Somaliland Ministry of Energy & Minerals

Eastern Africa Power Pool

WASTE MANAGEMENT PLAN
ETHIOPIA-SOMALILAND NORTHERN HIGH VOLTAGE INTERCONNECTOR: SOMALILAND
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ETHIOPIA-SOMALILAND NORTHERN HIGH VOLTAGE INTERCONNECTOR: SOMALILAND

WASTE MANAGEMENT PLAN

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ACRONYMS

C-ESMP	Construction Environmental and Social Management Plan
EAPP	Eastern Africa Power Pool
EHV	Extra High Voltage
EIA	Environmental Impact Assessment
ESIA	Environment and Social Impact Assessment
HV	High voltage
IMS	Incidence Management System
Kv	Kilovolts
LV	Low Voltage
MoEM	Ministry of Energy and Minerals
PIU	Project Implementing Unit
RoW	Right of Way
WM&M	Waste Management and Minimization Plan

1 INTRODUCTION

This Waste Management and Minimization Plan (WM&M Plan) has been prepared to accompany the Environment and Social Impact Assessment (ESIA) developed for the Eastern Africa Power Pool's 271.3km Togo Wajaale-Hargeisa-Berbera 400kV high voltage transmission line.

1.1 Purpose of the WM&M Plan

The purpose of the WM&M Plan is to describe the principles and procedures for the management of the waste generated by the Project and outline measures to manage and mitigate waste generation and resource consumption during Project construction and operation. This includes addressing sources of waste from construction and operation of the Project and the measures to be implemented to manage, reuse, recycle and safely dispose of the identified waste. The Waste Management and Minimization Plan will be updated prior to construction.

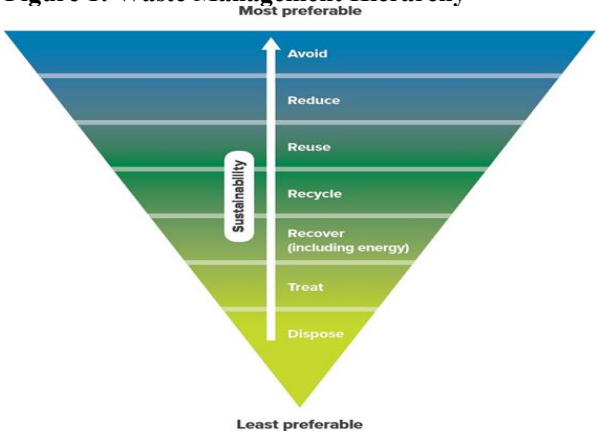
2 LEGISLATIVE REQUIREMENTS

The National Environment Policy, 2015 incorporates a clear set of Objectives, Guiding Principles and Strategies that will bind all organizations and individuals to exercise due care to avoid depletion of natural assets and environmental degradation. sets out the general environmental duty to take all reasonable and practical steps to prevent or minimise any resulting environmental harm.

The Policy emphasizes that it is the duty of any institution, government or non-governmental organization, any community group or people's organization or any individual that uses or otherwise carries out activities that affect the environment in any way, to exercise proper control to maintain the productivity and integrity of the environment. The Policy is set against a background that includes macroeconomic issues, the Millennium Development Goals, and National Poverty Reduction Strategy and it considers economic incentives for improved environmental management.

This requirement includes the management of waste. The policy provides guidelines on Waste management. Figure 1 below depicts a typical waste management hierarchy. Under the hierarchy, avoiding waste generation is most preferable and disposal of waste least preferable

Figure 1: Waste Management Hierarchy



Somaliland Environment Management Law No 79/2018 clearly explains the role and mandatory and regulatory issues of Environmental Impact Assessment (EIA) of developmental projects while conducting EIA in the Democratic Republic of Somaliland. Under Part 5 Environmental Impact Assessment of this low (Article 11-17) encompasses fiscal incentives, application for an Environmental Impact Assessment, publication of Environmental Impact assessment, Submission of fresh EIA report after Environmental Impact assessment License, Transfer of EIA license, Protection in respect of a license and revocation and cancelation of license. Furthermore, the law explains about: -

- Part 6 (Article 6-7) refers to Environmental Audit and Environmental Monitoring
- Part 7 (Article 8-54) refers to Environmental Quality Standards
- Part 12 (Article 69-81) states about Environmental offences

The goal is to achieve sustainable waste management by applying the waste management hierarchy consistently with the principles of ecologically sustainable development. In order to meet this waste management objective, waste management should:

- promote best practice and accountable waste management
- include effective recording, monitoring and reporting systems for the treatment, transportation and disposal of waste and other matter
- promote environmental responsibility and involvement in waste avoidance, waste minimization and waste management within the community.

This EAPP project will emphasize maximizing the reuse, recycling and recovery of materials.

3 PROJECT DESCRIPTION

The proposed Wajaale-Hargeisa-Berbera EHV 400kV transmission line is located in Somaliland and traverses 2 regions i.e. Marodi-Jeh and Sahil starting at the outskirts of Wajaale (border between Ethiopia and Somaliland) and terminating at the proposed Berbera substation passing through Hargeisa. The line crosses 3 districts (Gebiley, Hargeisa and Berbera) and several villages found in the 2 regions. It is expected that upon completion, the 400kV double circuit transmission line will be energized and become part of the national grid. The proposed Right of Way (RoW) for the transmission line will be approximately 40 metres wide.

Table 3-1Project Salient Features

#	Features	Description
1	Voltage Rating	400kV
2	Type of Transmission Line	Double Circuit
3	Width of T/L Right of Way (RoW)	40m
4	Type of Line Support	Steel Towers
5	Conductor	AAAC Ash 180.7 mm^2
6	Conductor Material	Aluminum Alloy
7	Line Insulator	Disc type, Porcelain
8	Type of Connection	Substation
	Tapping point:	Jijiga Substation
	Termination point:	Hargeisa Substation
9	Number of Angle Towers	
	Approximate number of towers to erect:	TBD
10	Average/Standard Tower Height (m)	40

11	Approximate Length of T/L	273.1
	Average span between towers over normal topography	400m
12	Total land requires for installing a typical Tower	256m^2 (16m x 16m)
13	Standard Distance between phase-to-phase conductors (approx.)	4m

3.1 Key Project activities

Construction

The key construction activities to be undertaken consist of the following:

- establishment of access tracks
- vegetation clearance and earthworks at tower locations, camps and laydown areas
- temporary stockpiling of top soils and subsoils
- establishment and operation of associated temporary facilities (e.g. construction camps, concrete batching plants, laydown areas)
- transport of materials and equipment to construction locations
- bore piling and pouring of concrete footings
- installation of towers
- stringing and connection of electrical conductors
- installation of permanent security fencing/gates.
- commissioning
- rehabilitation of temporary areas of disturbance
- clean up of waste materials.

Operation and maintenance

Key operation and maintenance activities to be undertaken include but are not limited to:

- Tower and conductor inspection and maintenance
- Easement access and maintenance
- Routine maintenance including visual inspections.

4 POTENTIAL PROJECT WASTE SOURCES

The construction of the Project requires a range of materials including steel, electrical components, concrete, plastics and timber and waste will be generated from these sources. Waste generated during Project operation is anticipated to be minimal compared to the construction phase.

Potential sources of waste generated during construction and operation of the Project are described in Table 4-1.

Table 4-1: Potential sources of waste from the Project

Potential sources of waste	Project element and or activity	Construction	Operation
General construction	• Tower footings, land clearance for access and stringing tracks, substation and ancillary infrastructure, laydown areas, construction camp	□	
Spoil	• Spoil from excavation materials	□	
Potentially contaminated soil	• Tower footings, land clearance for access and stringing tracks, substation and ancillary infrastructure, laydown areas, construction camp	□	

Clean fill material	• Tower footings, land clearance for access and stringing tracks, substation and ancillary infrastructure, laydown areas, construction camp	□	
Vegetation and organicmaterial	• Tower footings, land clearance for access and stringing tracks, substation and ancillary infrastructure, laydown areas, construction camp	□	□
Wastewater	• Construction camp • Concrete batching	□	
Waste concrete	• Tower footings, substation and ancillary infrastructure	□	
Waste concrete	• Tower components, substation and ancillary infrastructure	□	
Conductor drums	• Tower components, substation and ancillary infrastructure	□	
Electrical (HV and LV),conductors, insulators	• Tower components, substation and ancillary infrastructure	□	□
Steel	• Tower components, tower footings, substation and ancillary infrastructure	□	
Domestic waste	• Construction camp waste (i.e. kitchen waste, paper, cardboard, plastics glass)	□	□
Timber	• Tower footings, land clearance for access tracks and stringing tracks, substation and ancillary infrastructure, laydown areas, construction camp	□	
Hazardous materials andchemicals	• Tower footings, land clearance for access and stringing tracks, substation and ancillary infrastructure, laydown areas, construction camp	□	□

5 WASTE MANAGEMENT HIERARCHY

Waste management for the Project will be undertaken in accordance with the waste management hierarchy (refer Figure 1). The waste management hierarchy demonstrates the preferred approaches to waste management in the order of priority as follows:

A. avoidance of the production of waste
B. minimisation of the production of waste
C. reuse of waste
D. recycling of waste
E. recovery of energy and other resources from waste
F. treatment of waste to reduce potentially degrading impacts
G. disposal of waste in an environmentally sound manner.

5.1 Avoidance and Minimisation of Waste

5.1.1 Construction materials

The Project will avoid waste generation and endeavour to reuse waste where practicable. Waste will be avoided through strategic selection of materials during design and purchasing which take into account options which may reduce waste generation for the Project. Careful planning for procurement of the specific types and quantities of materials required for construction activities, including the temporary construction camp will further minimise waste generation.

Measures to achieve avoidance and reduction of waste may include:

- development of a procurement policy which considers waste avoidance measures such as:
  - ordering site specific or prefabricated items where practicable to minimise surplus material
  - consideration of packaging material provided by suppliers during purchasing and reduce this requirement where possible, or consider returnable packaging
  - consideration of recycled items when selecting materials
  - consideration of reusable materials for meal packaging at accommodation camps
- refinement of waste stream estimates to ensure adequate on-site storage and waste segregation to facilitate recycling
- refinement of estimated volumes of materials for construction.

5.1.2 Vegetation Clearance

The area of disturbance for towers and other infrastructure will be minimised through detailed design. Where possible, infrastructure will be located in already disturbed areas and groundcover will be retained where possible (e.g. for the stringing access corridor). Vegetation clearance required for towers and other infrastructure will be minimised though detailed design. Vegetation assessments, including canopy height measurement, are used during the detailed engineering phase to design the line profile. Where possible, conductor heights will be set to avoid or minimise the requirement for vegetation clearance both during construction and ongoing maintenance. Where vegetation clearance is unavoidable and to minimise the risk of power outages, damage to transmission lines or fire starts, vegetation management works are undertaken to make sure that clearance distances between vegetation and transmission lines are established and maintained in accordance with the Ministry of Energy and Minerals (MoEM) regulations.

5.2 Reuse and Recycling

Measures to separate waste streams will be implemented to maximise opportunities for reuse of waste materials on site. This includes segregation of wastes into appropriate dedicated bins or areas on site, or transportation to a designated recycling facility. The Project will reuse or recycle waste material where possible including concrete, timber, plastic, and metals (refer Table 5-1).

Table 5-1: Construction waste recycling and reuse

Waste source	Recycling options
Waste concrete	• Transport to another Project site for use. • Where this is not possible, waste concrete will be collected in washout bays, solidified and transported to a licensed facility forreuse or disposal.
Excess steel	• Recycle at other sites where applicable, or collect during and afterconstruction and recycle via scrap metal recyclers.
Timber e.g. formwork, pallets etc.	• Reuse where applicable or return to supplier for reuse. • If not accepted by supplier, separate and dispose of at wastefacility for mulching where applicable.
Conductor drums	• Return to supplier for reuse.

Electrical (HV and LV), conductors, insulators	• Return to supplier for reuse.
Vegetation and organic material	• Stockpile for use in rehabilitation where required.
Spoil from excavation materials	• Reuse in areas that require capping / rehabilitation. • If not required, remove from site using appropriate wastecontractor.

5.3 Treatment and Disposal

If waste materials cannot be reused on site, they will be collected by appropriately licensed contractors for off-site reuse, reprocessing, recycling or final disposal. Final disposal of wastes will be to a licensed waste facility that is suitable for the type and quantity of waste. Waste tracking forms will be provided to the waste facility upon arrival.

Measures to manage the treatment and disposal of waste materials during construction and operation may include:

- ensuring wastes which cannot be reused or recycled and require disposal are clearly segregated from those which have the potential to be reused
- providing segregated bins for subcontractors to dispose of construction waste (i.e., metal, plastics and cardboard)
- inducting contractors and staff into site waste management practices
- disposing of hazardous materials in accordance with the handling and disposal requirements.
- disposing of general wastes in accordance with local council requirements
- ensuring camp ablutions facilities are installed in accordance with federal government regulations.

Only appropriately licensed transport contractors will be engaged to transport waste material offsite. The contractors appointed to transport waste will be required to demonstrate and ensure that:

- they are licensed to transport the type of waste they are contracted to receive / handle
- waste is transported to a licensed facility capable of receiving the type of waste and quantity they are carrying waste is adequately covered during transport
- waste data forms are provided to the waste facility upon arrival.

6 MANAGEMENT OF PROJECT GENERATED WASTE

Specific waste source management options will be implemented across the Project site to ensure appropriate waste handling and to ensure waste-related impacts to the local and surrounding environment are minimised. Waste source management will be updated based on refinement of Project design. All waste management options for construction and operation phases of the Project, will be in accordance with, and follow best practice of the waste management hierarchy.

Table 6-1 describes waste sources for Project construction and operation and associated mitigation and management controls.

Table 6-1: Waste management during Project construction and operation

Waste source	Mitigation and management controls	Construction	Operation
General construction	• Manage general construction waste in accordance with national regulations • Classify all waste in accordance with the waste definitions guideline and separated into waste streams. • Classify construction waste material in accordance with the waste definitions guideline and separate into waste streams for reuse or recycling potential and stockpiled on site. • Clearly label waste in a secure storage area that ensures waste is contained and managed in the most appropriate and efficient manner i.e. reuse, recycled, disposed. • Store electrical waste for collection by an authorised contractor for recycling offsite, where feasible, or dispose at an appropriately licensed facility. • Where offsite disposal is required, dispose to a suitable licensed facility by an appropriately licensed transport contractor in line with federal government requirements.	✓	
Spoil from excavation materials	• Use spoil material from excavation works on site where appropriate (e.g. for capping of access roads, spread between tower footings). • Where not suitable for on-site use, use spoil for other purposes such as capping off-site, or classify and take offsite to a licensed waste management facility that is permitted to accept that waste for reuse, recycling or disposal.	✓	
Contaminated soil	• Classify soil by an appropriately qualified environmental practitioner in line with best practice and in accordance with the C-ESMP. • In the unlikely event that contaminated soils are encountered, segregate soils from the surrounding environment to prevent cross contamination and remove from site for remediation or disposal according to the nature of contamination.	✓	
Stockpiled soil / clean fill material	• Locate temporary topsoil stockpiles in areas clear of vegetation as far as practicable and away from defined watercourses to reduce the potential for surface water erosion impacts to creek lines. • Re-spread stockpiled topsoil following completion of construction activities (as far as practicable and subject to suitability) and leave sites to naturally revegetate. • Manage soil stockpiles in accordance with the national guidelines for stockpile management. Size of stockpiles typically below 2 m in height (to be determined by material quantity requirements, space availability, stockpile stability and safety).	✓	
Vegetation and organic material	• Stockpile cleared vegetation for use in rehabilitation where required. • Place cleared vegetation stockpiled during access and clearing over returned topsoil to assist in natural regeneration. • Dispose of noxious weeds in accordance with relevant guidelines / requirements.	✓	✓
Wastewater	• Manage camp wastewater in accordance with health regulations and relevant federal requirements.	✓	

	• Alternatively, treat sewage for irrigation over a pre-approved disposal area. • Use licensed contractors where wastewater is removed for offsite treatment or disposal. • Collect wastewater from concrete batching in temporary lined pits for to reuse or disposal at a licensed facility.		
Waste concrete	• Transport waste concrete to other sites for use. • Where this is not possible, waste concrete will be collected in washout bays, solidified and transported to a licensed facility for re-use or disposal.	✓	
Conductor drums	• Return conductor drums to supplier for reuse.	✓	
Electrical (HV andLV), conductors, insulators	• Return all waste electrical material to supplier for reuse.	✓	✓
Steel	• Recycle steel components at other sites where applicable or collect during and after construction for recycling via authorised scrap metal recyclers.	✓	
Domestic waste	• Store waste containing food appropriately (covered), and regularly remove from site for disposal to reduce the likelihood of attracting pests and vermin (including birds) and to prevent the occurrence of windblown rubbish. • Store recyclable materials such as paper, cardboard, plastics, glass, ferrous, and non-ferrous containers at recycling bins for collection by an authorised contractor and recycling off-site. • Where recycling is not feasible, collect waste and store in designated waste storage areas for collection by an authorised contractor for offsite disposal at a licensed waste facility.	✓	✓
Timber (e.g. formwork, pallets etc)	• Re-use excess and / or waste timber material where applicable or return to the supplier for reuse. • If timber is not accepted by the supplier, separate timber and dispose of at waste facility for mulching where applicable.	✓	
Hazardous materialsand chemicals	• Dispose of all waste hazardous substances to a suitably licensed facility by an appropriately licensed transport contractor, in line with federal legislation and requirements. • Collect waste from construction vehicle and plant maintenance activities and store in designated waste storage areas for collection by an authorised contractor foroffsite disposal. • Store containers holding oil, grease and lubricants separately for recycling / return to supplier or disposal as hazardous waste. • Store waste oil and oil filters stored in recycling bins for collection by an authorised contractor and recycled offsite (where feasible). • Undertake hydrocarbon and chemical storage in accordance with federal bundingguidelines. • Handle fuels in accordance with relevant standards and guidelines. • Bund diesel fuel storages at laydown areas.	✓	✓

	• Store chemicals and fuels in appropriate containers suitable for purpose. • Separate hazardous materials and store in accordance with relevant legislation and regulations. • Clean up any spills in accordance with relevant guidelines.		

Final locations of waste management storage and disposal areas will be confirmed during detailed design of the final alignment and easement of the transmission line and locations of temporary construction camps.

7 IMPLEMENTATION

7.1 Role and Responsibilities

MoEM, as the implementing agency, has primary responsibility for the management and minimisation of waste, and ensuring that all legislative and regulatory requirements are met. During the construction phase, the construction Contractor will be responsible for undertaking waste management and minimisation in accordance with this plan, MoEM specifications and legislative and regulatory requirements.

Licensed waste transport contractors will be employed during construction and operation (as required), and will be responsible for undertaking waste transport and disposal activities in accordance with this plan, MoEM specifications, legislative and regulatory requirements and license conditions.

7.2 Awareness and Training

MoEM and the construction contractor will develop and implement an awareness and training program that will be delivered to all employees involved in the waste generation activity. The training will include:

- the application of the waste management hierarchy
- common waste sources and waste streams generated from the Project
- dangerous goods segregation and hazard classification codes
- spill Response
- community impacts of poor waste management.

7.3 Monitoring

Regular inspections and monitoring will be undertaken for the Project during construction and operation to ensure the measures put in place to manage waste (e.g., collection and storage areas, licensed contractors) are implemented, maintained and reviewed / updated if required.

Monitoring will include the following:

- records of the type, quantity and locations of waste generated
- regular (timing to be determined) inspection of waste storage containers to ensure that they are maintained in a condition appropriate for their use and containment of the specific waste

- regular (timing to be determined) inspection of skips and / or bins to ensure that cross contamination does not occur
- records of all waste removed from site including products for reuse.

7.3.1 Reporting and Compliance

Contractors will report all Safety and Sustainability Events related to waste management (including any notice received from a government agency) to the MoEM Project Implementing Unit (PIU) within one hour of the incident occurring, or if not reasonably practicable, as soon as possible. The relevant notification entry will be made into the MoEM Incident Management System (IMS) within 24 hours.

The Contractor will also report on wase related matters (frequency to be determined and in accordance with regulatory requirements) including the following:

- results of inspections and formal environmental audits
- report of compliance with approval and licensing conditions
- summary of complaints received during the Project construction and operation.

Non-compliances will be reported to the PIU and appropriate corrective actions undertaken in line with MoEM's systems.

7.3.2 Review

The Waste Management and Minimisation Plan will undergo periodic review and revision. Review will include a process of adaptive management, whereby the effectiveness and performance of current controls and mitigation measures are assessed and improved to ensure robust environmental performance.

Regular reviews of the waste monitoring will also be undertaken, and updated if required.