms for the protection, conservation and sustainable use of biological diversity.

***Natural Disaster Management***

- Disaster Risk Management and Reduction Law, Law No. 10/2020, August 24th;

- Disaster Risk Management and Reduction Regulation, Decree No. 76/2020, September 1st.

***Labour***

- Labour Law (Law 23/2007 of August 1st) and subordinate Labour, Health and Safety Regulations, including the Regulations of Health and Safety at Work in Industrial Establishments (Legislative Diploma 48/1973);
- Protection Law of Workers with HIV / AIDS, Law 5/2002 of February 13th;
- Regulation on General Labour Inspectorate, Decree 45/2009 of August 14th;
- Legal regime for accidents at work and occupational diseases, Decree 62/2013 of December 4th.

***Gender and Social Protection***

- Family Law, Law No. 22/2019 of December 11th;
- Social Protection Law, Law No. 4/2007 of February 7th;
- Law to Prevent and Combat Premature Unions, Law No. 19/2019 of October 22nd;
- Law on Violence against Women, Law No. 29/2009 of September 29th.

***Sectorial legislation***

- Train Circulation Regulation;
- General Instructions (in the context of the introduction and implementation of the OBC system);
- Railway Transport Regulation;
- Regulation of Track Services and Construction Works;
- Supervision Regulation;
- Railway Safety Management System Standard (in the process of approval);
- Railway Transportation of Dangerous Goods Standard (in the process of approval).

## 3.2 African Development Bank (AfDB) Safeguard System

In addition to national legislation, the ESMP was prepared in accordance with the African Development Bank Group's Integrated Safeguards System (ISS) and, specifically with the respective Integrated Safeguards Policy Statement and Operational Safeguards (OS) and their Guidance Notes (ISS GN):

- Operational Safeguard 1 (OS1): Environmental and Social Assessment .
- Operational Safeguard 2 (OS2): Involuntary resettlement: land acquisition, population displacement and compensation.
- Operational Safeguard 3 (OS3): Biodiversity, renewable resources and ecosystem services.
- Operational Safeguard 4 (OS4): Pollution prevention and control, hazardous materials and resource efficiency.
- Operational Safeguard 5 (OS5): Labour conditions, health and safety.

The set of E&S OSs is globally aligned with IFC PSs.

## 3.3 Other Applicable Requirements Guidance

Other applicable requirements and guidance will include:

- The criteria set by the ISO 14001 standard for an environmental management system;
- The World Bank Group (WBG) / International Finance Corporation (IFC) Environmental, Health and Safety (EHS) guidelines;
- In general, the internationally recognized environmental and social management good practices were considered and cited along the document whenever relevant.

The Environment, Health, and Safety (EHS) Guidelines of the WBG/IFC have been prepared as reference documents containing general and industry-specific examples of Good International Industry Practice (GIIP). Guidance documents for the assessment and management of the environmental and social impacts of the railway sector are listed below:

- EHS Guidelines for Railways (2007);
- General EHS Guidelines (2007);
- EHS Guidelines for Metal, Plastic, and Rubber Products Manufacturing (2007);
- Stakeholder Engagement Handbook (2007).

# 4 Potential Environmental and Social Impacts

## 4.1 General Considerations

Railway operation (including maintenance), like any large transportation infrastructure project, can have significant environmental and social risks and impacts. These can vary depending on the location, scale, and design of the railway. Below are some **potential risks and impacts** generically associated with railway operations:

- **Noise and Vibrations**: Train traffic generate significant noise and vibrations from running engine (diesel), wheel/rail track friction, brakes, as well as aerodynamic noise (mainly in highspeed trains). This can be an important issue, especially in urban areas, and close to residential areas, potentially causing disturbance to nearby communities and affecting their quality of life and, indirectly, their health.
- **Air Pollution**: Diesel-powered locomotives emit air pollutants from combustion, including particulate matter and nitrogen oxides (NOx), both of which contribute to public health problems, and carbon dioxide (CO2), a greenhouse gas (GHG). Additionally, transportation and transfer of dry granular materials (e.g., minerals and grain) may result in dust emissions, while the storage and transfer of fuels or volatile chemicals may result in fugitive emissions.
- **Waste Generation**: Railway operations can produce various types of waste, such as maintenance materials, discarded parts, and hazardous waste (e.g., oils, chemicals), requiring proper management and disposal. Improper management may lead to soil and water contamination, and community health safety issues.
- **Resource Consumption**: The operation of locomotives requires significant energy consumption, fossil fuels (diesel) in CFM's case, leading to indirect environmental impacts from its sourcing.
- **Wildlife Mortality**: Running trains may pose a threat to wildlife through collisions, especially if railways pass through natural habitats or migratory routes.
- **Health and safety concerns:** The most significant safety issue is the threat of serious injury or the potential loss of life due to train collisions (with other trains or with road vehicles, at level crossings), as well as a result of derailments. Trespassers on rail lines and facilities may incur in high risks from moving trains, equipment, and hazardous substances, among other issues. Additionally, railways are often used to transport hazardous materials, which can pose a risk of accidental spills, potentially leading to environmental contamination and public safety concerns.
- **Social Disruption**: Noise, vibration, air emissions, and increased safety risks around railway lines can disrupt local communities' daily activities and affect their well-being.
- **Inequitable Distribution of Benefits and Burdens**: The benefits of railway operations, such as improved transportation and economic opportunities, may not be equitably distributed among all communities, leading to social disparities.

To address these risks and impacts, railway operators can implement various measures:

- Implementing traffic management (i.e., lower speeds, nighttime restrictions) measures, noise barriers and vibration-reducing measures near residential areas, to mitigate nuisances.
- Using cleaner energy sources for locomotives, such as electrification or alternative fuels.
- Properly managing waste and hazardous materials to prevent environmental contamination.
- Implementing wildlife protection measures, such as wildlife crossings, fencing and warning systems.
- Ensuring proper maintenance and safety protocols to prevent accidents.
- Engaging with local communities to address concerns and incorporate their feedback into operation management operational planning.
- Supporting and investing in local infrastructure and community development to share benefits more equitably.

By proactively addressing these issues, railway operators can minimize negative impacts and contribute to sustainable and socially responsible transportation solutions.

In general, railway operations can bring about several **positive impacts** on the environment, society, and the economy. Here are some of the positive aspects associated with the operation of a railway:

- **Reduced pollution:** Compared to other modes of transportation, such as cars/trucks/busses and airplanes, trains (even diesel-powered) generally produce lower emissions (including of Greenhouse Gases - GHG) per passenger or ton of freight moved. Overall, this provides for not only lower environmental impacts (air, climate, noise) but also social (nuisances, health). Electrified railways or those using cleaner fuels can further reduce emissions, contributing to climate change mitigation (by diverting users from other modes of transportation).
- **Energy Efficiency**: Trains are generally more energy-efficient than individual vehicles, particularly when transporting a large number of passengers or goods over long distances.
- **Congestion Reduction**: By providing an alternative mode of transportation, railways can help alleviate road congestion, reducing travel times and enhancing overall transportation efficiency.
- **Safer Transportation**: Rail travel is statistically one of the safest modes of transportation, leading to fewer accidents and fatalities compared to road transport.
- **Accessibility and Connectivity**: Railways can improve accessibility to remote areas, linking communities to essential services, job opportunities, and education.
- **Economic Development**: Efficient railways can facilitate the movement of goods and people, stimulating economic development and regional trade.
- **Job Skills Development**: The operation of railways requires a skilled workforce, creating development skills opportunities in various fields, such as engineering, operations, maintenance, and customer service.
- **Land Use Efficiency**: Railways have a smaller land footprint per passenger or freight capacity compared to roads or airports, making them a more efficient use of space.

To maximize these positive impacts, railway operators can focus on continuous improvement in efficiency, emissions reduction, safety, and community engagement. Additionally, integrating railways with other modes of transportation and developing multimodal transport networks can enhance overall mobility and sustainability.

## 4.2 Impact Identification

An impact is any change, or perceived change, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products, or services. Any project can generate a wide range of potential impacts, of different types:

- ***Direct*** – impacts that result from the direct interaction between a given project activity and the receiving environment (e.g., dust generation that affects air quality).
- ***Indirect*** – impacts that result from other activities (other than the project) but which are facilitated because of the project (e.g., immigration of job seekers, which places additional demands on natural resources) or, impacts that occur because of the subsequent interaction of the project's direct impacts within the environment (e.g., a reduced water supply that affects crop production and then impacts livelihoods based on livelihoods).
- ***Cumulative*** – impacts that act in concert with potential current or future impacts from other existing or proposed activities in the area/region that affect the same resources and/or receptors (e.g., the combined effects of wastewater discharges from more than a project for the same water resource, which may eventually be acceptable in isolation, but which cumulatively results in reduced water quality and fisheries productivity).

The purpose of the impact assessment is to inform what kind of mitigation / enhancement is required to reduce the residual effect of a negative impact to acceptable levels or to maximize the benefits of a positive impact. Mitigation hierarchy, shall follow the following basic principles:

- Anticipate and avoid risks and negative impacts;
- Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels;
- Once risks and impacts have been minimized or reduced, mitigate; and
- Where significant residual impacts remain, compensate for or, in the case of biodiversity and habitat losses, offset them, where technically and financially feasible.

Most usual environmental and social issues associated with the operation and maintenance of locomotives/trains, arise from:

- Air emissions;
- Noise emissions;
- Fuel management;
- Wastewater;
- Waste;
- Hazardous materials;
- Fauna mortality.

Most common occupational health and safety issues[3] include train / worker accidents, exposure to noise, vibration and exhaust emissions (diesel) and physical, chemical, and biological hazards from performing maintenance activities.

Community health and safety issues[4] may be related to:

- General rail operational safety;
- Transport of dangerous goods;
- Level crossings safety;
- Pedestrian safety.

The impact matrix presented below covers the main potential impacts associated with CFM operation and maintenance of locomotives[5].

[3] As CFM locomotives operate exclusively on diesel, no electrical and electromagnetic related impacts and risks are applicable.

[4] As CFM locomotives operate exclusively on diesel, no electrical hazards and electromagnetic fields related impacts and risks are applicable.

[5] Considered, in environmental terms, as “train operation” (i.e., locomotive and a number of connected passenger or freight rail cars) as mentioned in the scope section (please see section 1.4).

**Table 4-1 – Potential risks and impacts and mitigation/enhancement measures**

| Potential Risks and Impacts / Status (+ / -) | Cause of Impact | Mitigation/Enhancement measures |
|---|---|---|
| 1. Degradation of the acoustic environment, causing community nuisances and health issues (-) | - Noise emissions and vibrations from train traffic (engine, wheel / track friction, brakes)<br>- Noise emissions from train maintenance activities at the workshops | - Develop and implement a noise and vibrations management and monitoring plan (according to the framework programme on section 6)<br>- Limit to a minimum the use of locomotive horns when crossing inhabited areas<br>- Provide adequate soundproofing of workshops' buildings and of noisy equipment<br>- Provide adequate PPE to workers located in noisy areas<br>- Ensure preventive and corrective maintenance is carried out timely, to keep rolling stock within manufacturer's specifications<br>- Whenever practical, perform high-noise maintenance activities inside the workshop buildings and not on the access track<br>- If workshops are located in noise-sensitive areas (residential areas), no high-noise activities should be undertaken in the nighttime period (22-07h)<br>- Ensure that the grievance mechanism is communicated to the communities crossed by the railway and around workshops |
| 2. Degradation of air quality (mostly by emitting particulate matter and NOx), causing labour and community nuisances and health issues (-) | - Exhaust gases from diesel powered locomotives<br>- Dust emissions from transportation of dry granular cargo (minerals, grain, cement, etc.)<br>- Exhaust gases from coal fired forges used in the workshops<br>- Fugitive emissions (VOCs) from storage and transfer/transport of fuels or volatile chemicals | - Develop and implement an air emissions management and monitoring plan (according to the framework programme on section 6)<br>- Ensure preventive and corrective maintenance is carried out timely, to keep rolling stock within manufacturer's specifications<br>- Use of enclosed cars or covering of open cars used to carry minerals and grains, to reduce fugitive dust emissions<br>- Consider the use, or conversion to, alternative fuels for locomotive powering (e.g. low-sulphur diesel, bio-diesel) and workshop forges (LPG)<br>- Invest in locomotive re-powering programmes<br>- Installation of high-efficiency catalytic exhaust emission control systems in locomotives<br>- Use of alternative power sources for idling locomotives<br>- Implement fuel consumption reduction / energy efficiency measures (see air emissions management and monitoring programme on section 6) |

| Potential Risks and Impacts / Status (+ / -) | Cause of Impact | Mitigation/Enhancement measures |
|---|---|---|
| 3. Contribution to GHG emissions and to climate change (-) | - Exhaust gases from diesel powered locomotives<br>- Exhaust gases from coal fired forges used in the workshops<br>- Fugitive emissions (VOCs) from storage and transfer/transport of fuels or volatile chemicals | - Develop and implement an air emissions management and monitoring plan (according to the framework programme on section 6)<br>- Ensure preventive and corrective maintenance is carried out timely, to keep rolling stock within manufacturer's specifications<br>- Consider the use, or conversion to, alternative fuels for locomotive powering (e.g. low-sulphur diesel, bio-diesel) and workshop forges (LPG)<br>- Invest in locomotive re-powering programmes<br>- Use of alternative power sources for idling locomotives<br>- Implement fuel consumption reduction / energy efficiency measures (see air emissions management and monitoring programme on section 6) |
| 4. Potential soil contamination (-) | - Inadequate management of hazardous products (e.g., oils and lubricants, solvents, paints, fuels) and wastes<br>- Inadequate management of wastewater (sewage from passenger trains sanitary facilities is sometimes discharged directly to the land surface along the track)<br>- Accidental spills of hazardous products on rail track, fuelling stations and workshops | - Develop and implement a waste management plan (for hazardous and non-hazardous waste) (according to the framework programme on section 6)<br>- Develop and implement a hazardous products management plan (including fuel) (according to the framework programme on section 6)<br>- Implementation of emergency response procedures for accidental spills, including removal and treatment of contaminated soils (according to Company ERPs) |
| 5. Potential surface and ground water contamination (-) | - Inadequate management of hazardous products (e.g., oils and lubricants, solvents, paints, fuels) and waste<br>- Inadequate management of wastewater (industrial – washing, etc.; and sewage – from workshops and passenger trains sanitary facilities, being the former sometimes discharged directly to the land surface along the track)<br>- Accidental spills of hazardous products on rail track, fuelling stations and workshops | - Develop and implement a waste management plan (for hazardous and non-hazardous waste) (according to the framework programme on section 6)<br>- Develop and implement a hazardous products management plan (including fuel) (according to the framework programme on section 6)<br>- Develop and implement a wastewater management and monitoring plan (according to the framework programme on section 6)<br>- Implementation of emergency response procedures for accidental spills (according to Company ERPs)<br>- Workshops must have a segregated system to drain the pavement of the operational area, where hazardous substances are used (oils and lubricants, solvents and paints, etc.) and wastes are produced (e.g., sand blasting waste, used oil). The system must be equipped, at least, with an oil-water separator. Oily waste to be collected by an authorised waste contactor and transported to |

| Potential Risks and Impacts / Status (+ / -) | Cause of Impact | Mitigation/Enhancement measures |
|---|---|---|
| | | approved disposal. Resulting effluent must be tested for compliance with national regulation and IFC EHS guidelines before discharge to the environment<br>- Workshops must have a sewage collection system equipped with onsite treatment facilities or, alternatively, collected sewage may be transported to adequate offsite treatment and disposal<br>- Sewage from sanitary facilities on passenger trains must not be discharged directly to the track. Tanks should be used (or retrofitted) to collect sewage, to be temporarily stored at central locations and then transported by an authorised waste contractor to approved treatment facilities/disposal |
| 6. Fauna mortality (-) | - Train circulation | - Develop and implement a biodiversity management and monitoring plan (according to the framework programme on section 6) |
| 7. Occupational health and safety hazards (train / worker accidents, worker's exposure to noise, vibration, diesel exhaust; physical, chemical, and biological hazards) (-) | - Train operation (train / worker accidents, worker's exposure to noise, vibration, diesel exhaust)<br>- Maintenance activities (physical, chemical, and biological hazards)R | - Implement Company OHS Plan and train workers in OHS procedures. This plan will comply with national legislation, AfDB OS 5 (Labour conditions, health and safety), and WBG/IFC General and Railways EHS Guidelines<br>- Develop and implement a noise and vibrations management and monitoring plan (according to the framework programme on section 6)<br>- Limit the time locomotives are allowed to run indoors and use of pusher cars to move locomotives in and out of maintenance shops<br>- Ventilation of locomotive shops or other enclosed areas where diesel exhaust may accumulate<br>- Replacement of the hazardous substances with a less hazardous substitutes, as feasible as possible<br>- No employee should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection<br>- Use of adequate and certified PPE where engineering controls are not sufficient to reduce contaminant exposure to acceptable levels |

| Potential Risks and Impacts / Status (+ / -) | Cause of Impact | Mitigation/Enhancement measures |
|---|---|---|
| 8. Community health and safety – Accidents involving train derailments, train collisions (with other trains or road vehicles) and pedestrians (-) | - Inadequate train operation (excessive speed, track defects, mechanical failures, human error, weather conditions, etc.)<br>- Road vehicles trespassing rail track (mainly at level crossings)<br>- Pedestrian trespassing rail track/facilities | - Implementation of rail operational safety procedures aimed at reducing the likelihood of train collisions such as a positive train control (PTC) system<br>- Progressively install automatic gates at all level crossings, and perform regular inspection/maintenance to ensure proper operation<br>- Regular inspection and maintenance of the rail lines and facilities to ensure track stability and integrity in accordance with national and international track safety standards<br>- Enforce the Company safety management plan<br>- Ensure preventive and corrective maintenance is carried out timely, to keep rolling stock within manufacturer's specifications<br>- Posting of clear and prominent danger warning signage at potential points of entry to track areas (e.g. stations and level crossings)<br>- Installation of fencing or other barriers at station ends and other dangerous locations to prevent access to tracks by unauthorized persons<br>- Conduct regular community awareness initiatives, specially focusing the risks of trespassing<br>- Implementation of emergency preparedness and response procedures (according to Company ERPs) |
| 9. Community health and safety – Accidents involving hazardous goods (-) | - Cargo train circulation | - Implementation of a system for the proper screening, acceptance, and transport of hazardous goods<br>- Use of tank cars and other cargo rolling stock that meet national and international safety standards appropriate for the cargo being carried<br>- Ensure preventive and corrective maintenance is carried out timely, to keep rolling stock within manufacturer's specifications<br>- Implementation of spill prevention and control, and emergency preparedness and response plan (according to Company)<br>- Regular dissemination of emergency preparedness and response information to the potentially affected communities |
| 10. Improved circulation/increase in the volume of transported goods and people (+) | - Acquisition and availability of additional locomotives | - Implementation of the project as defined by CFM<br>- Identification of additional and potential clients for cargo operations |

| Potential Risks and Impacts / Status (+ / -) | Cause of Impact | Mitigation/Enhancement measures |
|---|---|---|
| 11. Country economic development by tax payments (+) | - Acquisition and availability of additional locomotives | - Guarantee the allocation of due taxes to the government authorities |
| 12. Low freight cost for large volumes of cargo (+) | | - Identification of additional and potential clients for cargo operations<br>- Apply fair costs for cargo transport operations |

# 5 Roles and Responsibilities

As mentioned in section 1.1, in the context of the restructuring process operated in the 1994, and after the concession of the port and railway activities in the Central and Northern systems, currently CFM-managed railways operations are performed only in the southern system and CFM-Centro, that is on Ressano Garcia, Limpopo and Goba lines and Salamanga branch, , as well as Machipanda, Sena and branches and associated support facilities (maintenance workshops, fuelling stations) managed by CFM-Sul.

CFM-Sul and CFM-Centro, headed by its Executive Directorate (DE), consists of two operative directorates: the railway directorate and the port directorate, along with several support areas known as Central or Support Services:

*CFM-Sul*

- Human Resources;
- Finance;
- Xai-Xai and Inhambane Representations;
- Procurement Management Unit;
- Legal Advisory;
- Safety, Quality and Environmental Management Unit (UGSQMA);
- Sales Office;
- Regional Training Center;
- Secretariat/Public Relations;
- Inspection.

*CFM-Centro*

- Human Resources;
- Finance;
- Manica, Tete, and Zambezia Representations;
- Procurement Management Unit;
- Legal Advisory;
- Safety, Quality and Environmental Management Unit (UGSQMA);
- Sales Office;
- Regional Training Center;
- Secretariat/Public Relations;
- Inspection.

*CFM-Sul*

The Railway Directorate (DF) is responsible for managing the approximately 772 km of railway lines:

- Limpopo Line with a length of 522 km;
- Ressano Garcia Line with a length of 88 km;
- Goba Line with a length of 69 km, including the Salamanga Branch with a length of 61 km.

This directorate includes the Railway Transport Services (STF), General Workshops (SOG), Track and Construction (SVO), and Passenger Transport Services (STP). These services ensure railway traffic and maintenance of rolling stock and tracks, with the assistance of technical support services.

A more detailed breakdown of the services is presented below:

- Railway Directorate (DF)[6]:
  - Railway Transport Services (STF):
    - Movements Department
    - Manoeuvring Department
    - Circulation Department
    - Traction Department
  - Signalization and Communication Department (SDept)
  - Executive Direction
  - General Workshop Services (SOG):
    - Runing Maintenance workshop Engine Maintenance Service
    - Carriages and Wagons Maintenance workshop
    - Running maintenance for wagons and cars
    - Parts manufacture and workshop conservation
  - Track and Construction Services (SVO):
    - Rail track Department
    - Construction Department
    - Equipment Department
  - Passenger Transport Services (STP)

*CFM-Centro*

The Railway Directorate is responsible for managing 996.7 km of railway lines (Fig.2-2)

- Machipanda line with 317.7 km of extension (connecting to the Republic of Zimbabwe)
- Sena line with 547 km
- Marromeu Branch 88 km
- Branch from Dona Ana – Vila Nova da Fronteira – 44 Km (Connection with the Republic of Malawi)

Concerning Environmental and Social Management, and by its nature of Support Service, the key player will be the Safety, Quality and Environmental Management Unit (UGSQMA). UGSQMA will be in close contact with Railway Directorate (DF) and work together with several other CFM-Sul services and subordinated departments, whose most relevant will be, by the nature of their activities, the Railway Transport Services (STF) and the General Workshop Services (SOG).

The overall responsibilities of each of these key role players in the ESMP are described in the following paragraphs.

6 Note: In relation to the DF's structure, it is identical for the Executive Directorates except for the difference between the Transport Service in CFM-Sul and the Department of Passenger Transport in CFM-Centro.

- **Executive Directorate (DE):**
    - Appoint an Environmental and Social Governance Manager (ESGM), responsible for monitoring compliance with the prescriptions of the ESMP, including the undertaking of environmental audits. The ESGM, assisted by other UGSQMA team members shall have the following responsibilities:
        - Review and approve large structural investment proposals (such as locomotive fleet modernization and re-powering programmes);
        - Allocate human and financial resources to implement the ESMP.
- **Safety, Quality and Environmental Management Unit (UGSQMA)**, as cross-sector Support Service, shall have the following main attributions:
    - The ESGM, assisted by other UGSQMA team members shall have the following responsibilities:
        - Ensure that the relevant CFM services, departments and executive management are duly informed of the ESMP and of its requirements;
        - Perform environmental awareness training;
        - Develop and implement management and monitoring plans according to the framework programmes defined in section 6.2;
        - Supervise activities of the downstream services responsible for implementation and monitoring of mitigation, management and monitoring plans;
        - Elaborate/review and approve standard operating procedures (SOP) and method statements (MS) for addressing environmental and social aspects;
        - Collect, organize and maintain relevant records and statistics regarding the ESMP;
        - Track key performance indicators of environmental management (defined in section 6.1);
        - Prepare periodic Performance Reports and Audits;
        - Identify areas of non-compliance and prepare action plans to timely address issues;
        - Propose investments required to resolve the non-compliances and/or improve environmental performance;
        - Provide feedback to management regarding environmental performance and continual improvement;
        - Procure and supervise contractors to be appointed to conduct support studies and projects that may be required for the ESMP implementation;
        - Update the ESMP over time.
    - The ESGM will be supported by a **Community Liaison Officer (CLO),** appointed by the UGSQMA, who will have the following main responsibilities:
        - Liaise with communities and report to ESGM any issues that need to be resolved;
        - Provide information to local communities about the railway activities;

  - Together with the ESGM, evaluate the company's communication plan and update requires to fit the purposes of the ESMP;
  - Together with the ESGM, ensure that the Grievance Mechanism (GM) is implemented and disclosed to the communities around the construction corridor. The CLO will be the point of contact for lodging of grievances and suggestions resulting from the Project's construction phase.

- **Railway Directorate (DF):**
  - Review and approve other investment proposals required to resolve non-compliances and/or improve environmental performance;
  - Delegate environmental actions on the adequate service/department under their management;
- **Railway Transport Services (STF):**
  - Ensure that all relevant train operation activities, including those related to safety, are undertaken in accordance with the ESMP;
  - Enforce Company safety management plans;
  - Ensure that subcontractors, if any, comply with the ESMP;
  - Supervise subcontractor licenses, permits and activities.
- **Officer of the Environmental management unit (STF)**
  - Undertake visual inspections and supervision of environmental, health and safety sensitive activities/areas;
  - Assist ESGM in developing environmental induction and awareness training for site personnel;
  - Operator training in environmental, health and safety procedures;
  - Implement the required monitoring activities and report to ESGM;
  - Record all environmental incidents;
  - Develop and submit SOP/MS to the ESGM for approval;
  - Keep any records as required in the ESMP;
  - Monitor KPIs that have been assigned to SOG and share them with ESGM;
  - Monitor KPIs that have been assigned to SOG and share them with ESGM;
  - Notify the ESGM of any non-compliance with the ESMP, or any other complaints or issues of environmental and or social concern;
  - Compile and submit performance reports to the ESGM, when required;
  - Ensure that all the necessary equipment (e.g., waste containers, safety equipment, fire extinguishers) and materials (e.g., spill kits) are available on trains and stations;
  - Be open to periodic audits from the ESGM and provide necessary information to do so.
  - Implement all necessary correctives measures. Keep record of the incidents, accidents and community complains;
  - Monitor fauna mortality along the rail track;
  - Assist the CLO in community engagements;
  - Assist the ESGM in community awareness actions;

- **General Workshop Services (SOG):**
  - Ensure that all maintenance and fuelling activities, as well as support activities (waste and wastewater management, etc.) on site are undertaken in accordance with the ESMP;
  - Ensure that subcontractors, if any, comply with the ESMP;
  - Supervise subcontractor licenses, permits and activities.
- **Officer of the Environmental management unit (SOG)**
  - Implement the required monitoring activities and report to ESGM;
  - Develop and submit SOP/MS to the ESGM for approval;
  - Keep documentation related to environmental management on site (e.g., permits, ESMP, Environmental Method Statements, Environmental License, reports, audits, receipts for waste removal, etc.);
  - Undertake visual inspections and supervision of environmental, health and safety sensitive activities/areas;
  - Record all environmental incidents;
  - Monitor KPIs that have been assigned to SOG and share them with ESGM;
  - Notify the ESGM of any non-compliance with the ESMP, or any other complaints or issues of environmental and or social concern;
  - Assist ESGM in developing environmental induction and awareness training for site personnel;
  - Keep any records as required in the ESMP;
  - Compile and submit performance reports to the ESGM, when required;
  - Get all necessary licenses and permits to perform the maintenance activities;
  - Get all the licenses and permits required for wastewater discharge;
  - Get all the licenses and permits required for storage and handling of hazardous products, such as fuels;
  - Ensure that all the necessary equipment (e.g., waste containers, safety equipment, fire extinguishers) and materials (e.g., spill kits) are available on site;
  - Be open to periodic audits from the ESGM and provide necessary information to do so.
  - Implement all necessary correctives measures. Keep record of the incidents, accidents and community complains;
- **Track and Construction Services (SVO):**
  - Ensure that trail rack maintenance activities are undertaken in accordance with the ESMP.
  - Assist the CLO in community engagements;
  - Assist the ESGM in community awareness actions;
- **Passenger Transport Services (STP):**
  - Assist the CLO in community engagements;
  - Assist the ESGM in community awareness actions;

The specific responsibilities expected in progress monitoring and within each management plan are described in sections 6.1 and 6.2.

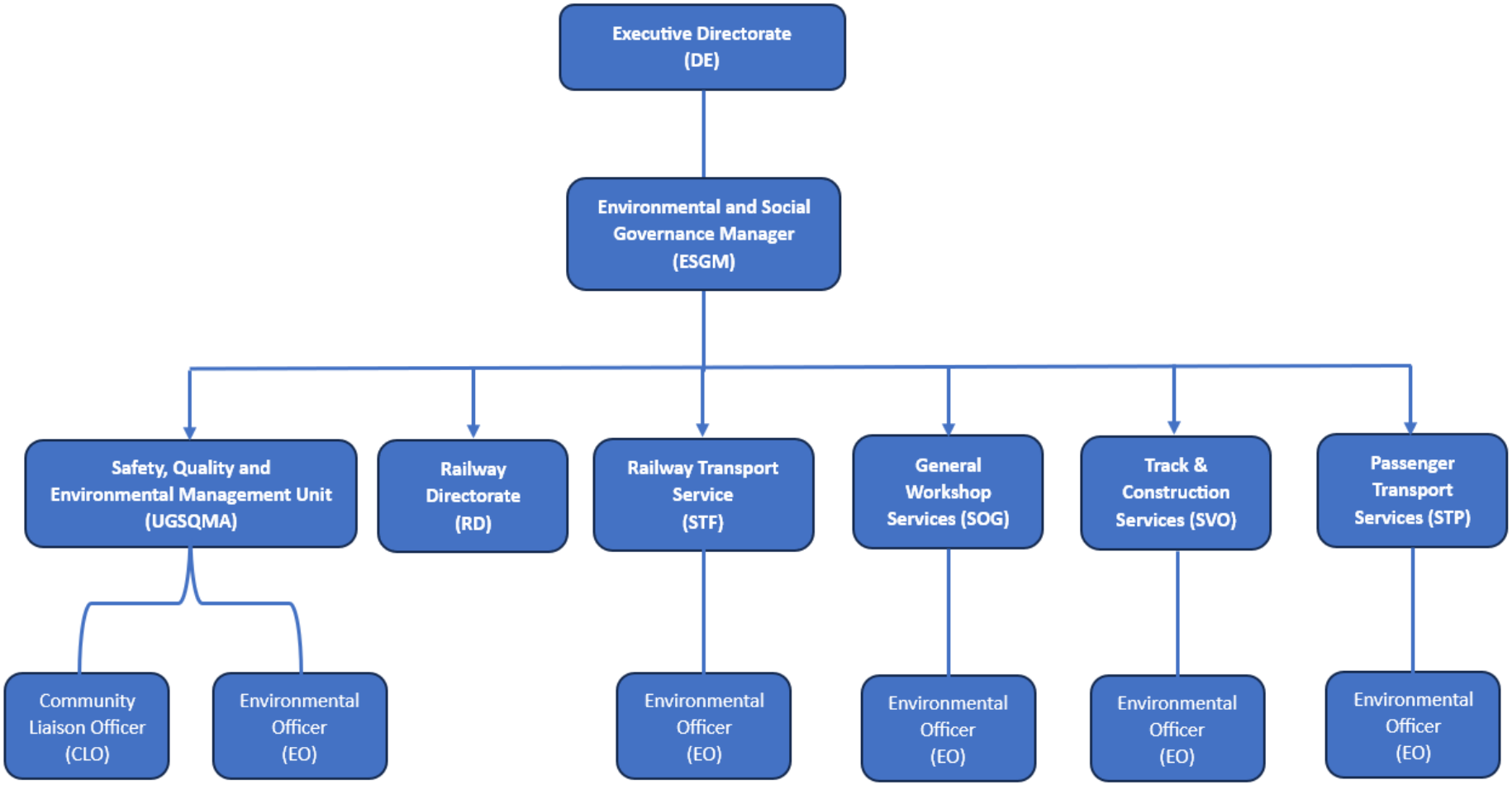



**Figure 5-1 – ESMP Implementation organisational chart**

# 6 Environmental and Social Management and Programmes

Following the impact assessment of the operation and maintenance of locomotives (see scope definition on section 1.4), performed in section 4, the present section provides:

- Implementation plan of the general mitigation measures (i.e., not integrated into a specific management programme/plan) (section 6.1);
- Specific management and monitoring programmes for key environmental factors (section 6.2).

## 6.1 Environmental and Social Management

The following table develops the results of the impact assessment (see section 4.2) by:

- Defining the roles and responsibilities for implementing and monitoring the mitigation measures;
- Establishing key performance indicators (KPIs) to measure and evaluate environmental and social performance;
- Designing a monitoring frequency to track the implementation and effectiveness of mitigation measures.

The assessment will conclude of an adequate (conformity) or inadequate (non-conformity) implementation of the measures, allowing the definition of corrective actions, when necessary.

**Table 6-1 – Potential risks and impacts and mitigation/enhancement measures**

| Potential Risks and Impacts | Mitigation/Enhancement measures | Responsible | Monitoring and Performance Evaluation | | |
|---|---|---|---|---|---|
| | | | Monitoring Methods | Performance Indicators | Timing / Frequency |
| 1. Degradation of the acoustic environment, causing community nuisances and health issues | - Develop and implement a noise and vibrations management and monitoring plan (according to the framework programme on section 0) | - ESGM<br>- DF | - Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - Quarterly |
| | - Limit to a minimum the use of locomotive horns when crossing inhabited areas | - STF | - Operational procedures<br>- Inspection records<br>- Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - Quarterly |
| | - Provide adequate soundproofing of workshops' buildings and of noisy equipment | - SOG | - Soundproofing projects<br>- Performance report<br>- Audits | - No. of Non-conformities<br>- No. of soundproofing projects implemented | - According to Company investment plan<br>- Annually (E&S follow-up) |
| | - Ensure preventive and corrective maintenance is carried out timely, to keep rolling stock within manufacturer's specifications | - SOG | - Maintenance records<br>- Performance report<br>- Audits | - No. of Non-conformities (missed planned maintenance) | - According to Company Maintenance Plan<br>- Annually (follow-up) |
| | - Whenever practical, perform high-noise maintenance activities inside the workshop buildings and not on the access track | - SOG | - Operational procedures<br>- Inspection records<br>- Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - Annually |
| | - If workshops are located in noise-sensitive areas (residential areas), no high-noise activities should be undertaken in the nighttime period (22-07h) | - SOG | - Operational procedures<br>- Inspection records<br>- Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - Annually |
| | - Ensure that the grievance mechanism is communicated to the communities crossed by the railway and around workshops | - UGSQMA / CLO<br>- DF | - Community meetings minutes<br>- Performance report<br>- Audits<br>- Company Communication Plan | - N.º of engagements with communities<br>- No. of Non-conformities<br>- No. of complaints resolved in due time | - Biannually or whenever necessary |

| Potential Risks and Impacts | Mitigation/Enhancement measures | Responsible | Monitoring and Performance Evaluation | | |
|---|---|---|---|---|---|
| | | | Monitoring Methods | Performance Indicators | Timing / Frequency |
| 2. Degradation of air quality (mostly by emitting particulate matter and NOx), causing community nuisances and health issues<br>3. Contribution to GHG emissions and to climate change | - Develop and implement an air emissions and GHG management and monitoring plan (according to the framework programme on section 0) | - ESGM<br>- DF | - Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - Annually |
| | - Ensure preventive and corrective maintenance is carried out timely, to keep rolling stock within manufacturer's specifications | - SOG | - Maintenance records<br>- Performance report<br>- Audits | - No. of Non-conformities (missed planned maintenance) | - According to Company Maintenance Plan<br>- Annually (follow-up) |
| | - Use of enclosed cars or covering of open cars used to carry minerals and grains, to reduce fugitive dust emissions | - STF | - Inspection records<br>- Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints (dust) | - Biannually |
| | - Consider the use, or conversion to, alternative fuels for locomotive powering (e.g. low-sulphur diesel, bio-diesel) and workshop forges (LPG) | - DF<br>- SOG | - Company investment plan<br>- Fuel usage records<br>- Performance report<br>- Audits | - Quantity of alternative fuels used vs conventional fuels | - Annually |
| | - Invest in locomotive re-powering programmes | - CFM (admin. council)<br>- DE | - Company investment plan<br>- Performance report<br>- Audits | - No. of re-powered locomotives | - According to Company investment plan<br>- Annually (E&S follow-up) |
| | - Installation of high-efficiency catalytic exhaust emission control systems in locomotives | - DF<br>- SOG | - Company investment plan<br>- Company maintenance plan<br>- Performance report<br>- Audits | - No. of exhaust emission control systems installed / refurbished | - According to Company investment plan<br>- Annually (E&S follow-up) |
| | - Use of alternative power sources for idling locomotives | - DF<br>- SOG | - Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - Annually |
| | - Implement fuel consumption reduction / energy efficiency measures (see air emissions management and monitoring programme on section 6) | - ESGM<br>- DF | - Performance report<br>- Audits | - No. of Non-conformities<br>- No. of energy efficiency measures adopted | - Annually |

| Potential Risks and Impacts | Mitigation/Enhancement measures | Responsible | Monitoring and Performance Evaluation | | |
|---|---|---|---|---|---|
| | | | Monitoring Methods | Performance Indicators | Timing / Frequency |
| 4. Potential soil contamination<br>5. Potential surface and ground water contamination | - Develop and implement a waste management plan (for hazardous and non-hazardous waste) (according to the framework programme on section 0) | - ESGM<br>- STF<br>- SOG | - Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - Annually |
| | - Develop and implement a hazardous products management plan (including fuel) (according to the framework programme on section 0) | - ESGM<br>- SOG | - Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - Annually |
| | - Implementation of emergency response procedures for accidental spills, including removal and treatment of contaminated soils (according to Company ERPs) | - ESGM<br>- DF<br>- STF | - Accident records<br>- Performance report<br>- Audits | - No. of Non-conformities<br>- No. of accidents involving spills to soil<br>- Quantity of contaminated soil removed ($m^3$)<br>- No. of accidents involving spills to water resources<br>- No. of remedial actions | - Annually |
| | - Develop and implement a wastewater management and monitoring plan (according to the framework programme on section 0) | - ESGM<br>- STF<br>- SOG | - Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - Annually |
| | - Workshops must have a segregated system to drain the pavement of the operational area, where hazardous substances are used (oils and lubricants, solvents and paints, etc.) and wastes are produced (e.g., sand blasting waste, used oil). The system must be equipped, at least, with an oil-water separator | - SOG | - Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - Biannually |
| | - Workshops must have a sewage collection system equipped with onsite treatment facilities or, alternatively, collected sewage may be transported to adequate offsite treatment and disposal | - SOG | - Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - Biannually |
| | - Sewage from sanitary facilities on passenger trains must not be discharged directly to the track | - STF | - Operational procedures<br>- Inspections<br>- Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - Annually |

| Potential Risks and Impacts | Mitigation/Enhancement measures | Responsible | Monitoring and Performance Evaluation | | |
|---|---|---|---|---|---|
| | | | Monitoring Methods | Performance Indicators | Timing / Frequency |
| 6. Fauna mortality | - Develop and implement a biodiversity management and monitoring plan (according to the framework programme on section 0) | - ESGM<br>- STF | - Performance report<br>- Audits | - No. of Non-conformities (namely, the number of dead animals during operations). | - One-off activity<br>- Annually (follow-up) |
| 7. Occupational health and safety hazards (train / worker accidents, worker's exposure to noise, vibration, diesel exhaust; physical, chemical, and biological hazards) | - Implement Company OHS System and train workers in OHS procedures. The system and OHS plans will comply with national legislation, AfDB E&S OS 2 (Labour and Working Conditions), and WBG/IFC General and Railways EHS Guidelines | - UGSQMA<br>- ESGM<br>- OHS committees | - Company OHS system<br>- Performance report<br>- Audits | - No. of Non-conformities<br>- No. of OHS training actions | - One-off activity<br>- According to Company OHS Management Plan/System<br>- Annually (E&S follow-up) |
| | - Develop and implement a noise and vibrations management and monitoring plan (according to the framework programme on section 0) | - ESGM<br>- DF | - Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - One-off activity<br>- Annually (E&S follow-up) |
| | - Limit the time locomotives are allowed to run indoors and use of pusher cars to move locomotives in and out of maintenance shops | - STF<br>- SOG | - Company OHS system<br>- Workshop operational procedures<br>- Performance report<br>- Audits | - No. of Non-conformities | - Annually |
| | - Ventilation of locomotive shops or other enclosed areas where diesel exhaust may accumulate | - SOG | - Company OHS system<br>- Workshop operational procedures<br>- Performance report<br>- Audits | - No. of Non-conformities | - Annually |
| | - Replacement of the hazardous substances with a less hazardous substitutes, as feasible as possible | - SOG | - Performance report<br>- Audits | - No. of replaced hazardous substances | - Annually (quarterly) |
| | - No employee should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection | - OHS committees<br>- SOG | - Company OHS management system<br>- Noise monitoring plan<br>- Inspection records<br>- Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - According to Company OHS management system / noise monitoring plan<br>- Daily/Annually (E&S follow-up) |

| Potential Risks and Impacts | Mitigation/Enhancement measures | Responsible | Monitoring and Performance Evaluation | | |
|---|---|---|---|---|---|
| | | | Monitoring Methods | Performance Indicators | Timing / Frequency |
| | - Use of adequate PPE where engineering controls are not sufficient to reduce contaminant exposure to acceptable levels | - OHS committees<br>- SOG | - Inspection records<br>- Performance report<br>- Audits | - No. of Non-conformities<br>- No. of complaints | - According to Company OHS management system<br>- Annually (E&S follow-up) |
| 8. Community health and safety – Accidents involving train derailments, train collisions (with other trains or road vehicles) and pedestrians | - Implementation of rail operational safety procedures aimed at reducing the likelihood of train collisions such as a positive train control (PTC) system | - DE<br>- DF<br>- STF | - Company investment plan<br>- Operational safety improvement projects<br>- Operational safety procedures<br>- Performance report<br>- Audits | - No. of completed of rail operational safety improvement projects<br>- % of rail network with automatic operation | - According to Company investment plan<br>- Annually (E&S follow-up) |
| | - Progressively install automatic gates at all level crossings, and perform regular inspection/maintenance to ensure proper operation | - DE<br>- DF<br>- SVO | - Company investment plan<br>- Inspection / maintenance records<br>- Level crossing improvement projects<br>- Performance report<br>- Audits | - No. of completed level crossing improvement projects | - According to Company investment plan<br>- Annually (E&S follow-up) |
| | - Regular inspection and maintenance of the rail lines and facilities to ensure track stability and integrity in accordance with national and international track safety standards | - SVO | - Inspection records<br>- Maintenance records<br>- Performance report<br>- Audits | - No. of Non-conformities (missed planned inspections & maintenance) | - According to Company maintenance plan<br>- Annually (E&S follow-up) |
| | - Enforce the Company safety management plan | - UGSQMA<br>- ESGM<br>- DF | - Company emergency plan<br>- Inspection records<br>- Performance report<br>- Audits | - No. of Non-conformities | - According to Company emergency plan<br>- Annually (E&S follow-up) |
| | - Ensure preventive and corrective maintenance is carried out timely, to keep rolling stock within manufacturer's specifications | - SOG<br>- STF | - Maintenance records<br>- Performance report<br>- Audits | - No. of Non-conformities (missed planned maintenance) | - According to Company maintenance plan<br>- Annually (E&S follow-up) |

| Potential Risks and Impacts | Mitigation/Enhancement measures | Responsible | Monitoring and Performance Evaluation | | |
|---|---|---|---|---|---|
| | | | Monitoring Methods | Performance Indicators | Timing / Frequency |
| | - Posting of clear and prominent danger warning signage at potential points of entry to track areas (e.g. stations and level crossings) | - UGSQMA<br>- ESGM<br>- SVO<br>- Department off Signalization and Telecommunications | - Inspection records<br>- Signalization projects<br>- Performance report<br>- Audits | - No. of completed signalization (or repair) projects<br>- No. of Non-conformities | - Quarterly |
| | - Installation of fencing or other barriers at station ends and other dangerous locations to prevent access to tracks by unauthorized persons | - UGSQMA<br>- ESGM<br>- SVO | - Fencing projects<br>- Performance report<br>- Audits | - No. of completed fencing or repair projects / metres of fence installed / repaired<br>- No. of Non-conformities | - Biannually |
| | - Conduct regular community awareness initiatives, specially focusing the risks of trespassing | - UGSQMA<br>- CLO<br>- STF | - CFM Communication Plan<br>- Community meetings minutes<br>- Performance report<br>- Audits | - N.° of engagements with communities<br>- No. of Non-conformities | - Biannually |
| | - Implementation of emergency preparedness and response procedures (according to Company ERPs) | - UGSQMA<br>- ESGM<br>- DF<br>- STF | - Accident records<br>- Performance report<br>- Audits | - No. of Non-conformities<br>- No. of accidents involving community members | - According to Company ERPs<br>- Annually (E&S follow-up) |

| Potential Risks and Impacts | Mitigation/Enhancement measures | Responsible | Monitoring and Performance Evaluation | | |
|---|---|---|---|---|---|
| | | | Monitoring Methods | Performance Indicators | Timing / Frequency |
| 9. Community health and safety – Accidents involving hazardous goods | - Implementation of a system for the proper screening, acceptance, and transport of hazardous goods | - STF | - Performance report<br>- Audits | - No. of Non-conformities | - One-off activity<br>- Annually (E&S follow-up) |
| | - Use of tank cars and other cargo rolling stock that meet national and international safety standards appropriate for the cargo being carried | - STF<br>- SOG | - Performance report<br>- Audits | - No. of Non-conformities | - Annually |
| | - Ensure preventive and corrective maintenance is carried out timely, to keep rolling stock within manufacturer's specifications | - SOG<br>- STF | - Maintenance records<br>- Performance report<br>- Audits | - No. of Non-conformities (missed planned maintenance) | - According to Company maintenance plan<br>- Annually (E&S follow-up) |
| | - Implementation of spill prevention and control, and emergency preparedness and response procedures (according to Company ERPs) | - UGSQMA<br>- ESGM<br>- DF<br>- STF | - Accident records<br>- Performance report<br>- Audits | - No. of Non-conformities<br>- No. of accidents involving spills | - According to Company ERPs<br>- Annually (E&S follow-up) |
| | - Regular dissemination of emergency preparedness and response information to the potentially affected communities | - UGSQMA<br>- ESGM<br>- CLO<br>- STF | - CFM Communication Plan<br>- Community meetings minutes<br>- Performance report<br>- Audits | - No. of engagements with communities<br>- No. of Non-conformities<br>- No. of complaints | - Annually |

## 6.2 Environmental and Social Programmes

Considering the key environmental factors and impacts/risks associated with the operation and maintenance of locomotives, the following sectorial management and monitoring programmes were defined to complement the general measures outlined in the previous section:

- Air Emissions and GHG Management and Monitoring Programme;
- Noise and Vibrations Management and Monitoring Programme;
- Waste Management Programme;
- Hazardous Products Management Programme;
- Wastewater Management and Monitoring Programme;
- Biodiversity Management Programme;
- Community Health and Safety Management Programme;
- Stakeholder Engagement Framework/Programme.

Additionally, other good practice plans and programmes are proposed, in line with international guidelines, namely those from the AfDB and WBG, namely:

- Gender Based Violence (GBV) / Sexual exploitation, abuse and sexual harassment (SEAH) Prevention and Response Programme;
- Environment, Health and Safety Training Programme.

These programmes provide a broader and ongoing framework that integrates management strategies and monitoring activities for a larger scope of operation, that can be further developed to a more specific Management and Monitoring Plan, that outlines the protocols for managing and monitoring a particular activity, site, region, or aspect within the larger programme, facilitating a more efficient implementation by CFM.

The further development and implementation of the management plans, based on the requirements presented in this ESMP, will generally be the responsibility of ESGM, as centralized E&S unit, along with the relevant directorates and services for each case.

Additionally, CFM has the following relevant plans in place or in imminent approval stage, that are considered important impact mitigation tools, thus are considered to make part of the ESMP and shall not be repeated here:

- Occupational Health and Safety Management System;
- Emergency Response Plans for passenger and cargo trains;
- Maintenance Plan for Locomotives;

### 6.2.1 Air Emissions and GHG Management and Monitoring Programme

#### 6.2.1.1 Justification and objectives

The operation and maintenance of locomotives may result in the degradation of ambient air quality from:

- Exhaust gases from diesel powered locomotives (mostly by emitting particulate matter and NOx, along with CO and $CO_2$, a GHG);
- Dust emissions from transportation of dry granular cargo (minerals, grain, cement, etc.);
- Exhaust gases from coal fired forges used in the workshops (mainly particulate matter, $SO^2$ and NOx, along with CO and $CO_2$, a GHG);
- Fugitive emissions (VOCs) from storage and transfer/transport of fuels or volatile chemicals.

Sensitive receptors located around the rail track and workshops may suffer from annoyances and health issues from the operational emissions.

Emissions of GHG, such as $CO_2$ have broader scale impacts, contributing to climate change.

This Air Emissions and GHG Management and Monitoring Programme aims to provide guidelines and strategies to prevent, control and monitor air emissions, as well as a management framework for further development into a specific plan.

The present programme takes into consideration the Mozambican legislation, as well as international best practices on the subject, namely the recommendations of AfDB E&S OS3 / IFC PS3 (Resources Efficiency and Pollution Prevention) and the IFC EHS General and Railways' Guidelines.

It is expected that the CFM will prepare a project-specific Air Emissions and GHG Management and Monitoring Plan that aligns with the framework set out in this Programme.

#### 6.2.1.2 Legal framework

Air quality standards aim to safeguard public health and the protection of ecosystems. Mozambican air quality standards are established through Decree No. 18/2004, of 2 June (Regulation on Environmental Quality Standards and Effluent Emissions), as amended by Decree No. 67/2010, of 31 December. The relevant air quality standards, including IFC General EHS (that point to World Health Organization thresholds) are listed below.

**Table 6-2 – Relevant ambient air quality standards**

| Pollutant | Averaging Period | Mozambique ($\mu g/m^3$) | IFC/WHO+($\mu g/m^3$) |
|---|---|---|---|
| TSP | 24 hours | 150 | -- |
| | 1 year | 60 | -- |
| $PM_{10}$ | 24 hours | -- | 45 |
| | 1 year | -- | 15 |
| $SO_2$ | 10 minutes | 500 | -- |
| | 1 hour | 800 | -- |
| | 24 hours | 100 | 40 |

| Pollutant | Averaging Period | Mozambique (µg/m³) | IFC/WHO+(µg/m³) |
|---|---|---|---|
| | 1 year | 40 | -- |
| CO | 30 minutes | 60 000 | -- |
| | 15 minutes | 100 000 | -- |
| | 1 hour | 30 000 | -- |
| | 8 hours | 10 000 | -- |
| | 24 hours | -- | 4 000 |
| $NO_2$ | 1 hour | 190 | -- |
| | 24 hours | -- | 25 |
| | 1 year | 10 | 10 |
| $O_3$ | 1 hour | 160 | -- |
| | 8 hours | 120 | -- |
| | 24 hours | 50 | -- |
| | 1 year | 70 | -- |

***** Decree No. 18/2004 as amended by Decree No. 67/2010.

**+** World Health Organization (WHO, 2021)

### 6.2.1.3 Proposed actions

The table below provides possible prevention, control and mitigation actions for air emissions, including GHG.

**Table 6-3 – Air emissions management actions**

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| GHG emissions assessment | - Conduct a GHG emissions assessment for the operation and maintenance of locomotives and propose specific prevention, control and mitigation measures, as well as a monitoring plan | - Q1-Q2 2024 | - ESGM |
| Diesel exhaust emissions (including GHG)<br>Reduction of fuel consumption<br>Energy efficiency | - Conduct an initial assessment (e.g, throughout emissions modelling) to identify likely impact hotspots and to support the definition of a monitoring network | - Q2 2024 | - ESGM |
| | - Ensure preventive and corrective maintenance is carried out timely, to keep rolling stock within manufacturer's specifications | - Ongoing | - SOG |
| | - Use of modern, fuel-efficient, low-emission locomotives or scheduled substitution or re-powering of existing fleets | - Operation | - CA(council administration)<br>- DE<br>- SOG |
| | - Maximizing cargo and passenger space utilization, within safety standards, to minimize specific fuel consumption | - Ongoing | - STF |
| | - Decreasing wind resistance (e.g. by grouping intermodal loads with rail cars of height similar to the containers and filling empty slots with empty containers, covering of empty freight cars, and acquisition of new rolling stock with low wind resistance | - Ongoing | - STF |

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| | - Improving driving economy through staff training, incentive programs, driving advice systems, and improved traffic flow to minimize unnecessary acceleration and deceleration | - Ongoing | - STF |
| | - Consider the use, or conversion to, alternative fuels for locomotive powering (e.g. low-sulphur diesel, bio-diesel) and workshop forges (LPG) | - Assessment of possible use of alternative fuels Q2 2024 | - DE<br>- CA<br>- SOG |
| | - Invest in locomotive re-powering programmes | - Ongoing (according to company investment plan) | - DE<br>- CA<br>- DE |
| Diesel exhaust emissions (including GHG)<br>Reduction of fuel consumption<br>Energy efficiency | - Installation of high-efficiency catalytic exhaust emission control systems in locomotives | - Baseline assessment Q1 2024<br>- Implementation 2025 | - DE<br>- SOG |
| | - Use of alternative power sources for idling locomotives | - Baseline assessment Q1-Q2 2024<br>- Implementation 2025 | - DE<br>- DF<br>- SOG<br>- |
| Fugitive emissions (dust, VOCs) | - Use of enclosed cars or covering of open cars used to carry minerals and grains, to reduce fugitive dust emissions | - Ongoing | - STF |
| | - Implementing a leak detection and repair (LDAR) programme for control of fugitive emissions from diesel tanks and fuelling stations, by regularly monitoring to detect leaks, and implementing repairs within a predefined time period | - LDAR programme development Q2 2024<br>- Implementation 2025 | - SOG |

#### 6.2.1.4 Monitoring and follow-up

Air quality monitoring actions should be developed nearby relevant sensitive receptors. The following paragraphs define the criteria for the selection of the monitoring points and the air quality monitoring procedures. Two types of monitoring actions are required: periodic air quality monitoring, to verify the effectiveness of the control and mitigation in place and monitoring in response to complaints or grievances.

***Monitoring Locations***

Monitoring should be undertaken in the major existing settlements along the rail network and around the maintenance workshops, where sensitive receptors (such as residential areas, health facilities and schools) may be concentrated and might be affected by the locomotive emissions. An initial assessment shall be carried out to propose a monitoring network, whose implementation can be phased.

***Monitoring Parameters***

At the locations to be selected after a baseline survey, air quality monitoring should be undertaken for the following parameters:

- Total Suspended Particle Matter concentrations;
- Nitrogen oxides (as $NO_2$) and Carbon Monoxide (CO) concentrations. Sulphur dioxide ($SO_2$), should additionally be monitored around maintenance workshops;
- Visual identification of dust plumes resulting from the transportation of dry granular materials.

Concentrations should comply with the guideline established in Decree No. 18/2004 (as amended by Decree 67/2010) and WB/WHO guidelines. TSP will be used as an indicative proxy for PM10.

***Monitoring Frequency***

At the minimum, bi-annual monitoring campaigns shall be conducted (dry season and wet season campaigns).

***Sampling Methods***

The reference methods to be applied in the Air Quality monitoring campaigns should preferably be the following:

- USEPA 40 CFR part 50, Appendix J – "Sampling of Ambient Air for Total Suspended Particulate Matter and PM10" or equivalent method.
- EN 12341: 2014 "Ambient air - Standard gravimetric measurement method for the determination of the PM10 or PM2,5 mass concentration of suspended particulate matter" or equivalent method. (Gravimetric determinations for particulate matter and PM10 concentrations should be made by a certified laboratory with EN ISO/IEC 17025:2018 Accreditation).
- Nitrogen Oxides: Measurement by continuous direct-reading electrochemical analyser or Real time monitoring using method EN 14211:2005: Ambient air quality. Standard method for the measurement of the concentration of nitrogen.
- Carbon Monoxide: Measurement by continuous direct-reading non-dispersive infrared (NDIR) analyser following EN 14626:2005 Ambient air quality. Standard method for the measurement of the concentration of carbon monoxide by non-dispersive infrared spectroscopy or measurement by continuous direct-reading electrochemical analyser.

Gaseous pollutants may be measured by e.g. portable direct measurement equipment's through the use of electrochemical sensors technology provided with valid calibration certificates or by the use of passive sampling techniques (e.g. Radiello or similar technique) with pollutants concentrations determined by an certified laboratory with EN ISO/IEC 17025:2018 accreditation.

***Result Interpretation***

The air quality monitoring results should be compared against applicable air quality guidelines, as listed on Table 6-2**Error! Reference source not found.**, to identify any non-compliance with such guidelines.

#### 6.2.1.5 Corrective actions

If exceedances of the air quality guidelines are recorded (see previous section for the proposed monitoring actions), or if complaints from the local communities are logged, the causes of such exceedances should be identified and corrected. Exceedances may result from:

- Presence of unidentified (new) sensitive receptors;
- Lack of adequate maintenance of machinery and equipment;
- Inadequate implementation of the proposed control and mitigation actions.

In the event of non-conformities, additional mitigation should be implemented, as required, to eliminate or minimize the negative effects. These additional mitigation measures should be defined case by case, depending on the assessment of the specific issues. The following are examples of possible additional mitigation and control actions that may be adopted:

- Intensify and monitor the maintenance of locomotives and other emitting equipment, to avoid inadequate working conditions that may cause an increase of dust and tailpipe emissions;
- Provide additional training to workers, regarding the environmental management requirements set out in this management program;
- Adopt traffic restrictions;
- Invest in alternative fuels or re-powering for locomotives.

After the implementation of the corrective actions, a monitoring campaign should be undertaken for the areas where the non-compliances were recorded, to verify the resolution of the issue.

#### 6.2.1.6 Performance and reporting

***Performance Indicators***

The following performance indicators should be monitored for the Air Quality Management Plan:

- Number and magnitude of TSP guidelines exceedances during periodic monitoring;
- Number and magnitude of NOx (as $NO_2$), CO and $SO_2$ guidelines exceedances during periodic monitoring;
- Number of community complaints regarding air quality and subsequent verification monitoring;
- Number and type of air quality mitigation measures undertaken in response to complaints.

The performance indicators results should be determined and compiled in annual reports, as indicated in the following section.

***Reports***

The table below summarizes the documental records that should be kept to control the execution of the management and monitoring plan. These documents should be prepared, archived, and maintained by ESGM and DF, to document the results of implementation. Records of relevant events should be made following the occurrence, and annual Performance Reports should be prepared, reporting on the recorded events and performance indicators.

**Table 6-4 – Record documents for the air emissions management and monitoring plan**

| Document Title | Document Type | Frequency of Record or Report |
|---|---|---|
| Record of periodic air quality monitoring | Record | Whenever necessary |
| Initial noise GHG assessment | Report | On-off activity |
| Record of air quality monitoring in response to complaints and mitigation responses | Record | Whenever necessary |
| Progress Report | Report | Bi-annual |
| Performance Report | Report | Annual |

## 6.2.2 Noise and Vibrations Management and Monitoring Programme

### 6.2.2.1 Justification and objectives

Train traffic generate significant noise and vibrations from running engine (diesel), wheel/rail track friction, brakes, as well as aerodynamic noise (mainly in highspeed trains). This can be an important issue, especially in urban areas, and close to residential areas, potentially causing disturbance to nearby communities and affecting their quality of life and, indirectly, their health. On the other hand, crew members may be exposed to noise from locomotives, rolling stock, and machinery, as well as to significant repetitive mechanical shocks and / or vibrations. Workshop workers are regularly exposed to high noise levels from repair activities and machinery operation.

This programme defines measures to prevent, control and mitigate noise and vibration emissions from operation and maintenance of locomotives, as well for conducting monitoring activities.

The present programme takes into consideration the Mozambican legislation, as well as international best practices on the subject, namely the recommendations of AfDB OS4 / IFC PS3 (Pollution Prevention and control, hazardous materials and resource efficiency) and the IFC EHS General and Railways' Guidelines.

It is expected that the CFM will prepare a project-specific Noise and Vibrations Management and Monitoring Plan that aligns with the framework set out in this Programme.

### 6.2.2.2 Legal framework

Mozambique has no specific legal framework on ambient noise.

The World Health Organization (WHO) and the World Bank (WB) noise guidelines are widely accepted guidelines and have been adopted as project standards. WHO's recommended noise guidelines were determined considering noise's potentially negative effects on health and specific environments. Under WHO's noise policy residential areas, schools and hospitals are sensitive receptors / land uses. The table below lists WHO's ambient noise guidelines for such sensitive receptors.

**Table 6-5 – WHO Ambient Noise Levels Guidelines**

| Land use / Specific Environment | Guideline ($L_{Aeq}$ in dB (A)) | Reference Period | Effect on Health |
|---|---|---|---|
| Outdoor of residential areas (day-time) | 55 dB(A) | 16 hours (06h00 – 22h00) | Serious annoyance |
| Outdoor of residential areas (night-time) | 45 dB(A) | 8 hours (22h00 – 06h00) | Sleep disturbance |

**Source:** Berglund *et al*. (1999).

In 1998, WB developed a pollution management program, so as to ensure that WB financed projects in developing countries were environmentally sustainable (WBG, 1999), the scope of which included noise. The results were then incorporated into WB and International Finance Corporation (IFC) guidelines, which state that noise impacts from a particular project should not exceed the levels presented in Table 6-6 or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

**Table 6-6 – WB/IFC Noise Level Guidelines**

| Receptor | One Hour LAeq (dB(A)) | |
|---|---|---|
| | Daytime (07:00 - 22:00) | Night-time (22:00 – 07:00) |
| Residential; institutional; educational | 55 | 45 |
| Industrial, commercial | 70 | 70 |

**Source**: IFC (2007).

As can be seen from the table above, the WHO noise guideline for outdoors of residential areas are the same as IFC's guidelines for residential, institutional, or educational receptors, for both the daytime and night-time periods.

### 6.2.2.3 Proposed actions

The table below provides possible prevention, control and mitigation actions for noise and vibraton emissions.

**Table 6-7 – Noise and vibrations management actions**

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| Prevention, control and mitigation at the source | - Conduct an initial noise survey and assessment (e.g, throughout emissions modelling) to identify likely impact hotspots and to support the definition of a monitoring network | - Q2 2024 | - ESGM |
| | - Provide adequate soundproofing of workshops' buildings and of noisy equipment | - As necessary | - SOG |
| | - Whenever practical, perform high-noise maintenance activities inside the workshop buildings and not on the access track | - Ongoing | - SOG |
| | - If workshops are located in noise-sensitive areas (residential areas), no high-noise activities should be undertaken in the nighttime period (22-07h) | - Ongoing | - SOG |
| | - Ensure preventive and corrective maintenance is carried out timely, to keep rolling stock within manufacturer's specifications | - Ongoing | - SOG |

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| | - Use of modern non-metallic disc brakes, which can reduce rolling noise by 8-10 decibels (dB) compared to cast-iron block tread brakes utilized on older vehicles (non-metallic disc brakes also reduce wearing of wheels and rails) | - Ongoing | - SOG |
| | - Reducing the roughness of running surfaces through regular maintenance of wheels and tracks, and consideration for replacing traditional jointed track with continuously welded rail | - Ongoing | - SVO |
| | - Installation of other noise abatement measures at the source for improved sound-proofing, and other noise reducing features (e.g. engine enclosures and exhaust muffling for diesel engines, and shielding of wheels with vehicle-mounted shrouds | - TBD (depends on the results of the previous measures implemented at the source and of the monitoring data) | - STF<br>- SOG |
| | - Limit to a minimum the use of locomotive horns when crossing inhabited areas | - Ongoing | - STF |
| Other prevention, control and mitigation | - If noise abatement measures at the source are not sufficient, consider the installation of other mitigation measures on the propagation path, such as noise barriers and vegetation screens | - TBD (depends on the results of the previous measures implemented at the source and of the monitoring data) | - STF<br>- SVO<br>- DF |
| | - Ensure that the grievance mechanism is communicated to the communities crossed by the railway and around workshops | - Ongoing | - ESGM<br>- CLO<br>- DF |
| Occupational exposure to noise and vibrations | - Reduction of internal venting of air brakes to a level that minimizes noise without compromising the crew's ability to judge brake operation | - Ongoing | - STF |
| | - Use of dampers at the seat post to reduce the vibration experienced by the operator | - Ongoing | - SOG<br>- STF |
| | - No employee should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. Use of adequate PPE | - Ongoing | - OHS committees |

#### 6.2.2.4 Monitoring and follow-up

Noise and vibrations monitoring actions should be developed nearby relevant sensitive receptors. The following paragraphs define the criteria for the selection of the monitoring points and the noise and vibrations monitoring procedures.

Two types of monitoring actions are required: periodic noise monitoring, to verify the effectiveness of the control and mitigation in place and monitoring in response to complaints or grievances.

***Monitoring Locations***

Monitoring should be undertaken within the major existing settlements along the rail network and around the maintenance workshops, where closest sensitive receptors (such as residential areas, health facilities and schools) may be concentrated and might be affected by the locomotive noise and vibrations emissions. An initial assessment shall be carried out to propose a monitoring network, whose implementation can be phased.

***Monitoring Parameters***

At the locations to be selected after a baseline survey, noise monitoring should be undertaken for the following parameters:

- At all the monitoring points the continuous A-weighted equivalent sound pressure level (LAeq) will be recorded. The statistical noise level indicators L95, L90, L50, L10, Lmax, and Lmin will also be determined. 1/3 Octave Band Spectrum will also be recorded at each site. Measurements are to be performed during the daytime reference period (7h-22h), and also during the night-time period (22h-7h), if train circulation is expected;
- Terrain vibration is recorded in terms of particle velocity (ppv) in millimetres per second in three orthogonal directions.

***Monitoring Frequency***

At the minimum, bi-annual monitoring campaigns shall be conducted. After the first two year, results can support eventual changes.

***Sampling Methods***

The reference methods to be applied in the noise monitoring campaigns should preferably be the following:

- ISO EN 1996-1: 2017 – Acoustics – Description, measurement, and assessment of environmental noise – Part 1: Basic Quantities and assessment procedures;
- ISO EN 1996-2: 2018 - Acoustics – Description, measurement, and assessment of environmental noise - Part 2: Determination of environmental noise levels.

Note that the sampling setup should include:

- mount the sound level meter on a tripod 1.5 m above the ground;
- evaluation of free-field conditions, at least 3.5m away from hard reflecting surfaces;
- use of a windshield to avoid wind noise on the microphone;
- calibration of the noise meter at start of survey.

Monitoring should be planned to avoid large contribution from other noise sources. This means avoiding:

- wind speeds above 5 m/s;
- rain or adverse weather conditions such as thunder; and
- monitoring near other localised noise sources (e.g. running vehicle engines, roads, barking dogs, music).

All samples should be for a minimum of 15 minutes.

Vibrations measurement will be carried out using a vibration monitor capable of recording vibration both on the ground and in the air. The vibration of the terrain is recorded in terms of particle velocity in millimetres per second in three orthogonal directions. Vibration in the air is measured in terms of decibels (dB). The equipment must be properly calibrated in an accredited laboratory.

***Result Interpretation***

Noise monitoring results should be compared against the adopted project guidelines, as listed on Table 6-6 and **Table** 6-5, to identify any non-compliance.

### 6.2.2.5 Corrective actions

If exceedances of the noise project standards are recorded, or if complaints from the local communities are logged, the causes of such exceedances should be identified and corrected. Exceedances may result from:

- Presence of unidentified (new) sensitive receptors;
- Lack of adequate maintenance of machinery and equipment;
- Inadequate implementation of the proposed control and mitigation actions.

In the event of non-conformities, additional mitigation should be implemented, as required, to eliminate or minimize the negative effects. These additional mitigation measures should be defined case by case, depending on the assessment of the specific issues. The following are examples of possible additional mitigation and control actions that may be adopted:

- Intensify and monitor the maintenance locomotives and other emitting equipment, to avoid inadequate working conditions that may cause increased noise emissions;
- Reenforce measures at the source (soundproofing, etc.);
- Install noise barriers between the noise source and the affected receptors;
- Adopt traffic restrictions;
- Invest in quieter locomotives;
- Provide additional training to workers, regarding the environmental management requirements set out in this programme.

After the implementation of the corrective actions, a monitoring campaign should be undertaken for the areas where the non-compliances were recorded, to verify the resolution of the issue.

**Table 6-8** presents the main proposed corrective actions.

**Table 6-8 – Noise and vibrations corrective actions**

| Corrective Actions | Description | Implementation Schedule |
|---|---|---|
| Act on exceedances of noise project standards | - If exceedances of the noise project standards are recorded, the causes of such exceedances should be identified and corrected, through the implementation of adequate mitigation and control measures, to be identified based on the nature of the specific conditions that led to the recorded exceedances. Following correction, monitoring should be undertaken to verify resolution | Whenever necessary |
| Act on local complaints and grievance claims | - If complaints from the local population regarding noise emissions are registered, act on them in consultation with local authorities. This may require the adoption of additional mitigation and control measures, as appropriate. Following correction, monitoring should be undertaken to verify resolution | Whenever necessary |

#### 6.2.2.6 Performance and reporting

***Performance Indicators***

The following performance indicators to be monitored for the Noise and Vibrations Management and Monitoring Plan:

- Number and magnitude of guidelines exceedances during periodic monitoring;
- Number of community complaints regarding noise and subsequent verification monitoring;
- Number and type of noise mitigation measures undertaken in response to complaints.

The performance indicators results should be determined and compiled in annual reports, as indicated in the following section.

***Reports***

The table below summarizes the documental records that should be kept to control the execution of the management and monitoring plan. These documents should be prepared, archived, and maintained by ESGM and DF, to document implementation. Records of relevant events should be made following the occurrence, and annual Performance Reports should be prepared, reporting on the recorded events and performance indicators.

**Table 6-9 – Record documents for the noise and vibrations management and monitoring plan**

| Document Title | Document Type | Frequency of Record or Report |
|---|---|---|
| Initial noise survey and assessment | Report | On-off activity |
| Record of periodic noise and vibrations monitoring | Record | Whenever necessary |
| Record of noise and vibrations associated community complaints | Record | Whenever necessary |
| Record of noise and vibrations monitoring in response to complaints and mitigation responses | Record | Whenever necessary |
| Progress Report | Report | Bi-annual |
| Performance Report | Report | Annual |

### 6.2.3 Waste Management Programme

#### 6.2.3.1 Justification and objectives

Waste management comprises the collection, conditioning, transportation and deposition at an appropriate final disposal. Adequate waste management is fundamental to prevent the contamination of soils and water resources (surface and groundwater). It is also important so as to prevent jeopardizing the public health of the local communities and workers, and prevent the proliferation of pests.

The objective of the Waste Management Programme is to ensure adequate management of hazardous and non-hazardous waste.

The present programme takes into consideration the Mozambican legislation, as well as international best practices on the subject, namely the recommendations of AfDB OS4 (Pollution Prevention and control, hazardous materials and resource efficiency and), the IFC PS3 and IFC EHS General and Railways' Guidelines.

It is expected that the CFM will prepare a project-specific Waste Management Plan that aligns with the framework set out in this Programme.

### 6.2.3.2 Legal framework

The table below compiles the applicable national regulations applicable to CFM activities in what concerns waste and waste management.

**Table 6-10 – Key national regulations on waste and waste management**

| Act | Description |
|---|---|
| Decree No. 94/2014, 31st of December | **Regulation on Urban Solid Waste Management**<br>The purpose of this Regulation is to establish rules for the management of solid urban waste in the national territory.<br>Applies to all individuals and legal entities, public and private, involved in the production and management of solid urban waste and in the production and management of industrial and hospital waste assimilated to urban waste. Establishes that urban solid waste is classified according to the Mozambican Standard NM339 - Solid Waste – Classification. |
| Decree no. 83/2014, 31st December | **Regulation on Hazardous Waste Management**<br>Establishes the legal framework for the management of hazardous waste. The key objective is to establish rules for the production, collection or disposal of hazardous waste in order to minimise their negative impacts on health and the environment. Annex IX to this Regulation shows the classification of waste.<br>Under the scope of the Decree No. 83/2014, of December 1st, the Ministry that oversees the Environmental sector (MTA) is responsible for the following main items, concerning hazardous waste management:<br>- Issuing and disclosing binding rules on the procedures to be followed under hazardous waste management;<br>- Carrying out the environmental licensing of storage and / or waste disposal facilities or sites;<br>- Accrediting, in coordination with the supervisory entities, after hearing the institutions concerned, hazardous waste operators and transporters, including the respective vehicles used for waste transport;<br>- Registering public and private entities that handle hazardous waste;<br>Monitoring compliance with hazardous waste regulations. |

There are no Biomedical Wastes on operation and maintenance of locomotives, thus Decree No. 8/2003, 18th February is not applicable.

The table below compiles the relevant international conventions that Mozambique is signatory and that relate to waste.

**Table 6-11 – Relevant international conventions (waste)**

| Order | Description |
|---|---|
| Basel Convention on the control of Trans-boundary Movements of Hazardous Wastes and their Disposal (UNEP, 1989) | This convention regulates the import, export and trans-boundary movement of hazardous waste. The Basel Convention was superseded by the Bamako Convention (see below). The Republic of Mozambique ratified the Basel Convention on the control of Trans-boundary Movements of Hazardous Wastes and their Disposal by way of Resolution 18/96 of 26 November. |
| Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movements and Management of Hazardous Wastes within Africa (AU, 1991) | During the negotiation of the Basel Convention, the African states represented by the Organisation for African Unity (AU) adopted the Bamako Convention believing that the Basel Convention was not strict enough. The Bamako Convention totally prohibits the import of hazardous waste into Africa. The Convention came into force on April 22, 1998. The Republic of Mozambique ratified the Bamako Convention by way of Resolution 19/96 of 26 November. |
| Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (UN 1998) | The objective of this Convention is to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm and to contribute to their environmentally sound use, by facilitating information exchange about their characteristics, by providing for a national decision-making process on their import and export and by disseminating these decisions to Parties. Mozambique accessed in 2010. |
| Stockholm Convention on Persistent Organic Pollutants (UNEP 2001) | Persistent Organic Pollutants (POP) is a global treaty to protect human health and the environment from chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the fatty tissue of humans and wildlife, and have harmful impacts on human health or on the environment. In response to this global problem, the Stockholm Convention, which was adopted in 2001 and entered into force in 2004, requires its parties to take measures to eliminate or reduce the release of POPs into the environment. POPs to be prohibit and/or whose production and use are to be eliminated are listed in Annex A. Annex B lists POPs whose production and use are to be restricted. Annex C lists unintentionally produced POPs whose releases shall be reduce or eliminated.<br>Regarding waste, the convention defines as one of its mains provisions: “Ensure that stockpiles and wastes consisting of, containing or contaminated with POPs are managed safely and in an environmentally sound manner (Article 6)”.<br>The Convention requires that such stockpiles and wastes be identified and managed to reduce or eliminate POPs releases from these sources. The Convention also requires that wastes containing POPs are transported across international boundaries taking into account relevant international rules, standards and guidelines.<br>Mozambique ratified this convention in 2005. |

### 6.2.3.3 Availability of waste disposal facilities

When planning its waste management activities, CFM and its Contractors will take into consideration the availability, or lack thereof, of adequate waste disposal facilities in Mozambique, namely:

- In what regards urban solid wastes (non-hazardous), no adequate waste disposal facilities exist in Mozambique. Waste management is the responsibility of municipalities, or district authorities where no municipalities exist. No public landfills exist in Mozambique as a whole. Municipalities use open air dump sites, without adequate environmental controls or monitoring;
- As for hazardous waste, there is one licensed facility in Boane District, Maputo Province – the Mavoco Industrial Landfill. This facility is an adequate final disposal for the volumes of hazardous waste produced by the Project.

#### 6.2.3.4 Proposed actions

Table below summarizes the proposed waste management actions.

**Table 6-12 – Waste management actions**

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| Prepare waste inventory | - Prepare inventory of any hazardous and non-hazardous waste<br>- Classify the waste according to Decree No. 94/2014 and Decree No. 83/2014<br>- Define sources, volumes and indicate appropriate final destination for each type of waste, taking into consideration the specifications of the region in question in what concerns the availability of waste treatment and disposal facilities | - Q1 2024<br>- Ongoing | - ESGM<br>- SOG<br>- STF |
| Reduce waste production | - Working sites must be kept clean, neat and tidy at all times<br>- Avoid leaving garbage unattended, in order to avoid attracting pests and nocturnal carnivores<br>- Implement daily cleaning routines to minimize waste<br>- Promote the recycling and recovery of waste in coordination with municipal authorities or private entities<br>- Use materials which can be reused easily<br>- List and estimate the volume of waste that can be reused, recycled or re-process (example, wood scraps, soils, none used materials)<br>- Ensure that the quantities of maintenance materials on site are as accurate as possible, to avoid surpluses that could result in waste | - Ongoing | - ESGM<br>- SOG<br>- STF |
| Non-hazardous waste segregation | - Provide containers of appropriate size (according to the expected quantity of waste) for the placement of waste in different working areas. The segregation will be carried out as close as possible to the place of production. These shall ensure adequate hygiene and sealing conditions<br>- Strictly prohibit littering with plastic or other wastes by all project personnel<br>- Provide different containers for each type of waste that can be reused, recycled or re-processed. Containers will be clearly identified according to their categorization and classification, allowing to clearly identifying its contents<br>- Waste segregation must be carried out accordingly, ensuring that waste does not exceed the top of containers<br>- Maintain containers clean and always closed<br>- All produced waste will be sorted according to its type. Waste segregation will be initially done by workers<br>- Produced waste will be removed daily and temporary stored in Temporary Store Facilities until transported to final disposal site | - Ongoing | - ESGM<br>- SOG<br>- STF |
| Temporary storage facilities for non-hazardous waste | - Non-hazardous waste must be temporarily stored, prior to final disposal/ recycling, at only one designated area. This area must be duly delimited and signed ("Waste Storage Area"). The area must be roofed, properly ventilated and have waterproof surface floor. Waste temporary storage | - Ongoing | - ESGM<br>- SOG<br>- STF |

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| | areas need to be secured, so that they do not create health and safety hazards to people<br>- Inert waste may be stored in the open without the need for a waterproofing floor in a designated and delimited area<br>- Location of the Waste Temporary Store Facilities must be at least (50 m) away from water courses and ground depressions<br>- Maintain a good organization of space and cleaning of waste storage areas | | |
| Non-hazardous waste final disposal | - The transportation of waste must be carried out in an appropriate vehicle, capable of containing the waste, and in good operating condition. These vehicles must be easily washable<br>- Transfer operations of waste containers must be carried out safely: without compromising its segregation, not damaging containers, without causing leaks or spills and originating dust<br>- The final disposal and transport of waste must be agreed and authorized by the municipal/district authorities. The necessary licenses must be obtained<br>- Burning, burial or dump of any type waste in soil, water resources (lakes, rivers, etc.) or at sea is strictly prohibited<br>- Non-hazardous waste will be removed from the facilities at least on a weekly basis<br>- CFM and the wate contractor will agree on and document the final disposal site for the waste ensuring that it meets national and IFC requirements, and will keep records of the delivery of the waste at such facilities | - Ongoing | - ESGM<br>- SOG<br>- STF |
| Hazardous waste segregation | - Provide containers for segregation of hazardous waste. These must be hermetically sealed (ensuring that waste does not exceed the top of containers) and have an appropriate size. Containers will be made of appropriate material so that they are not damaged by their content and that damaging or dangerous substances are formed. They shall ensure adequate hygiene and sealing<br>- Provide different containers for each type of hazardous waste to be produced. The containers will be clearly identified and include the symbols defined in Decree no. 83/2014<br>- Hazardous waste will not be mixed with other types of waste<br>- Containers will be placed top of wooden pallets or plastic pails<br>- Maintain containers clean and always closed<br>- All produced waste will be sorted according to type (defined in the list of characteristics of Annex III of Decree no. 83/2014) and placed in the corresponding container | - Ongoing | - ESGM<br>- SOG<br>- STF |
| Temporary storage facilities for hazardous waste | - Hazardous waste will not be stored at random areas and must be transported daily to Temporary Storage Facilities managed by a certified waste contractor<br>- Hazardous waste must be temporarily stored, prior to final disposal/recycling, at only one designated area. This area must be duly delimited and signed (“Hazardous Waste Storage Area”) and with restricted access. The area must | - Ongoing | - ESGM<br>- SOG<br>- STF |

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| | be roofed, properly ventilated and have impermeable surface floor<br>- Location of the Waste Temporary Store Facilities must be at least (50 m) away from water courses and ground depressions<br>- No smoking will be allowed in the vicinity of hazardous waste storage area. Place appropriate symbolic signage (No smoking, No naked light and danger)<br>- Provide extinguishers near the waste storage areas<br>- Maintain a good organization of space and cleaning of waste storage areas | | |
| Transportation of hazardous waste | - The transportation of hazardous waste, within the facilities of the producing entity up to the storage location, will be made resorting to appropriate equipment or vehicles capable of containing the waste and in good operating conditions. These vehicles must be easily washable. The transport vehicle will be dully identified with signs for the transportation of hazard material<br>- Hazardous waste must be transported (internal transportation) in containers. The transport must have steel clamps for securing the containers and guarantee safe transport<br>- Any holder of hazardous waste that does not personally carry out the elimination operations, shall give this work to a private collecting service that will carry out the operations, provided it is duly licensed by MTA to carry out these activities<br>- The transportation of hazardous waste outside the facilities of the producing entity can only be made by an entity licensed by MTA and will comply with the basic rules and procedures defined in Decree No. 83/2014<br>- When the hazardous waste is collected, a manifest, in four copies, will be completed, indicating the quantities, quality and destination of the collected waste (according to Decree No. 83/2014, appendix VI); one copy is kept by the waste generating entity, another copy is kept by the waste transporting entity, the third copy is kept by the entity receiving the product and the fourth copy is sent to MTA<br>- The crossing of borders with hazardous waste shall comply with the provisions of the Basel Convention and with the instructions of MTA<br>- Provide the workers responsible for the handling of hazardous waste with adequate PPE (work wear, gloves, boots and masks) | - Ongoing | - ESGM<br>- SOG<br>- STF |
| Hazardous waste final disposal | - The final disposal of hazardous waste will be made at an infrastructure licensed by MTA for storage, treatment and/or final disposal of hazardous waste. The nearest such infrastructure is the Mavoco Industrial Landfill, located in Boane District, Maputo Province<br>- Whenever possible, batteries and tires will be returned to the supplier | - Ongoing | - ESGM<br>- SOG<br>- STF |
| Workers training | - Workers must be briefed on the need to reduce the production of waste as much as possible. The use of disposable products (such as plates or plastic or paper cups, products with excessive packaging) will be limited | - Ongoing | - ESGM<br>- SOG<br>- STF |

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| | as much as possible, and the use of reusable products will be promoted<br>- Workers must be trained on the classification, correct sorting and handling of waste<br>- Workers responsible for hazardous waste handling must be trained on the classification, correct sorting, handling and transport of hazardous waste. Workers must be briefed on the use of personal protection equipment | | |

#### 6.2.3.5 Follow-up

**Table 6-13** summarizes the follow-up and/or systematic and/or periodic verification actions proposed for waste management.

**Table 6-13 – Waste management follow-up and/or systematic and/or periodic verification actions**

| Follow-up and/or verification action | Description |
|---|---|
| Inspection of the waste storage areas | - Perform daily visual inspections of the hazardous and non-hazardous waste storage areas, to verify if the existing containers are adequate to the volume of waste produced, the correct waste sorting and conditioning is being carried out, that there are no spills and contamination and that the waste has been properly removed<br>- Verify the integrity of the containers and other environmental control systems/equipment |
| Inspection of working areas | - Perform daily visual inspections of work areas to verify the organization and cleanliness of the site |
| Verification of final disposal sites | - Undertake biannual due diligence visits to the final disposal sites (when managed by a third party service provider) to confirm that final disposal is compliant with applicable national standards and IFC EHS guidelines |

#### 6.2.3.6 Corrective actions

**Table 6-14** summarizes the corrective actions and their implementation schedule.

**Table 6-14 – Waste management corrective actions**

| Corrective Actions | Description | Implementation Schedule |
|---|---|---|
| Spill mitigation actions | - Removal of substances accumulated in the spill containment trays or basins;<br>- Repair or change the damaged container that leaks | When applicable |
| Response to complaints | - In response to workers or community complaints about odours or pests proliferation, increase the frequency of waste collection | When applicable |
| Corrective action for improper waste storage | - Provide or increase the quantities of proper containers in the storage areas where the increase of wastes being produced are evident;<br>- Increase the frequency of waste collection | When applicable |
| Corrective action for littering and illegal dumping | - Increase awareness about waste management | When applicable |

#### 6.2.3.7 Performance and reporting

***Performance Indicators***

The following table lists the performance indicators to be monitored for the Waste Management Plan.

**Table 6-15 – Performance indicators for the waste management plan**

| Indicator | Target | Trend |
|---|---|---|
| Weekly volume of waste produced, by type (hazardous and non-hazardous) | Volumes will be recorded. No target is applicable (as volumes will depend on activity). | Volume of waste per workday decreases quarterly (showing efforts to reduce waste production) |
| Weekly volume of waste transported to final deposition | Equal to weekly volume of waste produced. | n.a. |
| Number of improper waste management procedures detected | < 5 per quarter | Number of events decreases quarterly |
| Number of adopted corrective actions in response to detection of improper waste management procedures | Equal to number of improper waste management procedures detected | n.a. |

**Note:** n.a. – not applicable.

The performance indicators results will be determined monthly and compiled in quarterly reports, as indicated in the following section.

***Reports***

The following table summarizes the documental records that will be kept to control the execution of the waste management plan. These documents will be prepared, archived and maintained by ESGM, STF and SOG, in order to document the results of implementation. Records of relevant events and performance indicators shall be kept as appropriate and a quarterly Performance Report will be prepared by STF and SOG and submitted to the ESGM, reporting on the recorded events and performance indicators.

**Table 6-16 – Record documents for the waste management plan**

| Document Title | Document Type | Frequency of Record or Report |
|---|---|---|
| Waste inventory | Record | Monthly |
| Weekly volume of waste produced, by type | Record | Monthly |
| Weekly volume of waste by category transported to final deposition | Record | Monthly |
| Weekly volume of waste recycled or reused | Record | Monthly |
| Record improper waste management procedures detected and remediation actions undertaken | Record | Monthly |
| Performance Report | Report | Quarterly |

## 6.2.4 Hazardous Products Management Programme

### 6.2.4.1 Justification and objectives

Hazardous products management includes all aspects from procuring, receiving, storing, handling and tracking hazardous products, including proper labelling, storage conditions, and shelf-life monitoring.

Adequate management is fundamental to prevent accidents and spills that can contaminate soils and water resources (surface and groundwater). It is also important to safeguard the health and safety of the local communities and workers, and of biodiversity.

The objective of the programme is to ensure adequate management of hazardous products used in maintenance of locomotives. There is a wide range of hazardous materials being used for planned and emergency maintenance and repair of locomotives, including solvents, coolants, acids, and alkalis, oils and lubricants, hydrocarbons (diesel and others, as cleaning agents). Polychlorinated biphenyls (PCB) may be found in older electrical equipment (e.g., transformers and capacitors), and asbestos may be present in older parts such as wheel bearings.

The present programme takes into consideration the Mozambican legislation, as well as international best practices on the subject, namely the recommendations of AfDB OS3 (Pollution prevention and control, hazardous materials and resource efficiency), the IFC PS3 and IFC EHS General and Railways' Guidelines.

It is expected that the CFM will prepare a project-specific Waste Management Plan that aligns with the framework set out in this Programme.

#### 6.2.4.2 Proposed actions

Table below summarizes the proposed waste management actions.

**Table 6-17 – Hazardous products management actions**

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| Hazardous products inventory and hazard / risk assessment | - Prepare an inventory of required hazardous products for maintenance and operation and a hazard assessment<br>- Define locations, stored volumes, storage conditions, existence of MSDS, handling and disposal procedures, emergency response, among others<br>- Preparation of written Standard Operating Procedures (SOPs) for filling tanks or other containers or equipment as well as for transfer operations by personnel trained in the safe transfer and filling of the hazardous material, and in spill prevention and response<br>- SOPs for the management of secondary containment structures, specifically the removal of any accumulated fluid, such as rainfall, to ensure that the intent of the system is not accidentally or wilfully defeated | - Q1-Q2 2024 | - ESGM<br>- SOG |
| Reduction of hazardous products usage / alternatives | - Replacement of the hazardous substances with a less hazardous substitutes, as feasible as possible<br>- Ensure that the quantities of maintenance materials on site are as accurate as possible, to avoid surpluses<br>- Use of aqueous detergent cleaning solutions or steam cleaning, or use and recycling of aliphatic cleaning | - Ongoing / 2024 | - SOG |

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| | solvents (e.g. 140 solvent), for example when removing axle protective coatings or for cleaning of large equipment<br>- Use of water-based paints<br>- Use of track mats to retain wayside grease and other contaminants<br>- Avoiding use of new or replacement parts with asbestos-containing materials | | |
| Fuel management (at fuelling stations) | - Storage tanks and components should meet international standards for structural design integrity and operational performance to avoid catastrophic failures during normal operation and during exposure to natural hazards and to prevent fires and explosions<br>- Storage tanks should have appropriate secondary containment:<br>  - Generally, appropriate secondary containment structures consist of berms, dikes, or walls capable of containing the larger of 110 percent of the largest tank or 25% percent of the combined tank volumes in areas with above-ground tanks with a total storage volume equal or greater than 1,000 litres and will be made of impervious, chemically resistant material. Secondary containment design should also consider means to prevent contact between incompatible materials in the event of a release.<br>  - Secondary containment in rail fuelling areas should be appropriate for the size of the railcar, level, curbed, sealed, and draining to a sump connected to a spill retention area. The spill retention area should also be equipped with an oil-water separator to allow the routine discharge of collected rainwater<br>- Fuelling facilities should develop a formal spill prevention and control plan that addresses significant scenarios and magnitude of releases. The plan should be supported by the necessary resources and training. Spill response equipment should be conveniently available to address all types of spills, including small spills | - Q1 2024 (baseline assessment)<br>- Q2-Q4 2024 (implementation of the required improvements) | - ESGM<br>- SOG<br>- DF |

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| Hazardous materials transfer | - Use of dedicated fittings, pipes, and hoses specific to materials in tanks (e.g., all acids use one type of connection, all caustics use another), and maintaining procedures to prevent addition of hazardous materials to incorrect tanks<br>- Use of transfer equipment that is compatible and suitable for the characteristics of the materials transferred and designed to ensure safe transfer<br>- Regular inspection, maintenance and repair of fittings, pipes and hoses<br>- Provision of secondary containment, drip trays or other overflow and drip containment measures, for hazardous materials containers at connection points or other possible overflow points.<br>- Overfill protection measures:<br>  - Prepare written procedures for transfer operations that includes a checklist of measures to follow during filling operations and the use of filling operators trained in these procedures<br>  - Installation of gauges on tanks to measure volume inside<br>  - Use of dripless hose connections for vehicle tank and fixed connections with storage tanks<br>  - Provision of automatic fill shutoff valves on storage tanks to prevent overfilling<br>  - Use of a catch basin around the fill pipe to collect spills<br>  - Use of piping connections with automatic overfill protection (float valve)<br>  - Pumping less volume than available capacity into the tank or vessel by ordering less material than its available capacity<br>  - Provision of overfill or over pressure vents that allow controlled release to a capture point | - Q1 2024 (baseline assessment)<br>- Q2-Q4 2024 (implementation of the required improvements) | - ESGM<br>- SOG<br>- DF<br>- Suppliers |
| Storage | - Storage of hazardous materials in a covered and impervious area / room, distant from heat / ignition sources, easily flooded areas, and other risk areas<br>- Storage area / room shall be isolated or drained to an oil-water separator<br>- Products shall be stored on top of pallets or other risers to facilitate inspection/detection and cleaning of leaks/spills<br>- Storage of drummed hazardous materials with a total volume equal or greater than 1,000 litres in areas with covered and impervious surfaces that are sloped or bermed to contain a minimum of 25 percent of the total storage volume<br>- Spill kits, adequate firefighting gear and EHS signage, as well as emergency contacts shall be always available on-site<br>- Conduct periodic reconciliation of tank contents, and inspection of visible portions of tanks and piping for leaks<br>- Maintain containers clean and always closed | - Q1 2024 (baseline assessment)<br>- Q2-Q4 2024 (implementation of the required improvements) | - SOG |

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| Spill management | - In the event of a fuel/other significant hazardous product spill, the area should be immediately isolated and access should be restricted to cleaning and repair crews. The emergency response team must be called, the firefighting equipment must be ready, and the firefighters of the nearest locality must be alerted. As much of the spilled hazardous product has to be pumped into a tanker truck and returned to the supplier for recovery, if possible, or safe disposal. Absorbent materials may be used to control the spill, if secondary contention is not available or if the characteristics of the product require. Result wastes must be managed according to the waste management plan. | - Ongoing | - SOG |
| Workers training | - Training of operators on release prevention, including drills specific to hazardous materials as part of emergency preparedness response training<br>- Training should incorporate information from Material Safety Data Sheets (MSDSs) for hazardous materials being handled. MSDSs should be readily accessible to employees in their local language.<br>- Provision of suitable personal protection equipment (PPE) (footwear, masks, protective clothing and goggles in appropriate areas), emergency eyewash and shower stations, ventilation systems, and sanitary facilities | - Ongoing | - ESGM<br>- SOG |

### 6.2.4.3 Follow-up

**Table 6-13** summarizes the follow-up and/or systematic and/or periodic verification actions proposed for management plan.

**Table 6-18 – Hazardous products follow-up and/or systematic and/or periodic verification actions**

| Follow-up and/or verification action | Description |
|---|---|
| Inspection of storage areas | - Perform weekly visual inspections of the hazardous products storage areas, to verify that there are no leaks and spills<br>- Monthly verification the integrity of the tanks/containers and other environmental and safety control systems/equipment |
| Inspection of working areas | - Perform daily visual inspections of work areas to verify the organization and cleanliness of the site |

### 6.2.4.4 Corrective actions

**Table 6-14** summarizes the corrective actions and their implementation schedule.

**Table 6-19 – Hazardous products corrective actions**

| Corrective Actions | Description | Implementation Schedule |
|---|---|---|
| Spill mitigation actions | - Removal of substances accumulated in the spill containment trays or basins;<br>- Repair or change the damaged container that leaks | When applicable |
| Response to complaints | - In response to workers or community complaints about odours, contamination, etc., promptly investigate root causes and define the appropriate resolution measures | When applicable |

#### 6.2.4.5 Performance and reporting

***Performance Indicators***

The following performance indicators should be monitored for the Hazardous Products Management Plan:

- Number of procurement initiatives for acquiring less hazardous alternative products / Volume replaced;
- Number, type of product and magnitude (volume) of spills;
- Number, type of and magnitude (victims) of OHS incidents related to hazardous products;
- Number of workers and or community complaints regarding hazardous products;

The performance indicators results should be determined and compiled in annual reports, as indicated in the following section.

***Reports***

The following table summarizes the documental records that will be kept to control the execution of the management plan. These documents will be prepared, archived and maintained by the ESGM and SOG, in order to document the results of implementation. Records of relevant events and performance indicators shall be kept as appropriate and a quarterly Performance Report will be prepared by SOG and submitted to the ESGM, reporting on the recorded events and performance indicators.

**Table 6-20 – Record documents for the hazardous products management plan**

| Document Title | Document Type | Frequency of Record or Report |
|---|---|---|
| Hazardous products inventory | Record | Monthly |
| Weekly volume of hazardous products stored onsite, by type | Record | Monthly (report) |
| Weekly Inspections for leak detection | Record | Monthly (report) |
| Accident records | Record | When necessary |
| Record improper hazardous products procedures detected and remediation actions undertaken | Record | When necessary |
| Performance Report | Report | Quarterly |

### 6.2.5 Wastewater Management and Monitoring Programme

#### 6.2.5.1 Justification and objectives

Railway operations can produce various types of waste, such as maintenance materials, discarded parts, and hazardous waste (e.g., oils, chemicals), requiring proper management and disposal. Inadequate management may lead to soil and water contamination, and community health safety issues. Most notable source of wastewater are the maintenance workshops, where several hazardous products are manipulated, and small spills of oils and other lubricants are frequent. Trains with onboard sanitary facilities produce sewage.

This programme defines measures to prevent, control and mitigate wastewater and related impacts, as well as basic requirements for conducting monitoring activities.

The present programme takes into consideration the Mozambican legislation, as well as international best practices on the subject, namely the recommendations of AfDB OS4 / IFC PS3 (Pollution prevention and control, hazardous materials and resource efficiency) and the IFC EHS General and Railways' Guidelines.

It is expected that the CFM will further develop a project-specific Wastewater Management and Monitoring Plan that aligns with the framework set out in this Programme.

### 6.2.5.2 Legal framework

Wastewater Management is regulated by Decree no.18/2004, 2nd June (Amended by Decree no. 67/2010 of 31st December - modifies former Annexes I and V, as well as articles 23rd and 24th, and created Annexes 1A and 1B to the Regulation), the Regulation on Environmental Quality Standards and Effluent Emission. Annex III - Emission Standards for Liquid Effluents from Industries, emission limits are the following:

The table below compiles the applicable national regulations applicable to water and effluents.

**Table 6-21 – National wastewater emission limits**

| Pollutants | Limit |
|---|---|
| **Annex III - Emission Standards for Liquid Effluents from Industries: Workshops** | |
| BOD (Biological Oxygen Demand) | 30 mg/l |
| COD (Chemical Oxygen Demand) | 80 mg/l |
| Oils and greases | 10 mg/l |
| Chromium (total) | 10 mg/l |
| Phosphorus | 2 mg/l |
| Temperature increase | <=3 ° |
| **Annex IV - Emission Standards for domestic sewage** | |
| Colour | 1: 20 dilution (present/not present) |
| Smell | 1: 20 dilution (present/not present) |
| pH (25ºC) | 6.0-9.0 |
| Temperature | 35 ºC |
| COD (Chemical Oxygen Demand) | 150 mg/l |
| TSS (Total Suspended Solids) | 60 mg/l |
| Phosphorus (total) | 10 mg/l |
| Nitrogen (total) | 15 mg/l |

IFC EHS for railways (2007) states “Effluents from maintenance facilities should be treated to a level consistent to the requirements of local sewer network operator or, if discharged into surface waters, according to the guideline values provided in the EHS Guidelines for Metals, Plastics, and Rubber Products Manufacturing, which provide treated effluent guideline values applicable to metals machining, cleaning, and plating and finishing processes, including painting.”

**Table 6-22 – IFC wastewater levels**

| IFC EHS Guidelines for Metals, Plastics, and Rubber Products Manufacturing (2007) Effluent Levels | | |
|---|---|---|
| **Pollutants** | **Units** | **Guideline Value** |
| pH | S.U. | 6 – 9 |
| COD | mg/L | 250 |
| TSS | mg/L | 50<br>25 (electroplating) |
| Oil and Grease | mg/L | 10 |
| Aluminium | mg/L | 3 |
| Arsenic | mg/L | 0.1 |
| Cadmium | mg/L | 0.1 |
| Chromium (total) | mg/L | 0.5 |
| Chromium (hexavalent) | mg/L | 0.1 |
| Copper | mg/L | 0.5 |
| Iron | mg/L | 3 |
| Lead | mg/L | 0.2 |
| Mercury | mg/L | 0.01 |
| Nickel | mg/L | 0.5 |
| Silver | mg/L | 0.2 |
| Tin | mg/L | 2 |
| Zinc | mg/L | 2 |
| Cyanides (total) | mg/L | 1 |
| Cyanides (free) | mg/L | 0.2 |
| Ammonia | mg/L | 10<br>20 (electroplating) |
| Fluorides | mg/L | 20 |
| Phenols | mg/L | 0.5 |
| Total Nitrogen | mg/L | 15 |
| Total Phosphorus | mg/L | 5 |
| Sulphide | mg/L | 1 |
| Volatile Organic Halogens (VOX) | mg/L | 0.1 |
| Toxicity | To be determined on a case specific basis | |
| Temperature increase | °C | <3a |

| IFC EHS Guidelines for Metals, Plastics, and Rubber Products Manufacturing (2007) Effluent Levels | | |
|---|---|---|
| **Pollutants** | **Units** | **Guideline Value** |
| a At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity. | | |

### 6.2.5.3 Proposed actions

The table below provides possible prevention, control and mitigation actions for wastewater.

**Table 6-23 – Wastewater management actions**

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| Prevention, control and mitigation at the source | - Implementation of emergency response procedures for accidental spills, including removal and treatment of contaminated soils (according to Company ERPs) | - Ongoing | - DE<br>- UGSQMA<br>- ESGM<br>- |
| | - Use of ultrafiltration to extend the life of washing solutions for aqueous parts or use of alternatives to water cleaning (e.g. dry cleaning by wire brush or bake oven) | - Q1 2024 | - SOG |
| | - Plumbing connection of floor drains, if any, in maintenance areas to the wastewater collection and treatment system | - Immediate | - SOG<br>- SVO |
| | - Prevention of discharge of industrial wastes to septic systems, drain fields, dry wells, cesspools, pits, or separate storm drains or sewers. Keep wastewater from service bays out of storm drains by constructing berms or other barriers | - Ongoing<br>- Immediate | - SOG |
| | - Workshops must have a segregated system to drain the pavement of the operational area, where hazardous substances are used (oils and lubricants, solvents and paints, etc.) and wastes are produced (e.g., sand blasting waste, used oil). The system must be equipped, at least, with an oil-water separator | - Ongoing<br>- Immediate | - SOG<br>- UGSQMA |
| | - Resultant effluent from oil-water separator must be tested for legal / IFC guideline compliance before release into the municipal system or directly to surface waters | - Immediate | - SOG |
| | - Workshops must have a sewage collection system equipped with onsite treatment facilities or, alternatively, collected sewage may be transported to adequate offsite treatment and disposal | - Immediate | - SOG |
| | - Sewage from sanitary facilities on passenger trains must not be discharged directly to the track. It must be collected to septic tanks and transported to adequate disposal (either own facilities or offsite) | - Ongoing / Immediate | - STF<br>- STP<br>- UGSQMA |
| | - Ensure preventive and corrective maintenance is carried out timely, to keep rolling stock within manufacturer's specifications | - Ongoing | - STF<br>- STP<br>- SOG |

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| | - Wastes shall be managed according with the Waste Management Plan (see framework in section 6.2.3) | - Ongoing / Q1 2024 | - SOG<br>- ESGM<br>- UGSQMA SOG<br>- STF |

#### 6.2.5.4 Monitoring and follow-up

Wastewater monitoring actions should be implemented at the sources, being the main one the maintenance workshops.

Locomotive and rail car maintenance and repair typically involves a high-pressure water wash, which may contain residues from transported materials, paint, oil and grease, and other contaminants. Shop floor washing drags all sorts of residues from sandblasting, oil spills, etc. Caustic solutions and hydrocarbons are often used to remove grease and dirt from axles and other metal parts. Acids and caustics may also be used for rust removal. Locomotive coolants are usually water-based with corrosion inhibitor additives.

CFM Sul and Center maintenance workshops have a segregated drainage system for the “dirty” area, that is equipped with an oil-water separator. Resultant oily waste is managed by a certified contractor. Resultant pre-treated effluent is discharged into the city’s stormwater system and then into the sea, in Maputo and Beira case. This final effluent needs to be tested periodically before release.

***Monitoring Locations***

Monitoring should be undertaken at the pipe end of the oil-water separators and sewage treatment systems, if existent or future.

***Monitoring Parameters***

The following parameter must be determined:

- Aluminium
- Ammonia
- Arsenic
- BOD (Biological Oxygen Demand)
- Cadmium
- Chromium (hexavalent)
- Chromium (total)
- COD (Chemical Oxygen Demand)
- Colour
- Copper
- Cyanides (free)
- Cyanides (total)
- Fluorides

- Hydrocarbons
- Iron
- Lead
- Mercury
- Nickel
- Nitrogen (total)
- Oil and Grease
- pH
- Phenols
- Phosphorus (total)
- Silver
- Smell
- Sulphide
- Temperature
- Tin
- Toxicity
- TSS (Total Suspended Solids)
- Volatile Organic Halogens (VOX)
- Zinc

***Monitoring Frequency***

Quarterly monitoring campaigns shall be conducted in the first year of implementation. Frequency may be adjusted after that depending on the results.

***Sampling Methods***

Sampling must be carried out in accordance with the international standard ISO (International Organization for Standardization) 5667-1 Water Quality – Sampling, or another recognized international standard.

***Result Interpretation***

The above-mentioned parameters must be determined and compared against the legal/guideline thresholds mentioned on section 6.2.5.2), to identify any non-compliance.

### 6.2.5.5 Corrective actions

If exceedances of the applicable legal/guideline thresholds are recorded, the causes of such exceedances should be assessed and corrected. Exceedances may result from:

- Inadequate functioning of treatment systems;
- Presence of unidentified (new) pollutants that are causing the treatment systems to mal-function;
- Significant hazardous substance spill.

In the event of non-conformities, an investigation must be conducted, and additional mitigation should be implemented, as required, to eliminate or minimize the issues. These additional mitigation measures should be defined case by case, depending on the assessment of the specific issues.

After the implementation of the corrective actions, a monitoring campaign should be undertaken for the areas where the non-compliances were recorded, to verify the resolution of the issue.

#### 6.2.5.6 Performance and reporting

***Performance Indicators***

The following performance indicators should be monitored for the wastewater management plan:

- Number and magnitude of guidelines exceedances during periodic monitoring;
- Number of community complaints regarding wastewater issues;
- Number and type of noise mitigation measures undertaken in response to exceedances.

The performance indicators results should be determined and compiled in annual reports, as indicated in the following section.

***Reports***

The table below summarizes the documental records that should be kept to control the execution of the management plan. These documents should be prepared, archived, and maintained by ESGM and DF, to document the results of implementation. Records of relevant events should be made following the occurrence, and annual Performance Reports should be prepared, reporting on the recorded events and performance indicators.

**Table 6-24 – Record documents for the wastewater management and monitoring plan**

| Document Title | Document Type | Frequency of Record or Report |
|---|---|---|
| Record of periodic wastewater monitoring (sampling, lab results) | Record | Whenever necessary |
| Record of wastewater related community complaints | Record | Whenever necessary |
| Progress Report | Report | Bi-annual |
| Performance Report | Report | Annual |

### 6.2.6 Biodiversity Management Programme

#### 6.2.6.1 Justification and objectives

The Biodiversity Management Programme aims to provide guidelines and strategies to prevent, control and monitor fauna mortality due to circulation of trains as well as a management framework for further development into a specific plan.

In addition to the actions for managing/monitoring the impacted fauna on train operation, CFM is committed to assessing wider potential impacts on biodiversity and identifying mitigation measures, as necessary.

The present programme takes into consideration the Mozambican legislation, as well as international best practices on the subject, namely the recommendations of AfDB OS3 / IFC PS6 (Biodiversity, renewable resources and ecosystem services) and the IFC EHS General and Railways' Guidelines.

It is expected that the CFM will prepare a project-specific Management Plan that aligns with the framework set out in this Programme.

### 6.2.6.2 Legal framework

The table below compiles the applicable national regulations applicable to CFM activities in what concerns waste and waste management.

**Table 6-25 – Key national regulations on biodiversity**

| Legislation | Description |
|---|---|
| Law 20/97 – Environmental Law | Articles 12 and 13 state that the planning, implementation, and operation of projects should guarantee the protection of biological resources, particularly of plant or animal species threatened with extinction or that, by their genetic value, ecological, cultural, or scientific, require special attention and this issue is to extend their habitats, especially those built within areas of environmental protection. |
| Law 10/99 - Forests and Wildlife Law | Establishes the principles and basic rules on protection, conservation and sustainable use of forest and wildlife resources. |
| Decree 12/2002 – Regulation on the Forests and Wildlife Law | Applies to protection, conservation, use, exploration and production activities of fauna and flora resources. Includes the commerce, transport, storage and primary artisanal or industrial transformation of these resources. Annex I include a list of classification of wood-producing species, including precious wood and woods of 1st, 2nd, 3rd, and 4th grades. Annex II includes a list of protected fauna species, for which hunting is prohibited. |
| Decree No. 25/2008 – Regulation for the Control of Invasive Alien Species | Article 8 of this decree prohibits activities involving invasive alien species without prior authorization and states that 'after hearing the Interinstitutional Group for the Control of Exotic Species Invasive, the National Environmental Authority (MTA) may prohibit any activity which, by its nature, may involve the spread of invasive alien species'. Activities include the following:<br>- Import of any type of invasive exotic species, whether by sea, land or air;<br>- Possess any type of invasive exotic species;<br>- Develop, breed or otherwise propagate any type of invasive alien species; and<br>- Transport, move or relocate any type of invasive alien species |
| Law 16/2014 (as amended by Law 5/2017) – Protection, Conservation and Sustainable Use of Biodiversity Law and its Regulation | This Law regulates the creation and management of all conservation areas in Mozambique, revoking the Forestry and Wildlife Law competences in this matter. Article 16 states that all activities that could result in changes to vegetation cover, or that could disturb flora, fauna, and ecological processes up to the point of compromising their maintenance, are interdicted within national parks, except if required for scientific reasons or management needs. Article 26 states that activities can be approved within conservation areas, if planned in the area's management plan, which among other things defines the construction of the infrastructure required for the area's management or that aimed to improve the quality of life of the local populations. |
| Decree No. 89/2017 of December 29th - Regulation of Protection, Conservation and Sustainable Use of Biological Diversity; | The present Regulation applies to the set of values and natural resources existing in the national territory and in the waters under national jurisdiction, covering all public or private entities that may directly or indirectly influence the national system of the country's conservation areas, under the terms of the Law No. 16/2014 (Amended by Law 5/2017), law for the Protection, Conservation and Sustainable Use of Biological Diversity. |

| Legislation | Description |
|---|---|
| Decree 51/2021 of July 19th - Regulation for the Protection, Conservation and Sustainable Use of Avifauna | This decree regulates the protection, conservation and sustainable use of avifauna, including its natural, continental, marine, lake and river habitats.<br>Art 5 defines as avifauna protection zones the "Key Areas for Biodiversity", and "Important Areas for Birds" and art. 4 prohibits the exercise of any activity or construction of infrastructure capable of disturbing the avifauna or its habitat in the protection areas, as well as any economic or social infrastructure, to be built in sensitive areas for birds, must respect the international standards of good practice, ensuring the placement of signalling devices that prevent collision of birds or any other damage that affects the avifauna.<br>Appendices A and D define the protected species whose exploitation is not permitted; Appendix B defines the species of avifauna in Mozambique included in CITES. |
| Ministerial Diploma No. 55/2022 of May 19th – Adoption of the Biodiversity Counterbalances Directive | Establishes the principles, methodologies, requirements and procedures for the correct implementation of Biodiversity Counterbalances, integrated into environmental impact assessment processes. |

Relevant international conventions on biodiversity are provided in **Table 6-26**.

**Table 6-26 – Relevant international conventions (biodiversity)**

| Convention | Description |
|---|---|
| African Convention on the Conservation of Nature and Natural Resources (AU 1968) as well as its Revised Version (AU 2017) | Under this Convention, the Contracting States commit to take action to ensure the conservation, use and development of soil, water, flora, and fauna resources in accordance with scientific principles and with due regard to the best interests of the people. Pursuant to Resolution 18/81, of 30 December 1981, the Republic of Mozambique acceded to this convention. |
| United Nations Convention on Biological Diversity (UN 1992) | The main goals of this convention are the conservation of biodiversity, the sustainable use of biodiversity, and the fair and equitable sharing of the benefits arising from the use of genetic resources. Its overall objective is to encourage actions which will lead to a sustainable future. Mozambique ratified this convention in 1994, through Resolution 2/94. |
| Convention on Wetlands of International Importance, Especially as Waterfowl Habitat – Ramsar Convention (UNESCO 1971) | Pertains to the sustainable use and conservation of wetlands. Ratified by Mozambique in 2003. |
| Convention on the International Trade of Endangered Species of Wild Fauna and Flora (CITES 1973) | Aims to ensure that international trade in specimens of wild animals and plants does not threaten the species survival. It accords varying degrees of protection to more than 33,000 species of animals and plants. Convention ratified by Mozambique through Resolution 20/81. |
| Convention on the Conservation of Migratory Species of Wild Animals (CMC 1979) | Aims to foster protection measures for migratory species of wild animals throughout their natural range, through a conservation strategy of wildlife and habitats on a global scale. Ratified by Mozambique in 2008. |
| SADC's Protocol on Wildlife Conservation and Law Enforcement (SADC 1999) | Aims to ensure the conservation and sustainable use of wildlife resources. Ratified by Mozambique in 2002. |

### 6.2.6.3 Proposed actions

Table below summarizes the proposed biodiversity management actions.

**Table 6-27 – Biodiversity management actions**

| Prevention, Control and Mitigation Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| Biodiversity initial assessment | - Conduct an initial assessment for identifying the major risk areas for fauna mortality, based on a desktop analysis of the location of natural habitats, conservation areas, known migratory routes, and other sensitive areas, crossed by the railways network. The study shall also consider the operator crew records for incidents involving fauna and may consider conducting some support fieldwork (fauna observations, interviews with local communities, etc)<br>- Based on the results of the study define a monitoring plan and specific wildlife management and protection measures, such as wildlife crossings, fencing and warning systems. | - Q1-Q2 2024 | - ESGM<br>- STF |
| Incidents involving fauna | - Develop, implement and review operator crew records for incidents involving fauna, organizing information into a georeferenced database for future reference and spatial analysis to support management actions | - Q1 2024 | - STF<br>- ESGM<br>- STP<br>- UGQSMA |
| | - Inspect and maintain culverts, bridges and other structures that may be acting as fauna passages to ensure that possibility is enabled/enhanced | - Ongoing | - SVO<br>- CLO<br>- UGQSMA |

#### 6.2.6.4 Monitoring and follow-up

**Table 6-28** summarizes the monitoring follow-up actions proposed for biodiversity management.

**Table 6-28 – Biodiversity monitoring and follow-up actions**

| | |
|---|---|
| **Objectives** | Minimize risk of wildlife collisions |
| **Monitoring location** | To be designated after initial assessment |
| **Monitoring parameters** | - Presence and identification of wildlife roadkill<br>- Reports by community members<br>- Reports by operation staff |
| **Monitoring frequency** | Ongoing |
| **Sampling methods** | Observation |
| **Responsibility for implementation** | STF/UGQSMA |
| **Implementation schedule** | - Q2-Q3 2024 |
| **Record type** | - Incident record<br>- Report |

The survey of the roadkill can be carried out by the operators or other workers who operate on the railway.

The survey of affected fauna shall collect information enabling the recording of:

- Taxonomic identification, being as accurate as possible according to the conservation status of the animal;
- Date, noting the day and time of the record;
- Locality, indicating the geographical coordinates;

- Pictures, in order to show the identification and condition of the animal; and
- Characterization of the surroundings (type of natural environments and land use), using standardized forms to have a consistent information.

After registration, the carcasses should be removed from the railway gauge to avoid double counting of the animals, and to avoid attracting carnivorous to the vicinity of the tracks causing further roadkill.

### 6.2.6.5 Corrective actions

If non-conformities are detected through the follow-up and monitoring actions, corrective actions should be implemented, as required, to address them. The nature of these corrective actions or additional mitigation measures should be defined on a case-by-case basis, depending on the assessment of the specific issues. Examples where corrective actions may be required relate to the following:

- Regular or repeated incidence of wildlife collisions in specific zones requiring remedial measures (e.g., traffic speed control measures, fauna passages, fencing, signalization, training and awareness, etc.);
- Inadequate implementation of the proposed control and mitigation actions.

After corrective actions have been taken, additional monitoring of the non-conformities may be required to verify resolution of the issues that have arisen.

Table 6-8 following table presents the main proposed corrective actions.

**Table 6-29 – Biodiversity corrective actions**

| Corrective Actions | Description | Implementation Schedule |
|---|---|---|
| Act on repeated incidence of animal collisions in specific zones | - Implement additional mitigation (e.g., traffic speed control/restrictions, fauna passages, fencing, signalization, training and awareness, etc.) | Whenever necessary |
| Act on non-conformity of fauna incidents' register | - Staff awareness and training to provide proper registers of incidents involving fauna | Whenever necessary |

### 6.2.6.6 Performance and reporting

***Performance indicators***

The following performance indicators should be monitored:

- No. of incidents involving fauna recorded by staff;
- No. of incidents involving fauna recorded by community members;
- No. of species recorded and No. of incidents by specie;
- Seasonal distribution (seasonality and trends);
- Spatial distribution of incidents;
- % of affected species with conservation status;
- Identification of factors associated with roadkill, mainly considering the characteristics of the surroundings of the places where the incident has happened;

- No. of iconic species;
- No. of additional measures implemented for preventing/managing fauna mortality.

The observation of the places (or even species) with the highest incidence of incidents, should serve as a basis for proposing specific measures to minimize the losses of individuals, namely domestic animals with an impact on the community.

The performance indicators results should be determined and compiled in annual reports, as indicated in the following section.

***Reports***

The table below summarizes the documental records that should be kept, to control the execution of the management plan. These documents should be sourced, archived, and maintained by the ESGM, along with UGSQMA, to document implementation. Records of relevant events should be made following the occurrence, and annual Performance Report should be prepared, reporting on the recorded events and performance indicators.

**Table 6-30 – Record documents for biodiversity management plan**

| Document Title | Document Type | Frequency of Record or Report |
|---|---|---|
| Initial assessment | Report | On-off activity |
| Record of incidents with fauna | Record | Whenever necessary |
| Performance Report | Report | Annually |

## 6.2.7 Community Health and Safety Management Programme

### 6.2.7.1 Justification and objectives

The operation and maintenance of locomotives can result in community health and safety issues, being the most significant the threat of serious injury or the potential loss of life due to train collisions (with other trains or with road vehicles, at level crossings), as well as a result of derailments. Trespassers on rail lines and facilities may incur in high risks from moving trains, equipment, and hazardous substances, among other issues. Additionally, railways are often used to transport hazardous materials, which can pose a risk of accidental spills, potentially leading to environmental contamination and public safety concerns.

Management of these risks will require implementation of the mitigation measures proposed in section 6.1, which will be compiled in this Community Health and Safety Management Programme. This section sets out the framework from which a project specific Plan shall be developed.

Note that management of community health risks will also be supported by the implementation of other plans mentioned in this ESMP, such as the noise and air emissions, wastewater, wate and hazardous products, as well as the GRM.

The present programme takes into consideration the Mozambican legislation, as well as international best practices on the subject, namely the recommendations of AfDB OS7 and IFC PS4 (Labour conditions Health and Safety) and the IFC EHS General and Railways' Guidelines.

### 6.2.7.2 Proposed actions

**Table 6-31** presents the main actions for the implementation of the Community Health and Safety Management Programme.

**Table 6-31 – Community Health and Safety Management actions**

| Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| Minimise noise and air quality nuisance on communities | - Any nuisance complaint will be addressed and resolved through the Project's GRM and Noise and Air Quality Management and Monitoring Plan. Any complaint will be investigated and resolved through adequate mitigation, to be defined case by case, but following best practices in terms of mitigation | - Ongoing | - ESGM<br>- CLO<br>- STF |
| Minimize community security hazards due to interaction with security personnel | - CFM will develop a Security Management Plan, detailing the security arrangements to be deployed at trains and maintenance areas. This plan will be compliant with IFC's PS 4, and with the Voluntary Principles on Security and Human Rights<br>- This plan will include mandatory training for all security personnel, in what regards human rights, proportionate force use and adherence to CFM's code of conduct | - Q1-Q2 2024 | - UGSQMA<br>- ESGM |
| General rail operational safety | - Implementation of rail operational safety procedures aimed at reducing the likelihood of train collisions such as a positive train control (PTC) system. If a full PTC system is not practical, automatic rail switches should be installed or, where manual switches remain, documenting when a manually operated switch in non-signalled territory is changed from the main track to a siding, and returned back to the normal position for main track movements. This information should be communicated to all crew members and the train dispatcher | - Ongoing<br>- 2024-2025 (new investments) | - DE<br>- DF<br>- STF |
| | - Regular inspection and maintenance of the rail lines and facilities to ensure track stability and integrity in accordance with national and international track safety standards | - Ongoing | - SVO<br>- STF<br>- Sinalizations and Telecomunications |
| | - Enforce the Company safety management plan | - Ongoing | - UGSQMA<br>- ESGM<br>- DE |
| | - Implementation of emergency preparedness and response procedures (according to Company ERPs) | - Ongoing | - UGSQMA<br>- ESGM<br>- DF<br>- STF<br>- STP<br>- DE |
| | - Ensure preventive and corrective maintenance is carried out timely, to keep rolling stock within manufacturer's specifications | - Ongoing | - SOG<br>- STF<br>- STP |

| Actions | Description | Implementation Schedule | Responsibility for Implementation |
|---|---|---|---|
| Level crossings and pedestrian safety | - Posting of clear and prominent danger warning signage at potential points of entry to track areas (e.g. stations and level crossings) | - Q3-Q4 2024 | - UGSQMA<br>- ESGM<br>- Dpt Sinalization and Telecomunications<br>- SVO |
| | - Installation of fencing or other barriers at station ends and other dangerous locations to prevent access to tracks by unauthorized persons | - 2024-2025 | - UGSQMA<br>- ESGM<br>- SVO |
| | - Progressively install automatic gates at all level crossings, and perform regular inspection/maintenance to ensure proper operation | - >2025 | - DE<br>- Dpt Sinalization and Telecomunications<br>- DF |
| | - Conduct regular community awareness initiatives, specially focusing the risks of trespassing | - Ongoing | - ESGM<br>- CLO<br>- STF |
| Accidents involving hazardous goods | - Implementation of a system for the proper screening, acceptance, and transport of hazardous goods | - Ongoing | - STF<br>- UGSQMA<br>- ESGM |
| | - Use of tank cars and other cargo rolling stock that meet national and international safety standards appropriate for the cargo being carried | - Ongoing | - STF<br>- SOG<br>- UGSQMA |
| | - Implementation of spill prevention and control, and emergency preparedness and response procedures (according to Company ERPs) | - Ongoing | - ESGM<br>- UGSQMA<br>- DF<br>- STF |
| | - Regular dissemination of emergency preparedness and response information to the potentially affected communities | - Ongoing | - ESGM<br>- UGSQMA<br>- CLO<br>- STF |

### 6.2.7.3 Follow-up

**Table 6-13** summarizes the follow-up and/or systematic and/or periodic verification actions proposed.

**Table 6-32 – Community health and safety management follow-up and/or systematic and/or periodic verification actions**

| Follow-up and/or verification action | Description |
|---|---|
| Inspection of rail operation safety | - Perform daily visual inspections of general rail operation safety |
| Inspection of level crossings | - Perform (if possible) daily visual inspections of level crossings safety conditions (signage, gates, etc.) |
| Inspection of wagons for dangerous goods transportation | - Perform visual or other specialized inspections of wagons for dangerous goods transportation |

### 6.2.7.4 Corrective actions

**Table 6-14** summarizes the corrective actions and their implementation schedule.

**Table 6-33 – Waste management corrective actions**

| Corrective Actions | Description | Implementation Schedule |
|---|---|---|
| Spill mitigation | - Removal of substances accumulated in the spill containment trays or basins | When applicable |
| Response to complaints | - In response to community complaints about noise, dust, fumes | When applicable |
| Act on inadequate level crossing safety conditions | - Provide adequate level crossing safety conditions<br>- Reinforce staff onsite to ensure safety crossing<br>- Reduced speed on affected section<br>- Enforce signalization off the affected section<br>- Information to locomotive operators | When applicable |

### 6.2.7.5 Performance and reporting

***Performance Indicators***

The following table lists the performance indicators to be monitored for the Community Health and Safety Plan:

- No. of completed of rail operational safety improvement projects
- % of rail network with automatic operation
- No. of completed level crossing improvement projects
- No. of Non-conformities (missed planned inspections & maintenance, others)
- No. of completed signalization (or repair) projects
- No. of completed fencing or repair projects / metres of fence installed / repaired
- No. of engagements with communities
- No. of accidents involving communities
- No. of accidents involving spills

The performance indicators results will be determined semi-annually and compiled in annual reports, as indicated in the following section.

***Reports***

The following table summarizes the documental records that will be kept to control the execution of the management plan. These documents will be prepared, archived and maintained by ESGM and -UGSQMA, in order to document the results of implementation. Records of relevant events and performance indicators shall be kept as appropriate and an annual Performance Report will be prepared by SHE Officers and submitted to the ESGM, reporting on the recorded events and performance indicators.

**Table 6-34 – Record documents for the community health and safety management plan**

| Document Title | Document Type | Frequency of Record or Report |
|---|---|---|
| Improvement projects | Report | Whenever necessary |
| Accident records | Record | Whenever necessary |
| Complaints | Record | Whenever necessary |
| Engagement with communities | Record / Report | Whenever necessary |
| Performance Report | Report | Annually |

## 6.2.8 Community Engagement Framework

### 6.2.8.1 Background

Meaningful stakeholder engagement with all relevant Project stakeholders is a crucial requirement of international safeguards best practice, including the African Development Banks (AfDB) Integrated Safeguard System (ISS). Meaningful engagement is considered to be an iterative **process** of interaction between the Project and;

- Individuals and/or groups or organisations who hold the potential to influence or affect the Project in either a negative or a positive way; and
- Individuals and/or groups or organisations who are impacted/affected, either directly or indirectly by the Project.

The overall objectives or purposes of this type of iterative stakeholder engagement are to;

- **Improve Project efficiency and minimise risks** – where the specific objectives are to improve the Project's success rate, which includes making Project activities easier in its environmental and social context (also more enjoyable for staff), reducing opposition to the Project and avoiding potential conflict and generating added value (knowhow/experience) from the local community/context; and
- **Contribute to Project longevity and local and community socio-economic development** – where the specific objectives are to contribute toward local socioeconomic and environmental developmental objectives, which in turn, as a by-product, enhance prospects of Project longevity and sustainability, as well as reputational aspects of the Project.

To this end, CFM elaborated an internal communication plan targeted at specific stakeholders, including clients, services and equipment providers, contractors, government authorities and business partners. However, the plan does not include strategies or methods for the Projects engagement with other interested and affected parties, including local communities.

#### 6.2.8.2 Objective

This community engagement framework (CEF) seeks to complement the CFM's communication plan with a framework for engagement, communication and learning with/from communities interested or affected by the Project.

The specific objectives of this CEF are, therefore to define an approach to:

- Identify and assess key stakeholder groups and their potential interests, concerns and potential influence on the Project or its activities (stakeholder mapping);
- Identify principal Project phases and processes relevant to meaningful stakeholder engagement, including the identification of core phase and process messaging and disclosure requirements; and
- Detail the main engagement strategies, including principles, approaches, methods and tools for all identified stakeholder groups, which shall form the basis for and guide the elaboration of subsequent detailed Project phase and process specific operational stakeholder engagement plans.

#### 6.2.8.3 Stakeholder Identification and Analysis

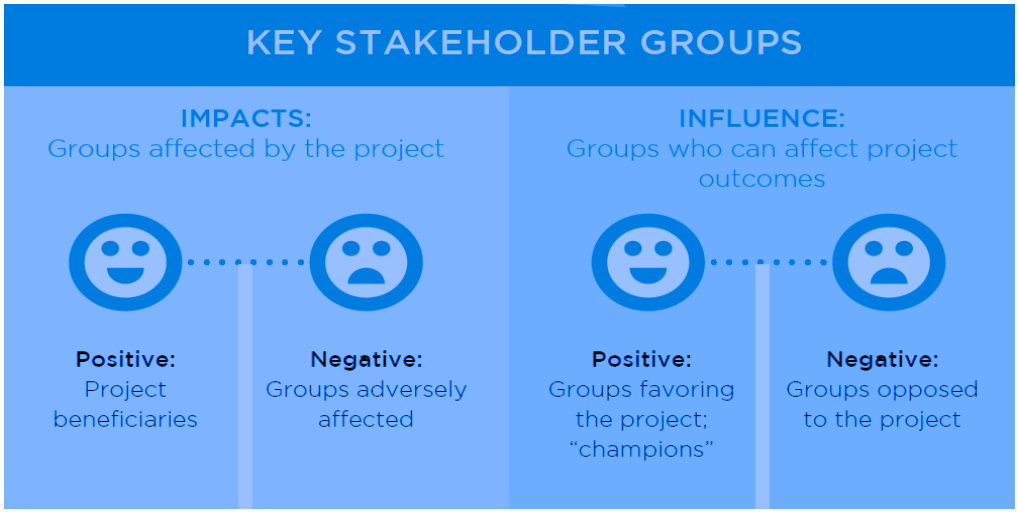
In order to develop an effective Community Engagement Framework, it is necessary to determine who the key stakeholders are, how they are affected/impacted by the Project, understand their needs and expectations for engagement, as well as their priorities and objectives in relation to the Project and its processes. This information shall subsequently be utilised to tailor engagement with each category of stakeholder and in relation to the specific Project phases or processes.

In addition to this, an integral element within the process of stakeholder identification is the identification of individuals, households, communities and/or groups or organisations who may find it more difficult to participate, have less influence or power as well as those who may be differentially or disproportionately affected by the Project as a result of their marginalised or vulnerable status.

Furthermore, stakeholder identification should be understood of as a process where stakeholders are identified on a continuous basis through the ongoing assessment of stakeholder categories which may be affected by, or be interested in, the Project and its activities during its lifespan. Specific individuals, households, communities, groups and organisations within each of these categories should take into account:

- The geographical area over which project interventions may cause impacts (both positive and negative) during its lifecycle;
- Key Project processes; and
- The nature, scale and duration of the impacts

This Project may involve a broad range of community stakeholder types, whom shall be identified and categorised in accordance with the figure below.




Source: IADB 2019

**Figure 6-1 – Preliminary basis for Identification of stakeholders**

The identified community stakeholder selection should be analysed and further categorised in accordance with the following;

- **Core influencers** – those directly responsible for aspects of Project decision making, e.g. government agencies, financial institutions (due diligence procedures), contractors, board as well as implementing agency staff;
- **Affected Groups/Organisations or Individuals** – those directly affected, either positively or negatively by the Project, e.g. adversely affected peoples or organisations, intended beneficiaries, project workers and/or their representatives, etc; and
- **Others of Influence and/or Interest** – those who may have some interest or influence on Project, e.g. other agencies or institutions collaborating/dependent on the Project, government policy makers, civil society, media, academic and research organisations or other interested groups etc.

Further to the key categories defined above, groups considered to be disproportionally impacted shall be included in the stakeholder analysis. Such groups consist of persons, households and/or communities, who may be differentially or disproportionately or further disadvantaged by the Project, as compared to any other group, and as a result of their vulnerable or marginal status. In general, engagement with vulnerable groups should be directly proportional to both impact and influence, and as the extent of impact of the Project on a stakeholder group increases, and the extent of power of this particular stakeholder on a Project decreases, engagement with this particular stakeholder group should intensify and deepen in terms of the frequency and the intensity of the engagement method used. All engagement should, however, proceed based on what is socio-culturally acceptable and with appropriate methods for each of the different stakeholder groups targeted. A stakeholder power/Impact matrix provides a useful tool to perform such an exercise.

Ordinarily, the application of the influence/impact matrix defines the levels of engagements with stakeholders as follows:

- Category A (Low power/influence – High interest/impact) – show consideration, keep informed;
- Category B (High power/influence – High interest/impact) – engage/manage closely, key player;
- Category C (High power/influence – Low interest/impact ) – meet basic needs, keep satisfied;
- Category D (Low power/influence – low interest/impact) – Monitor.

#### 6.2.8.4 Strategy for Communication Participation and Disclosure

Once the stakeholders have been categorised and analysed according to the above, the Project should consider the variety of approaches and engagement techniques used to build relationships, gather information, consult and disseminate project information to stakeholders. When selecting an appropriate consultation technique, accessibility, culturally appropriate consultation methods, including the use local languages, application of vulnerability measures and the specific purpose of engagement with stakeholder group(s) should be adequately considered.

***Types of stakeholder engagement***

Based on the analysis of stakeholders the overall types of communication and engagement techniques shall be identified. Note that for the techniques, this is a preliminary list and techniques will be subject to change or amendment as the Project progresses.

**Table 6-35 – Types of stakeholder engagement**

| Type of Stakeholder Engagement | Objective | Direction of Information Exchange |
|---|---|---|
| **Inform** | Provision of accessible, clear and objective information to improve understanding of issues alternative and/or decisions | One-way |
| **Consult** | To obtain feedback from stakeholder on issues, alternatives and/or decisions. | Two-way |
| **Collaborate** | To partner with stakeholders and enable their participation in each aspect of a decision-making process. | Two-way |
| **Empower** | To place final decision-making in the hands of the stakeholders. | Two-way |

**Source**: International Association for Public Participation (IAP2) (2004).

***Stakeholder engagement techniques***

**Table 6-36 – Stakeholder engagement techniques**

| Engagement technique | Appropriate application of the technique, includes but not limited to; |
|---|---|
| Correspondence (emails, letters, phone calls & reports) | Distribute/share information to/with government officials (including district/municipality), core stakeholders and project contractors (*influencers, decision makers and operators: inform, collaborate and consult*);<br>Invite stakeholders to meetings and follow up;<br>Place emphasis on this technique/medium in light of the Covid-19 pandemic and ensure logging and recording of details. |

| Engagement technique | Appropriate application of the technique, includes but not limited to; |
|---|---|
| One – on – one meetings | Seeking views/information and opinions from stakeholder (*decision makers, influencers and operators: consult*);<br>Enable stakeholder to speak freely on sensitive issues (such as GBV/SEA and other sensitive grievances) or provide opportunity for voice (e.g. vulnerable) – (*impacted: consult and empower*);<br>Share information with and include information from stakeholders during the Project M&E processes (*impacted: consult*);<br>Record meetings; and<br>Where feasible/realistic place emphasis on virtual meetings in light of the Covid-19 pandemic. When not feasible, ensure Covid-19 protocols are adhered to. |
| Formal meetings | Present and discuss relevant Project information with stakeholders – includes reporting, requests, processes, scheduling and budgetary (*decision makers and operators: inform and consult*);<br>Disseminate technical information (*decision makers and operators: inform*);<br>Build relationships with stakeholders to improve efficiency and effectiveness of Project (*decision makers, influencers and operators: inform, consult and collaborate*);<br>Record meetings; and<br>Where feasible/realistic place emphasis on virtual meetings in light of the Covid-19 pandemic. When not feasible, ensure Covid-19 protocols are adhered to. |
| Public meetings, workshops or community consultation | Present Project information to larger groups of stakeholders – enable inclusion of opinion/view/voice/participation (including vulnerable, accessibility etc) (*influencers and impacted: inform and consult*);<br>Build relationships with stakeholders (*influencers and impacted: collaborate*);<br>Disseminate relevant Project data/briefs in accessible format (*influencers and impacted: inform*);<br>Facilitate meetings through use of presentations (*influencers and impacted: inform*); and<br>Record discussions, comments, questions etc.: and<br>All Covid-19 protocols shall apply. |
| Focus group meetings | Present Project information and specific objectives (such as development M&E processes) to a selected group of stakeholders (e.g. vulnerable, age group etc). (*impacted: inform and consult*);<br>Enable stakeholder groups to provide input with regard specific baseline information and requirements (*impacted: consult*);<br>Record discussions, comments, questions etc.; and<br>All Covid-19 protocols shall apply |
| Project website | Present Project information, key processes and progress updates; (*general public: inform*)<br>Disclose – upload company labour, GBV/SEA and HR and anti-corruption policies, and other relevant documents (*general public: inform*) |
| Media | National Radio may be utilised to disseminated information about the Project (*general public: inform*);<br>National newspaper ads may be utilised to disseminate information on the Project such as key milestones or upcoming events (*general public: inform*); and<br>Community radio may be utilised to disseminate information on the GRM, community consultations and/or site-specific construction works and impacts – such as road closures etc. (*Impacted*). |

| Engagement technique | Appropriate application of the technique, includes but not limited to; |
|---|---|
| Direct targeted communication (DTC) with district services and impacted communities (including the use of community leaders, billboards and community notices). | Timeously share information on Project activities related to the resettlement process, livelihoods restoration and community support plan as well as any potential recruiting for temporary employment (*impacted: inform*); and<br>Timeously share information/details on GRM, community consultations and/or site-specific construction works and impacts – such as road closures etc. (*impacted: inform*). |
| Trainings | Specific training on implementation, adherence and monitoring of procedures/strategies, such as GBV/SEA and labour policies (*operational: inform and empower*); and<br>Improve, strengthen Project knowledge and expertise on specific key issues (*operational: empower*);<br>Improve monitoring and reporting procedures (*operational*); and<br>All Covid-19 protocols shall apply. |
| GRM systems (logbooks, hotlines, community leaders and GRM focal point) | Timeously and objectively respond and resolve grievances, issues, challenges and problems prior to escalation and dispute (*impacted, influencers: inform and empower*);<br>Build relationships and trust between the Project and communities and community leaders (impacted: collaborate and empower); and<br>Utilise as a means to include external stakeholders in Project decision making and as a Project learning process (*general public: consult*). |

Below is an example of engagement plan by project processes or activities.

**Table 6-37 – example of engagement methods by project activities**

| Main Process | | Information to be Disclosed | Proposed Methods | Frequency | Key Stakeholders | Responsibility |
|---|---|---|---|---|---|---|
| Involvement of key stakeholders | | Overall project progress, reports on key milestones achieved, due diligence processes | Correspondence<br>Individual meetings<br>Formal meetings | Regular/monthly (tbd) | Financiers, lenders and contractors | CFM |
| Complete project life cycle | | Project summary, funding and progress, major milestones.<br>Public disclosure of ESMP and other relevant documents such as labour and GBV/EAS policies.<br>Brief update of the main processes resulting from the ESMP | Project website<br>Social Media | Regular website update (whenever necessary/monthly),<br>Announcements/ summaries on key project milestones | General public and I&AP´s (see target) | |
| ESMP | General | Global compliance report on implementation of ESMP requirements<br>Letter of approval from MTA and lender related to the operation, maintenance and decommissioning, including air quality management plans, noise and vibration management and waste management. | Formal meetings<br>Correspondence | Regular compliance reports on an annual basis | MTA | |
| | | Emergency Response Plan | Formal meetings<br>Correspondence | Regular compliance reports on an annual basis | MTA e other national authorities associated with the emergency response (SENSAP/Hospitals/Police) | |
| | | Implementation of emergency response preparedness requirements as detailed in the plan | Focus group meetings<br>Workshops | Once at the beginning and update sessions regularly - annually | Local emergency response teams, I&APs and vulnerable targets | |

| Main Process | | Information to be Disclosed | Proposed Methods | Frequency | Key Stakeholders | Responsibility |
|---|---|---|---|---|---|---|
| | Operation and maintenance phase | Maintenance schedule and requirements.<br>Type of work and processes, as well as key impacts and mitigation measures. | Formal meetings<br>Correspondence | Regularly (tbd) | Port and government authorities<br>MTA | CFM |
| | | Temporary labour requirements for the project.<br>Develop an approach to the temporary employment, including targeting vulnerable groups.<br>Limit community expectations to what is realistic and achievable. | Public meeting<br>Focal group meeting | In due time, before the beginning of the operations | Port and government authorities (labour)<br>Local communities including vulnerable groups. | |
| | | Project-wide awareness of GM related to all maintenance activities and temporary manpower requirements | Social media | In due time, before the beginning of the operations | Local communities and general public | |
| | | ESMP implementation progress | Formal meetings | Annual (tbd) | MTA and other government authorities | |
| Grievance Mechanism (GM) | | Project-wide awareness of GM | CFM website<br>Social media | Regular updating of the website (when necessary/monthly) | General public and interested and affected parties (see target) | |
| | | | Correspondence | Once | General public and interested and affected parties (see target) | |
| | | MRR implementation progress/feedback (throughout the project cycle) | Correspondence (report)<br>Individual meetings<br>Formal meetings | Regular/monthly | I&AP´s and lenders | |
| | | | Formal meetings | Monthly or as defined | MTA and other government authorities | |

| Main Process | Information to be Disclosed | Proposed Methods | Frequency | Key Stakeholders | Responsibility |
|---|---|---|---|---|---|
| | | Public meeting<br>Focal group meeting | Regular/or as defined | General public and I&AP´s | CFM |
| Environmental and Social Performance | Implementation progress/feedback & results | Public meeting<br>Focal group meeting<br>Workshops | Every two years | MTA, Municipio e PAPs | |
| | | CFM website<br>Social media | Annual (tbd) | General public and I&AP´s | |
| | Project performance results and demobilization phase | Public meeting<br>Workshops<br>Social media | Once | I&AP´s | |

#### 6.2.8.5 Monitoring and Evaluation

Monitoring the stakeholder engagement activities is important to ensure that consultation and disclosure efforts are effective and in particular that stakeholders have been meaningfully consulted during and throughout all Project processes. Monitoring also allows the Project to improve its strategies by using pertinent information acquired from the monitoring activities. The Projects key processes and activities will be the basis on which all stakeholder engagement should be developed and which will be utilised as a platform to monitor all stakeholder engagement activities.

The CEF will be monitored and evaluated regularly using the indicators. The monitoring of results, both qualitative and quantitative, will be disclosed to all stakeholders. Suggested monitoring and evaluation activities are outlined below:

- Annual update of the stakeholder register and stakeholder risk analysis during operation,;
- Keep records of all engagement activities including meetings attended, open-house events, focus group discussions, road shows, etc.;
- Keep a library (electronic or hard copy) of all communication material;
- Develop a stakeholder satisfaction survey format and conduct stakeholder interviews to gauge level of satisfaction;
- Assess performance using Key Performance Indicators (KPIs), including;
    - Materials/information disseminated/disclosed, by type frequency and location
    - Place and time of formal engagement events and level of participation by specific stakeholder categories and groups;
    - Number of comments by issue/ topic and type of stakeholders, and details of feedback provided;
    - An analysis of the number and type of grievances received and resolved, whether they are anonymous (no name will be recorded) or non-anonymous (names and contact details for replies will be recorded);
    - Community attitudes and perceptions towards the Project based on media reports and stakeholder feedback
- Revise plans and activities.

Throughout the project lifecycle, the Project will maintain communication channels with relevant stakeholders as identified. Any additional stakeholder identified during the lifecycle of the Project will also be added to the Stakeholder List and communication with them will be initiated. In case of significant changes or updates regarding the project, environmental and social issues will continue to be addressed and reported to the stakeholders. Improvements, upgrades, and key information on all environmental and social issues will be timely communicated in a timely manner via an appropriate communication platform.

The CEF will be updated periodically with any major project changes clearly communicated. Updates will provide brief summaries of issues, concerns and questions raised during the previous year, as well as information on any changes between planned and actual real-time activities.

Monitoring and control processes that continually track, review, adjust and report on project performance will have to disclose the issues raised in stakeholder engagement meetings as well as present the activities undertaken to control and resolve these issues, including their rate of success. Experts can be consulted during grievance redress and more appropriate monitoring and evaluation techniques applied as a result.

### 6.2.9 GBV / SEAH Prevention and Response Programme

#### 6.2.9.1 General Considerations

Gender Based Violence (GBV) / Sexual exploitation, abuse and sexual harassment (SEAH) are closely related. In this plan, the term SEAH is used to refer to sexual exploitation and abuse and sexual harassment and GBV is violence targeted at individuals because of socially ascribed gender differences. GBV is always perpetrated because of gender inequality whereas SEAH can also be driven by other forms of abuse of power and inequalities (racial, age, social status etc or a combination of these etc). There is both a strong ethical argument and a compelling business case for companies and investors to tackle SEAH and GBV.

#### 6.2.9.2 Legal and Policy Environment for Women's Safety

The international legal and policy framework establishes standards for action by countries to meet their legal obligations and policy commitments to address violence against women. Some of the key International instruments6 for the protection of women include the following:

- **United Nations General Assembly, Convention on the Elimination of All Forms of Discrimination Against Women** (CEDAW): Under CEDAW, States ensure through competent national tribunals and other public institutions the effective protection of women against any act of discrimination and refrain from engaging in any practice of discrimination against women and to ensure that public authorities and institutions shall act in conformity with this obligation;
- **Fourth World Conference on Women, Beijing Declaration and Platform for Action**: The Platform for Action states that 'women may be vulnerable to violence perpetrated by persons in positions of authority in both conflict and non-conflict situations. Training of all officials in humanitarian and human rights law and the punishment of the perpetrators of violent acts against women would help to ensure that such violence does not take place at the hands of the public officials in whom women should be able to place trust, including police and prison officials and the security forces;
- **United Nations General Assembly, Resolution 52/86 on Crime Prevention and Criminal Justice Measures to Eliminate Violence Against Women**; and
- **World Bank's Guidance note on Management of Labour Influx, 2016**. The document provides guidelines to address issues and risks arising from influx of migrant labour leading to gender-based violence, forced labour etc.

### 6.2.9.3 Objectives

The objective of this programme is to:

- Reduce the negative impact of GBV and SEAH on individuals;
- Improve relations with local communities and service users;
- Have a positive impact on company culture and the working environment through increasing worker morale which heightens productivity; and
- Reduce absenteeism and improve workers' concentration and performance at work, which increases profits.

### 6.2.9.4 Definitions

| *TERM* | *DEFINITION* |
|---|---|
| **SEAH** | Sexual Exploitation, Abuse and Sexual Harassment (defined separately below) |
| **Sexual Exploitation** | 'Any actual or attempted abuse of a position of vulnerability, differential power, or trust for sexual purposes. Includes profiting momentarily, socially, or politically from sexual exploitation of another'. This includes transactional sex, solicitation of transactional sex and exploitative relationship (UN, 2017). |
| **Sexual Abuse** | 'The actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions. It should cover sexual assault (attempted rape, kissing / touching, forcing someone to perform oral sex / touching) as well as rape.' All sexual activity with someone under the age of 18 is considered sexual abuse (DFID, 2019). |
| **Sexual Harassment** | 'A continuum of unacceptable and unwelcome behaviours and practices of a sexual nature that may include, but are not limited to, sexual suggestions or demands, requests for sexual favours and sexual, verbal or physical conduct or gestures, that are or might reasonably be perceived as offensive or humiliating' (UN, 2018). |
| **GBV** | Gender-based violence: 'An umbrella term for any harmful act that is perpetrated against a person's will, and that is based on socially ascribed gender differences between males and females' (HMG, 2018). GBV can be perpetrated by staff, contractors, and community members. |
| **VAWG** | Violence Against Women and Girls: 'Any act of gender-based violence that results in, or is likely to result in, physical, sexual or psychological harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or in private life' (Taylor, 2015). |

### 6.2.9.5 Proposed actions

#### *GBV or SEA/SH Related Actions*

The **Table 6-1** summarises the proposed actions and the schedule for their implementation.

**Table 6-1 – Actions, description and implementation timeline.**

| Action | Description | Implementation schedule | Responsibility for Implementation |
|---|---|---|---|
| **Planning** | - Clearly define SEA/SH requirements in a CoC which addresses SEA/SH, in a compatible fashion with AfDB/WB guidance documents<br>- Operationalize or constitute Internal Grievance Committee as per Prevention of Sexual Harassment at Workplace procedure<br>- Ensure Codes of Conduct are clearly understood and signed by those with a physical involved on the operation and maintenance of locomotives | Ongoing / Q1 2024 | - ESGM<br>- CLO<br>- DF<br>- DE |

| Action | Description | Implementation schedule | Responsibility for Implementation |
|---|---|---|---|
| **Project-level activities** | - Develop and implement a specific GBV/SEAH Prevention and Response Plan<br>- Separate, safe and easily accessible facilities for women and men in the place of work (e.g. toilets should be located in separate areas, well-lit)<br>- Display signs that SEA/SH is prohibited in all operations | Ongoing / Q1 2024 | - ESGM<br>- DF<br>- DE |
| **Training** | - Train project staff on the behaviour obligations under the CoC and Disseminate the CoC (including visual illustrations) and discuss with employees and local communities | Upon hiring or whenever necessary | - ESGM<br>- CLO<br>- DF |
| **Monitoring** | - Undertake regular M&E of progress on SEA/SH prevention and response activities, including reassessment of risks as appropriate | Ongoing | - ESGM<br>- UGSQMA<br>- DF |

### 6.2.9.6 Follow-up

The **Table 6-2** summarises the systematic and/or periodic follow-up and/or verification actions and the schedule for their implementation.

**Table 6-2 – GBV/SEAH follow-up and/or verification actions**

| Follow-up and/or verification | Description |
|---|---|
| Policies and procedures | - GBV/SEAH has been reflected in company policy<br>- The code of conduct is clear and prohibits all forms from GBV/SEAH<br>- GBV/SEAH policies and codes of conduct are available to workers and stakeholders in accessible formats |
| Grievance mechanisms and investigation procedures | - The grievance mechanism is confidential and concerns related to GBV/SEAH can be raised<br>- Reporting channels available to workers, community members and service users, include anonymous options and are accessible<br>- Procedures to respond to reports of GBV/SEAH when they are made are in place and include clear investigation procedures that focus on the safety and wellbeing of survivor |
| Recruitment and performance assessment | - Recruitment procedures are in place, with interview panels staffed by at least two people<br>- Candidates' identities are checked at interview and references are requested |
| Training and awareness raising | - Mandatory training on GBV/SEAH, company policies and procedures is provided to all workers of all grades, including contractors and security personnel, as well as induction training for new recruits.<br>- Additional specialised training is provided to members of staff with specific responsibilities for GBV/SEAH prevention and response.<br>- A clear message is provided to service users and communities on GBV/SEAH in how to report it and how reports will be handled. |
| Work with contractors and suppliers | - Contractors and suppliers are required to share their GBV/SEAH policies and procedures<br>- Clauses included in contracts are committing contractors and suppliers to adhere to company codes of conduct.<br>- Information is provided to contractors and suppliers about company grievance mechanisms for reporting GBV/SEAH. |
| Physical design | - GBV/SEAH is included in workplace safety assessments, including worker accommodation and transportation. |

#### 6.2.9.7 Performance and reporting

***Performance Indicators***

The following performance indicators should be considered:

Based on GRM Indicators:

- Number of GBV cases received
- Number of GBV cases resolved
- Time taken to resolve

Based on Actions indicators:

- Successful implementation of agreed GBV Action Plan.
- Number of training courses related to GBV delivered.
- Percentage of workers that have signed a CoC.
- Percentage of workers that have attended the CoC training.

Performance indicators should be accounted for on a monthly basis and compiled into a report.

***Reports***

The documents required are summarised in the **Table 6-3**. These are to be prepared, filed and maintained as part of this programme.

**Table 6-3 – Documents linked to the GVB/SEAH Prevision and Response Plan.**

| Document title | Document type | Frequency of Record or Report |
|---|---|---|
| Code of Conduct (CoC) | Record | On hiring |
| Claim Record (GRM) | Record | Whenever necessary |
| Attendance record (Training) | Registration | Monthly |
| Performance Report | Report | Annual |

### 6.2.10 Environment, Health and Safety Training Programme

All workers shall get training when they are hired, every year and whenever justifiable. The main topics to be addressed for the different target audiences are specified below.

#### 6.2.10.1 Objectives

The objective of this programme is to establish criteria and actions for the training of workers on environment, health and safety issues.

#### 6.2.10.2 Proposed actions

***Awareness-raising Actions***

The **Table 6-4** summarises the proposed actions and the schedule for their implementation.

**Table 6-4 – Training actions, description and implementation timeline**

| Awareness Action | Description | Implementation schedule | Responsibility for Implementation |
|---|---|---|---|
| **Basic Training** | - Basic information on classification of different types of waste<br>- Disclosure of a code of conduct:<br>  - Do not dump or leave waste (hazardous and non-hazardous) on the ground, in watercourses, or the sea;<br>  - Do not bury waste (hazardous or non-hazardous);<br>  - Do not burn waste (hazardous and non-hazardous);<br>  - Do not eat food or drink in workplaces where there may be contamination. | - Upon hiring, annually and whenever justified | - UGSQMA<br>- ESGM<br>- SOG<br>- SVO<br>- DF |
| **Waste Management** | - Information regarding the characteristics and risks inherent in the handling of each type of waste<br>- Specific training for the safe and correct execution of the different tasks they perform in the collection, separation, transport and/or storage<br>- Specific training for the correct and safe handling, transport and storage of hazardous waste<br>- Raising awareness about the proper use of personal protective equipment necessary for carrying out their activities<br>- Specific training for driving vehicles<br>- Emergency procedures in case of contact with waste at an individual level<br>- Emergency procedures in case of spillage and waste contamination | - Upon hiring, annually and whenever justified | - ESGM<br>- SOG<br>- SVO<br>- DF |
| **Other training actions** | - Periodic campaigns to raise employee awareness through posters, distribution of information leaflets and lectures | - Annually and whenever justified | - ESGM<br>- DF |
| **Health and safety** | - Develop a clear STD and HIV and AIDS policy and implement a worker awareness campaign<br>- Raising awareness of the use of emergency equipment to fight fires, spills and leaks, both from vehicles and machines (fire extinguishers, absorbent material for oil spills, etc.)<br>- Raising awareness of the use of a first-aid post and a vehicle for transporting victims<br>- Carry out awareness-raising actions in order to ensure that all employees are aware of the Emergency Response Plan and their commitment to the actions that are their responsibility<br>- Promote simulations for different emergency scenarios | - Upon hiring, annually and whenever justified | - UGSQMA<br>- ESGM<br>- DF<br>- STP |
| **GBV/SEA** | - Carry out awareness-raising actions on GBV and SEAH<br>- Periodic campaigns to raise employee awareness through posters, distribution of information leaflets and lectures | - Upon hiring, annually and whenever justified | - ESGM<br>- DF |
| **GRM** | - Carry out awareness-raising actions on resolution process of related grievance<br>- Periodic campaigns to raise employee awareness through posters, distribution of information leaflets and lectures | - Upon hiring, annually and whenever justified | - ESGM<br>- UGSQMA<br>- CLO<br>- DF<br>- DE |

***Systematic and/or Periodic Monitoring and Verification Actions***

The **Table 6-5** summarises the systematic and/or periodic follow-up and/or verification actions and the schedule for their implementation.

**Table 6-5 – Systematic and/or periodic follow-up and/or verification actions, description and implementation timeline.**

| Action follow-up and/or verification | Description | Implementation schedule |
|---|---|---|
| Training of workers | Ensure that all unit workers receive specific training to carry out their activity safely and correctly. | Upon hiring, annually and whenever justified |
| | Review training records. | |

### 6.2.10.3 Performance Indicators

The following performance indicators should be considered:

- Number of awareness-raising actions performed;
- Number of trainees per awareness-raising action; and
- Number of incidents and non-conformities.

Performance indicators should be accounted for on a monthly basis and compiled into an annual report.

### 6.2.10.4 Records

The documents required are summarised in the **Table 6-6**. These are to be prepared, filed and maintained as part of this programme.

**Table 6-6 – Documents linked to the Environmental and Safety Training Programme**

| Document title | Document type | Reporting frequency |
|---|---|---|
| Awareness action program | Inspection | Annually |
| Attendance record | Registration | Annually |

# 7 Grievance Mechanism

## 7.1 General Considerations

Interactions with Stakeholders will occur frequently during the project. This includes several types of interaction including nuisance effects caused by operation and maintenance of locomotives. Interactions between CFM and communities, workers or other stakeholders may generate complaints. A complaint is an issue, concern, problem or claim (perceived or real) that an individual, group, or representative presents to the company, or its contractors, for consideration and resolution (Ombudsman, 2008). A simple complaint can escalate into a dispute if not adequately and timely addressed.

Understanding and managing the concerns of communities, workers and other stakeholders is essential to ensure a good long-term relationship between the Proponent and Stakeholders. Unresolved community concerns may negatively affect the project. It is therefore important that a simple and effective grievance management process is developed and implemented.

The scope of this GRM shall include all complaints associated with operation and maintenance of locomotives (the Project).

It is recommended that a comprehensive GRM be developed, based on the guidelines provided in this ESMP, the scope of which should include all Project activities. The project GRM should be a stand-alone protocol integrated into the CFM's Environmental and Social Management System.

## 7.2 Objectives

The GRM protocol will provide guidance for the management of suggestions and complaints from communities, workers and other stakeholders throughout all project phases. This protocol will allow one to:

- Understand how stakeholders perceive the risks and impacts of the project, so as to adjust its measures and actions to address their concerns;
- Inform stakeholders and affected parties on the process that will be followed to respond to complaints;
- Address and respond to stakeholder complaints;
- Handling and resolving GBV and SEAH related complaints;
- Make available to affected parties an effective grievance mechanism; and
- Record stakeholder suggestions as an opportunity for continuous improvement by creating or improving a learning system and process.

## 7.3 Target Audience

This protocol applies to any stakeholder (individuals, groups of individuals, workers, communities, companies, institutions, NGOs, among others) affected by the project activities or by the activities of contractors hired by the Proponent to carry out any work under this project. The GRM is therefore a tool for the resolution of stakeholder complaints, throughout the project cycle.

## 7.4 Principles

The protocol is governed by the following principles:

- Security: any interested or affected party should feel safe and confident in making a complaint or suggestion, without fear of reprisal;
- Accessibility: the protocol should be made widely available and easily accessible to any interested party. CFM will make all reasonable efforts to disseminate the mechanism and remove potential constraints to accessing it, such as language, illiteracy and distance;
- Timeliness: all complaints should be managed in a timely manner to avoid escalation into dispute and associated risks to the project;
- Respect: the complaint resolution process will be in accordance with internationally recognised human rights standards, such as the International Covenants on Economic, Social and Cultural Rights and Civil and Political Rights, the Convention on the Elimination of Discrimination against Women (CEDAW), International Convention on the Rights of Persons with Disabilities (CRPD), Committee on the Elimination of Racial Discrimination (CERD) and Convention on the Rights of the Child, all of which have been ratified by Mozambique;
- Transparency and Accountability: the grievance response process and its outcomes should be sufficiently transparent to address public interest concerns without compromising the privacy and identity of individuals. They should also be fair, independent and legitimate - and be perceived to be so; and
- Predictability: the process should be applied consistently, with defined timelines for each step, and should be clear about the type of processes and outcomes that can and cannot be offered.

## 7.5 Types of Complaints and Suggestions

There are three types of complaints and suggestions:

- **Individual**: refers to a complaint or suggestion made by an individual member of the communities, a worker or by another individual stakeholder;
- **Group**: refers to a complaint or suggestion submitted by a specific group of individuals or stakeholders such as a gender group, professional association, etc.; and
- **Community**: refers to a complaint or suggestion that involves a community as a whole. These complaints may be made at a community meeting or by the community leader, on behalf of the community, in which case they should explain why it is a community complaint.

## 7.6 Reception and Registration

In compliance with the principle of accessibility, CFM will allow the presentation of grievance through multiple communication channels, namely:

- **Verbal complaint in person**: refers to a formal or informal conversation with a representative of CFM/Contractor;
- **Written complaint**: refers to a record in a grievance book, or a formal letter, fax or e-mail;
- **Telephone complaint**: refers to a telephone conversation to a dedicated (toll-free) number, including recorded messages left on voicemail; and
- **Confidential channels** (such as dedicated phone line or designated community liaison contacts) as agreed for exclusive use as part of the GBV (Gender Based Violence) / SEAH (Sexual Exploitation, Abuse and Harassment) prevention and response framework and action plan.

A Suggestions and Grievance Book will be made available by CFM at specific locations in communities and on CFM's premises. Any affected person may register a written complaint in these books. Assistance should be made available to interested parties in registering the complaint as required. As mentioned above, written complaints can also be submitted by formal letter, fax or e-mail.

In the case of verbal complaint (in person or by telephone), the receiver shall complete the appropriate form in the Suggestions and Grievance Book so that the process can be opened. In these cases, the receiver should explicitly state that he accepts the suggestion or complaint and register preliminary information about the person affected (e.g., name, community / institution, subject, contact).

Language is often a restriction to communication (especially when interacting with communities with low literacy levels). Therefore, CFM should ensure that complaints and suggestions can also be made in local languages. Thus, the protocol should adopt both Portuguese and local languages as languages of communication.

## 7.7 Suggestion/Request and Complaint Management Procedure

### 7.7.1 Procedures for Handling Suggestions

Suggestions are typically easier to manage than complaints. Suggestion management will follow the actions outlined in the **Table 7-1**.

**Table 7-1 – Methods for managing suggestions/requests**

| Stage | Action | Responsible Person / Entity |
|---|---|---|
| Presentation | - Presentation of the suggestion using one of the available communication channels (in-person interaction, complaints and suggestions book, e-mail or telephone call) | Affected person or interested party |
| Reception and acknowledgment | - Reception of the suggestion<br>- Registration of the suggestion in the Grievance and Suggestions Book<br>- Sending a letter of confirmation of receipt, within 5 days | CFM<br>CLO<br>UGQSMA<br>ESGM |
| Answer | - After proper analysis of the suggestion, prepare a letter indicating the result of the suggestion and deliver it to the affected person | CFM<br>CLO<br>UGQSMA<br>ESGM |
| Closure | - After the delivery of the reply letter, the matter should be considered closed. The CFM Community Liaison Officer will be responsible for additional actions, if necessary | CFM<br>CLO<br>UGQSMA<br>ESGM |

### 7.7.2 Procedure for Managing Grievance

Managing a complaint is more complex than managing a suggestion. The **Figure 7-1** and **Table 7-2** summarise the steps to be taken for this management.

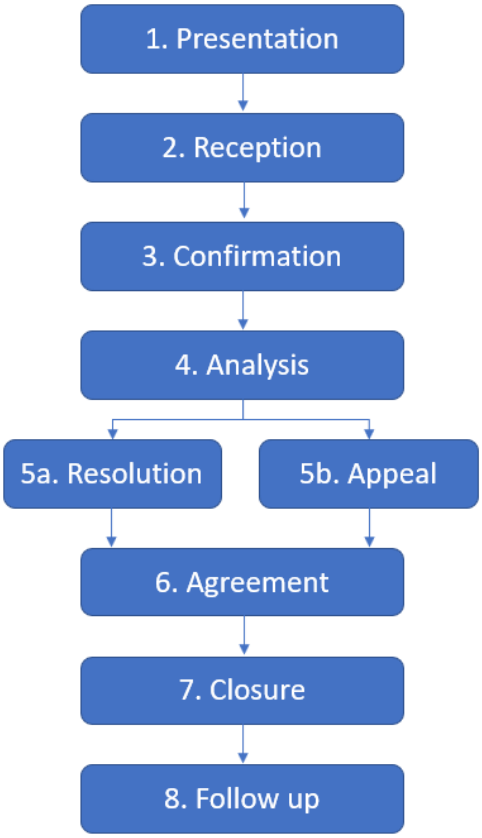



**Figure 7-1 – Flowchart of the Suggestion/Request and Complaint Management Procedure**

**Table 7-2 – Complaint management methods**

| Stage | Action | Responsible Person / Entity | Time |
|---|---|---|---|
| 1. Presentation | - Presentation of the complaint using one of the available communication channels (in-person interaction, complaints and suggestions book, e-mail or telephone call) | Affected person or interested party | Day 1 |
| 2. Reception | - Complaint receipt<br>- Registration of the complaint in the Grievance and Suggestions Book<br>- Confirmation of receipt of letters is made upon delivery, through the stamp, signature and date of receipt<br>- In cases where the complaint is sent by e-mail, a reply is sent acknowledging receipt | CFM<br>CLO<br>UGQSMA<br>ESGM | Day 7 |
| 3. Acknowledgment | - Clarification and confirmation of the issues involved in the complaint, through a meeting with the affected person<br>- Preliminary agreement (if applicable) | CFM<br>CLO<br>UGQSMA<br>ESGM<br>Affected person or interested party | Day 7 |

| Stage | Action | Responsible Person / Entity | Time |
|---|---|---|---|
| 4. Analyses | - Analysis of the complaint to confirm the alleged facts | CFM<br>CLO<br>UGQSMA<br>ESGM<br>Affected person or interested party<br>Others as needed | Days 7 - 14 |
| 5a. Resolution or 5b. Appeal | - Motion for a resolution<br>- Acceptance or appeal<br>- Registration of the proposed resolution in the Grievance and Suggestions Book | CFM<br>CLO<br>UGQSMA<br>ESGM<br>Affected person or interested party<br>Others as needed | Days 15 - 28 |
| 6. Agreement | - Meeting with the affected person to communicate the proposed resolution, reach a mutual agreement and sign it | CFM<br>CLO<br>UGQSMA<br>ESGM<br>Affected person or interested party | Day 29 |
| 7. Closure | - Delivery of a closing letter to the affected person or interested party<br>- Complaint closing record in the Grievance and Suggestions Book | CFM<br>CLO | Day 30 |
| 8. Follow up | - Implementation of agreed corrective or compensatory measures that require a timetable | CFM / responsible part<br>CLO<br>UGQSMA<br>ESGM | According to the agreed schedule |

CFM shall manage a complaint within a period of 30 days of receipt. In cases where it takes more than 30 days to carry out the investigation, CFM shall notify the concerned party (in writing and in advance), stating the reasons for the delay.

If the complainant does not agree with the proposed settlement, and it is not possible to reach agreement on it, the complainant may request that the complaint be escalated to the CFM Directors, who will review the case and communicate their decision to the complainant within 29 days.

If the complainant does not agree with the resolution proposed by the CFM Managers, the complainant has the right to appeal to a third party, which is proposed herein to be the Arbitration Committee. The Arbitration Committee shall be composed of senior representatives of:

- CFM;
- Representatives of the District Government or of community leaders (as applicable);
- Community representatives (minimum of two, male and female);
- Representative of interested and affected parties; and
- Experts as required and agreed.

The Arbitration Committee will consider the case and reach a decision. Decisions made by this forum will be considered final as far as the scope of this grievance management protocol is concerned. If the complainant does not agree with the decision of the Arbitration Committee, he/she may ascend the matter to the judicial system. In this case, the complainant will be provided with information about their right to grievance and the appropriate judicial channel, or available World Bank complaint response mechanisms, to direct their complaint to. That level of grievance is, however, outside the scope of this management protocol.

# 8 Monitoring and Reporting

This section outlines the environmental assessment and improvement processes associated with this ESMP which constitutes environmental monitoring, inspections, audits, corrective action, and improvement. These activities form an integral part of implementing the ESMP, and are necessary to:

- verify and document the implementation of the mitigation measures identified in the ESMP;
- monitor and document the effectiveness of the mitigation measures and assessed impacts;
- demonstrate compliance with applicable legal and other requirements;
- evaluate the effectiveness of the ESMP; and
- highlight areas in need of improvement to drive continuous improvement for all ESMP activities.

This section also outlines the reporting and notification associated with implementation of the ESMP.

## 8.1 Environmental Monitoring

Environmental monitoring will be carried out in different layers of entities through:

- Site inspection;
- Audit programs, coordinated by CFM, which include independent audits by independent external auditors;
- Sampling and measurements, to monitor the conditions of site and define effectiveness of implemented mitigation measures. Depending on the object of monitoring, this may involve site survey with sample collections for laboratory or *in-situ* measurements, and/or stakeholder engagement to gather factual data. Scope of this survey will be defined based on the operational scope and applicable regulations and permits.

### 8.1.1 Inspection

Scope of environmental inspection is governed by the scope of the ESMP. CFM is responsible to inspect its operations on regular basis to ensure that mitigation measures are implemented as per ESMP. CFM will be required to implement field-based inspection programmes that demonstrate their implementation of – and, in some instances, the effectiveness of the mitigation measures.

Inspection programs should cover wider scope, not only environment or social matters but also occupational health and safety, housekeeping, and compliance issues.

Inspection programs, findings, and status of close-out shall be documented and reported to management.

### 8.1.2 Auditing

Auditing is a more structured approach to inspect and verify the site conditions and compliance with mitigation measures described in the ESMP. CFM will organise for programmed internal audits to operation and maintenance of locomotives. Also, CFM will organize independent audits by an independent external consultant throughout the project's operations. This may include environment certification audits by certifying institutions.

Audits will be performed by qualified and trained staff, and results will be described in a report that will determine the severity of non-compliances, as well as the recommended remedial action.

Regular checks and audits will be undertaken by CFM, who carries out periodic audits and will be responsible for monitoring, surveillance and decision-making on all operational Environment, Health and Safety and (EHS) and Occupational Health and Safety (OHS) matters. In addition to assessing operational aspects and monitoring, checks shall assess compliance with agreed objectives and targets, and the effectiveness of the ESMP and its implementation. The ESMP will therefore be subject to ongoing review and update to ensure that it remains appropriate to all aspects of the project.

All findings should be reviewed by the relevant project team and, where corrective actions are deemed necessary, specific actions (with designated responsibility and timing) should be developed and aimed at achieving continuous improvement in performance. These shall be documented.

Regular feedback meetings should be scheduled with stakeholders to provide feedback on performance and results of monitoring activities for the duration of the proposed project.

### 8.1.3 Site Survey and Measurements

Measurements involve mobilization of trained personnel and equipment to collect samples from strategic locations and analysis the samples for pre-defined parameters to validate the effectiveness of mitigation measures. Site survey and measurements may involve stakeholder engagement to collect factual site data on social matters.

## 8.2 Corrective Actions and Improvement

Tracking of corrective actions is one of the tools to facilitate progress and continual improvements. As part of the ESMP, the Project will implement a formal environmental and social tracking system that will include the details of all environmental and social non-conformances, identify the corrective actions required, assign actions/timings to responsible parties, and indicate the status of the actions required. Status of corrective action close-out will be reviewed and reported to management on monthly basis during monthly EHS management meeting.

## 8.3 Incident Notification Investigation and Documentation

Any environmental or social incident must be investigated and immediately reported to the appropriate CFM departments. Depending on the severity of incident, investigation or board of enquiry team will be mobilized to investigate the root cause of the incidents and propose corrective actions.

CFM will ensure that all environmental and social incidents are appropriately documented, that the relevant parties are notified, and that reporting requirements around the incident are met. Environmental and social incidents may include spills of hazardous materials into environment, labour and community incidents, or major non-compliance to regulations or permit conditions.

## 8.4 Reporting

CFM will comply with all statutory notification and reporting requirements. This section will be developed based on the applicable regulatory and lender requirements and permits which will elaborate:

- Scope of reporting;
- Schedule of reporting;
- To whom the report will be distributed and in what format;
- Report archive requirement.

Considering the AfDB requirements and procedures for E&S reporting, in the event of any severe incident (fatalities, fire or explosions, significant fuel/chemical spills, strikes or employee unrest, regulator enforcement actions/notices, etc.), CFM shall report it to AfDB within 3 working days. As stated above, investigation or board of enquiry team will be mobilized to investigate the root cause of such incidents and propose corrective actions.

# 9 ESMP Implementation Schedule and Budget

Part of the costs associated with the development of specific social and environmental management plans and the implementation of mitigation measures cannot be specified at this stage because initial baseline assessments are required.

Given this uncertainty, contingency funds were added, and the budget estimate is limited to the first five years of implementation.

The **Table 9-1** presents a preliminary estimate of the budget for the ESMP, based on the main costs.

**Table 9-1 – Preliminary estimated EMP budget for operation and maintenance of locomotives (initial 5 years), based on core costs**

| Item | Cost (USD) |
|---|---|
| Development and implementation of the Air Emissions and GHG Management and Monitoring Plan | $75 000 |
| Development and implementation of the Noise and Vibrations Management and Monitoring Plan | $75 000 |
| Development and implementation of the Hazardous Products Management Plan | $25 000 |
| Development and implementation of the Wastewater Management and Monitoring Plan | $25 000 |
| Development and implementation of the Biodiversity Management Plan | $50 000 |
| Development and implementation of the Community Health and Safety Management Plan | $25 000 |
| Development and implementation of the Waste Management Plan | $25 000 |
| Development and implementation of the Safety Plan | $50 000 |
| Develop and implement a GBV/SEAH Plan | $12 500 |
| Environment, Health and Safety Training Plan (development and implementation) | $12 500 |
| Development and implementation of a Grievance Response Mechanism (GRM) | $12 500 |
| Monitoring of social and environmental performance, including the development of adaptive mitigation measures (if necessary)[7] | $250 000 |
| Annual E&S performance audit | $62 500 |
| **Subtotal** | **$700 000** |
| **Contingency Fund** (~20% of the operational budget) | **$140 000** |
| **Grand Total (preliminary)** | **$840 000** |

The implementation schedule is detailed in each programme along section 6.2.

[7] Excluding mitigation detailed design, civil construction works and specialized equipment acquisition, if required