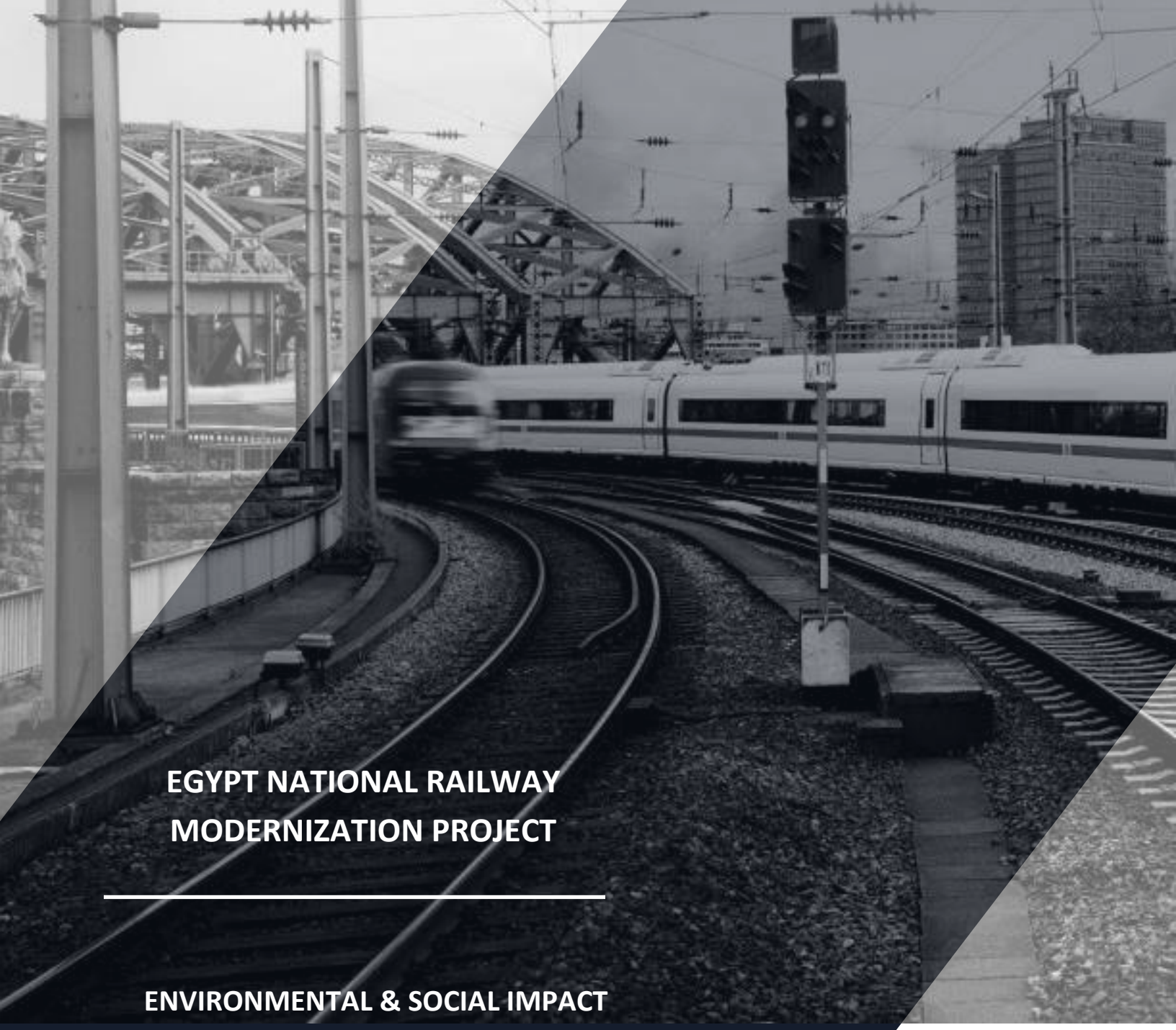


EGYPT NATIONAL RAILWAY MODERNIZATION PROJECT

ENVIRONMENTAL & SOCIAL IMPACT ASSESEMENT

Installation of Automatic Train Protection (ATP) System

Cairo – Beni Suef

Benha – Port Said

Alexandria – Cairo

Beni Suef – Asyut

Asyut – Nagh Hammadi

Prepared by

www.be-masader.com

environmental & energy services masader

I. List of Acronyms and abbreviations

AfDB	African Development Bank
CAPEX	Capital Expenditure
EEAA	Egyptian Environmental Affairs Agency
EHS	Environmental, health and safety and social
EIA	Environmental Impact Assessment
ESMP	Environmental and Social Management Plan
GBV	Gender-based violence
GHG	Greenhouse Gas
GRM	Grievance Redress Mechanism
HVAC	Heating, Ventilation and Air Conditioning
IFC	International Finance Corporation
ILO	International Labour Organization
ISS	Integrated Safeguards System
IUCN	International Union for Conservation of Nature
NH	Non-Hazardous
NO_x	Nitrogen Oxides
OS	Operational Safeguards
OVI	Objectively Verifiable Indicator
PAP	Project-affected Person
PM10	Particulate matter 10 micrometres or less in diameter
SEP	Stakeholder Engagement Plan
SNSC	Safeguards and Compliance Department at the AfDB
SO_2	Sulphur dioxide
TSP	Total Suspended Particulates
WB	World Bank

II. List of Tables

III. List of Figures

EXECUTIVE SUMMARY

E.1 Project Background

The railway sector in Egypt is vertically integrated and is owned by the Egypt National Railways Authority (ENR), a public entity established in 1851 and subordinated to the Ministry of Transport.

Since 2010, the government, with the support of the World Bank and other development partners, has embarked on railway reforms to make the railways safer, responsive, and competitive, through: (i) investing in rail infrastructure and modernization of the Signalling systems to improve efficiency, service levels and operational capacity; and (ii) introduce measures to strengthen ENR management capacity.

The African Development Bank (AfDB) has received a formal request from the Government of Egypt (GoE) for supporting the ongoing efforts for upgrade and modernization of the railway infrastructure in the country. The Bank support will be through investment finance to the tune of EUR 141 million.

The ENRMP will have four components as follows:

i. Modernization of signals and rail renewals (USD 643 million, WB & GoE): Upgrading of the Signalling system to electronic interlocking system (EIS), and rail renewals in selected sections of the main. This component is an ongoing project financed by the World Bank and the GoE;

ii. Installation of the Automatic Train Protection (ATP) System (USD 155 million, AfDB): Supply and installation of on-board ATP equipment in about 100 locomotives, and installation of track-side ATP equipment; and supply of spare parts and maintenance for a specified period of 3 years or more;

iii. Capacity building (USD 2.0 million, AfDB); and

iv. Project Management Support (USD 3.0 million, AfDB):

The total project cost estimate is USD 803 million. Components (ii), (iii) & (iv) are the subject of this ESIA, and will be financed by an AfDB loan with a total cost estimate of USD 160 million.

As stated under Component (ii), the ENRMP will support the installation of an ATP system comprising on-board ATP equipment in 100 locomotives, and ATP track-side equipment on 953 km of the rail network in the following sections:

a) Alexandria – Cairo (208 km);

b) Cairo – Beni Suef (125 km);

c) Beni Suef – Asyut (250 km);

d) Asyut – Negh Hammadi (180 km); and

e) Benha – Port Said (190 km).

The proposed ATP system will be based on the European Train Control System Level 1 (ETCS-L1). The ATP system electronically supervises the train, in terms of track profile ahead, which includes permissible speeds, allowable distance to be travelled by the train, stopping distances and section speed restrictions. In addition, where train crew do not comply with the ATP operation parameters, the system automatically takes over, and where necessary under critical conditions, brings the train to a stop to prevent potential accidents.

E.2 ESIA Scope, Boundaries and Objectives

Scope and Boundaries

The purpose of the ESIA is to identify and assess the potential positive and adverse risks and impacts that may arise from the installation of the ETCS-L1 on 990 km of the railway network. A new ESIA study (the current document) has been developed for two sections of the railway network, for which no previous ESIAs have been developed; namely: Cairo – Beni Suef (138 km) and Benha – Port Said (214 km). In addition to that, the ESMPs already developed for the rest of the line sections have been updated as to accommodate for any additional mitigation measures for risks and impacts arising from component (ii), (iii) and (iv).

The Project activities that have been considered as part of the ESIA include those to be undertaken during the construction, operation and decommissioning of the ETCS-L1.

The ESIA has been prepared in line with: the national environmental, social and EIA requirements within Egypt; AfDB environmental and social safeguards policies and standards including AfDB Integrated Safeguard Standards (ISS); and other international applicable standards, such as the International Finance Corporation (IFC) Environmental, Health & Safety (EHS) General and Specific Guidelines for Railways (April 2007).

The draft ESIA has been disclosed to the public via pubic consultation sessions and a number of focus group discussions and interviews. Comments and feedback have been reflected in the ESIA by updating the study and addressing comments made by stakeholders. Information has been provided about how comments have been addressed.

No-project Alternative

To continue operating the Benha – Port Said and Cairo – Beni Suef rail sections with the existing, mechanical Signalling system, with its safety challenges, poor reliability and poor capacity, places a major burden on the ENR's efforts to improve its services to the public and overcome its major financial difficulties. It is expected that difficulties facing ENR will aggravate and will become more difficult to resolve without the implementation of the proposed project. Without the project, the railway service line will further deteriorate, affecting the safety and well-being of millions of users of those lines.

E.3 Legal Framework

This ESIA has been prepared to forestall environmental and social impacts that could arise during the development and operational implementation of the project based on Operational Safeguard Policies of the AfDB, as well as all applicable Egyptian laws and regulations. The AfDB's five Operational Safeguard Policies, as outlined and summarized in Table 2-1 below, have guided the development of this ESIA and thereafter, a determination has been made on whether any of the following safeguards will be triggered or not as a result of the implementation of the project: (1) Environmental Assessment (OS1); (2) Involuntary Resettlement including Land Acquisition, Population Displacement and Compensation (OS2); (3) Biodiversity and Ecosystem Services (OS3); (4) Pollution Prevention and Control, Greenhouse Gases, Hazardous Materials and Resource efficiency (OS4); and, (5) Labour Conditions, Health and Safety (OS5).

AfDB Operational Safeguards

Operational Safeguards Triggered by the Project	Yes	No	Justification
OS1: Environmental Assessment	**x**		This Safeguard is applicable to all projects funded by the AfDB bank. It pays regard to determining a project's environmental and social category and the resulting environmental and social assessment requirements.
OS2: Involuntary Resettlement: Land Acquisition, Population Displacement and Compensation		x	The installation of the ETCS-L1, for which this ESIA has been developed will only involve digging a 1 m deep and 2-3 m long trench perpendicular on the railway track (within the railway right of way), every approximately 1 km. Cables will be installed and then the soil will be deposited back to close the trench. Based on the expected activities during construction (and/or decommissioning), there will be no need for any Resettlement: Land Acquisition, Population Displacement and Compensation arising from these impacts.
OS3: Biodiversity and Ecosystem Services		x	The project will be implemented along an already existing railway corridor and will therefore not affect any existing habitats.
O**S4**: Pollution Prevention and Control, Greenhouse Gases, Hazardous Materials	**x**		The project will entail excavation activities, waste generation and consumption of resources during the construction phase.
OS5: Labour Conditions, Health and Safety	**x**		The project will include considerable labour and working environments during the construction phase.

In accordance with the Egyptian Law No. 4 of 1994 and following consultation between ENR's Environmental Department with EEAA representatives, the project is classified as a Category Scope B, which requires a scoped ESIA (equivalent of Category 2 as per the Bank's ISS). The category 2 classification was approved by SNSC on November 6th, 2019. Indeed, the Project is mainly confined to existing footprints of the railway track. The physical works on the track during the preparation and the installation of the ATP system will be minor as it will involve trenching and installation of ETC equipment on tracksides and on locomotives. The project will not cause any physical nor economic displacement as it is limited to linking each semaphore to the railway track via a 2 m long cable within the right of way of the railway. The digging will be intermittent (approximately every 1 km) and not continuous and would not affect more than 0.7 m and there are no archaeological structures in near proximity to the railway corridor. No activities are planned in areas of known physical cultural importance. According to the AfDB, Category 2 projects are "*likely to have detrimental site-specific environmental and/or social impacts that are less adverse than those of Category 1 projects. Likely impacts are few in number, site-specific, largely reversible, and readily minimised by applying appropriate management and mitigation measures or incorporating internationally recognised design criteria and standards*."

The ***EHS Guidelines,*** the WB Group Environmental, Health, and Safety Guidelines referred to as the EHS Guidelines have also been used as guidelines. These are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). They contain the performance levels and measures that are normally acceptable to the WB Group. When preparing the ESIA report and assessing the different impacts, the relevant levels and measures have been adopted as will be indicated in the following sections.

Environmental assessment for projects is included in the environmental legislation in Republic of Egypt: Law No. 4 of 1994 Amended by Law No. 9 of 2009 and Resolution 1095 of 2011, Decree No. 710 of 2012, Decision of the Prime Minister No. 964 of 2015 and Decree No. 618 and 1963 of 2017. The Ministry of State of Environmental Affairs (MSEA) and the Egyptian Environmental Affairs Agency (EEAA), its executive agency, enforce Law No. 4 of 1994. According to Law 4/1994 and its amendments, the Environmental Impact Assessment (EIA) is a licensing requirement for development projects that are likely to cause environmental and social impacts. The current project falls under Category B projects according to EEAA classification. Other relevant legislations and regulation include several laws and decrees covering occupational health and safety provisions at the work place, sets out limits for workers' exposure to noise, heat stress as well as ambient air quality standards for work premises, waste management and a number of international conventions signed by Egypt and ratified by the Egyptian parliament are relevant to the project as part of the national legislative framework. According to Article 93 of the Egyptian Constitution in terms of hierarchy, treaties are below the constitution and are equivalent to the laws issued/enacted by the parliament.

The 2009 Egyptian EIA Guidelines set out the EIA requirements, which include both environmental and social assessment and consultation. The Egyptian EIA guidelines cover all the environmental assessment requirements of the AfDB. However, unlike AfDB requirements, there is no requirement for stakeholder consultation, public participation and disclosure for Categories A & B projects (low and medium impact projects) according to national classification.

Stakeholder engagement and public consultation are a requirement for category C projects (national classification) only.

E.4 Environmental and Social Baseline

Benha – Port Said

The terrain is mostly agricultural land on the east and Suez Canal on the west of the railway. However, there are few spots of arid desert land between *El Qantara* and *Al Ismailia*. Highly populated clusters exist near the train stations.

Cairo – Beni Suef

The terrain through which the railway passes is mainly agricultural land on both sides, with clusters of densely populated areas around the main stations. However, after Al Hawamidia, the agricultural land starts to become sparser and almost disappears.

Noise

With the greatly varied physical settings, background noise levels along the railway corridors are expected to vary considerably. Noise levels are also expected to vary at different times of the day as a result of variation of levels and types of human activities. Permissible noise standards given in the Egyptian legislations besides noise emissions from passing trains have been used as basis for comparing present and potential, project-induced changes in noise levels.

Air Quality

The Ministry of Environment in Egypt has a network of stations which monitors air quality across different regions in the Country. The yearly reports published by EEAA were used to describe the air quality baseline.

Biodiversity

The railway track corridors have been in place for more than a century and is already part of the man-made landscape. Although some wild animals and plants seem to utilise man-made microhabitats around the track corridor, none seems to be obligate user that requires these microhabitats for its survival. Available data show that none of the IUCN Red List species are likely to be threatened.

Waste Management

Waste along the railway corridors is particularly common and extensive and a lot of dumping sites exist along and in very close proximity to the railway corridors on both lines. For hazardous waste, the Nasreya is the only licensed Hazardous (non-medical) waste disposal facility in Egypt and is located in Alexandria Governorate in the North.

The Socio-Economic Setting

Egypt is administratively divided into twenty-six governorates in addition to the City of Luxor, which is given a special administrative status similar to that of a governorate. Each governorate is

further divided into a number of Administrative Centres "Marakez"[1]. Egypt has a total of 180 of these Administrative Centres, 213 Cities, 74 Neighbourhoods and 4,632 Villages[2].

Socioeconomic features of the influence area of the project vary considerably along that long stretch of the railway. Communities inhabiting that area include affluent communities of high economic sectors of Cairo and Giza and Port Said, as well as poorest of the poor of the Egyptian society in informal urban areas and in remote villages. The greatest part of the railway corridor runs through rural areas where the main economic activity is agriculture. A great variety of crops are cultivated in that part of the valley, but the most common are wheat, corn, cotton, and vegetables, as well as groves of citrus and other fruit trees. The line also cuts through urban areas with more diverse economic activities.

Areas around the main train station in larger towns are usually the local hubs of economic activities. Some of the businesses in these areas are directly dependent on the operation of the railway service (such as local passenger transportation, restaurants, coffee shops, etc.). Others also benefit from high demands for goods and services created by the movement of the large number of train users who frequent the train station area.

The railway corridor is walled within urban areas, allowing vehicular traffic and pedestrian crossing through level crossings that have different degrees of traffic control measures. These level crossings invariably form traffic bottlenecks, particularly in larger, more crowded area. Informal crossings created by breaching the protective walls are extremely common and create a major hazard to its users and the passing trains.

Poverty

The poverty rate is highest in Upper Egypt and specifically rural Upper Egypt (51.5 %), followed by urban Upper Egypt (29.4 %) and it is the least prevalent in Urban Governorates (9.6 %); the same applies to the poverty gap and the squared poverty gap[3,4].

Poverty in Upper Egypt is mainly structural/chronic poverty that is driven by lack of adequate public infrastructure, private capital accumulation, and low investment in human capital and the absence of pro-poor program-based fiscal policy, which collectively lead to deterioration in living standards in Upper Egypt, compared to other regions. (CAPMAS, Population Department)

E.5 Environmental and Social Impact Assessment

E-5-1 Key environmental and social impacts

The environmental and social impacts identified during the construction phase include the following key impacts:

[1] Earth Trends Country Profiles (2003), Population, Health and Human Well Being - Egypt

[2] Year Book (2007) Egypt State Information Service.

[3] The poverty gap index amounted to 35.3% compared to 5.9% at the level of total rural Egypt.

[4] Geographically, Egypt is divided into seven regions: Metropolitan including Cairo, Alexandria, Port Said and Suez governorates which are fully Lower Urban and Lower Rural which include urban and rural areas of Damietta, Dakahlia, Sharkia, Qualiobia, Kafr el Sheikh, Garbeyya, Menoufia, Beheira, Ismailia governorates, Upper Urban and Upper Rural which include urban and rural areas of Giza, Bani Suef, Fayoum, Menia, Asyut, Sohag, Qena, Aswan and luxor governorates, and Border Urban and Border Rural which include urban and rural areas of Red Sea.

During the Operation phase, the main positive impacts are:

- increased safety and reliability of the national railway service and,
- decrease (or nearly elimination) of train-related accidents, which either involve derailments of the trains, and train to vehicle accidents at road crossings;
- improvement of safety for rail transport will therefore benefit both women and men in terms of reduced injuries and fatalities;
- increase mobility of people who use trains to travel to work, business, health and education centres, and for leisure purposes.

During the construction and operational phases of the railway project, *negative environmental risks and impacts include:*

- *Soils and water* contamination during construction works due to leaks from temporary office septic tank; *accidental spills of hydrocarbons* from construction machinery and diesel generators;
- *Noise and vibration* generation by diesel generators and trucks at certain durations of the day and in particular between 4 pm and 6 am;
- *Construction site waste* consisting of soil and debris, used wiring cables, organic waste and food residuals, paper, plastic, scrap cables and spent oil;
- Poor management of occupational health and safety may lead to accidents, injuries and illnesses among workers. In the absence of an effective management system and OHS plans, the following risks/challenges may occur (Physical hazards from equipment and vehicles, Fire, Slippage, lifting, excavation, trains accidents, electrical hazards, and poor working conditions including the presence of nearby and accessible sanitation services, breaks at appropriate timing, discrimination, forced and child labour;
- *Trespassers* on rail lines and facilities may incur risks from electrical lines and equipment, and hazardous substances; *reckless driving* by truck drivers delivering construction materials to the site will be sources of potential accidents to road users and pedestrians;
- *Sanitation* concerns for the construction crew could occur as workers at the construction site will require sanitation facilities during construction period, which if not well maintained and cleaned, may lead to outbreaks of illnesses mainly at the time the Covid-19 pandemic;
- *Unexpected train delays* due to reduction of train speed at the project's construction sites will result in longer train trip time are the key E&S risks and potentials impacts related to the installation of the ATP systems.
- While the current maximum speed on the two lines is 120 km/hr, a maximum speed of 140 to 160 km/hr may be considered. With the extremely common illegal pedestrian and vehicle crossing of the railway tracks all along these lines, as well as the apparent inadequate control over open level crossings, the issue of safety becomes even more pressing.
- Public services and infrastructure represent another important impact area that might potentially be affected by the project as they use the level crossing for their daily commute. This includes elements such as public transportation, local traffic and traffic control services, emergency services and public safety, and to a lesser extent education, and health care, shopping, and employment opportunities, which can be indirectly influenced by the project construction activities.

Following the completion of the ATP installation, maintenance may be necessary at regular or irregular intervals, or due to system failure. As a result, any of the construction impacts may re-occur.

The results of environmental and social impacts identification and assessment are shown in Table E-2. It is not expected that the operation of the ATP to have any potential risks and impacts other than the listed above, and only if the maintenance work has involved excavation and/or replacement of the cables.

E-5-2 Cumulative impacts

Cumulative impacts are expected from the on-going implementation of other components of the ENRMP. Indeed, the overall project involves the railway service that is being used by millions of Egyptians. It also covers a very large geographical area along almost the entire length of the Egyptian Nile Valley. If all the components are being implemented in parallel at the same period, communities are expected to be affected by the project therefore, include those living in areas adjacent to the railway corridor, daily commuters using different sections of the lines, and the general populations of the areas linked by the lines who directly or indirectly benefit from the railway service to different degrees.

Most of the potentially adverse impacts of the project are expected to occur during the construction phase of the project mainly when several contractors and subcontractors are commissioned at the same time. Construction will involve activities that may affect the local communities and environmental conditions at the construction sites and may also directly or indirectly affect the surrounding areas. Construction process will also certainly result in temporary impacts that will affect users of the lines or those directly or indirectly dependent on the services rendered by these lines. Environmentally important activities of the construction phase for the different ENRMP components are linked to the removal of old tracks and cables and installation of communication and power cables, installation of track-side and on-board locomotive equipment; transport of construction material, storage of construction material; finishing work (painting, tiling, plumbing, and electrical, noise pollution, storage and disposal of construction solid waste). The ATP installation, subject of this ESIA, involves digging a 2 m long trench (relatively small trench) every approximately 1 km along the track. This activity is not expected to exaggerate the impacts resulting from the other components due to the fact that the associated risks and impacts are much less as compared with the other components. The potential impacts of ATP installation will therefore be fully diluted within ENRMP different activities. An inclusive and agreed work plan under the leadership of ENR will completely avoid any risk of potential cumulative impacts resulting from ATP installation.

E-5-3 Management of residual impacts

Very little negative residual impact is expected after mitigation measures have been applied. This assessment of residual impacts is presented in the summary table of impacts and measures. The environmental management and monitoring plan in the ESMP will minimise the residual impacts and ensure effective monitoring of the components likely to be affected by the project so that no significant residual negative effects occur. The EPC company will have to draw up a construction ESMP (ON site ESMP) to ensure compliance with the Bank's ISS requirement and applicable national regulations before the start of construction work.

Table E-2: Summary of Environmental and Social Impact Assessment Results

	Project activity/aspect \ Impact	(Hydro)Geology	Pollution of soils and water	Air quality	Noise & vibration	Resources and waste	Energy Efficiency & GHG emissions	Biodiversity**	Displacement of People, Property, Assets & Resources	Livelihood impacts	Cultural Heritage	Community Health, Safety & Security	Traffic and difficulty of access impacts	Workforce-Community Interactions	Labour & Working Conditions	Train trip delays
Construction Phase	Hauling of construction materials and equipment (if any*)															
	Storing of construction materials															
	Excavation, preparing and placing the cables and filling back the trench															
	Operation of Diesel-fuelled generators															
	Workers Influx															
	Building and operating on-site temporary contractors' offices															
	Removal of old cables Cables															
	Disposal of old cables															
	Maintenance of ATP system:															

Major Moderate Minor

E.6 Environmental and Social Management Plan

ESMP approach

The Environmental and Social impact reduction plans are compilation of the mitigation and monitoring measures for the impacts previously identified and assessed in Chapter 5, while indicating the implementation and supervision responsibilities for both the mitigation and monitoring measures. There is one plan, that is for the construction phase, but is applicable to any maintenance works that include construction activities. For each impact, verifiable monitoring indicators, reporting requirements, responsibilities and an estimate of the budget required are included. Internal monitoring measures indicated in the ESMP tables refer to **auditing measures** to be taken on a regular basis by the contractor, supervising consultant and ENR to ensure the correct implementation of impact mitigation measures. External monitoring visits/measures are yet to be determined depending on agreements between the concerned parties (Owner/Lender), in addition to any regulatory visits.

As per the Bank ISS, mid-term and project completion E&S compliance and performance Audits should be conducted by the project management unit through a contracted independent Consultant. Indeed, Projects which have been effectively implemented for at least one year is due for E&S performance Audit. As such, they are due for an Environmental and Social Compliance Audit in order to ensure that the projects are being implemented in compliance with the loan conditions/agreements; applicable national regulations and AfDB's Integrated Safeguard System operational safeguard policies and their requirements. As such the E&S Compliance and Performance Audits will have to be undertaken before the end of the 2nd year and each following year.

The budget given for each management measure is an estimate, calculated based on an average man-day costs in EGP. It also considers the material costs of implementing measures, wherever possible. The budget is presented in both investment expenditure (CAPEX) and operational expenditure (OPEX).

Roles and Responsibilities

This section describes the overall organisation of environmental and social management for implementation of the ESMP during construction and operation phases. Detailed roles and responsibilities are clarified in the ESMP table.

Project Owner (ENR):

As Project developer and owner, ENR will take general responsibility for correct application of the ESMP and provision of necessary resources for its implementation via its Environmental Department, the Project Management Unit (PMU), and contractors. The latter shall hire an EHS Manager(s), with at least 8 years of experience demonstrating sufficient level of expertise and should have proper accreditation. During the construction phase, the Environmental Department will be responsible for the supervision of the correct implementation of the ESMP as per the Bank ISS requirements and national regulations and conditions laid on the environmental permit delivered by EEAA, by reviewing Contractor's EHS reports, conducting

site visits where required and preparing reports to Lending institutions or regulatory authorities as required. This will be performed in full coordination with the PMU.

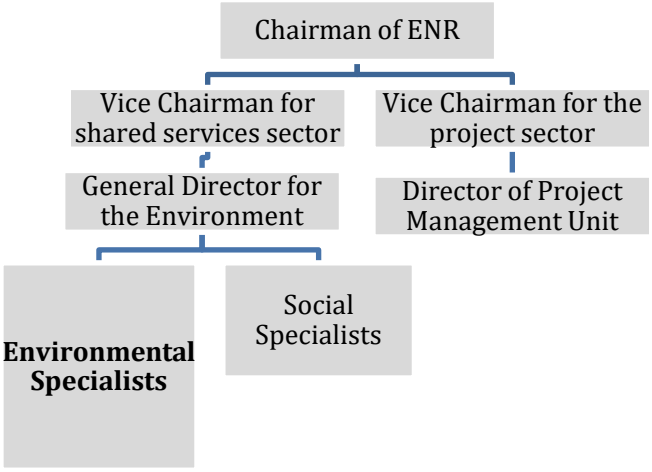
The General Director of the Environment Department, along with his environmental and social specialists, will be notably responsible for:

- Implementing and monitoring the ESMP;
- Coordinating and leading awareness campaigns and capacity building needs;
- Coordinating with main contractor with regard to ESMP requirements;
- Responding to the results of internal and external (lenders or regulatory) monitoring visits/ inspections;
- Supervising the reception, registration and correct processing of any complaints/grievances received from the different stakeholders;
- Prepare and deliver reports on the ESMP and EHS performance as required to Lending and/or regulatory institutions.

Institutional capacity building plan

To enable all actors to play their role, it is necessary to strengthen their capacities on environmental and social issues related to the project. The environmental and social specialists have been involved in managing the ENRMP previous phases and will be able to manage the current project based on their previous experience. However, capacity building and training will be required as a fresher and also in order to train them on the AfDB E&S safeguards to which they are less familiar with. Please refer to the section below for the proposed training and capacity building topics.

ENR shall develop a capacity-building program for both the Environmental Department and hired contractor on the implementation and monitoring of the ESMP. The contractor shall train his workers on the ESMP implementation including EHS requirements during the induction session or by conducting additional sessions, this shall be performed before the commencement of any work to prevent exposure to construction activities associated and be made aware of national regulatory requirements, the additional Bank's requirements as per the ISS requirements.



List of required plans and procedures

Below is a list of the plans (and procedures) which shall be developed by the contractor and ENR in order to implement the ESMP during the construction and operation phases.

- Waste Management Plan;
- Construction Activity Pollution Prevention Plan;
- Emergency preparedness and response plan (to include fire, medical, train accidents, security emergencies and environmental incidents);
- Occupational Health and Safety Plan;
- Workers code of conduct;
- Project and Workers Grievance Redress Mechanism;
- Stakeholders Engagement Plan.

Guidance on the content of the different plans and procedure is given in relevant sections within the ESMP tables. All plans should **at minimum** specify the following in addition to the management requirements: applicable local and international legal standards, roles & responsibilities of the plan/ implementation procedures, non-conformity management, review and monitoring and training requirements where applicable. Where needed, separate plans should be prepared for the construction and operation phase (maintenance work) in order to take into account, the differences of activities and site arrangements of both phases (e.g. differences in waste collection/storage points and disposal frequencies).

Budget estimate for ESMP implementation

The costs for ESMP implementation have been estimated and are shown below (Table E-3). The budget is including the cost estimation for the ESMP implementation for Benha – Port Said, Cairo – Beni Suef, as well as for the updated ESMP for Beni Suef – Asyut – Nagh Hammadi and the updated ESMP for Cairo – Alexandria. Thus, the budget below is covering all parts of the project.

Table E-3: Budget estimate for ESMP implementation.

Project Phase	Aspect	Fixed/Annual cost	Mitigation and Monitoring costs	
			EGP	USD
Pre-Construction	Training workshop for ENR Staff on ESMP mitigation measures, supervision and monitoring	Fixed	30,000	1,900
Pre-Construction	Waste Management Plan for all lines	Fixed	90,000	5,700
Pre-Construction	Construction Pollution Activity Prevention Plan for all lines	Fixed	90,000	5,700

Pre-Construction	Stakeholders Engagement Plan for all lines	Fixed	150,000	9,600
Public awareness and sensitization	Local communities at level crossings and trains users at train station	Before and during construction	750,000	48,000
Total (Fixed costs)			**1,110,000**	**70,900**
Construction	Ambient Air Quality for all lines	Annual	144,000	9,000
Construction	Ambient Noise for all lines	Annual	18,000	1,140
Construction	Refresher training workshop for ENR Staff on ESMP mitigation measures, supervision and monitoring	Annual	30,000	1,900
Construction	E&S compliance and performance audits by an independent consultant for all lines (each year)	Annual	240,000	15,400
Total (Annual costs)			**432,000**	**27,500**
Total (Annual costs; Total for 5 years)			**2,160,000**	**137,500**
Total (Fixed + Annual costs for 5 years)			**3,270,000**	**208,400**

Grievance Mechanism

Given the nature of the project activities, the most effective mitigation measure for the identified risks will be ensuring that project beneficiaries and project-affected people are actively involved. In this regard, there are two main tools through which this can be achieved: (i) raising public awareness and carrying out mandatory public displays; and (ii) establishment of a viable grievance redress mechanism (GRM).

***Raising public awareness*:** Information about the grievance handling system described below will be distributed at an early stage of the project to all project affected people through regular information channels used by the project. This includes initiating meetings at the start of the project where feasible, public meetings during project implementation, brochures/pamphlets in Arabic language and posting on notice boards and online when necessary. The process of raising a complaint should be explained by reaching out the community or by conducting a meeting with community representatives. It is important that community representatives include women at all times.

Grievance Redress Mechanism: Transparency and accountability should be core elements of the Project. Comprehensive GRM will be set up for all subprojects to account for all potential complaints arising from the project's potential impacts. In addition to the main project GRM, two additional GRMs will be developed by the contractor; one for the community and the second for the workers.

The goal of the GRM is to increase transparency and accountability and to reduce the risk of the project inadvertently affecting citizens and serves as an important feedback and learning mechanism that can help improve project impact. The objective will be to provide channels for project stakeholders to provide feedback on project activities via a mechanism that allows for the identification and resolution of issues affecting the project, promptly and effectively in a culturally appropriate manner and at no cost. This includes safeguards-related complaints pertaining to this ESIA and the AfDB safeguards policies as a whole.

A project specific GRM for complaints handling will be developed at ENR with dedicated personnel from the Environmental and Social departments and made accessible to all.

As a minimum, the project will establish the following channels through which citizens/beneficiaries/ PAPs can make complaints regarding project-funded activities:

a) A dedicated email address;

b) A dedicated phone line;

c) A dedicated address to send written letters;

d) Feedback boxes located at project sites;

e) Verbal or written complaints to community leaders, or project staff directly or through project meetings. If project stakeholders provide verbal feedback/complaint, project staff will lodge the complaint on their behalf, and it will be processed through the same channels;

f) Periodic project meetings, each of which shall include women.

The GRM should comprise of a set of operating procedures to ensure successful implementation. The procedures would include the following set of measures as a minimum:

- Receive and register complaints;
- Grievance's document verification;
- Conduct field inspections in order to verify and confirm the authenticity and eligibility of the reported grievance. The field inspection could include interviews with different parties involved;
- Referring cases to other GRMs, if necessary and/or to the courts;
- Referring cases to a third party;
- Track, and evaluate the process and results.

In case an agreement could not be reached, the borrower could play the role of a mediator via well-trained voluntary mediators following a pre-set time frame.

Contractor's Grievance Mechanism

The borrower will include the construction-related GRMs into the contractor's terms of references and contracts. Accordingly, the contractor will establish an external GRM (for the community) and an internal one for the workers. The respective Contractor shall disclose the GRM on a board that is easily legible and accessible at all worksites. For the community GRM, a multi-stage mechanism will be used comprising of but not necessarily limited to the stages listed below:

a) **Stage 1**, any person aggrieved by any aspect can lodge a grievance to the Contractor, which in turn should provide resolution within 10 calendar days;

b) **Stage 2**, if the aggrieved person is not satisfied with the decision of the Contractor during Stage 1, she (he) can present the case to the supervising company to resolve within 10 calendar days.

c) **Stage 3**, if the complainant is still dissatisfied with the outcome of stage 2, she (he) can escalate the complaint to ENR to resolve the issue within 15 calendar days.

Environmental and Social Management and Monitoring Plans

Table E-4 shows the project's ESMP including the required mitigation and monitoring measures and indicates the roles and responsibilities associated with implementation and supervision. The contractor shall implement all the mitigation measures and monitor their effectiveness according to the plan. The contractor shall submit a monthly Environmental and Social progress report and quarterly Environmental Measurement reports to ENR highlighting the implementation of ESMP commitments as stated in the different sections of the plan. The quarterly reports shall highlight non-conformances (in case of exceedances of Egyptian and/or WBG EHS standards).

For the Beni Suef – Asyut – Nagh Hammadi, as well as Cairo – Alexandria parts of the line, an ESIA has earlier been conducted. The ESMPs of these earlier ESIAs have been updated and included as Tables E-5 and E-6 respectively.

E.7 Public Consultations

A public consultation meeting (public hearing) was convened at Pyramisa Hotel in Dokki, Cairo on Monday 16th of March 2020, at 10:30 am. The participants included Researchers from the Environmental Research Institutes, technical experts, consultants, media and NGO. In addition to the public consultation, scoping sessions were conducted, as well as interviews and focus group discussions with interested and affected stakeholders. Due to the circumstances surrounding the Covid-19 pandemic, the final public consultation (FPC) with key informant interviews and focus group discussions were conducted via phone and/or remote communication tools. This has been performed on one to one brief interviews, without allowing people to gather. Majority of the people expressed their concern regarding publishing their names or photos. Photographs have not been taken accordingly and contact details have been kept confidential.

Direct invitation letters, Facebook event on Masader's Facebook Page and Newspaper advertisement and an Arabic non-technical Summary of the ESIA study was uploaded to the Consultant's website and

referred to in all communications. The aim was to present the results of the ESIA, as well as the grievance redress management mechanism. The main concerns expressed are: (i) train delays; (ii) jobs created by the project for local people; (iii) safety measures taken during the project; (iv) information on the project: request for precision on the map to see the passage of the line; start date and duration of the project; and (v) reasons for the location of the substations. (See Chapter 8 of the ESIA document and **Annex III** for documentation).

Due to the pandemic, extensive consultations were not possible. It is therefore required to conduct additional consultation during pre-construction phase.

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
a) Pollution of Soils & Water							
Pollution of Soils & Water bodies due to poor solid and liquid waste management practices	Prepare and implement a **Solid and Hazardous Waste and Materials Management Plan** which include arrangements for managing solid and liquid hazardous and non-hazardous waste (to be approved by the supervising consultant and the environmental department before the start of the construction) including but not limited to: ○ Waste minimisation and prevention hierarchy ○ Design a segregation system based on compatibility of different waste streams and based on the recycling services (if locally available) ○ Identification of the types and dimensions of storage means at source for hazardous and non-hazardous wastes ○ Design and construct a central waste storage area for non-hazardous wastes which accommodate for the received segregated streams /or any alternative solution proposed by the contractor ○ Identify the nearest landfill for the disposal	1- Submission and approval of the waste management plans covering at minimum all the aspects detailed in this ESMP (once at the beginning of the project). 2- Submission and approval of the of hazardous substance management procedure (standalone or included in EHS plan) covering at minimum all the aspects detailed in this ESMP. 3- All mitigation measures have been implemented 4- Amounts of solid and hazardous waste sent to landfill/ month 5- Amount of total solid and hazardous waste	Visual inspection of the site and proper use of PPEs	Construction sites	Daily throughout construction	**Contractor:** Development of the required plans. Implementation of plans, internal monitoring and reporting to ENR **ENR:** Reviewing Contractor's plans to ensure their compliance to ENR's EHS	Included in the waste section below
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

[5] Cost estimate refers to the additional cost which the contractor/ENR will need to consider as compared to the conventional

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
	of the non-recycled items ○ Identify a recycling contractor preferably from the nearby villages ○ Waste contractors' certifications and compliance assurance. All waste streams should be transported and disposed of by certified service providers, in compliance with Egyptian regulations and disposed of in licensed landfills/dump sites, including. ○ Training for workers on sound environmental practices to manage solid wastes. ○ Storage spent oils in sealed drums sheltered from the sun until collection ○ Record keeping (waste inventory, waste disposal registers and consignment notes) ○ Complete prohibition dumping of solid and liquid waste in any water body ○ When using diesel generators, place the generator on an impermeable protective base layer. ○ In case of accidental spills of hydrocarbons, isolate and collect the contaminated soil and store as hazardous waste to be disposed of in hazardous waste landfills. ○ For the contractors' temporary offices, use intact septic tanks, free of any leaks and to be regularly emptied before reaching its maximum capacity. ○ Development and implementation of a hazardous substances' management procedure. The procedure should at	generated/month 6- Amount of total solid and hazardous waste reused and/or recycled/month 7- Record of the sewage collection date and amount. 8- Number of Environmental and OHS incidents related to soil and water pollution 9- Number of Environmental and OHS incidents related to hazardous substance management 10- Valid Certificates for all waste contractors and chain of custody 11- Number of complaints related to soil and/or water pollution and time it took to solve them 12- Number of unresolved complaints	Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	weekly	and ESMP requirements. Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
	minimum address the following aspects: operational procedures, procurement, prohibited substances, inventory, risk assessments, labelling, storage, Safety Data Sheets and control measures. The procedure should mention specific measures for the control of risks associated with the use of the diesel fuel for power generation. The management plans and procedures can be standalone documents or part of an overall construction EHS management plan. This shall also include a note on accidental spills of hydrocarbons, and methods of isolation and collection of the contaminated soil and storage as hazardous waste to be disposed of in hazardous waste landfills. ○ Inspection of the site for existing contamination from previous work/ activities. Where inspection results were positive, carefully collect and isolate all the contaminated soil in sealed bags to be disposed in the nearest hazardous waste landfill/treatment facility.						

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
b) Ambient Air Quality							
Dust/PM10 emissions from construction and vehicles movement on unpaved roads PM10, TSP, NOx, SO_2, CO emissions from Diesel-fuelled generators and transport vehicles	Implement a **Construction Activity Pollution Prevention Plan** (to be approved by the supervising consultant and the environmental department before the construction work start) including but not limited to: ○ Store excavation and construction materials such as sand and other friable waste material in ENR designated places and cover them with suitable materials to control and prevent dust generation and minimise spillage. ○ All vehicles used by the contractor to deliver construction materials and/or collect waste materials to and from the site should be completely covered to avoid material spillage. ○ Install a solid fence around the excavation site in all areas adjacent to residential clusters, roads, water bodies and agricultural lands. ○ Implement a preventive maintenance program for vehicles and equipment working on site and promptly repair/replace vehicles, equipment and generators with any visible exhaust fume. ○ Implement best practice site housekeeping measures. ○ Regular maintenance and inspection of equipment and vehicles used on site ○ Favour the purchase of low-sulphur diesel.	1-Construction Activity Pollution Prevention Plan has been prepared and approved 2-All mitigation measures have been implemented 3-Number of complaints received with regards to air quality and dust generation the time it took to solve them. 4-Number of unresolved complaints 5-Results of measurements and % not compliant with applicable legal standards including reasons for non-compliance	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily	**Contractor** Implementation of mitigation measures, internal monitoring and reporting to ENR May hire a third party for the quarterly monitoring measurements or use calibrated instruments approved by ENR. **ENR:** Ensuring the correct implementation of the mitigation and monitoring	EGP 48,000 (USD 3,000) for 8 measurement points (two measurement points per quarter) EGP 30,000 (USD 1,900) for preparing the Construction Pollution Prevention Plan
			Measure ambient air quality parameters (PM10, NOx, SO_2, CO and TSP)	Construction Sites at nearest sensitive receptor and central to the major construction activities	Quarterly		
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		
			Complete a compliance checklist for mitigation actions and measures and conduct a	Construction sites	Weekly		

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
	○ As much as practically possible, construction material and waste should be transported to and from construction sites using cargo trains. ○ Vehicles uploading material should maintain the lowest possible fall height to reduce noise and dust generation.		Documents and records review			measures Review and assurance of Contractor's reports	
c) Noise & Vibration							
Impacts on ambient noise levels	Develop and implement a **noise management procedure** as a standalone document or as a part of an OHS plan. The following measures as a minimum should be covered: ○ Optimise the use of equipment and turn off any equipment when not in use. ○ Use of modern, well-maintained equipment fitted with abatement devices (e.g. mufflers, noise enclosures). ○ Control exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure. ○ Stop all noisy work at night (before 6 am after 6pm)	1- Development of the noise management procedure/OHS plan 2- All mitigation measures have been implemented 3- Number of complaints received with regards to noise associated with the construction work and the time it took to solve them. 4- Number of unresolved complaints 5- Results of noise ambient measurements including reasons for non-compliance (if any)	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to the ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring	EGP 6,000 (USD 380) for 8 measurements (2 per quarter)
			Measure ambient Noise (in case of use of mechanical/ electrical digging equipment and machinery)	Construction Sites at nearest sensitive receptor and central to the major construction activities	Quarterly		
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary		

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
					during the work	measures	
			Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	Weekly	Review of Contractors reports	

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
d) Resources & Waste							
Impacts associated with increased consumption of resources and waste generation	Prepare and implement a **Solid and Hazardous Waste and Materials Management Plan** which include arrangements for managing solid and liquid hazardous and non-hazardous waste (to be approved by the supervising consultant and the environmental department before the start of the construction) including but not limited to: ○ Waste minimisation and prevention hierarchy ○ Design a segregation system based on compatibility of different waste streams and based on the recycling services (if locally available) ○ Identification of the types and dimensions of storage means at source for hazardous and non-hazardous wastes ○ Design and construct a central waste storage area for non-hazardous wastes which accommodate for the received segregated streams /or any alternative solution proposed by the contractor ○ Identify the nearest landfill for the disposal of the non-recycled items and get the required permits. ○ Identify an authorized recycling contractor	1- Submission and approval of the waste management plans covering at minimum all the aspects detailed in this ESMP (once at the beginning of the project) 2- Submission and approval of the of hazardous substance management procedure (standalone or included in EHS plan) covering at minimum all the aspects detailed in this ESMP 3- All mitigation measures have been implemented 4- Amounts of solid and hazardous waste sent to landfill/month	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Development of the required plans. Implementation of plans, internal monitoring and reporting to ENR **ENR:** Reviewing Contractor's plans to ensure their compliance to ENR's EHS and ESMP requirements.	EGP 30,000 (USD 1,900) for preparing the waste management plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
	preferably from the nearby villages ○ Waste contractors' certifications and compliance assurance. All waste streams should be transported and disposed of by certified service providers, in compliance with Egyptian regulations and disposed of in licensed landfills/dump sites, including. ○ Training for workers on sound environmental practices to manage solid wastes. ○ Storage of spent oils in sealed drums sheltered from the sun until collection by authorized service providers ○ Record keeping (waste inventory, waste disposal registers and consignment notes) ○ Complete prohibition dumping of solid and liquid waste in any water body ○ When using diesel generators, place the generator on an impermeable protective base layer. ○ For the contractors' temporary offices, use intact septic tanks, free of any leaks and to be regularly emptied before reaching its maximum capacity. ○ Development and implementation of a hazardous substances' management procedure. The procedure should at minimum address the following aspects: operational procedures, procurement, prohibited substances, inventory, risk assessments, labelling, storage, Safety Data Sheets and control measures. The procedure	5- Amount of total solid and hazardous waste generated/month 6- Amount of total solid and hazardous waste reused and/or recycled/month 7- Record of the sewage collection date and amount. 8- Number of Environmental and OHS incidents related to soil and water pollution 9- Number of Environmental and OHS incidents related to hazardous substance management 10- Valid Certificates for all waste contractors and chain of custody 11- Number of complaints with regards to waste and resources and time it took to solve them 12- Number of unresolved complaints	Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	weekly	Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
	should mention specific measures for the control of risks associated with the use of the diesel fuel for power generation. The management plans and procedures can be standalone documents or part of an overall construction EHS management plan. This shall also include a note on accidental spills of hydrocarbons, and methods of isolation and collection of the contaminated soil and storage as hazardous waste to be disposed of in hazardous waste landfills.						
e) Energy Efficiency & GHGs							
Impacts associated with low energy efficiency and increased GHGs.	Opportunities for reducing GHG emissions, to be adopted by the contractor where **technically and financially feasible**. ○ Adjust work schedule to daytime as much as possible ○ Design and construct thermally insulated temporary offices, with a natural ventilation option to reduce as much as possible the need for mechanical	Total amount of fuel used on site and electricity consumption where applicable	Visual Site inspection and records review	Construction sites	At the beginning of the construction work and monthly after that	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR	Covered in construction cost

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
	ventilation and reduce the associated electricity and GHG emissions. ○ Design and install solar PV system on the roof of the temporary offices to cover basic electricity office needs		Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	Weekly	**ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
f) Biodiversity							
Flora and Fauna Impacts	○ Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan (please refer to section b and d)** ○ Reuse the top-soil layer for filling the trench, which necessitate a method to	1- All mitigation measures have been implemented 2- Number of complaints related to biodiversity and time it took to solve them	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting	Covered in construction cost

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
	differentiate between the different layers of excavated soil. ○ Train workers on reusing the top-soil layer in filling back the trench.	3- Number of unresolved complaints	Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
			Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		
g) Cultural Heritage							
Impacts associated with chance finds	In the unlikely event of encountering a chance-find the following measures are to be taken: - Stop the construction activities in the area of the chance find and delineate the discovered site or area - Secure the site to prevent any damage or loss of	Chance Finds reports	- Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	**Contractor:** Implementation of mitigation measures, internal monitoring	EGP 20,000 (USD1,300) /day and estimated duration is 4 days

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
	discovered objects. - Notify the (ENR's and Contractor's) site managers and EHS supervisors who in turn will notify the responsible local authorities and the Antiquities Authority immediately (within 24 hours). - Responsible local authorities and the Antiquities Authority would be in charge of protecting and preserving the site before deciding on subsequent steps - Construction work can resume only after permission is given from the responsible local authorities and the Antiquities Authority. - Record any chance-finds and the detailed procedure followed to handle them.		Conduct a Documents and records review	Construction sites	In case of chance-finds	and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
h) Community Health, Safety and Security (including traffic and accessibility)							
Poor construction management practices Noise, dust and other types Trespassers on rail lines Level Crossings Safety Impacts related to access	○ Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan.** ○ Prepare and adopt a **Stakeholder Engagement Plan** ○ Clearly place a sign in Arabic language on each construction site stating the objective of the project, duration of the work and the phone number to receive grievances for both the contractor and ENR. The sign should also include a prominent warning to cross the fence boundaries. ○ Securely surround the trench with a solid fence when working adjacent to residential clusters or any area where children are suspected to be present. Only in desert areas, that this fence could be substituted with an open one. ○ Implementation of a health management system for the construction workforce, to ensure through medical check-ups, they are fit for work and that they will not introduce disease into local communities. ○ Prohibit trespassing adjacent to construction	1- Stakeholder Engagement Plan prepared and approved 2- All mitigation measures have been implemented 3- Number of community health and safety-related complaints received and the time it took to resolve them 4- Number of unresolved complaints 5- % drivers trained on safe driving procedures 6- Number of accidents associated with community, trespassers, or railway users. Serious injuries and fatalities are to be reported to relevant	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of	EGP 50,000 (USD 3,200) for preparing a SEP Other measures should be Covered in the construction costs covered by other sections of this plan EGP750,000 (USD48,000) for the public awareness and
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
restrictions and commuting disruptions Construction works induced traffic: Train trips delays	sites. ○ Instruct all vehicles drivers contracted by the project on safe driving guidelines. ○ When working near residential clusters, photo-document the condition of the nearest residential building to the trench before beginning the construction work. ○ Implement an Emergency Response Plan to manage major incidents if they should occur, such as train accidents in the vicinity of the construction site. ○ Prepare and implement a project and workers **Grievance Redress Mechanism (GRM)** ○ Negotiate construction schedule with ENR to minimise train delays and associated adverse impacts. ○ Re-schedule train timetable considering the expected delays where necessary and disclose the modified time-table to the public. This procedure is already being adopted by ENR for their current projects. ○ A public awareness campaign on railway safety, ○ Ongoing identification, evaluation and monitoring of potential community health and safety risks ○ No exposed, hot power cables should be left unattended at any time. ○ Storage of track units or construction material should be allowed on ENR's storage yards in a way that will not affect traffic or pose any risk to communities adjacent to the railway	authorities and ENR immediately/as soon as practicable.	Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly	Contractors reports	sensitization campaign

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
	corridors. o Conduct a communication campaign prior to construction kick-off to inform commuters.						
	i) Workers Influx/Workforce-Community Interactions						
Temporary Labour Influx Increased risk of illicit behaviour and crime Risk of	- Prepare and adopt a **Stakeholder Engagement Plan (SEP)**, as a framework for early and ongoing community consultation. - Prepare and implement a project and workers **Grievance Redress Mechanism (GRM)** - Develop work procedures, defining a **Code of Appropriate Conduct** for all workers, including acceptable behaviour with respect to community interactions and train workers - Provision of information regarding Worker Code of Conduct in local language. - Address risks in Workers Code of Conduct - Contractor to avoid hiring "at the gate" to discourage spontaneous influx of job seekers.	1- The Code of Conduct has been prepared and formally adopted 2- Number of complaints received from the community with regards to workers' behaviour in general and the time it took to solve them. 3- Training records 4- All mitigation measures have been implemented (in	Visual Inspection of the site, workers, equipment and vehicles Dated Photo documentation of the site conditions	Construction sites Construction sites	Daily throughout construction Before entering the site and as necessary during the work	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct	Covered in the construction costs and by other sections of this plan

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
social conflict	- Train all workers on GBV risks and related sanctions. - Ensure that management and security staff are adequately trained to identify and eradicate all forms pertaining to GBV and gender-based discrimination. - Introduction of strict sanctions (e.g. dismissal) for workers involved in any form of abuse, inappropriate behaviour or GBV	specific those related to the code of conduct including GBV and other labour influx risks,) 5- % of workers trained on Code of Conduct 6- % of workers trained on GBV	Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly	implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
j) Labour & Working Conditions							
<u>Occupational health & safety impacts</u> - Physical hazards from demolition waste - Physical hazards from	The Contractor shall prepare and adopt an **Occupational health and safety plan** (OHS) and an **Emergency preparedness and response plan** (EPRP) to include fire and medical emergencies, complying with the Egyptian Labour law No. 12 for 2003 during the construction phase and addressing the following aspects as minimum: o Hire an accredited Health & Safety professional o Identification of hazard sources to workers and identifying solutions to eliminate them o Workers must be trained to recognise potential hazards including electrical	1- The OHS and EPRP have been prepared and formally adopted 2- All mitigation measures have been implemented Undertake checks on workers right to work (including work permits, age etc.); 3- Reports on any accidents, hazardous events, as well as	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the	Covered in the construction costs and by other sections of this plan

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
equipment and vehicles - Fire Hazard - Slippage and Falling & Working at heights - Manual handling and lifting - Electrocution - Traffic and accessibility <u>Sanitation concerns for the construction crew:</u> Illnesses and Covid-19	hazards, use proper work practices and procedures, recognise adverse health effects, understand the physical signs and reactions related to exposures, and are familiar with appropriate emergency evacuation procedures. They must also be trained to how to use the Personal Protective Equipment (PPE). ○ Inspection and testing of all equipment and machines ○ Preparation of an emergency response plan ○ Provision of appropriate and enough first aid equipment, fire extinguishers in good working conditions on site and sand buckets ○ Create strictly No-Smoking zones in fire risk areas such as fuel storage areas and excavations ○ Strictly avoid excavations in areas with residential natural gas connections or works near natural gas piping ○ Follow latest WHO and national measures on Covid-19 as relevant ○ Regular inspection of workers against pathogenic agents and provision of immunization when needed ○ Identify and provide contacts of closest authorities and emergency services to contact in case of emergencies ○ Provision of full PPE including suitable footwear to avoid slippage and to protect ○ Workers exposed to noise exceeding	records and reports on health, safety and welfare of workers 4- Condition of fire extinguishing instruments 5- Condition of flammable material containers & storage 6- Availability & usage of PPEs 7- Condition of Rest Facilities 8- Workers right to work (including contracts, age etc.) and Inclusion of minimum labour standards in all workers contracts 9- % of site employees trained on OHS, emergency procedures and GRM 10-OHS statistics such as fatalities, injuries, lost time incidents, first aid cases. 11-Development of the Ethical Procurement Policy 12-Contractor-workers'	Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
			Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		

Table E-4 : ESMP for Cairo-Beni Suef and Benha –Port Said

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[5]
Fatigue	permissible levels (e.g. ballast uploading) should wear hearing protection.	contracts. 13-Number of complaints received, number solved and the time it took to solve them. 14-Number of unresolved complaints					
Total cost of the ESMP (Estimated overall budget (itemized matrix) for the implementation of all environmental and social measures (in local currency, EGP, and U.S. dollars, by source of funds) including provisions for E&S compliance and performance audits by an independent consultant for all lines estimated at an annual cost of EGP 240000 (USD 15400) and also including an initial training session for ENR Staff on ESMP implementation estimated at a cost of EGP 30,000 (USD 1900) , to be repeated annually during construction at a cost of EGP 30,000 (USD 1900))						**Fixed costs** EGP 890,000 (USD 56,700) **Annual costs** EGP 324,000 (USD 20,500) **Total Annual costs (for 5 years)** EGP 1,620,000 (USD 102,500)	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
PRE-CONSTRUCTION /DESIGN PHASE							
Land acquisition/ Livelihood or assets impacts due to Land allocation for CTC and MTBs along the railway corridor	ENR to maintain their avoidance strategy for any land with any uses as a priority action. RPF was prepared stipulating the principles to be followed in case this impact is encountered. RAPs and ARAPs should be prepared as needed for individual cases where land and livelihoods loss will be encountered as an impact. All efforts be made to allow for harvesting of crops prior to any land-related impacts. The contractor should comply with the avoidance strategy of ENR and should provide regular reporting supporting that to ENR. If the technical requirements of certain location made it impossible for the contractor to secure full avoidance, the various options should be discussed with ENR and reported to the Bank and actions should be taken accordingly (including preparing safeguards instrument such as RAP/ARAP) A robust and multi-channels project level Grievance Redress Mechanism (GRM[7]) to be developed and used	Documentation of the sharing sessions and consultations ESMP in Arabic GRM in place and known to local community - Number of complaints that were resolved and the time it took to resolve them Number of unresolved complaints Preliminary assessment report of land and livelihoods/assets loss	Review and audit	Construction sites	At the beginning of the construction phase then weekly	**Contractor:** Implementation of avoidance strategy and mitigation measures Reporting to ENR **ENR:** PMU with support from the WB will maintain land avoidance strategy, Reviewing Contractor's	Included in the waste section below

[6] Cost estimate refers to the additional cost which the contractor/ENR will need to consider as compared to the conventional

[7] Grievance Redress Mechanism

ENR has a department for complaints at their headquarters in Cairo, to which any person can file a complaint. ENR has also dedicated 2 phone lines (01274422925 - 0225753555) in addition to a hotline (147) for complaints related to ENR in general. There is no specific channel dedicated for the project; and since the project's geographic scope will be extended, the following multi-stage mechanism shall be adopted.

a) Stage 1, any person aggrieved by any aspect of the resettlement document can lodge an oral or written grievance to the Contractor, which in turn should provide resolution within 10 calendar days;

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
	ENR to conduct site specific information sharing session and consultation prior to the commencement of any works. Ensure that the local communities have access to the ESMP, RPF and subsequent ARAP/RAPs.in local language and are aware of the contractors' commitments. ENR to ensure dissemination of the GRM to local communities and potential PAPs prior to starting construction activities.	for selected locations for MTBs RAPs & ARAPs				performance and ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

b) Stage 2, if the aggrieved person is not satisfied with the decision of the Contractor at Stage 1, he can present the case to the Consulting/Supervision Company to resolve within 15 calendar days.
c) Stage 3, if the complainant is still dissatisfied with the Consulting/Supervision Company's decision, he can escalate the complaint to ENR to resolve the issue in 15 calendar days.

The respective Contractor shall disclose the grievance redress mechanism on a board that is easily legible and accessible at all worksites.

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
a) Pollution of Soils & Water							
Pollution of Soils & Water bodies due to poor solid and liquid waste management practices	Prepare and implement a **Solid and Hazardous Waste and Materials Management Plan** which include arrangements for managing solid and liquid hazardous and non-hazardous waste (to be approved by the supervising consultant and the environmental department before the start of the construction) including but not limited to: ○ Waste minimisation and prevention hierarchy ○ Design a segregation system based on compatibility of different waste streams and based on the recycling services (if locally available) ○ Identification of the types and dimensions of storage means at source for hazardous and non-hazardous wastes ○ Design and construct a central waste storage area for non-hazardous wastes which accommodate for the received segregated streams /or any alternative solution proposed by the contractor ○ Identify the nearest landfill for the disposal of the non-recycled items ○ Identify a recycling contractor preferably from	1- Submission and approval of the waste management plans covering at minimum all the aspects detailed in this ESMP (once at the beginning of the project). 2- Submission and approval of the of hazardous substance management procedure (standalone or included in EHS plan) covering at minimum all the aspects detailed in this ESMP. 3- All mitigation measures have	Visual inspection of the site and proper use of PPEs	Construction sites	Daily throughout construction	**Contractor:** Development of the required plans. Implementation of plans, internal monitoring and reporting to ENR **ENR:** Reviewing Contractor's plans to ensure their compliance to ENR's EHS	Included in the waste section below
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
	the nearby villages ○ Waste contractors' certifications and compliance assurance. All waste streams should be transported and disposed of by certified service providers, in compliance with Egyptian regulations and disposed of in licensed landfills/dump sites, including. ○ Training for workers on sound environmental practices to manage solid waste ○ Storage spent oils in sealed drums sheltered from the sun until collection ○ Record keeping (waste inventory, waste disposal registers and consignment notes) ○ Complete prohibition dumping of solid and liquid waste in any water body ○ When using diesel generators, place the generator on an impermeable protective base layer. ○ In case of accidental spills of hydrocarbons, isolate and collect the contaminated soil and store as hazardous waste to be disposed of in hazardous waste landfills. ○ For the contractors' temporary offices, use intact septic tanks, free of any leaks and to be regularly emptied before reaching its maximum capacity. ○ Development and implementation of a hazardous substances' management procedure. The procedure should at minimum address the following aspects: operational procedures, procurement, prohibited substances, inventory, risk assessments, labelling, storage, Safety Data	been implemented 4- Amounts of solid and hazardous waste sent to landfill/ month 5- Amount of total solid and hazardous waste generated/month 6- Amount of total solid and hazardous waste reused and/or recycled/month 7- Record of the sewage collection date and amount. 8- Number of Environmental and OHS incidents related to soil and water pollution 9- Number of Environmental and OHS incidents related to hazardous substance management 10- Valid Certificates for all waste	Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	weekly	and ESMP requirements. Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
	Sheets and control measures. The procedure should mention specific measures for the control of risks associated with the use of the diesel fuel for power generation. The management plans and procedures can be standalone documents or part of an overall construction EHS management plan. This shall also include a note on accidental spills of hydrocarbons, and methods of isolation and collection of the contaminated soil and storage as hazardous waste to be disposed of in hazardous waste landfills. ○ Inspection of the site for existing contamination from previous work/ activities. Where inspection results were positive, carefully collect and isolate all the contaminated soil in sealed bags to be disposed in the nearest hazardous waste landfill/treatment facility.	contractors and chain of custody 11- Number of complaints related to soil and/or water pollution and time it took to solve them 12- Number of unresolved complaints					

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
			b) Ambient Air Quality				
Dust/PM10 emissions from construction and vehicles movement on unpaved roads PM10, TSP, NOx, SO_2, CO emissions from Diesel-fuelled generators and transport vehicles	Implement a **Construction Activity Pollution Prevention Plan** (to be approved by the supervising consultant and the environmental department before the construction work start) including but not limited to: o Store excavation and construction materials such as sand and other friable waste material in ENR designated places and cover them with suitable materials to control and prevent dust generation and minimise spillage. o All vehicles used by the contractor to deliver construction materials and/or collect waste materials to and from the site should be completely covered to avoid material spillage. o Install a solid fence around the excavation site in all areas adjacent to residential clusters, roads, water bodies and agricultural lands. o Implement a preventive maintenance program for vehicles and equipment working on site and promptly repair/replace vehicles, equipment and generators with any visible exhaust fume. o Implement best practice site housekeeping measures. o Regular maintenance and inspection of equipment and vehicles used on site o Favour the purchase of low-sulphur diesel. o As much as practically possible, construction material and waste should be transported to and from construction sites using cargo trains. o Vehicles uploading material should maintain the	1- Construction Activity Pollution Prevention Plan has been prepared and approved 2- All mitigation measures have been implemented 3- Number of complaints received with regards to air quality and dust generation the time it took to solve them. 4- Number of unresolved complaints 5- Results of measurements and % not compliant with applicable legal standards including reasons	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily	**Contractor** Implementation of mitigation measures, internal monitoring and reporting to ENR May hire a third party for the quarterly monitoring measurements or use calibrated instruments approved by ENR. **ENR:** Ensuring the correct implementation of the mitigation and monitoring	EGP 48,000 (USD 3,000) for 8 measurement points (two measurement points per quarter) EGP 30,000 (USD 1,900) for preparing the Construction Pollution Prevention Plan
			Measure ambient air quality parameters (PM10, NOx, SO_2, CO and TSP)	Construction Sites at nearest sensitive receptor and central to the major construction activities	Quarterly		
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		
			Complete a compliance checklist for mitigation actions and measures and	Construction sites	Weekly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
	lowest possible fall height to reduce noise and dust generation. o Old, often contaminated ballast basalt should be removed to a government-designated dumpsite for disposal or for decontamination for future use. o Transportation of old ballast should be only in covered tracks to avoid spillage	for non-compliance	conduct a Documents and records review			measures Review and assurance of Contractor's reports	
c) Noise & Vibration							
Impacts on ambient noise levels	Develop and implement a **noise management procedure** as a standalone document or as a part of an OHS plan. The following measures as a minimum should be covered: o Optimise the use of equipment and turn off any equipment when not in use. o Use of modern, well-maintained equipment fitted with abatement devices (e.g. mufflers, noise enclosures). o Control exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure. o Stop all noisy work at night (before 6 am after 6pm)	1- Development of the noise management procedure/OHS plan 2- All mitigation measures have been implemented 3- Number of complaints received with regards to noise associated with the construction work and the time it took to solve them. 4- Number of unresolved	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to the ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring	EGP 6,000 (USD 380) for 8 measurements (2 per quarter)
			Measure ambient Noise (in case of use of mechanical/ electrical digging equipment and machinery)	Construction Sites at nearest sensitive receptor and central to the major construction activities	Quarterly		
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
		complaints 5- Results of noise ambient measurements including reasons for non-compliance (if any)			during the work	measures	
			Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	Weekly	Review of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
			d) Resources & Waste				
Impacts associated with increased consumption of resources and waste generation	Prepare and implement a **Solid and Hazardous Waste and Materials Management Plan** which include arrangements for managing solid and liquid hazardous and non-hazardous waste (to be approved by the supervising consultant and the environmental department before the start of the construction) including but not limited to: ○ Waste minimisation and prevention hierarchy ○ Design a segregation system based on compatibility of different waste streams and based on the recycling services (if locally available) ○ Identification of the types and dimensions of storage means at source for hazardous and non-hazardous wastes ○ Design and construct a central waste storage area for non-hazardous wastes which accommodate for the received segregated streams /or any alternative solution proposed by the contractor ○ Identify the nearest landfill for the disposal of the non-recycled items and get the required permits. ○ Identify an authorized recycling contractor preferably from the nearby villages ○ Waste contractors' certifications and compliance	1- Submission and approval of the waste management plans covering at minimum all the aspects detailed in this ESMP (once at the beginning of the project) 2- Submission and approval of the of hazardous substance management procedure (standalone or included in EHS plan) covering at minimum all the aspects detailed in this ESMP 3- All mitigation measures have been	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Development of the required plans. Implementation of plans, internal monitoring and reporting to ENR **ENR:** Reviewing Contractor's plans to ensure their compliance to ENR's EHS and ESMP requirements.	EGP 30,000 (USD 1,900) for preparing the waste management plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
	assurance. All waste streams should be transported and disposed of by certified service providers, in compliance with Egyptian regulations and disposed of in licensed landfills/dump sites, including. ○ Training for workers on sound environmental practices to manage solid wastes. ○ Storage of spent oils in sealed drums sheltered from the sun until collection by authorized service providers ○ Record keeping (waste inventory, waste disposal registers and consignment notes) ○ Complete prohibition dumping of solid and liquid waste in any water body ○ When using diesel generators, place the generator on an impermeable protective base layer. ○ For the contractors' temporary offices, use intact septic tanks, free of any leaks and to be regularly emptied before reaching its maximum capacity. ○ Development and implementation of a hazardous substances' management procedure. The procedure should at minimum address the following aspects: operational procedures, procurement, prohibited substances, inventory, risk assessments, labelling, storage, Safety Data Sheets and control measures. The procedure should mention specific measures for the control of risks associated with the use of the diesel fuel for power generation. The management plans and procedures can be standalone documents or part	implemented 4- Amounts of solid and hazardous waste sent to landfill/month 5- Amount of total solid and hazardous waste generated/month 6- Amount of total solid and hazardous waste reused and/or recycled/month 7- Record of the sewage collection date and amount. 8- Number of Environmental and OHS incidents related to soil and water pollution 9- Number of Environmental and OHS incidents related to hazardous substance management	Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	weekly	Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
	of an overall construction EHS management plan. This shall also include a note on accidental spills of hydrocarbons, and methods of isolation and collection of the contaminated soil and storage as hazardous waste to be disposed of in hazardous waste landfills.	10- Valid Certificates for all waste contractors and chain of custody 11- Number of complaints with regards to waste and resources and time it took to solve them 12- Number of unresolved complaints					
e) Energy Efficiency & GHGs							
Impacts associated with low energy efficiency and increased GHGs.	Opportunities for reducing GHG emissions, to be adopted by the contractor where **technically and financially feasible**. ○ Adjust work schedule to daytime as much as possible ○ Design and construct thermally insulated temporary offices, with a natural ventilation option to reduce as much as possible the need for mechanical ventilation and reduce the	Total amount of fuel used on site and electricity consumption where applicable	Visual Site inspection and records review	Construction sites	At the beginning of the construction work and monthly after that	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR	Covered in construction cost

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
	associated electricity and GHG emissions. ○ Design and install solar PV system on the roof of the temporary offices to cover basic electricity office needs		Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	Weekly	**ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
f) Biodiversity							
Flora and Fauna Impacts	○ Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan (please refer to section b and d)** ○ Reuse the top soil layer for filling the trench, which necessitate a method to differentiate between the different layers of excavated soil.	1- All mitigation measures have been implemented 2- Number of complaints related to	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting	Covered in construction cost

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
	○ Train workers on reusing the top soil layer in filling back the trench.	biodiversity and time it took to solve them 3- Number of unresolved complaints	Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
			Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		
g) Cultural Heritage							
Impacts associated with chance finds	In the unlikely event of encountering a chance-find the following measures are to be taken: - Stop the construction activities in the area of the chance find and delineate the discovered site or area - Secure the site to prevent any damage or loss of discovered objects.	Chance Finds reports	- Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	**Contractor:** Implementation of mitigation measures, internal monitoring	EGP 20,000 (USD1,300) /day and estimated duration is 4 days

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
	- Notify the (ENR's and Contractor's) site managers and EHS supervisors who in turn will notify the responsible local authorities and the Antiquities Authority immediately (within 24 hours). - Responsible local authorities and the Antiquities Authority would be in charge of protecting and preserving the site before deciding on subsequent steps - Construction work can resume only after permission is given from the responsible local authorities and the Antiquities Authority. - Record any chance-finds and the detailed procedure followed to handle them.		Conduct a Documents and records review	Construction sites	In case of chance-finds	and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
h) Community Health, Safety and Security (including traffic and accessibility)							
Poor construction management practices Noise, dust and other types Trespassers on rail lines Level Crossings Safety Impacts related to access	○ Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan.** ○ Prepare and adopt a **Stakeholder Engagement Plan** ○ Clearly place a sign in Arabic language on each construction site stating the objective of the project, duration of the work and the phone number to receive grievances for both the contractor and ENR. The sign should also include a prominent warning to cross the fence boundaries. ○ Securely surround the trench with a solid fence when working adjacent to residential clusters or any area where children are suspected to be present. Only in desert areas, that this fence could be substituted with an open one. ○ Implementation of a health management system for the construction workforce, to ensure through medical check-ups, they are fit for work and that they will not introduce disease into local communities. ○ Prohibit trespassing adjacent to construction sites. ○ Instruct all vehicles drivers contracted by the project on safe driving guidelines.	1- Stakeholder Engagement Plan prepared and approved 2- All mitigation measures have been implemented 3- Number of community health and safety, and train delays - related complaints received and the time it took to resolve them 4- Number of unresolved complaints 5- % drivers trained on safe driving procedures	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of	EGP 50,000 (USD 3,200) for preparing a SEP Other measures should be Covered in the construction costs and by other sections of this plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work **aa**		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
restrictions and commuting disruptions Construction works induced traffic: Train trips delays	○ A plan for making alternative means of transportation available in case of significant train delay should be developed and implemented. ○ Work should be so planned as to avoid the complete blockage of level crossing, as much as practical. ○ Concentrating work in level crossings during times of reduced traffic, possibly during the night, as long as noise level can be kept at an acceptable level. ○ In cases where a level crossing has to be completely closed during construction, an alternative crossing should be identified and advertised to the public in advance. Traffic detours will have to clearly marked and provided with proper direction signage for incoming traffic. ○ Law enforcement authorities (Traffic Police) should take charge of controlling vehicular and pedestrian traffic flow and preventing illegal track crossings ○ When working near residential clusters, photo-document the condition of the nearest residential building to the trench before beginning the construction work. ○ Implement an Emergency Response Plan to manage major incidents if they should occur, such as train accidents in the vicinity of the construction site. ○ Prepare and implement a project and workers **Grievance Redress Mechanism (GRM)** ○ Negotiate construction schedule with ENR to minimise train delays and associated adverse impacts. ○ Re-schedule train timetable considering the expected delays where necessary and disclose the modified	6- Number of accidents associated with community, trespassers, or railway users. Serious injuries and fatalities are to be reported to relevant authorities and ENR immediately/as soon as practicable. 7- Assess traffic flow across level crossings and their vicinity at selected level crossings and population centres. 8- Revised train schedule announced and applied 9- Document the Conditions of railway corridor	Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly	Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
	time-table to the public. This procedure is already being adopted by ENR for their current projects. o Ongoing identification, evaluation and monitoring of potential community health and safety risks o No exposed, hot power cables should be left unattended at any time. o Storage of track units or construction material should be allowed on ENR's storage yards in a way that will not affect traffic or pose any risk to communities adjacent to the railway corridors.	walls 10- Availability and cost of alternative transportation					
i) Workers Influx/Workforce-Community Interactions							
Temporary Labour Influx	- Prepare and adopt a **Stakeholder Engagement Plan (SEP)**, as a framework for early and ongoing community consultation. - Prepare and implement a project and workers **Grievance Redress Mechanism (GRM)** - Develop work procedures, defining a **Code of Appropriate Conduct** for all workers, including	1- The Code of Conduct has been prepared and formally adopted 2- Number of complaints received from the	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting	Covered in the construction costs and by other sections of this plan

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
Increased risk of illicit behaviour and crime Risk of social conflict	acceptable behaviour with respect to community interactions and train workers - Provision of information regarding Worker Code of Conduct in local language. - Address risks in Workers Code of Conduct - Contractor to avoid hiring "at the gate" to discourage spontaneous influx of job seekers. - Train all workers on GBV risks and related sanctions. - Ensure that management and security staff are adequately trained to identify and eradicate all forms pertaining to GBV and gender-based discrimination. - Provision of substance abuse prevention and management programs. - Introduction of strict sanctions (e.g. dismissal) for workers involved in any form of abuse, inappropriate behaviour or GBV	community with regards to workers' behaviour in general and the time it took to solve them. 3- Training records 4- All mitigation measures have been implemented (in specific those related to the code of conduct including GBV and other labour influx risks,) 5- % of workers trained on Code of Conduct 6- % of workers trained on GBV	Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
			Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
j) Labour & Working Conditions							
Occupational health & safety impacts - Physical hazards from demolition waste - Physical hazards from equipment and vehicles - Fire Hazard - Slippage and Falling & Working at heights - Manual handling and lifting	The Contractor shall prepare and adopt an **Occupational health and safety plan** (OHS) and an **Emergency preparedness and response plan** (EPRP) to include fire and medical emergencies, complying with the Egyptian Labour law No. 12 for 2003 during the construction phase and addressing the following aspects as minimum: ○ Hire an accredited Health & Safety professional ○ Identification of hazard sources to workers and identifying solutions to eliminate them ○ Workers must be trained to recognise potential hazards including electrical hazards, use proper work practices and procedures, recognise adverse health effects, understand the physical signs and reactions related to exposures, and are familiar with appropriate emergency evacuation procedures. They must also be trained to how to use the Personal Protective Equipment (PPE). ○ Inspection and testing of all equipment and machines ○ Preparation of an emergency response plan ○ Provision of appropriate and enough first aid equipment, fire extinguishers in good working conditions on site and sand buckets ○ Create strictly No-Smoking zones in fire risk areas such as fuel storage areas and excavations ○ Strictly avoid excavations in areas with	1- The OHS and EPRP have been prepared and formally adopted 2- All mitigation measures have been implemented Undertake checks on workers right to work (including work permits, age etc.); 3- Reports on any accidents, hazardous events, as well as records and reports on health, safety and welfare of workers 4- Condition of fire extinguishing instruments 5- Condition of flammable	Visual Inspection of the site, workers, equipment and vehicles Dated Photo documentation of the site conditions	Construction sites Construction sites	Daily throughout construction Before entering the site and as necessary during the work	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	Covered in the construction costs and by other sections of this plan

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
- Electrocution - Traffic and accessibility <u>Sanitation concerns for the construction crew:</u> Illnesses and Covid-19 Fatigue	residential natural gas connections or works near natural gas piping ○ Follow latest WHO and national measures on Covid-19 as relevant ○ Regular inspection of workers against pathogenic agents and provision of immunization when needed ○ Identify and provide contacts of closest authorities and emergency services to contact in case of emergencies ○ Provision of full PPE including suitable footwear to avoid slippage and to protect ○ Workers exposed to noise exceeding permissible levels (e.g. ballast uploading) should wear hearing protection. The contractor shall also develop and implement a **Labour Management Plan**, with clear employment requirements, transparent hiring and management procedures for the construction and operational/ maintenance workforce. Employment practices and working conditions should conform to International Labor Organization (ILO) Standards and national regulations, including but not limited to: ○ Provide rest and recreational facilities and time, and prohibit the consumption of alcohol and drugs on site, as defined and clearly communicated to workers; ○ Ensure fair hiring procedures are in place in order to ensure non-discrimination and equal	material containers & storage 6- Availability & usage of PPEs 7- Condition of Rest Facilities 8- Workers right to work (including contracts, age etc.) and Inclusion of minimum labour standards in all workers contracts 9- % of site employees trained on OHS, emergency procedures and GRM 10- OHS statistics such as fatalities, injuries, lost time incidents, first aid cases. 11- Development of the Ethical Procurement Policy	Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[6]
	opportunity are provided for all project workers. ○ Include clear and explicit measures in the contractors' contract to 1) prohibit labor under 18 years old in the main contract, 2) stipulate that this contract should go to all the subcontract as a binding condition. ○ Communicate and make clear to the workers their contracts terms and (working hours, wages, overtime, compensation and benefits…) ○ Ensure timely and sufficient payment to the contractors and sub-contractors' workers ○ Provide workers with annual holiday and other benefits as per the labour law. ○ Provide all types of workers with appropriate social insurance and health insurance schemes. The Insurance should also cover work-related accidents. ○ Copies of national IDs for all types of labourers, including casual labourers hired by subcontractor and contractor should be recorded.	12- Contractor-workers' contracts. 13- Number of complaints received, number solved and the time it took to solve them. 14- Number of unresolved complaints					
Total cost of the ESMP (Estimated overall budget (itemized matrix) for the implementation of all environmental and social measures (in local currency, EGP, and U.S. dollars, by source of funds) not including provisions for E&S compliance and performance audits by an independent consultant nor the trainings, since these have been added to the costs of the main ESMP table)						**Fixed costs** EGP 110,000 (USD 7,100) **Annual costs** EGP 54,000 (USD 3,500) **Total Annual costs (for 5 years)** EGP 270,000 (USD 17,500)	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
PRE-CONSTRUCTION /DESIGN PHASE							
Land acquisition/ Livelihood or assets impacts due to Land allocation for CTC and MTBs along the railway corridor	ENR to maintain their avoidance strategy for any land with any uses as a priority action. RPF was prepared stipulating the principles to be followed in case this impact is encountered. RAPs and ARAPs should be prepared as needed for individual cases where land and livelihoods loss will be encountered as an impact. All efforts be made to allow for harvesting of crops prior to any land-related impacts. The contractor should comply with the avoidance strategy of ENR and should provide regular reporting supporting that to ENR. If the technical requirements of certain location made it impossible for the contractor to secure full avoidance, the various options should be discussed with ENR and reported to the Bank and actions should be taken accordingly (including preparing safeguards instrument such as RAP/ARAP) A robust and multi-channels project level Grievance Redress Mechanism (GRM[9]) to be developed and used	Documentation of the sharing sessions and consultations ESMP in Arabic GRM in place and known to local community - Number of complaints that were resolved and the time it took to resolve them Number of unresolved complaints Preliminary assessment report of land and livelihoods/assets loss for	Review and audit	Construction sites	At the beginning of the construction phase then weekly	**Contractor:** Implementation of avoidance strategy and mitigation measures Reporting to ENR **ENR:** PMU with support from the WB will maintain land avoidance strategy, Reviewing Contractor's performance	Included in the waste section below

[8] Cost estimate refers to the additional cost which the contractor/ENR will need to consider as compared to the conventional

[9] **Grievance Redress Mechanism**

ENR has a department for complaints at their headquarters in Cairo, to which any person can file a complaint. ENR has also dedicated 2 phone lines (01274422925 - 0225753555) in addition to a hotline (147) for complaints related to ENR in general. There is no specific channel dedicated for the project; and since the project's geographic scope will be extended, the following multi-stage mechanism shall be adopted.

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
	ENR to conduct site specific information sharing session and consultation prior to the commencement of any works. Ensure that the local communities have access to the ESMP, RPF and subsequent ARAP/RAPs.in local language and are aware of the contractors' commitments. ENR to ensure dissemination of the GRM to local communities and potential PAPs prior to starting construction activities.	selected locations for MTBs RAPs & ARAPs				and ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

d) Stage 1, any person aggrieved by any aspect of the resettlement document can lodge an oral or written grievance to the Contractor, which in turn should provide resolution within 10 calendar days;
e) Stage 2, if the aggrieved person is not satisfied with the decision of the Contractor at Stage 1, he can present the case to the Consulting/Supervision Company to resolve within 15 calendar days.
f) Stage 3, if the complainant is still dissatisfied with the Consulting/Supervision Company's decision, he can escalate the complaint to ENR to resolve the issue in 15 calendar days.

The respective Contractor shall disclose the grievance redress mechanism on a board that is easily legible and accessible at all worksites.

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
a) Pollution of Soils & Water							
Pollution of Soils & Water bodies due to poor solid and liquid waste management practices	Prepare and implement a **Solid and Hazardous Waste and Materials Management Plan** which include arrangements for managing solid and liquid hazardous and non-hazardous waste (to be approved by the supervising consultant and the environmental department before the start of the construction) including but not limited to: ○ Waste minimisation and prevention hierarchy ○ Design a segregation system based on compatibility of different waste streams and based on the recycling services (if locally available) ○ Identification of the types and dimensions of storage means at source for hazardous and non-hazardous wastes ○ Design and construct a central waste storage area for non-hazardous wastes which accommodate for the received segregated streams /or any alternative solution proposed by the contractor ○ Identify the nearest landfill for the disposal	1- Submission and approval of the waste management plans covering at minimum all the aspects detailed in this ESMP (once at the beginning of the project). 2- Submission and approval of the of hazardous substance management procedure (standalone or included in EHS plan) covering at minimum all the aspects detailed in this ESMP. 3- All mitigation measures have been implemented 4- Amounts of solid and hazardous waste sent to landfill/ month 5- Amount of total solid	Visual inspection of the site and proper use of PPEs	Construction sites	Daily throughout construction	**Contractor:** Development of the required plans. Implementation of plans, internal monitoring and reporting to ENR **ENR:** Reviewing Contractor's plans to ensure their compliance to ENR's EHS	Included in the waste section below
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
	of the non-recycled items ○ Identify a recycling contractor preferably from the nearby villages ○ Waste contractors' certifications and compliance assurance. All waste streams should be transported and disposed of by certified service providers, in compliance with Egyptian regulations and disposed of in licensed landfills/dump sites, including. ○ Training for workers on sound environmental practices to manage solid wastes. ○ Storage spent oils in sealed drums sheltered from the sun until collection ○ Record keeping (waste inventory, waste disposal registers and consignment notes) ○ Complete prohibition dumping of solid and liquid waste in any water body ○ When using diesel generators, place the generator on an impermeable protective base layer. ○ In case of accidental spills of hydrocarbons, isolate and collect the contaminated soil and store as hazardous waste to be disposed of in hazardous waste landfills. ○ For the contractors' temporary offices, use intact septic tanks, free of any leaks and to be regularly emptied before reaching its maximum capacity. ○ Development and implementation of a hazardous substances' management procedure. The procedure should at	and hazardous waste generated/month 6- Amount of total solid and hazardous waste reused and/or recycled/month 7- Record of the sewage collection date and amount. 8- Number of Environmental and OHS incidents related to soil and water pollution 9- Number of Environmental and OHS incidents related to hazardous substance management 10- Valid Certificates for all waste contractors and chain of custody 11- Number of complaints related to soil and/or water pollution and time it took to solve them 12- Number of unresolved complaints	Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	weekly	and ESMP requirements. Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
	minimum address the following aspects: operational procedures, procurement, prohibited substances, inventory, risk assessments, labelling, storage, Safety Data Sheets and control measures. The procedure should mention specific measures for the control of risks associated with the use of the diesel fuel for power generation. The management plans and procedures can be standalone documents or part of an overall construction EHS management plan. This shall also include a note on accidental spills of hydrocarbons, and methods of isolation and collection of the contaminated soil and storage as hazardous waste to be disposed of in hazardous waste landfills. ○ Inspection of the site for existing contamination from previous work/ activities. Where inspection results were positive, carefully collect and isolate all the contaminated soil in sealed bags to be disposed in the nearest hazardous waste landfill/treatment facility.						

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
b) Ambient Air Quality							
Dust/PM10 emissions from construction and vehicles movement on unpaved roads PM10, TSP, NOx, SO_2, CO emissions from Diesel-fuelled generators and transport vehicles	Implement a **Construction Activity Pollution Prevention Plan** (to be approved by the supervising consultant and the environmental department before the construction work start) including but not limited to: ○ Store excavation and construction materials such as sand and other friable waste material in ENR designated places and cover them with suitable materials to control and prevent dust generation and minimise spillage. ○ All vehicles used by the contractor to deliver construction materials and/or collect waste materials to and from the site should be completely covered to avoid material spillage. ○ Install a solid fence around the excavation site in all areas adjacent to residential clusters, roads, water bodies and agricultural lands. ○ Implement a preventive maintenance program for vehicles and equipment working on site and promptly repair/replace vehicles, equipment and generators with any visible exhaust fume. ○ Implement best practice site housekeeping measures. ○ Regular maintenance and inspection of equipment and vehicles used on site ○ Favour the purchase of low-sulphur diesel. ○ As much as practically possible, construction	1- Construction Activity Pollution Prevention Plan has been prepared and approved 2- All mitigation measures have been implemented 3- Number of complaints received with regards to air quality and dust generation the time it took to solve them. 4- Number of unresolved complaints 5- Results of measurements and % not compliant with applicable legal standards including reasons for non-compliance	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily	**Contractor** Implementation of mitigation measures, internal monitoring and reporting to ENR May hire a third party for the quarterly monitoring measurements or use calibrated instruments approved by ENR. **ENR:** Ensuring the correct implementation of the mitigation and monitoring	EGP 48,000 (USD 3,000) for 8 measurement points (two measurement points per quarter) EGP 30,000 (USD 1,900) for preparing the Construction Pollution Prevention Plan
			Measure ambient air quality parameters (PM10, NOx, SO_2, CO and TSP)	Construction Sites at nearest sensitive receptor and central to the major construction activities	Quarterly		
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		
			Complete a compliance checklist for mitigation actions and	Construction sites	Weekly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
	material and waste should be transported to and from construction sites using cargo trains. o Vehicles uploading material should maintain the lowest possible fall height to reduce noise and dust generation. o Old, often contaminated ballast basalt should be removed to a government-designated dumpsite for disposal or for decontamination for future use. o Transportation of old ballast should be only in covered tracks to avoid spillage.		measures and conduct a Documents and records review			measures Review and assurance of Contractor's reports	
c) Noise & Vibration							
Impacts on ambient noise levels	Develop and implement a **noise management procedure** as a standalone document or as a part of an OHS plan. The following measures as a minimum should be covered: o Optimise the use of equipment and turn off any equipment when not in use. o Use of modern, well-maintained equipment fitted with abatement devices (e.g. mufflers, noise enclosures). o Control exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure.	1- Development of the noise management procedure/OHS plan 2- All mitigation measures have been implemented 3- Number of complaints received with regards to noise associated with the construction work and the time it took to solve them. 4- Number of unresolved complaints 5- Results of noise ambient measurements including reasons for non-compliance (if any)	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to the ENR **ENR:** Ensuring the correct implementatio	EGP 6,000 (USD 380) for 8 measurements (2 per quarter)
			Measure ambient Noise (in case of use of mechanical/ electrical digging equipment and machinery)	Construction Sites at nearest sensitive receptor and central to the major construction activities	Quarterly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
	○ Stop all noisy work at night (before 6 am after 6pm)		Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	n of the mitigation and monitoring measures	
			Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	Weekly	Review of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
d) Resources & Waste							
Impacts associated with increased consumption of resources and waste generation	Prepare and implement a **Solid and Hazardous Waste and Materials Management Plan** which include arrangements for managing solid and liquid hazardous and non-hazardous waste (to be approved by the supervising consultant and the environmental department before the start of the construction) including but not limited to: ○ Waste minimisation and prevention hierarchy ○ Design a segregation system based on compatibility of different waste streams and based on the recycling services (if locally available) ○ Identification of the types and dimensions of storage means at source for hazardous and non-hazardous wastes ○ Design and construct a central waste storage area for non-hazardous wastes which accommodate for the received segregated streams /or any alternative solution proposed by the contractor ○ Identify the nearest landfill for the disposal of the non-recycled items and get the required permits. ○ Identify an authorized recycling contractor	1- Submission and approval of the waste management plans covering at minimum all the aspects detailed in this ESMP (once at the beginning of the project) 2- Submission and approval of the of hazardous substance management procedure (standalone or included in EHS plan) covering at minimum all the aspects detailed in this ESMP 3- All mitigation measures have been implemented 4- Amounts of solid and hazardous waste sent to landfill/month 5- Amount of total solid and hazardous waste	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Development of the required plans. Implementation of plans, internal monitoring and reporting to ENR **ENR:** Reviewing Contractor's plans to ensure their compliance to ENR's EHS and ESMP requirements.	EGP 30,000 (USD 1,900) for preparing the waste management plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
	preferably from the nearby villages ○ Waste contractors' certifications and compliance assurance. All waste streams should be transported and disposed of by certified service providers, in compliance with Egyptian regulations and disposed of in licensed landfills/dump sites, including. ○ Training for workers on sound environmental practices to manage solid wastes. ○ Storage of spent oils in sealed drums sheltered from the sun until collection by authorized service providers ○ Record keeping (waste inventory, waste disposal registers and consignment notes) ○ Complete prohibition dumping of solid and liquid waste in any water body ○ When using diesel generators, place the generator on an impermeable protective base layer. ○ For the contractors' temporary offices, use intact septic tanks, free of any leaks and to be regularly emptied before reaching its maximum capacity. ○ Development and implementation of a hazardous substances' management procedure. The procedure should at minimum address the following aspects: operational procedures, procurement, prohibited substances, inventory, risk assessments, labelling, storage, Safety Data Sheets and control measures. The procedure	generated/month 6- Amount of total solid and hazardous waste reused and/or recycled/month 7- Record of the sewage collection date and amount. 8- Number of Environmental and OHS incidents related to soil and water pollution 9- Number of Environmental and OHS incidents related to hazardous substance management 10- Valid Certificates for all waste contractors and chain of custody 11- Number of complaints with regards to waste and resources and time it took to solve them 12- Number of unresolved complaints	Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	weekly	Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
	should mention specific measures for the control of risks associated with the use of the diesel fuel for power generation. The management plans and procedures can be standalone documents or part of an overall construction EHS management plan. This shall also include a note on accidental spills of hydrocarbons, and methods of isolation and collection of the contaminated soil and storage as hazardous waste to be disposed of in hazardous waste landfills.						
e) Energy Efficiency & GHGs							
Impacts associated with low energy efficiency and increased GHGs.	Opportunities for reducing GHG emissions, to be adopted by the contractor where **technically and financially feasible**. ○ Adjust work schedule to daytime as much as possible ○ Design and construct thermally insulated temporary offices, with a natural ventilation option to reduce as much as possible the need for mechanical ventilation and reduce	Total amount of fuel used on site and electricity consumption where applicable	Visual Site inspection and records review	Construction sites	At the beginning of the construction work and monthly after that	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR	Covered in construction cost

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
	the associated electricity and GHG emissions. ○ Design and install solar PV system on the roof of the temporary offices to cover basic electricity office needs		Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	Weekly	**ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
f) Biodiversity							
Flora and Fauna Impacts	○ Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan (please refer to section b and d)** ○ Reuse the top-soil layer for filling the trench, which necessitate a method to differentiate between the different layers of	1- All mitigation measures have been implemented 2- Number of complaints related to biodiversity and time it took to solve them 3- Number of unresolved complaints	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting	Covered in construction cost

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
	excavated soil. ○ Train workers on reusing the top soil layer in filling back the trench.		Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
			Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		
g) Cultural Heritage							
Impacts associated with chance finds	In the unlikely event of encountering a chance-find the following measures are to be taken: - Stop the construction activities in the area of the chance find and delineate the discovered site or area - Secure the site to prevent any damage or loss of	Chance Finds reports	- Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	**Contractor:** Implementation of mitigation measures, internal monitoring	EGP 20,000 (USD1,300) /day and estimated duration is 4 days

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
	discovered objects. - Notify the (ENR's and Contractor's) site managers and EHS supervisors who in turn will notify the responsible local authorities and the Antiquities Authority immediately (within 24 hours). - Responsible local authorities and the Antiquities Authority would be in charge of protecting and preserving the site before deciding on subsequent steps - Construction work can resume only after permission is given from the responsible local authorities and the Antiquities Authority. - Record any chance-finds and the detailed procedure followed to handle them.		Conduct a Documents and records review	Construction sites	In case of chance-finds	and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
		h) Community Health, Safety and Security (including traffic and accessibility)					
Poor construction management practices Noise, dust and other types Trespassers on rail lines Level Crossings Safety Impacts related to access	○ Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan.** ○ Prepare and adopt a **Stakeholder Engagement Plan** ○ Clearly place a sign in Arabic language on each construction site stating the objective of the project, duration of the work and the phone number to receive grievances for both the contractor and ENR. The sign should also include a prominent warning to cross the fence boundaries. ○ Securely surround the trench with a solid fence when working adjacent to residential clusters or any area where children are suspected to be present. Only in desert areas, that this fence could be substituted with an open one. ○ Implementation of a health management system for the construction workforce, to ensure through medical check-ups, they are fit for work and that they will not introduce disease into local communities. ○ Prohibit trespassing adjacent to construction	1- Stakeholder Engagement Plan prepared and approved 2- All mitigation measures have been implemented 3- Number of community health and safety, and train delays - related complaints received and the time it took to resolve them 4- Number of unresolved complaints 5- % drivers trained on safe driving procedures 6- Number of accidents associated with community, trespassers, or railway users. Serious injuries and fatalities are to be reported to relevant authorities and ENR	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of	EGP 50,000 (USD 3,200) for preparing a SEP Other measures should be Covered in the construction costs and by other sections of this plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
restrictions and commuting disruptions Construction works induced traffic: Train trips delays	sites. o Instruct all vehicles drivers contracted by the project on safe driving guidelines. o A plan for making alternative means of transportation available in case of significant train delay should be developed and implemented. o Work should be so planned as to avoid the complete blockage of level crossing, as much as practical. o Concentrating work in level crossings during times of reduced traffic, possibly during the night, as long as noise level can be kept at an acceptable level. o In cases where a level crossing has to be completely closed during construction, an alternative crossing should be identified and advertised to the public in advance. Traffic detours will have to clearly marked and provided with proper direction signage for incoming traffic. o Law enforcement authorities (Traffic Police) should take charge of controlling vehicular and pedestrian traffic flow and preventing illegal track crossings o When working near residential clusters, photo-document the condition of the nearest residential building to the trench before beginning the construction work. o Implement an Emergency Response Plan to manage major incidents if they should occur, such as train accidents in the vicinity of the	immediately/as soon as practicable. 7- Assess traffic flow across level crossings and their vicinity at selected level crossings and population centres. 8- Revised train schedule announced and applied 9- Document the Conditions of railway corridor walls 10- Availability and cost of alternative transportation	Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly	Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
	construction site. o Prepare and implement a project and workers **Grievance Redress Mechanism (GRM)** o Negotiate construction schedule with ENR to minimise train delays and associated adverse impacts. o Re-schedule train timetable considering the expected delays where necessary and disclose the modified time-table to the public. This procedure is already being adopted by ENR for their current projects. o Ongoing identification, evaluation and monitoring of potential community health and safety risks o No exposed, hot power cables should be left unattended at any time. o Storage of track units or construction material should be allowed on ENR's storage yards in a way that will not affect traffic or pose any risk to communities adjacent to the railway corridors.						
i) Workers Influx/Workforce-Community Interactions							
Temporary Labour Influx	- Prepare and adopt a **Stakeholder Engagement Plan (SEP)**, as a framework for early and ongoing community consultation. - Prepare and implement a project and workers **Grievance Redress Mechanism (GRM)** - Develop work procedures, defining a **Code of Appropriate Conduct** for all workers,	1- The Code of Conduct has been prepared and formally adopted 2- Number of complaints received from the community with regards to workers'	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring	Covered in the construction costs and by other sections of

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
Increased risk of illicit behaviour and crime Risk of social conflict	including acceptable behaviour with respect to community interactions and train workers - Provision of information regarding Worker Code of Conduct in local language. - Address risks in Workers Code of Conduct - Contractor to avoid hiring "at the gate" to discourage spontaneous influx of job seekers. - Train all workers on GBV risks and related sanctions. - Ensure that management and security staff are adequately trained to identify and eradicate all forms pertaining to GBV and gender-based discrimination. - Provision of substance abuse prevention and management programs. - Introduction of strict sanctions (e.g. dismissal) for workers involved in any form of abuse, inappropriate behaviour or GBV.	behaviour in general and the time it took to solve them. 3- Training records 4- All mitigation measures have been implemented (in specific those related to the code of conduct including GBV and other labour influx risks,) 5- % of workers trained on Code of Conduct 6- % of workers trained on GBV				and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	this plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		
			Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
j) Labour & Working Conditions							
<u>Occupational health & safety impacts</u> - Physical hazards from demolition waste - Physical hazards from equipment and vehicles - Fire Hazard - Slippage and Falling & Working at heights - Manual handling and lifting	The Contractor shall prepare and adopt an **Occupational health and safety plan** (OHS) and an **Emergency preparedness and response plan** (EPRP) to include fire and medical emergencies, complying with the Egyptian Labour law No. 12 for 2003 during the construction phase and addressing the following aspects as minimum: ○ Hire an accredited Health & Safety professional ○ Identification of hazard sources to workers and identifying solutions to eliminate them ○ Workers must be trained to recognise potential hazards including electrical hazards, use proper work practices and procedures, recognise adverse health effects, understand the physical signs and reactions related to exposures, and are familiar with appropriate emergency evacuation procedures. They must also be trained to how to use the Personal Protective Equipment (PPE). ○ Inspection and testing of all equipment and machines ○ Preparation of an emergency response plan ○ Provision of appropriate and enough first aid equipment, fire extinguishers in good working conditions on site and sand	1- The OHS and EPRP have been prepared and formally adopted 2- All mitigation measures have been implemented Undertake checks on workers right to work (including work permits, age etc.); 3- Reports on any accidents, hazardous events, as well as records and reports on health, safety and welfare of workers 4- Condition of fire extinguishing instruments 5- Condition of flammable material containers & storage 6- Availability & usage of PPEs 7- Condition of Rest Facilities 8- Workers right to work	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	Covered in the construction costs and by other sections of this plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
- Electrocution - Traffic and accessibility <u>Sanitation concerns for the construction crew:</u> Illnesses and Covid-19 Fatigue	buckets ○ Create strictly No-Smoking zones in fire risk areas such as fuel storage areas and excavations ○ Strictly avoid excavations in areas with residential natural gas connections or works near natural gas piping ○ Follow latest WHO and national measures on Covid-19 as relevant ○ Regular inspection of workers against pathogenic agents and provision of immunization when needed ○ Identify and provide contacts of closest authorities and emergency services to contact in case of emergencies ○ Provision of full PPE including suitable footwear to avoid slippage and to protect ○ Workers exposed to noise exceeding permissible levels (e.g. ballast uploading) should wear hearing protection. The contractor shall also develop and implement a **Labour Management Plan**, with clear employment requirements, transparent hiring and management procedures for the construction and operational/ maintenance workforce. Employment practices and working conditions should conform to International Labor Organization (ILO) Standards and national regulations, including but not limited to: ○ Provide rest and recreational facilities and time, and prohibit the consumption of alcohol and drugs on site, as defined and clearly	(including contracts, age etc.) and Inclusion of minimum labour standards in all workers' contracts 9- % of site employees trained on OHS, emergency procedures and GRM 10- OHS statistics such as fatalities, injuries, lost time incidents, first aid cases. 11- Development of the Ethical Procurement Policy 12- Contractor-workers' contracts. 13- Number of complaints received, number solved and the time it took to solve them. 14- Number of unresolved complaints	Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		

Updated ESMP for Cairo – Alexandria

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[8]
	communicated to workers; ○ Ensure fair hiring procedures are in place in order to ensure non-discrimination and equal opportunity are provided for all project workers. ○ Include clear and explicit measures in the contractors' contract to 1) prohibit labor under 18 years old in the main contract, 2) stipulate that this contract should go to all the subcontract as a binding condition. ○ Communicate and make clear to the workers their contracts terms and (working hours, wages, overtime, compensation and benefits…) ○ Ensure timely and sufficient payment to the contractors and sub-contractors' workers ○ Provide workers with annual holiday and other benefits as per the labour law. ○ Provide all types of workers with appropriate social insurance and health insurance schemes. The Insurance should also cover work-related accidents. ○ Copies of national IDs for all types of laborers, including casual laborers hired by subcontractor and contractor should be recorded						
Total cost of the ESMP (Estimated overall budget (itemized matrix) for the implementation of all environmental and social measures (in local currency, EGP, and U.S. dollars, by source of funds) not including provisions for E&S compliance and performance audits by an independent consultant nor the trainings, since these have been added to the costs of the main ESMP table)						**Fixed costs** EGP 110,000 (USD 7,100) **Annual costs** EGP 54,000 (USD 3,500) **Total Annual costs (for 5 years)** EGP 270,000 (USD 17,500)	

CHAPTER ONE: INTRODUCTION

1.1 Project Background

The railway sector in Egypt is vertically integrated and is owned by the Egypt National Railways Authority (ENR), a public entity established in 1851 and subordinated to the Ministry of Transport. As part of commercialization to improve performance, ENR has since 2007, been divided into 8 companies as follows: (1) Maintenance and Railway Services; (2) Railway and transport projects; (3) Metro Operation and Management; (4) Renewal and Maintenance of Tracks; (5) Development of Transport Technology and IT; (6) Management and Services of Sleeping Coaches; (7) Security and Cleaning; and (8) Medical Centre of ENR.

The rail sector is the common mode of transport for Egyptians. ENR has over the years been experiencing several challenges relating to safety of train operations, quality of services, and dependence on public resources. Since 2010, the government, with the support of the World Bank and other development partners, has embarked on railway reforms to make the railways safer, responsive, and competitive, through: (i) investing in rail infrastructure and modernization of the Signalling systems to improve efficiency, service levels and operational capacity; and (ii) introduce measures to strengthen ENR management capacity.

The African Development Bank (AfDB) has received a formal request from the Government of Egypt (GoE) for supporting the ongoing efforts for upgrade and modernization of the railway infrastructure in the country. The Bank support will be through investment finance to the tune of EUR 141 million.

The development objective of the Egypt National Railway Modernization Project (ENRMP) is to maximise the benefits of the on-going efforts for modernization of the Signalling and telecommunications system on the ENR rail network. The ENRMP will specifically contribute to: (i) increasing the rail network capacity; (ii) improving the safety of trains; and (iii) enhancing the reliability of train services.

Project Components

The ENRMP will have four components as follows:

v. Modernization of signals and rail renewals (USD643 million, WB & GoE): Upgrading of the Signalling system to electronic interlocking system (EIS), and rail renewals in selected sections of the main. This component is an ongoing project financed by the World Bank and the GoE.

vi. Installation of the Automatic Train Protection (ATP) System (USD 155 million, AfDB): Supply and installation of on-board ATP equipment in about 100 locomotives, and installation of track-side ATP equipment; and supply of spare parts and maintenance for a specified period of 3 years or more;

vii. Capacity building (USD 2.0 million, AfDB): Training of staff in maintenance and operation of the ATP system; and

viii. Project Management Support (USD 3.0 million, AfDB): Supervision services and technical assistance (TA) and annual financial audits.

The total project cost estimate is USD 803 million. Components (ii), (iii) & (iv) are the subject of this ESIA, and will be financed by an AfDB loan with a total cost estimate of USD 160 million.

As stated under Component (ii), the ENRMP will support the installation of an ATP system comprising on-board ATP equipment in 100 locomotives, and ATP track-side equipment on 953 km of the rail network in the following sections:

f) Alexandria – Cairo (208 km);

g) Cairo – Beni Suef (125 km);

h) Beni Suef – Asyut (250 km);

i) Asyut – Negh Hammadi (180 km); and

j) Benha – Port Said (190 km).

The proposed ATP system will be based on the European Train Control System Level 1 (ETCS-L1). The ATP system electronically supervises the train, in terms of track profile ahead, which includes permissible speeds, allowable distance to be travelled by the train, stopping distances and section speed restrictions. In addition, where train crew do not comply with the ATP operation parameters, the system automatically takes over and where necessary under critical conditions, brings the train to a stop to prevent potential accidents.

1.2 ESIA Scope, Boundaries and Objectives

Scope and Boundaries

The purpose of the ESIA is to identify and assess the potential positive and adverse impacts that may arise from the installation of the ETCS-L1 on 990 km of the railway network as detailed above. A new ESIA study (the current document) has been developed for two sections of the railway network, for which no previous ESIAs have been developed; namely: **Cairo – Beni Suef (138 km)** and **Benha – Port Said (214 km). In addition to that, the ESMP already developed for the rest of the mine sections has been updated as to accommodate for any additional mitigation measures for risks and impacts arising from component (ii), (iii) and (iv). Annex V and VI include the updated ESMP for Beni Suef – Asyut – Nagh Hammadi and Cairo-Alexandria respectively.**

The Project activities that have been considered as part of the ESIA include those to be undertaken during the construction, operation and decommissioning of the ETCS-L1. Figure 1-1 shows the Geographical locations of Project Components.

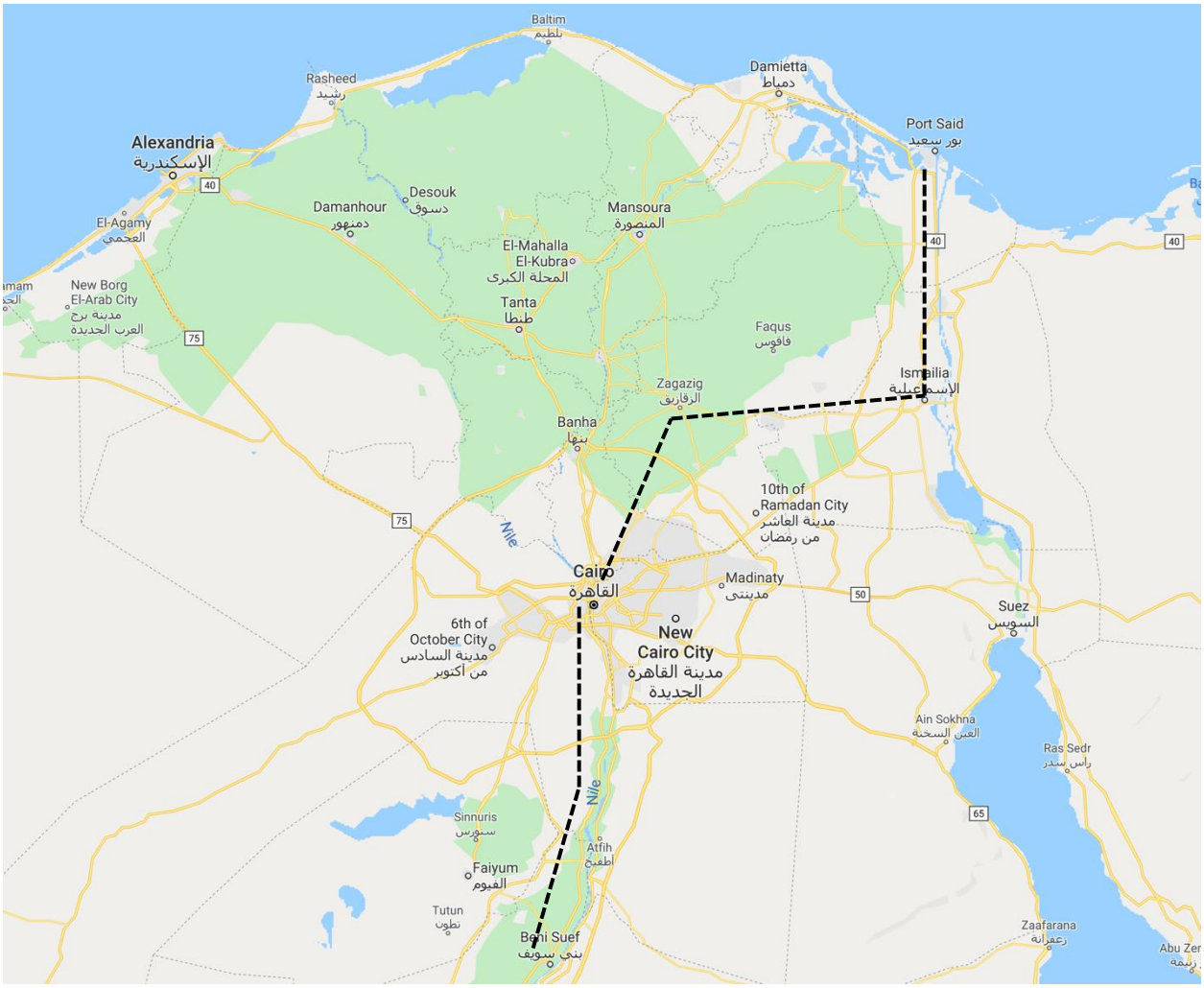


Figure 1-1: *Geographical locations of Project Components (Black dashed line represent an approximate illustration of the railway track from Cairo-Benha-Port Said and Cairo-Beni Suef)*

Objectives of the ESIA

The main objectives of the ESIA study are:

- Identify and assess risks and impacts taking into account the environmental and social baseline conditions analysed for the study area;
- To adopt a mitigation hierarchy and develop technically and financially feasible mitigation measures to avoid, prevent, mitigate or compensate significantly adverse impacts and enhance beneficial impacts have been proposed. Furthermore, the assessment determines the significance of residual effects following implementation of the mitigation measures.
- Develop a mitigation and monitoring plan to identify the implementation responsibilities for the identified mitigation measures and monitor and evaluate the effectiveness of implemented mitigation measures.
- To ensure that grievances from affected communities and external communications from other stakeholders are responded to and managed appropriately.

- To promote and provide means for adequate engagement with affected communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.

The ESIA has been prepared in line with: the national environmental, social and EIA requirements within Egypt; AfDB environmental and social safeguards policies and standards including AfDB Integrated Safeguard Standards (ISS); and other international applicable standards, such as the International Finance Corporation (IFC) Environmental, Health & Safety (EHS) General and Specific Guidelines for Railways (April 2007). In specific, the following AfDB policies and standards have been adopted:

- The Integrated Safeguards System (ISS) Policy adopted in December 2013
- The Gender Policy (2001) and Bank Group Gender Strategy (2013)
- AfDB Civil Society Engagement Framework (2012)
- Disclosure and Access to Information Policy (2012)
- Policy on Poverty Reduction (2001)
- Policy for Integrated Water Resources Management (2000)
- Environmental and Social Assessment Procedures (ESAP)
- AfDB ISS Guidance Materials
- AfDB ISS Sector Keysheets

The draft ESIA has been disclosed to the public via pubic consultation sessions and a number of focus group discussions and interviews. Comments and feedback have been reflected in the ESIA by updating the study and addressing comments made by stakeholders. Information has been provided about how comments have been addressed.

CHAPTER TWO: LEGAL AND POLICY FRAMEWORK

2.1 AfDB Environmental and Social Safeguards System

This ESIA has been prepared to forestall environmental and social impacts that could arise during the development and operational implementation of the project based on Operational Safeguard Policies of the AfDB as well as all applicable Egyptian laws and regulations. The AfDB's five Operational Safeguard Policies, as outlined and summarised in Table 2-1 below, have guided the development of this ESIA and thereafter, a determination has been made on whether any of the following safeguards will be triggered or not as a result of the implementation of the project: (1) Environmental Assessment (OS1); (2) Involuntary Resettlement including Land Acquisition, Population Displacement and Compensation (OS2); (3) Biodiversity and Ecosystem Services (OS3); (4) Pollution Prevention and Control, Greenhouse Gases, Hazardous Materials and Resource efficiency (OS4); and, (5) Labour Conditions, Health and Safety (OS5).

Table 2-1: AfDB Operational Safeguards

Operational Safeguards Triggered by the Project	Yes	No	Justification
OS1: Environmental Assessment	x		This Safeguard is applicable to all projects funded by the AfDB bank. It concerns determining a project's environmental and social category and the resulting environmental and social assessment requirements
OS2: Involuntary Resettlement: Land Acquisition, Population Displacement and Compensation		x	The installation of the ETCS-L1, for which this ESIA has been developed will only involve digging a 1 m deep and 2-3 m long trench perpendicular on the railway track (within the railway right of way), every approximately 1 km. Cables will be installed and then the soil will be deposited back to close the trench. Based on the expected activities during construction (and/or decommissioning), there will be no need for any Resettlement: Land Acquisition, Population Displacement and Compensation arising from these impacts
OS3 Biodiversity and Ecosystem Services		x	The project will be implemented along an already existing railway corridor and will therefore not affect any existing habitats
OS4: Pollution Prevention and Control, Greenhouse Gases, Hazardous Materials	x		The project will entail excavation activities, waste generation and consumption of resources during the construction phase
OS5: Labour Conditions, Health and Safety	x		The project will include considerable labour and working environments during the construction phase

This project fits the description for **Category 2** project of the AfDB EHS impact Project Categories. According to the AfDB, Category 2 projects are "likely to have detrimental site-specific environmental and/or social impacts that are less adverse than those of Category 1 projects. Likely impacts are few in number, site-specific, largely reversible, and readily minimised by applying appropriate management and mitigation measures or incorporating internationally recognised design criteria and standards."

The AfDB environmental and social standards described in the following references have been adopted when preparing the current study:

- AfDB Integrated Safeguards System (ISS)
- AfDB ISS Guidance Materials
- AfDB ISS Sector Keysheets

The ***EHS Guidelines,*** the WB Group Environmental, Health, and Safety Guidelines referred to as the EHS Guidelines have been also used as guidelines. These are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). They contain the performance levels and measures that are normally acceptable to the WB Group. When preparing the ESIA report and assessing the different impacts, the relevant levels and measures have been adopted as indicated in the following sections.

2.2 Egyptian Legal Framework

2.2.1 Environmental Assessment

Environmental assessment for projects is included in the environmental legislation in Republic of Egypt: Law No. 4 of 1994 Amended by Law No. 9 of 2009 and Resolution 1095 of 2011, Decree No. 710 of 2012, Decision of the Prime Minister No. 964 of 2015 and Decree No. 618 and 1963 of 2017. The Ministry of State of Environmental Affairs (MSEA) and the Egyptian Environmental Affairs Agency (EEAA), its executive agency, enforce Law No. 4 of 1994.

The Egyptian Environmental Affairs Agency (EEAA) was established in 1982 to be the administrative body responsible for environmental affairs in Egypt. Law 4/1994 states that EEAA is the entity responsible for environmental affairs. According to Law 4/1994 and its amendments, the Environmental Impact Assessment (EIA) is a licensing requirement for development projects that are likely to cause environmental and social impacts.

The projects are categorised into four main categories (each supplemented by a pre-defined list of projects/activities). These are listed below in the order of impact significance:

- Class C; which includes high-impact projects requiring full-fledged EIA;
- Scoped B projects; requiring Form B EIA, intended for projects with impacts higher than typical Form B projects whilst lower than Class C projects;
- Form B projects; requiring Form B EIA (less detailed than Class C EIA);

- Form A projects; requiring Form A EIA (fewer requirements as compared with Form B projects);
- Special condition projects; do not require the EIA but will be licensed given that the project developer will comply with certain standard requirements;
- Projects that are not subject to environmental licensing system.

The current project falls under **Category B projects** in this EEAA classification.

The 2009 Egyptian EIA Guidelines set out the EIA requirements, which include both environmental and social assessment and consultation. The Egyptian EIA guidelines cover all the environmental assessment requirements of the AfDB. However, unlike AfDB requirements, there is no requirement for stakeholder consultation, public participation and disclosure for Categories A & B projects (low and medium impact projects) according to national classification. Stakeholder engagement and public consultation are a requirement for category C projects (national classification) only.

2.2.2 Solid and Hazardous Wastes

Law 4/1994 and its amendments include procedures for handling hazardous substances and wastes, which are to a great extent conforming to international standards and best practices. It prohibits, through article 37, and articles 38, 39 and 41 of the executive regulations, the disposal of any solid wastes except in areas designated for this purpose. This includes construction and demolition wastes.

Hazardous wastes are governed through articles 29 to 33 of law 4/1994 and states that the entity producing hazardous wastes in gaseous, liquid or solid form is committed to collect and transport the generated waste to designated disposal sites, which are predetermined by the local authorities, the competent administrative authorities and the Egyptian Environmental Affairs Agency. The only licensed facility is located in Nasreya, Borg El Arab, Alexandria Governorate. This makes it more difficult for the industries to comply with the legislation.

Other laws that might be pertinent to waste management in Egypt are:

- Law 59 of 1979 regarding the establishment of new urban communities;
- Law 10/2005 establishing a solid waste collection fee system;
- Laws 106/1976 and 101/1996 allow local governments to include the management of construction and demolition waste in the permits required for construction activities;
- Law 140 of 1956 regarding occupation of public roads;
- Law 84 of 1968 regarding public roads;
- The public cleanliness law 38/1967 amended by law 31/1976 and its executive regulations issued by Minister of Housing Decree Number 134 of 1968;
- The prime minister decree no. 338 of 1995 and the national waste management strategy issued in 201;8
- Law no. 159 for the year 1953 regulates the cleanliness of fields, roads and streets as well as organisation of collection and transport of waste.

2.2.3 Air Quality

The provisions of Articles 34 to 40, 42, 43 and 47 bis in Law 4/1994, amended by Law 9/2009, Article 42 and Annex 5 and 6 of the Implementing Regulations set out maximum permissible limits for outdoor air pollutants.

Ambient air quality and emission standards of Law 4/1994 generally meet the interim targets of the WHO ambient air guidelines, with few exceptions that have little significance in the program's context. A brief gap analysis is presented in Table 2-2 below.

Table 2-2: Ambient Air Quality Gap Analysis.

	Egyptian Law 4 Requirements			**WB Requirements**		
	Ambient air quality limits			**IFC** General EHS Guidelines		
Exposure Period	**1 hr**	**24 hr**	**1 year**	**1 hr**	**24 hr**	**1 year**
Carbon monoxide CO (µg/m^3)	30 (urban and indus.)	N/A	N/A	N/A	N/A	N/A
Sulphur dioxide SO_2 (µg/m^3)	300 (urban) 350 (indus.)	125 (urban) 150 (indus.)	50 (urban) 60 (indus.)	N/A	125 (IT^{10}-1) 50 (IT-2) 20 (guideline)	N/A
Nitrogen Oxides NOx (µg/m^3)	300 (urban) 300 (indus.)	150 (urban) 150 (indus.)	60 (urban) 80 (indus.)	200 (guideline)	N/A	40 (guideline)
Particulates PM_{10} (µg/m^3)	N/A	150 (urban) 150 (indus.)	70 (urban) 70 (indus.)	N/A	150 (IT-1) 100 (IT-2) 75 (IT-3) 50 (guideline)	70 (IT-1) 50 (IT-2) 30 (IT-3) 20 (guideline)
Total suspended particles TSP (µg/m^3)	N/A	230 (urban) 230 (indus.)	125 (urban) 125 (indus.)	N/A	N/A	N/A

2.2.4 Water Quality

Law 40/1982 regulates the quality of freshwater resources. It includes standards for ambient water quality as well as limits for discharging wastewaters in different water bodies. Water discharged to sewers is required to comply with Law 93/1962 and its modified executive regulations (Decree 44/2000). The law prohibits the disposal of all types of wastewater, even if treated, in public drainage system without obtaining a prior approval.

[10] IT refers to Interim target, until achieving the guideline value

2.2.5 Noise

Law 4/1994 includes standards for ambient and occupational noise with correspondent exposure periods. A brief gap analysis is presented in Table 2-3 below.

Table 2-3: Comparison of National and WBG Noise limits.

	Egyptian Law 4 Requirements			**WB Requirements**		
Noise		Permissible noise intensity decibel		Receptor	One-hour L_{Aeq} (dBA)	
	TYPE OF AREA	DAY 7 a.m. to 10 p.m.	NIGHT 10 p.m. to 7 a.m.		DAY 7 a.m. to 10 p.m.	NIGHT 10 p.m. to 7 a.m.
	Sensitive Areas (Schools-hospitals- rural areas)	50	40	Residential; Institutional; educational	55	45
	Residential with limited traffic	55	45	Industrial; commercial	70	70
	Urban residential areas with commercial activities	60	50			
	Residential adjacent to roads less than 12 m wide	65	55			
	Residential adjacent to roads 12 m wide or more, or light industrial areas.	70	60			
	Industrial areas (heavy industries)	70	70			

2.2.6 Occupational Health and Safety

The Labour Law 12/2003 is the main legislation for health and safety issues. In addition, Law 4/1994 sets out limits for workers' exposure to noise, heat stress as well as ambient air quality standards for work premises.

Other laws and decrees relevant to occupational health and safety provisions include:

- Law 137/1981: Labour and Workforce Safety,
- Law No. 79/1975 as amended by Law No. 25/1977 defining the Social (and Health) Insurance.

2.2.7 Labour Conditions

The Unified Labour Law 12/2003 establishes comprehensive guidelines on labour relations, including hiring, working hours, and termination of employees, training, health, and safety. Under the law employees have qualified right to strike. Moreover, the law also provides rules and guidelines governing mediation, arbitration, and collective bargaining between employees and employers. The law includes non-discrimination clauses and complies with the International Labour Organization (ILO) conventions regulating the employment and training of women and eligible children (Egypt ratified ILO Convention 182 on combating the Worst Forms of Child Labour in April 2002). Under the law, a national committee to formulate general labour policies and the National Council of Wages, whose mandate is to discuss wage-related issues and national minimum-wage policy is established.

Under the Unified Labour Law, workers may join trade unions. A trade union or workers' committee may be formed if 50 employees in an entity express a wish to organize. The Minister of Manpower and Migration (MOMM) issued a decree in 2011 recognizing complete freedom of association. In March 2016, a directive was issued not to recognise documentation from any trade union without a stamp from the Egyptian Trade Union Federation (ETUF), the only official representative of trade unions recognised by the state.

The 2014 Constitution stipulates in article 76 that "establishing unions and federations is a right that is guaranteed by the law." Only courts may dissolve unions. The constitution states that "one syndicate is allowed per profession." The Egyptian constitutional legislation differentiates between white-collar syndicates (for professional workers e.g. doctors, lawyers, journalists) and blue-collar workers (e.g. transportation, food, mining workers).

MOMM sets worker health and safety standards. The Unified Labour Law prohibits employers from maintaining hazardous working conditions, and workers have the right to remove themselves from hazardous conditions without risking the loss of employment.

In the case of a dispute about work conditions, terms, or employment provisions arises a dispute resolution mechanism exists. Both the employer and the worker have the right to ask the competent administrative authorities to start informal negotiations to settle the dispute.

2.2.8 Equal opportunity and women

Labour Law No. 12/2003 prevents any discrimination against women and emphasizes the equal application of the labour law for both women and men. (Article 88) and prohibits gender wage discrimination to ensure that women and men receive equal pay for similar work (Article 35).

The labour law regulates women's maternity leave (Articles No. 91, 92, 93, 94 and 95) whereas pregnant women who have worked in an organisation for 10 months have the right to take maternity leave for 90 days, receiving full financial compensation during their leave. Maternity leave is available twice during a term of employment with the same employer. The employer cannot fire a woman during her maternity leave. Moreover, women have the right to take unpaid childcare leave for a period not exceeding two years and can do this twice during their service. Up until 24 months of the child's birth date, women have the right to a 30-minute breastfeeding break twice a day, with an option of joining the two periods.

The law (Article 90) prohibits women from working in specific jobs, which have been defined by the minister of Manpower Decree No 155/2003. The labour law restricts women from working overnight from 7:00 pm to 7:00 am, with the exception of certain businesses such as hotels, restaurants, theatres, hospitals, cinemas, airports, tourist and airline offices and senior occupations (OECD, 2015, pp. 47-48).

2.2.9 Natural habitats

Law 102/1984 regulates natural protected areas (including more than 140 islands in the Nile). Usually development of the protected areas is well monitored by EEAA. However, it has been noticed that for a number of islands, no effective law enforcement is in place, and many of them already host urban development activities.

2.2.10 Cultural Heritage

Law 117/1983 has been issued to protect antiquities and culturally valuable sites. The Law addresses structural protection of antiquities by placing certain procedures for chance finds. These procedures adequately safeguard against potential negative impacts during the construction activities associated with the program's sub-projects. Registered sites are closely inspected by the Antiquity Authority.

2.3 Ratified Conventions

According to Article 93 of the Egyptian Constitution in terms of hierarchy, treaties are below the constitution and are equivalent to the laws issued/enacted by the parliament. Below is a list of Conventions Egypt has ratified relevant to the project:

- International Plant Protection Convention (Rome 1951). The convention includes measures for the protection of natural vegetation cover;

- African Convention on the Conservation of Nature and Natural Resources (Algeria 1968) including threatened species of plants and animals and their natural habitats;
- Convention on Wetlands of International Importance Especially as Waterfowl Habitats (Ramsar, 1971). The convention identifies wetlands of international importance for resident and migratory birds. Some of the northern Delta lakes are among the wetland areas identified in the convention;
- UNESCO Convention for the Protection of the World Cultural and Natural Heritage (Paris, 16 November 1972) including archaeological sites;
- Convention for the Protection of Migratory Species of Wild Animals (Bonn, 1979). The convention covers migratory bird flights across Egypt in autumn and spring;
- Protocol Concerning Mediterranean Specially Protected Areas and Biological Diversity Convention (1992);
- United Nations framework convention on climate change (New York 1992). The convention covers measures to control greenhouse gas emissions from different sources including transportation;
- Convention on biological diversity (Rio de Janeiro 1992), which covers the conservation of habitats, animal and plant species, and intraspecific diversity;
- Convention on the Elimination of All Forms of Discrimination Against Women. The convention promotes gender equality by ensuring women's equal access to and equal opportunities in political and public life, including the right to vote and to stand for election as well as education, health, and employment;
- Promotion of Equal Remuneration Convention, 1951 (No. 100) The Convention promotes and ensures equal remuneration for men and women workers;
- Discrimination (Employment and Occupation) Convention, 1958 (No. 111) The convention promotes equality of opportunity and treatment between women and men in employment and occupation and focuses on the elimination of discrimination based on race, colour, sex, religion, political opinion, national extraction and social origin, which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation.

CHAPTER THREE: PROJECT DESCRIPTION

3.1 Project Rationale

Rail transportation has played and keeps playing an important role in the economic and social development of regions worldwide due to its ability to haul large quantities of goods and significant numbers of people over long distances and reasonable travel times. It is a highly competitive energy efficient means of land transport in that its consumption of energy per unit load per km is lower than road transportation. Moreover, relentlessly rising energy costs, which tend to curb the development of private car and truck traffic, are further making railway more important.

The railway sector in Egypt is vertically integrated and is owned by the Egypt National Railways Authority (ENR), a public entity established in 1851 and subordinated to the Ministry of Transport. The rail sector is the common mode of transport for low income Egyptians. ENR has been experiencing several challenges over the years relating to safety of train operations, quality of services, and dependence on public resources.

According to the Central Agency for Public Mobilization and Statistics (CAPMAS), the past 12 years have seen an average of 1,041 train accidents on an annual basis. A total of 13,539 train accidents occurred between 2004 and 2016, reports CAPMAS, citing numbers released by the National Railway Authority of Egypt.

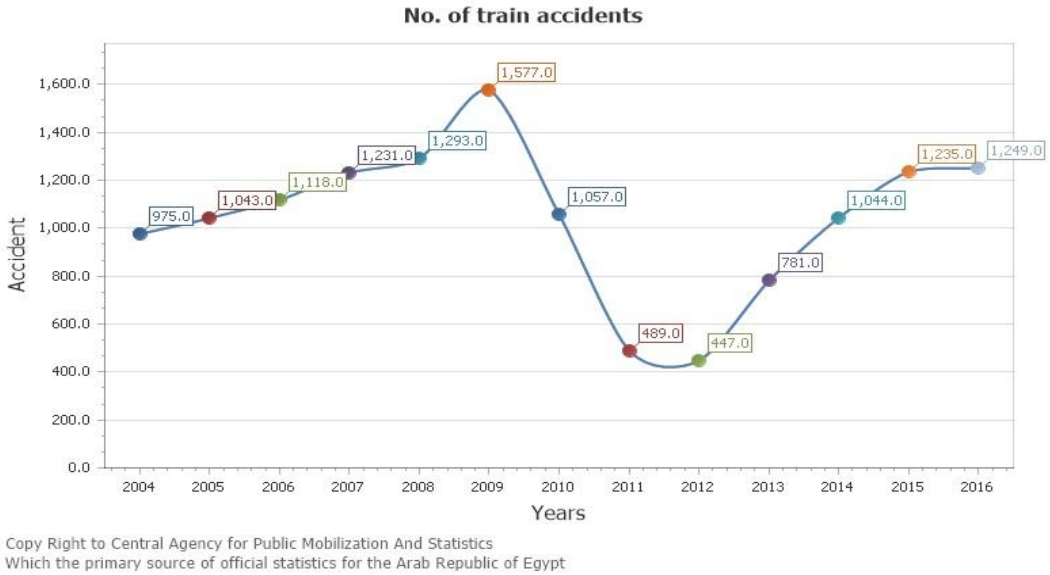


Figure 3-1: *Number of train accidents in Egypt.*

In the past 12 years, there have been more than 1,000 accidents on an annual basis every year apart for four years: 2004 (975), 2011 (489), 2012 (447), and 2013 (781). In 2016, 1,249 train accidents occurred, an increase of 19 accidents from 2015. Egypt recorded its highest number of train accidents in 2009, with

1,577 accidents occurring that year. The statistics showed that in 2016 total accidents amounted to 1,249 compared to 1,235 in 2015 and 1,044 in 2014.

Accidents from cars that crossed railroads and were hit by a train counted for 80 percent of the accidents, while accidents where trains deviated from the track made up 15 percent. The most recent accident occurred on March 12th, 2020 which saw two trains collide near Giza Station.

These conditions affect people´s trust in the railway system, expose them to significant risk and danger, and as a result affect their well-being and are a financial and economic burden, that deprives people of using an easy, affordable and safe mode of transportation.

3.2 Objectives of the Project

Since 2010, the government, with the support of the World Bank and other development partners, has embarked on railway reforms to make the railways safer, responsive, and competitive, through: (i) investing in rail infrastructure and modernization of the Signalling systems to improve efficiency, service levels and operational capacity; and (ii) introducing measures to strengthen ENR management capacity.

The development objective of the Egypt National Railway Modernization Project (ENRMP) is to maximise the benefits of the on-going efforts for modernization of the Signalling and telecommunications system on the ENR rail network, while the specific development objective of component (ii) is to improve the safety and reliability of trains.

The purpose of the ESIA is to identify and assess the potential positive and adverse impacts that may arise from the two sections of the railway network targeted for the work under Component (ii) of the ENRMP; namely: Cairo – Beni Suef (138 km) and Benha – Port Said (214 km), on the environment, on the socio-economic wellbeing and conditions of the population (community and workforce). The project will have the following positive impacts:

- Improved train operation safety.
- Enhanced reliability of trains.
- Improved operation safety of level crossings.
- Increasing the number of trains that can safely use the line per unit time.
- Reduce operational delays.

3.3 Project Description

3.3.1 Overview of ENR Signalling Modernization Project

The total length of the current ENR network extends to 6,679 km, as shown in Figure 3-2. The current ESIA is concerned with the installation of ETCS L1 on Cairo – Beni Suef (125 km) and Benha – Port Said (190 km) sections of the lines. The ESMP for the lines Alexandria – Cairo, Beni Suef – Asyut and Asyut – Negh Hammadi have to be also updated to account for the impacts resulting from the installation of ATP system. Most of the ENR lines currently have mechanical Signalling systems (85% of the total network) as shown in Figure 3-2.

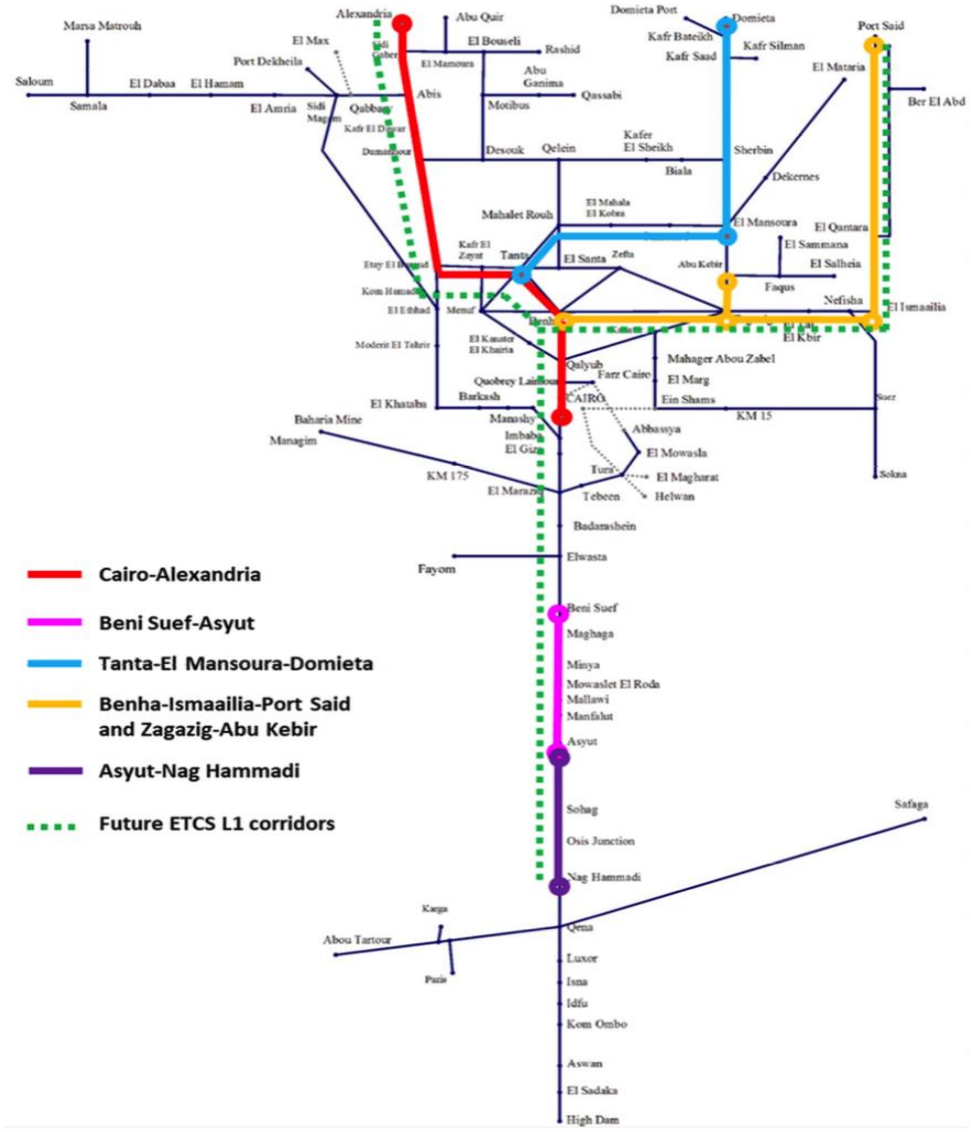


Figure 3-2: *ENR Signalling Modernization Projects.*

All tracks are compliant with the international standard gauge of 1.435 mm. The entire Cairo – Alexandria – Asyut – Nagh Hammadi main corridor is double track, except in the following stretches where it is four tracks:

- Cairo – Qalyub;
- Sidi Gaber – Alexandria.

The corridor Benha – El Ismaailia – Port Said is mainly double track. Table 3-1 show the length of the single, double and four track lines.

Table 3-1: ENR Network Structure.

The table below shows the features of the ENR network, in terms of length and number of tracks:

Number of Track	Length (Km)	Total Length (Km)
Four track lines	20	80
Double track lines	1.466	2.932
Single track lines	3.667	3.667
	Total length of ENR network	***6.679***

The modernization of the Signalling system in the following corridors of ENR network are planned or in progress:

- Corridor 1: Cairo – Alexandria (about 208 km, double track);
- Corridor 2: Cairo – High Dam, route sections Beni Suef – Asyut (about 250 km, double track) and Asyut – Nag Hammadi (about 180 km, double track);
- Corridor 3: Tanta – El Mansoura – Domieta (about 118 km, double and single track);
- Corridor 4: Benha – El Ismaailia – Port Said (about 190 km, double and single track)

3.3.2 Current status of Corridor 2

Corridor 2: Cairo – High Dam route sections Beni Suef – Asyut (about 250 km, double track) and Asyut – Nag Hammadi (about 180 km, double track).

The modernization of the corridor comprises Signalling, telecommunication, CTC and power supply equipment and it is a priority in the route sections Beni Suef – Asyut and Asyut – Nag Hammadi. The main objectives of the modernization are:

- Increase the line capacity from 90 trains/day to 200 trains/day to cover the future forecasted traffic demands;
- Increase the safety level;
- Supervision of the whole line from one CTC;
- Increase the line speed from 120 km/h to 160 km/h.

The existing mechanical interlocking will be replaced by modern electronic interlocking (EIS). The section Beni Suef – Asyut is contracted with Alstom: the Signalling, track and civil works are in progress and, , the final commissioning is expected in the middle of 2022. The section Asyut – Nagh Hammadi is contracted with Thales: the Signalling, track and civil works are in progress and, the final commissioning is expected in the Middle of 2022.

Thales is responsible to include in his project some arrangement for the future ETCS L1. This is the framework considered for the implementation of the future ETCS L1 in the Corridor 2.

Recently, ENR and Siemens contracted the supply of a new on-board computer, called ZUB 212 plus, fully compatible with the actual ZUB 100 and able to be upgraded in the future also for the ETCS L1 operations (ZUB 212+/ETCS L1 dual system).

3.3.3 Current status of Corridor 4

Corridor 4: Benha – El Ismaailia – Port Said (about 190 km, double and single track)

The modernization of the corridor includes the Signalling, the telecommunications, the CTC and the power supply system.

The main objectives are:

- To increase the line capacity from 90 trains/day to 200 trains/day to cover the forecasted traffic demands;
- To increase the safety level;
- To supervise the whole line from one CTC;
- To increase the line speed from 120 km/h to 160 km/h. The mechanical interlocking of the corridor will be replaced by a new modern Electronic Interlocking system (EIS).

The contract was signed with Siemens. The Signalling, track and civil works are in progress, but the final commissioning is delayed as compared to the expected date. This is the framework considered for the implementation of the future ETCS L1 in the Corridor 4. The ETCS will extend only in the section Benha – El Ismaailia – Port Said. The section Zagazig – Abu Kebir is out of the scope.

This ESIA study is prepared to assess the impacts due to the migration to ETCS level 1 for the sections Cairo – Beni Suef (Corridor 2) and Benha – Port Said (Corridor 4) for which no previous ESIAs were developed in addition to updating the already prepared ESMP for the sections Alexandria – Cairo; Beni Suef – Asyut; and Asyut – Negh Hammadi. Figure 3-3 shows the future ETCS L1 corridors (scope of the present Study).

Migrating to ETCS level 1 will not involve any above ground construction work nor acquisition of additional land. It mainly involves installation of cables perpendicular to the track in order to connect to the semaphores. Cables will be installed at a depth of 0.8 to 1 m. This will necessitate excavation work to form a trench of 1 m depth where the cables are installed then closing the trench. The semaphores are spaced approximately at intervals of 1 km.

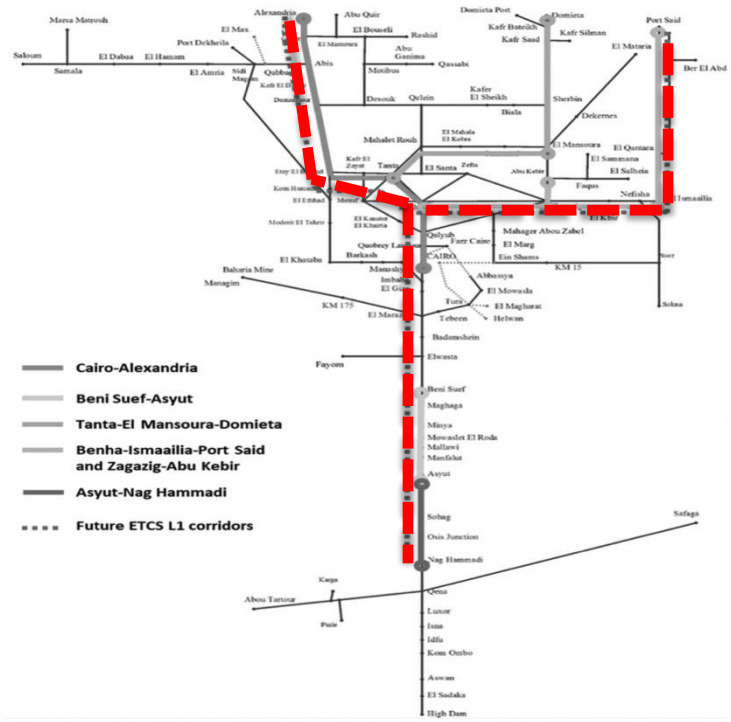


Figure 3-3: *Current ESIA boundaries.*

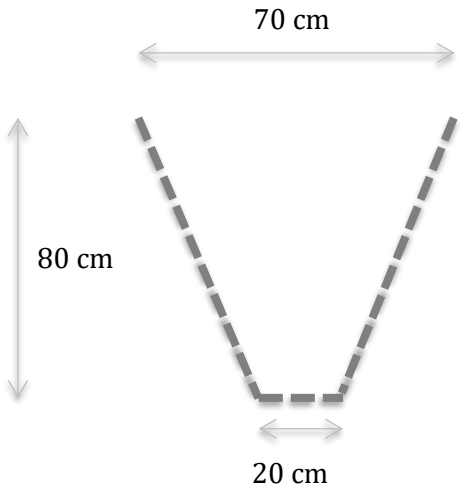
In order to install the ETCS – L1, a transmitter (Balise) will be installed on the tracks and will be connected to the sideway Semaphores via a 2-3 m long cable.

Figure 3-4: *Direction of the required cables* be connected to the sideway Semaphores via a 2-3m long cable.

3.4 Expected amount of resources and waste

Expected amount of waste

The spacing between semaphores is approximately 1 km. This number will be used in estimating the amount of waste and materials used. The trench will be approximately 80 cm deep and the digging will be mainly manual. This will result in a volume of excavated earth of approximately 0.36 m^3/m length or 1 m^3 of excavated earth per 1 km of railway. Around 70 % of the earth will be reused in filling the trench leaving around 30 % as waste or 0.3 m^3 waste soil and debris per 1 km of railway.



Expected amount of used materials

After the cable will be installed, a layer of sand will be placed over the cable as a protection layer covered by a protection plastic tape. The amount of sand, which will be used amount to approximately 0.3 m^3 per 1 km of railway.

Cables

The cables for the operation of the ETCS trackside are divided in two types, power cables and balise cables. All the cables shall fulfil with the following general requirements:

- Installation: designed for outdoor use, either in pipes or direct burial in cable routes.
- Conductor material: red copper wire type.
- Nominal diameter: depending on the distance and on the electrical parameters.
- Mechanical protection: galvanized double steel armoured.
- Water resistance: AD7 (temporary immersion, partial or total) according to the standard IEC 60364-5-51.

Energy and water

The digging will be manual so no energy will be consumed in digging and water is not a major component of the process.

Number of workers

Each trench requires 2 workers to complete the work, amounting to around ten workers for each 5 km. It is not yet determined how the work will be performed (i.e. in series or parallel). It could be concluded that the number of workers required will be ten, if work will be performed in parallel for each 5 km of the segment.

Contractors site offices

The contractor is expected to have a movable office space along each segment of the line for the management staff which will be supplied with a septic tank for sewage. No worker accommodation will be constructed as all workers will be sourced from nearby villages.

CHAPTER FOUR: ENVIRONMENTAL AND SOCIAL BASELINE

4.1 Geographical Scope

This section addresses the baseline of corridors 2 Cairo-High Dam, section of *Cairo – Beni Suef*, and Corridor 4 which is between *Benha – Port Said*.

A. Benha – Port Said (Corridor 4)

The section under study starts in Benha and terminates in Port Said. However, the train's initial station is Cairo (*Ramses Station*).

The train passes by 9 stations *Benha, Minyat Al Qmah, Al Zaqaziq, Abu Hammad, Al tal Al Kabir, Al Ismailia, Al Sheikh Zayed, Al Qantara Gharb and Port Said*. These stations are located in 4 governorates which are *Qaulibya, El Sharkia, Al Ismailia* and *Port Said*. Table 4-1 below shows the distribution of these stations along the 4 governorates and the coordinates of each station. *Al Qualibya* and *Al Sharkia* are in the Nile Delta and Al Ismailia and *Port Said* are along the Suez Canal. Towns and cities near the stations are densely populated, especially the ones near Nile Delta (Please refer to Table 4-3 and 4-4 for population data of both governorates).

Table 4-1: Benha – Port Said Stations

Station	Governorate	Coordinates
Banha	Qaylub	30°27'20.0"N 31°10'50.7"E
Minyat Al Qamh	Ash Sharqia	30°30'58.3"N 31°20'34.4"E
Al Zaqaziq	Ash Sharqia	30°34'54.7"N 31°30'04.3"E
Abu Hammad	Ash Sharqia	30°32'11.4"N 31°40'41.4"E
Al Tal El Kibir	Ash Sharqia	30°33'47.4"N 31°46'59.7"E
Al Ismailia	Al Ismailia	30°35'35.2"N 32°16'12.3"E
Al Sheikh Zayed	Al Ismailia	30°36'04.6"N 32°17'52.0"E
Al Qantara Gharb	Al Ismailia	30°51'24.4"N 32°18'50.8"E
Port Said	Port Said	31°15'35.2"N 32°18'03.2"E

The length of railway from Benha to Port Said is 138 190 km. To better understand the route of this corridor. we have divided it into three zones as shown in Figure 4-1. as detailed below[11]:

- **Zone 1** (*Port Said – Al Ismailia*): The Railway runs parallel to the Suez Canal and Port Said – Al Ismailia Highway for almost 71 km (near Al Sheikh Zayed Station). Then gradually it starts to diverge till it reaches Al Ismailia station, which is almost 900 m from Al Timsah Lake.

- **Zone 2** (*Al Ismailia – Al Zaqaziq*): From Al Ismailia the Railway follows the route of *Al Ismailia – Zaqaziq* highway (Agriculture Road), in one point the distance between the railway and the highway is approx. 6 m.

- **Zone 3** (*Al zaqaziq* to *Benha*): the railway is almost parallel to the highway between *Zaqaziq* and *Banha* and it crosses Cairo – Alexandria agriculture road east of Banha station (Approx. 350 m east of Damietta Branch).

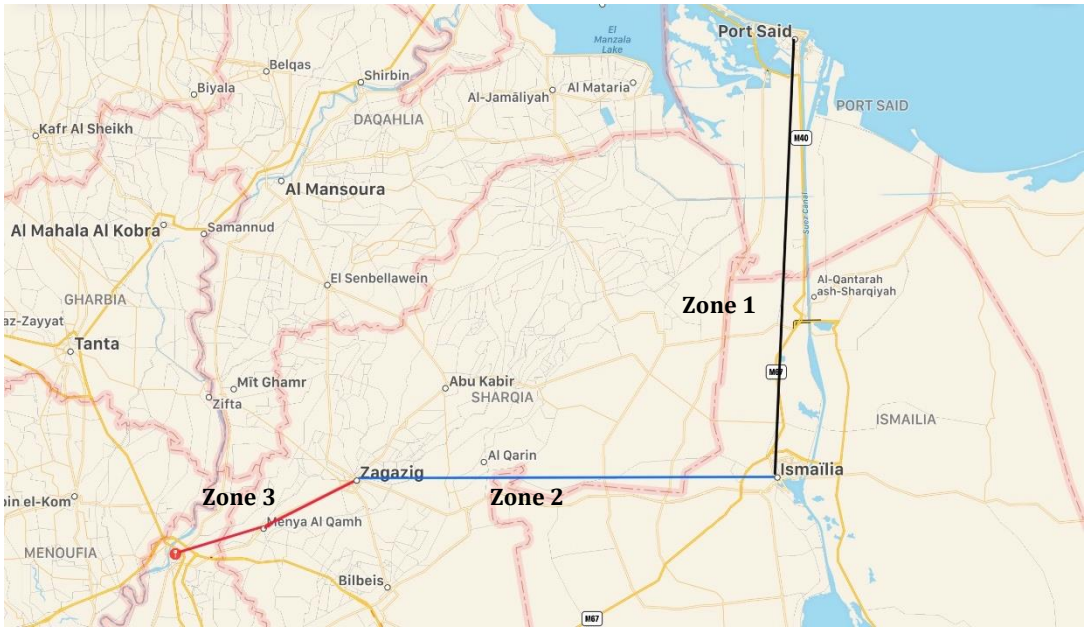


Figure 4-1: *Route corridor Benha – Port Said.*

B. Cairo – Beni Suef (Corridor 2)

This section addresses Corridor 2, which starts with Cairo and ends with Beni Suef. The railway passes by 13 stations, however not necessarily with a complete stop. These stations are in 3 governorates which are Cairo, Giza, Beni Suef. The stations coordinate and the governorates are shown below.

[11] this is based on a site visit along Benha – Port Said and Cairo – Beni Suef railway track where the adjacent land use along both routes have been fully documented and analysed.

Table 4-2: Cairo – Beni Suef Stations

Station	Coordinates	Governorate
Cairo (Ramses Station)	30°03'47.5"N 31°14'47.3"E	Cairo
Imbaba Station	30°04'37.4"N 31°13'04.5"E	Giza
	30°01'33.7"N 31°12'04.4"E	Giza
	30°01'02.2"N 31°12'14.5"E	Giza
Giza Station	30°00'38.6"N 31°12'25.5"E	Giza
	29°59'43.8"N 31°12'31.2"E	Giza
	29°58'51.4"N 31°12'43.4"E	Giza
El-Hawamdeyya Station	29°53'38.6"N 31°16'12.5"E	Giza
El Badrsheen Station	29°51'05.3"N 31°16'36.8"E	Giza
Al Ayat Station	29°37'12.6"N 31°15'20.3"E	Giza
Kafr Amr	29°29'57.2"N 31°14'06.7"E	Giza
Al Wasta	29°20'13.6"N 31°12'15.8"E	Beni Suef
Ashmant	29°12'13.0"N 31°10'19.6"E	Beni Suef
Beni Suef	29°04'33.7"N 31°05'41.3"E	Beni Suef

The route of the railway follows Cairo – Aswan western agricultural road. From *Beni Suef* till *Al Wasta* it is almost parallel to *Al Ibrahimya* canal which comes south from Asyut and ends in *Al Wasta*. The canal is to west of the railway and it mainly irrigates 3 governorates *Asyut*, *Al Minya* and *Beni Suef*.

4.2 The Physical and Biological Setting

A. Benha- Port Said

The terrain of Zone 1 is agricultural land on the west and Suez Canal on the east of the railway. However, there are few spots of arid desert land between *El Qantara* and *Al Ismailia*, as shown in Figure 4.2.

Figure 4-2: *Terrain of Benha – Port Said.*

The terrain of Zone 2 is mainly agricultural land on both sides, with some highly populated clusters near the train stations. The terrain of Zone 3 is similar to Zone 2, agricultural lands on both sides, with highly populated clusters near the train stations.

B. Cairo – Beni Suef

The terrain through which the railway passes is mainly agricultural land on both sides, with clusters of densely populated areas, around the main stations (Figure 4-3 & Figure 4-4. However, after Al Hawamidia, the agricultural land starts to become less and almost disappears as shown in Figure 4-5.)

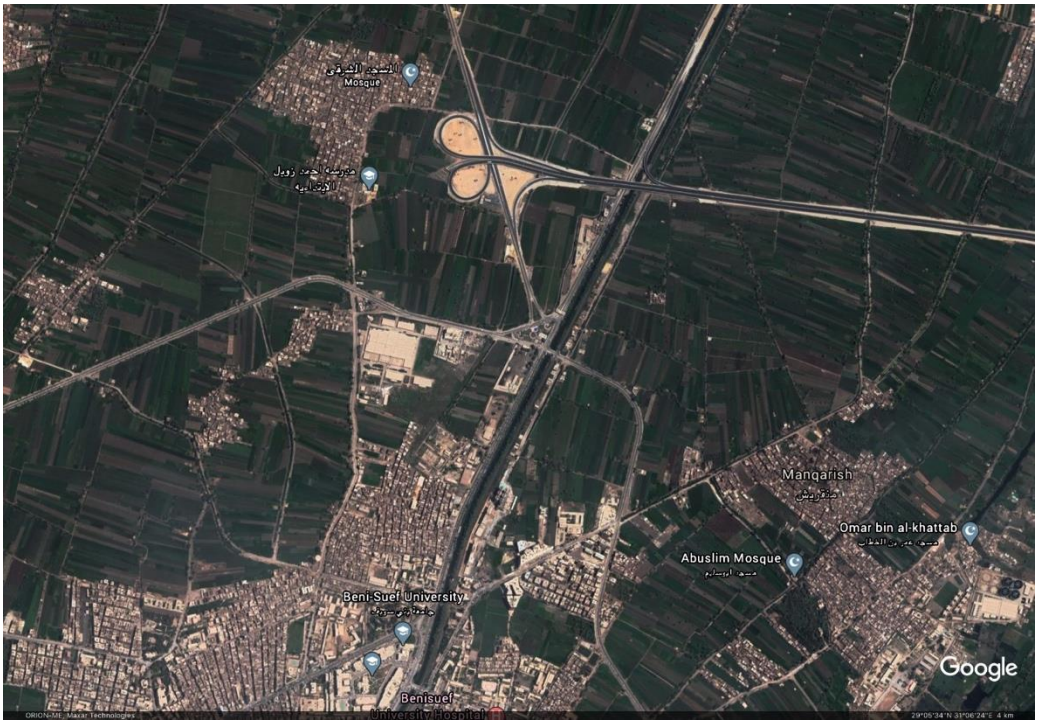


Figure 4-3: *Terrain Cairo – Beni Suef (1).*

Figure 4-4: *Terrain Cairo – Beni Suef (2).*

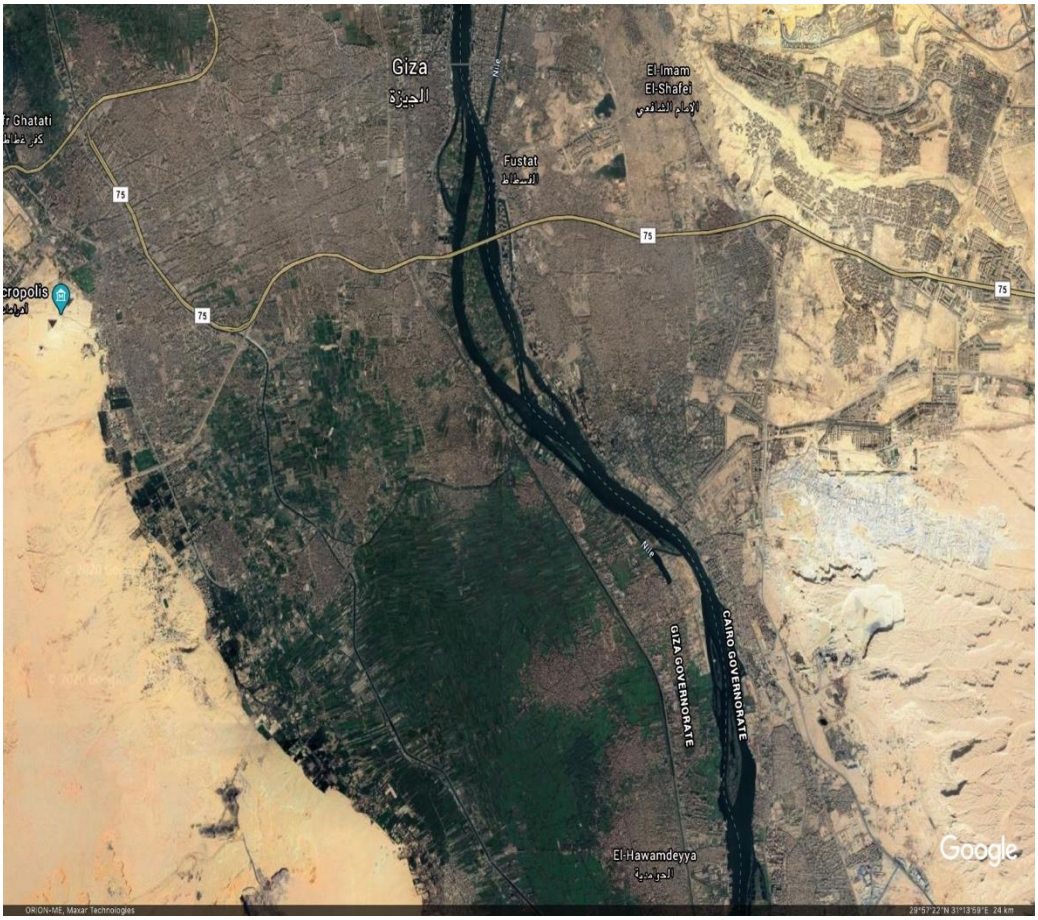


Figure 4-5: *Cairo – Beni Suef (3).*

4.3 Governorates overview

Egypt is a transcontinental country, which spans the southwest corner of Asia and the northeast corner of Africa. This is made possible through a land bridge formed by the Sinai Peninsula. Most of Egypt is located in North Africa and is bordered by both land and sea. Egypt is one of the most populous countries in Africa and the Middle East. With a 2018 estimated population of 99.38 million, Egypt ranks 15th in the world, compared to the last official census figure of 72.7 million in 2006.

The population density of Egypt as a whole is 84 people per square kilometre (218/square mile), with Cairo having the heaviest density. Overall, Egypt ranks 126th in the world in terms of population density. In general, the Nile Valley and the Nile Delta host the highest population and activity densities in Egypt. Around 8 million acres of agricultural land-use and the majority of rural and urban clusters are located in the Nile Valley and Delta.

As of the beginning of 2018 according to the latest demographic and social statistics by United Nations Statistics Division Egypt had 32.7 % population under 15 years old and 62.8 % between 15 and 64 years old.

***Beni Suef* (also *Bani Suwayf, Beni Swaif*)**

The Governorate lies along the Nile River in northern Upper Egypt, with an extension into the Libyan (Western) Desert at its southern end, and with Al-Fayum governorate to its west and Al-Minya to its south. Its cultivated, settled area consists mainly of a strip of the Nile River valley floodplain, extending about 80 km north south and 24 km in width at its widest point, near Beni Suef city. Because the river throughout history has eroded away the eastern bank, it now embraces only a narrow gravelly plain terminating abruptly below the hills of the Eastern Desert.

The governorate's capital is the city of Beni Suef, located about 120 km south of Cairo on the west bank of the Nile River. The city if famous for its cement factories. The nearby Meidum pyramid is the only prominent tourist attraction in the area.

According to population estimates from 2015 the majority of residents in the governorate live in rural areas, with an urbanisation rate of only 23.2 %. Out of an estimated 2,856,812 people residing in the governorate, 2,193,871 people live in rural areas as opposed to only 662,941 in urban areas. According to the Egyptian Governing Authority for Investment and Free Zones (GAFI), in affiliation with the Ministry of Investment (MOI), the following industrial zones are located in this governorate:

- Kom Abu Radi;
- Baiad Al Arab;
- The industrial zone 1/31;
- The industrial zone 2/31;
- The industrial zone 3/31;
- The industrial zone 4/31;
- Heavy industrial zone Gabal Ghareb;
- New Beni Suef (New urban community industrial zone).

Cairo

Cairo Governorate is the most populated of the governorates of Egypt. Its capital, the city of Cairo, is the national capital of Egypt, and is part of the Greater Cairo metropolitan area. Because it is completely urbanised, the governorate is considered a city proper, and functions as a municipality. However, there are uninhabited desert areas. Metropolitan Cairo is made up of the Cairo (governorate), as well as other districts, some of which belong to neighbouring governorates such as El-Giza and Qalūbiyyah. 60 % of all informal houses in Egypt are located in the Greater Cairo area.

The Cairo Governorate is divided into 41 administrative divisions (*Qism*):

- El Marg
- El Salam
- Ain Shams
- El Matareya
- Zeitoun
- Haddaiq El Qubbah
- El Nuzhah (Airport)
- Heliopolis
- El Waili
- El Zawiyah El Hamra
- El Sharabeya
- El Sahel
- Shubra
- Rud El Farag
- Bulaq
- Azbakeya
- Manshiyat Naser (incl. Garbage City, Mokattam, and City of the Dead)
- Nasr City 1
- Nasr City 2
- Qasr El Nil
- Zamalek
- Abdeen
- El Muski
- Bab El Shariyah
- El Zahir
- El Gamaliyah
- El Darb El Ahmar
- El Sayidah Zaynab
- Masr El Qadimah (includes Old Cairo, El-Manial, and Garden City)
- El Khalifa
- El Basatin
- Turah
- 15 Mayu
- Helwan
- El Tabin
- New Cairo 1 (includes Madinaty)
- New Cairo 2
- New Cairo 3
- El Shorouk City
- Badr City (includes New Heliopolis City)

According to the Egyptian Governing Authority for Investment and Free Zones (GAFI), in affiliation with the Ministry of Investment (MOI), the following industrial zones are located in the governorate:

- Torah and Shaq Al Tho'ban
- South Helwan
- Katamia
- Shaq Al Tho'ban
- Al Robeiky
- Al Maasara
- Division Maadi Company for Development and Reconstruction
- Egypt-Ismailia. Road - Al Nozha District
- El Salam City
- El Marg District
- El Sharabya District
- (New urban community industrial zone) Badr City
- (New urban community industrial zone) 15th of May
- (New urban community industrial zone) New Cairo
- (New urban community industrial zone) Al Shrouk

El-Giza Governorate (also Al-Jizah, Gizah, or El-Giza)

El-Giza governorate of Upper Egypt, is located on the west bank of the Nile River, extending toward the southwest into the Western (Libyan) Desert as far as Al-Wādī Al-Jadīd governorate. It is bordered on the north by Al-Minūfiyyah governorate and on the south by Beni Suef and Al-Fayyūm governorates, and It includes Al-Baḥriyyah and part of Al-Farāfirah oases, its capital is El-Giza, and it is also a suburb of the national capital (Cairo), with a distinctive character enriched by several archaeological and cultural sites, and is home to the Sphinx and the Great Pyramids of Giza.

Al-Jīzah is also a large industrial centre, where mineral resources including iron ore and coal are found at Al-Baḥriyyah oasis. A railway transports the ore to the steel plant at Ḥulwān, in Cairo governorate. Additionally, the governorate has an airport at Imbābah, north of Al-Jīzah, near Cairo, it is served by the Cairo-Aswān railway, which has a station in Al-Jīzah, and also by highway.

According to the Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS), the total population of the governorate as of January 2019 has been estimated to 8,915,164, with an urbanisation rate of 60.7 %, resulting in an estimated total of 5,410,061 people residing in urban areas, whereas 3,505,103 people reside in rural areas.

El-Giza Governorate is divided into the following administrative divisions *(Qism)*:

- Dokki
- Pyramids
- Agouza
- El-Hawamdeya
- Giza
- El-Omraniya
- El-Wahat El Bahariya
- El Warraq
- Sheikh Zayed City
- El-Talibeya
- Bulaq El Dakrour
- Imbaba
- 6th of October City (2)
- 6th of October City (1 & 3)

Al-Qalyubiyya Governorate

The governorate is located in Lower Egypt, and is situated north of Cairo at the top of the Nile River delta, it is bounded on the northeast by Al-Sharqiyyah governorate and on the northwest by the Damietta Branch of the Nile. It is densely populated, and about three-fifths of its population relies on agriculture. The alluvial farmland is irrigated mainly by the Al-Tawfīqī Canal, which parallels the Nile, and by the Al-Ismāʿīliyyah Canal to the east. There is also a chemicals plant, producing fertilizer, sulfuric acid, oleum, and aerosols. The principal towns are Banhā, capital of the governorate, and Qalyūb.

According to the Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS), the total population of the governorate as of January 2019 has been estimated to 5,792,066, with an urbanisation rate of 42.8 %, resulting in an estimated total of 2,479,382 people residing in urban areas, whereas 3,312,684 people reside in rural areas.

Al-Qalyubiyya Governorate is divided into the following administrative divisions *(Qism)*:

- El-Khanka
- El-Khusus
- El-Obour
- Banha 1
- Banha 2
- Qaha
- Qalyub
- Shubra El-Kheima 1
- Shubra El-Kheima 2

Al-Sharqiyyah Governorate

The governorate is located in Lower Egypt within the eastern region of the Nile River delta, touching the Mediterranean Sea just west of Suez, in the northeast it includes a part of the large Lake Manzala, a brackish coastal lagoon. Its chief port is Al-Manzilah, at the head of a branch railway from Al-Manṣūrah on the Damietta branch of the Nile, its Capital is Al-Zagazig. The flat, alluvial governorate supports a variety of irrigated crops. Additionally, poultry and fish farming industries are existent.

According to the Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS), the total population of the governorate as of January 2019 has been estimated to 7,401,700, with an urbanisation rate of 24.9%, resulting in an estimated total of 1,845,179 people residing in urban areas, whereas 5,556,521 people reside in rural areas.

Al-Sharqiyyah Governorate is divided into the following administrative divisions *(Qism)*:

- El-Qanayat
- El-Qurayn
- New Salhia
- Zagazig 1
- Zagazig 2
- Faqous
- 10th of Ramadan City 1
- 10th of Ramadan City 2

Al-Ismailiyyah Governorate

The governorate is located in Lower Egypt and is in the north-eastern region of the Nile River delta, its capital is the city of Ismailia. It is a square-shaped territory with a long, narrow extension northward along the Suez Canal, ending just south of Port Said. Its eastern boundary is the Suez Canal, including the Great Bitter Lake, a shallow, marshy salt lake forming part of the Suez Canal. The governorate consists mainly of desert, except in the northern part. The Ismailia Governorate is on the banks of the Suez Canal and its Ismailia Canal extends from the Nile River near Cairo, to the Suez Canal at the city of Ismailia, on Lake Timsah. The Ismailia Canal was built to provide fresh water to workers during the building of the Suez Canal, plus, the Suez Canal Authority headquarters is located in Ismailia.

According to the Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS), the total population of the governorate as of January 2019 has been estimated to 7,401,700, with an urbanisation rate of 24.9 %, resulting in an estimated total of 1,845,179 people residing in urban areas, whereas 5,556,521 people reside in rural areas.

Al-Ismailiyyah Governorate is divided into the following administrative divisions *(Qism)*:

- Ismailia 1
- Ismailia 2
- Ismailia 3
- El-Qantara El-Sharqiya

Port Said Governorate

The governorate is one of the Canal Zone governorates of Egypt. It is located in the northeastern part of the country, on the Mediterranean Sea at the northern gate of the Suez Canal, making it the second most important harbour in Egypt. Its capital is the city of Port Said, and it is the home of the Suez Canal Authority historical administrative building and the Lighthouse of Port Said.

According to the Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS), the total population of the governorate as of January 2019 has been estimated to 764,499, with an urbanisation rate of 100 %, making it a wholly urban governorate.

Port Said Governorate is divided into the following administrative divisions *(Qism)*:

- El-Dawahy
- El-Arab
- El-Ganoub
- El-Ganoub 2
- El-Manakh
- El-Manasra
- El-Sharq
- El-Zohour
- Port Fuad
- Port Fuad 2
- Police Department Port Said
- Mubarak East

4.4 Climate

Climate of Egypt is mostly hyper-arid, with the exception of coastal areas.

Table 4-3 below provides an overview of temperature and precipitation in Egypt (Weather Base 2017).

For the relative humidity, the lowest values are those of inland locations of the arid and hyper-arid provinces and the highest are those of locations closer to the Mediterranean coast and the Nile Delta within the arid province. Humidity is at its lowest in late spring whereas the highest records are those of late autumn and early winter.

Wind direction in most of the project areas is North-West South-East and its circulation over Egypt is controlled by three permanent high-pressure belts: the Azores, the South Atlantic subtropical and the Indian subtropical.

Table 4-3: Overview of temperature and precipitation in Egypt.

	ANNUAL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Average Temp. (C)	21.7	13.5	14.7	17.3	21.3	24.8	27.5	28.4	28.3	26.6	23.8	19.3	15.2
Average High Temp. (C)	27.8	19.4	20.8	23.6	27.8	31.5	33.9	34.4	34.3	32.5	29.8	25.4	21.1
Average Low Temp. (C)	16.1	8.4	9.2	11.6	15.0	18.5	21.3	22.6	22.9	21.2	18.6	14.3	10.2
Average Precipitation (mm)	49.5	11.2	6.8	4.8	2.2	1.5	0.3	0.2	0.3	0.3	2.9	6.1	10.3

4.5 Noise

With the greatly varied physical setting, background noise level along the railway corridors are expected to vary considerably. Noise levels are also expected to vary at different times of the day as a result of variation of levels and types of human activities. Permissible noise standards given in the Egyptian legislations besides noise emissions from passing trains have been used as basis for comparing present and potential, project-induced changes in noise levels. The background noise level of the areas along the railways will be considered therefore to the maximum permissible values in the times when no train passes. When the train passes, the noise emissions due to the train will dominate.

Cairo – Beni Suef (Corridor 2)

The area surrounding the railway in this corridor, could be represented by a permissible noise day average of 60 dB and night average will be approximately 50 dB.

The trains covering this corridor, also cover the whole area of upper Egypt, thus there is high frequency of trains passing through the corridor. According to the Egyptian National Railway website there are 28 trains covering this route 14 each direction. Table 4-4 below shows trains numbers and timings.

Table 4-4: Cairo-Beni Suef Train Schedule

Cairo-Beni Suef		Beni Suef-Cairo	
Train	Time	Train	Time
934	1:10	977	3:19
978	6:30	185	6:13
980	8:00	871	7:20
982	12:00	997	8:00
986	13:00	89	9:12
186	13:30	989	9:53
970	14:20	971	11:02
990	16:00	991	12:24
872	17:45	987	13:53
988	19:00	891	15:53
88	20:00	981	17:54
976	21:30	979	19:25
996	22:00	983	19:49
890	23:30	935	20:23

The graph below presents the level of baseline noise at a point in the middle of the route over the 24 hours of the day.

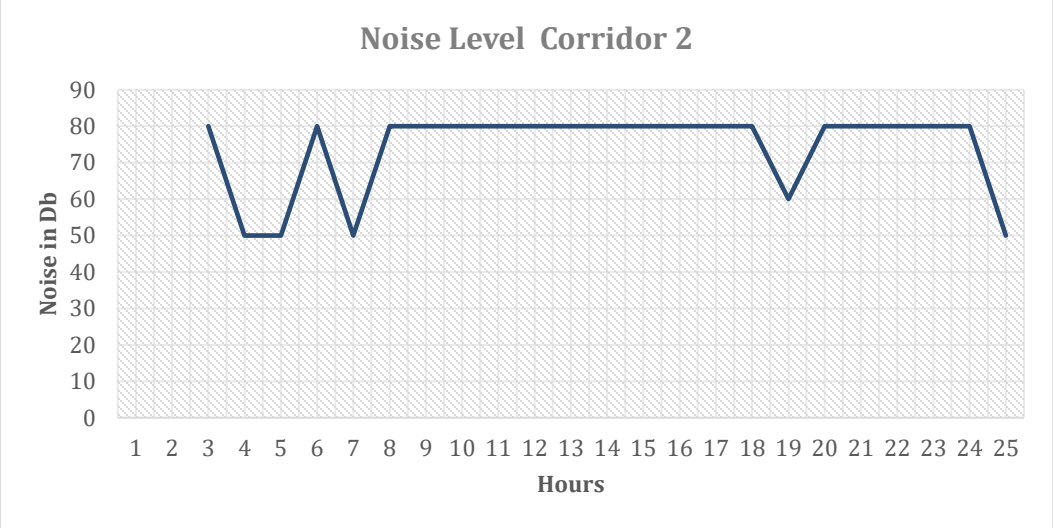


Figure 4-6: *Ambient Noise Baseline along Cairo-Beni Suef Corridor*

Banha – Port Said

The area surrounding the railway in this corridor could be represented by the same noise levels as Corridor 2. The trains from Cairo (first station of the train) to Port Said is not as frequent as Cairo – Beni Suef. There are 6 trains which cover this route 3 each direction. The earliest is at 5:30 am and the latest is 2:40 pm. Table 4-4 shows the trains number and schedule.

The graph below measures the level of noise in a point in the middle of the route over the 24 hours of the day. The hours where the train passes, permissible noise level (either day or night) is added to noise level of the train which assumed at 80 dB.

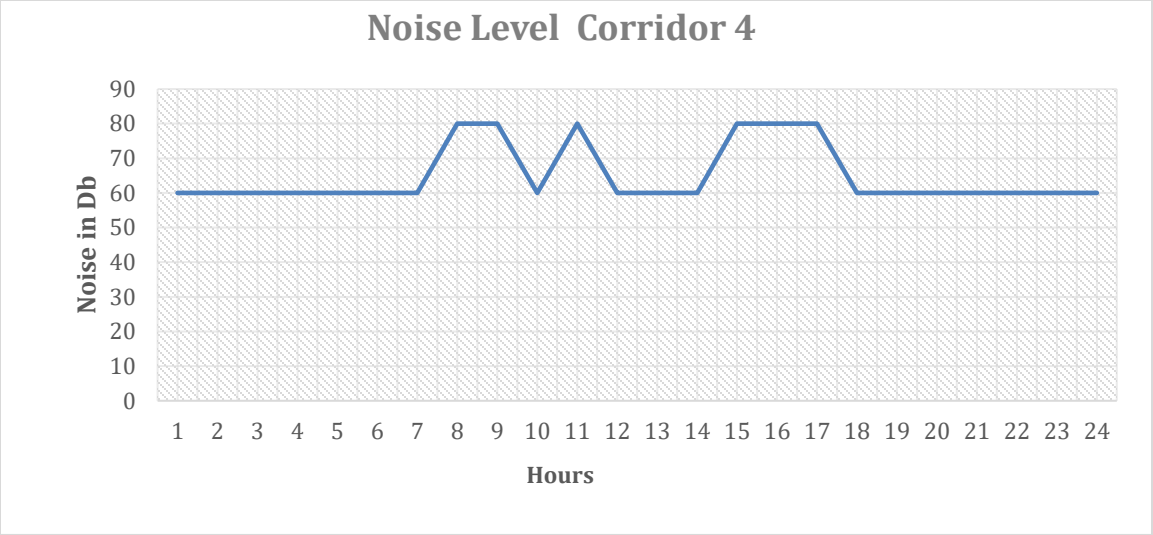


Figure 4-7: *Ambient Noise Baseline along Banha-Port Said Corridor*

4.5 Air Quality

This section addresses air quality along the two corridors[12]. The Ministry of Environment in Egypt has a network of stations which monitors air quality across different regions in the country.

The network consists of 96 stations which are distributed to cover different areas in Egypt. Table 4-5 below shows the distribution of these monitoring stations along Egypt.

Table 4-5: Distribution of Ambient Air quality monitoring stations along Egypt

Classification	Greater Cairo	Alexandria	Nile Delta	Upper Egypt	Sinai and Suez Canal	Total
Industrial	8	3	4	3	1	19
Urban	15	4	10	10	2	41
Traffic Area	9	-	-	1	-	10
Reference	-	-	-	-	2	2
Overlapping	16	1	2	3	-	22
Portable	2	-	-	-	-	2
Total	**50**	**8**	**16**	**17**	**5**	**96**

[12] Data extracted from Ministry of Environment website http://www.eeaa.gov.eg/en-us/topics/air/airquality/airqualityreports.aspx (Accessed 19 March 2020).

The graphs below (Figure 4-8 and Figure 4-9) show the air quality and the concentration of SO_2, NO_2 and PM10 in different parts of Egypt. With regards to assessing air quality around the areas which the railways pass for the two corridors, assumption is made to choose the closest monitoring station to each corridor. This assumption is due to the lack of monitoring stations which covers the whole of routes of the two corridors.

Sulphur Dioxide (SO_2)

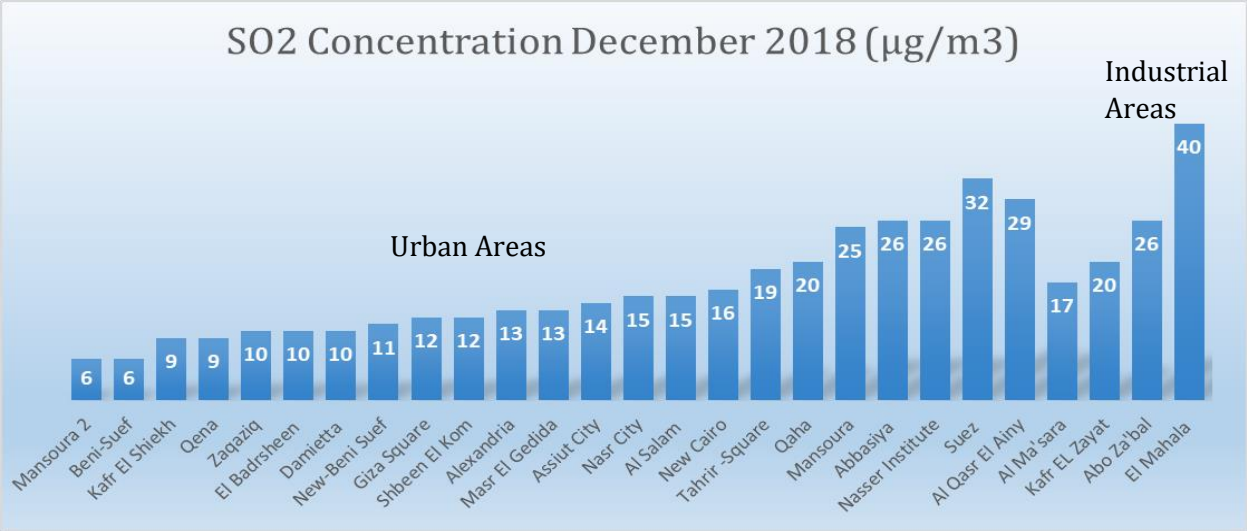


Figure 4-8: *SO_2 concentrations along Cairo – Beni Suef route (Corridor 2) - The closest monitoring stations are Beni Suef and Al Badrsheen.; and Banha – Port Said route (Corridor 4) - The closest monitoring station is Zaqaziq.*

Nitrogen Dioxide (NO_2)

Figure 4-9: *NO_2 concentrations along Cairo – Beni Suef route (Corridor 2) - The closest monitoring stations is Beni Suef.; and Banha – Port Said route (Corridor 4)- The closest monitoring station is Belbeis.*

Particulate Matter 10 (PM 10)

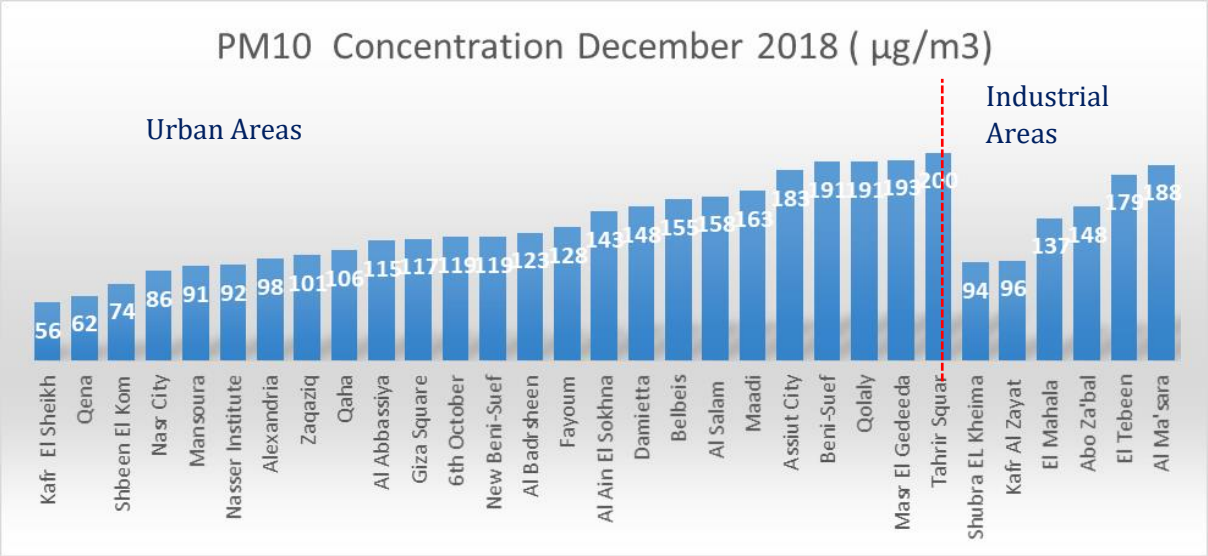


Figure 4-10: *PM10 concentrations along Cairo – Beni Suef route (Corridor 2) - The closest monitoring stations are Beni Suef; and Banha – Port Said route (Corridor 4) - The closest monitoring station is Zaqaziq.*

4.7 Biodiversity

The railway track corridors have been in place for more than a century and is already part of the man-made landscape. Although some wild animals and plants seem to utilise man-made microhabitats around the track corridor, none seems to be obligate user that requires these microhabitats for its survival. Available data show that none of the species that are likely to occur around the railway corridor is threatened.

Breeding colonies of the once declining, but now very common Cattle Egret (*Egretta ibis*) are found at several localities along the Ibrahimiya Canal, 30 m away from the railway corridor – which minimises construction phase impacts in terms of random liquid and/or waste disposal Many other bird species feed in habitats associated with that canal and the adjacent cultivated fields. Among the more visible bird species are the Spur-winged Plover, the Pied Kingfisher, the Common Kestrel, the Black-shouldered Kite and Palm Dove. Mammals include several rodents, the Egyptian Red Fox, the Egyptian Mongoose, and the Egyptian Wolf. Reptiles include the Bean Skink, the African Beauty Snake, the Egyptian Cobra and others.

4.8 Waste Management

Waste along the railway corridors is particularly common and extensive and a lot of dumping site exists along and in very close proximity to the railway corridors on both lines. For the hazardous waste, the Nasreya is only one licensed Hazardous (non-medical) waste disposal facility in Egypt and is located in Alexandria Governorate in the North.

4.9 The Socio-Economic Setting

Egypt is administratively divided into twenty-six governorates in addition to the City of Luxor which is given a special administrative status similar to that of a governorate. Each governorate is further divided into a number of Administrative Centres "Marakez"[13]. Egypt has a total of 180 of these Administrative Centres, 213 Cities, 74 Neighbourhoods and 4,632 Villages[14]. A governorate is either fully urban or a mixture of urban and rural. Fully urban governorates have no Administrative Centres and are administratively comprised of Cities only[15]. Egypt has four urban governorates, which are Cairo, Alexandria, Port Said and Suez. Please refer to Section 4.3 for the specificities of the governorates that will host the project.

4.10 Socioeconomic profile of the project area

Socioeconomic features of the influence area of the project vary considerably along that long stretch of the railway. Communities inhabiting that area include affluent communities of high economic sectors of Cairo and Giza and Port Said, as well as poorest of the poor of the Egyptian society in informal urban areas and in remote villages. The greatest part of the railway corridor runs through rural areas where the main economic activity is agriculture. A great variety of crops are cultivated in that part of the valley but the most common are wheat, corn, cotton, and vegetables, as well as groves of citrus and other fruit trees. The line also cuts through urban areas with more diverse economic activities.

Areas around the main train station in larger towns are usually the local hubs of economic activities. Some of the businesses in these areas are directly dependent on the operation of the railway service (such as local passenger transportation, restaurants, coffee shops, etc.). Others benefit from high demands for goods and services created by the movement of the large number of train users who frequent the train station area.

The railway corridor is walled within urban areas, allowing vehicular traffic and pedestrian crossing through level crossings that have different degrees of traffic control measures. These level crossings invariably form traffic bottlenecks, particularly in larger, more crowded area. Informal crossings created by breaching the protective walls are extremely common and create a major hazard to its users and the passing trains.

The following tables show population for each of the governorates on the corridors[16]:

Table 4-6: Population of governorates along Benha – Port Said corridor.

[13] Earth Trends Country Profiles (2003), Population, Health and Human Well Being - Egypt
[14] Year Book (2007) Egypt State Information Service.

[16] https://www.capmas.gov.eg/Pages/populationClock.aspx

Governorate	Population
Qaulibya	5,889,536
Ash Sharqia	7,549,109
Al Ismailia	1,383,376
Port Said	773,886

Table 4-7: Population of governorates along Cairo – Beni Suef corridor.

Governorate	Population
Cairo	9,936,851
Giza	9,091,051
Beni Suef	3,737,775

4.11 Poverty

The poverty rate is highest in Upper Egypt and specifically rural Upper Egypt (51.5 %), followed by urban Upper Egypt (29.4 %) and it is the least prevalent in Urban Governorates (9.6 %); the same applies to the poverty gap and the squared poverty gap[17,18].

Poverty in Upper Egypt is mainly structural/chronic poverty that is driven by lack of adequate public infrastructure, private capital accumulation, and low investment in human capital and the absence of pro-poor program-based fiscal policy, which collectively lead to deterioration in living standards in Upper Egypt, compared to other regions. (CAPMAS, Population Department)

Table 4-6 showcases that of the 1000 poorest villages in Egypt, 941 are located in Upper Egypt and the remaining 59 villages are scattered across the North in addition to the population densities in these governorates. In addition to the group of poverty indicators in Egypt's poverty map and which illustrate that 94 % of the poorest villages in rural Egypt are in the South, it is important to shed light on the most serious indicators of deprivation.

Table 4-8: Egypt's 1000 Poorest Villages in Poverty within Governorates[19].

[17] The poverty gap index amounted to 35.3% compared to 5.9% at the level of total rural Egypt.

[18] Geographically, Egypt is divided into seven regions: Metropolitan including Cairo, Alexandria, Port Said and Suez governorates which are fully Lower Urban and Lower Rural which include urban and rural areas of Damietta, Dakahlia, Sharkia, Qualiobia, Kafr el Sheikh, Garbeyya, Menoufia, Beheira, Ismailia governorates, Upper Urban and Upper Rural which include urban and rural areas of Giza, Bani Suef, Fayoum, Menia, Asyut, Sohag, Qena, Aswan and luxor governorates, and Border Urban and Border Rural which include urban and rural areas of Red Sea.

[19] Egypt's Poverty Map Report (2007).

Upper Egypt Governorate	No. of Poorest Villages	Total number of Families in the Poorest Villages	Number of Poor Families	Total Population in the Poorest Villages	Number of Poor People	Population Density/km^2
Giza	18	28,377	10,357	133,601	48,811	5,951
Beni Suef	13	15,542	5,584	86,807	31,162	1,933
Al Minia	310	654,148	272,083	3,049,039	1,270,324	1,987
Assiout	234	527,027	298,569	2,530,302	1,436,795	2,337
Souhag	250	593,151	274,017	2,733,101	1,268,608	2,473
Qena	112	305,470	119,167	1,497,021	587,743	2,276
Aswan	4	1,803	656	6,518	2,391	1,316
Total	**941**	**2,125,518**	**980,433**	**10,036,389**	**4,645,834**	

CHAPTER FIVE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

5.1 Scope of Study

The Egyptian National Railways Authority (ENR) undertook an ESIA for the Egyptian National Railways Restructuring Project (ENRRP) in accordance with the environmental procedures and guidelines of the Egyptian Environmental Affairs Agency (EEAA), and the World Bank's Operational Policies (OP 4.01) on Environmental Assessment in 2008. To satisfy the bank requirements on environmental assessment, this ESIA has been updated under the auspices of ENR and was submitted for approval by EEAA and disclosed in country in both English and Arabic, prior appraisal according to the Egyptian and Bank relevant policies and procedures. The ESIA for the following rail sections have been prepared: Alexandria – Cairo; Beni Suef – Asyut; and Asyut – Negh Hammadi. However, the ESIA for the following sections are to be prepared: Cairo – Beni Suef and Benha – Port Said.

The project scope of this present study aims at mitigating the impacts of the installation of an Automatic Train Protection system (ATP), mainly migration to ETCS L1 of the trackside and on-board subsystems in order to enhance of the performances in terms of line capacity and speed and operation efficiency, as well as at an increasing demand of safety level. The study will mainly focus on the sections Cairo – Beni Suef (Corridor 2) and Benha – Port Said (Corridor 4) for which no previous ESIAs were developed, in addition to updating the already prepared ESMP for the sections Alexandria-Cairo; Beni Suef – Asyut; and Asyut – Negh Hammadi.

The objective of the ESIA is to identify and examine the potential socio-cultural, economic, physical, and biological impacts of the proposed component of the project, propose measures to mitigate its adverse impacts, and develop plans for managing and monitoring its environmental impacts throughout the 990 km railway network.

In fact, the ENRMP has been classified as Category B according to the guidelines of the EEAA and as a Category 2 as per the Bank's ISS requirements. It is worth mentioning that although the ENRMP has been classified as Category B according to the guidelines of the EEAA, there is no matching project in the EEAA list to the ATP intervention in itself and it could be classified as Category A according to the guidelines of the EEAA as the project which includes projects with minimal environmental impacts.

5.2 Impact Assessment Approach and Methodology

5.2.1 Overall approach

An initial screening of potential Environmental and Social project impacts was done to identify the relevant impacts of the project during the different phases. All Environmental and Social impacts listed in the AfDB ISS Sector Key sheets on transport sector: railway construction and rail transportation have been considered, as well as impacts listed in the IFC Environmental, Health, and Safety Guidelines for railways.

Potential receptors for project impacts were found to be the following: i) construction workers; ii) environmental receptors (air, soil, etc.); iii) Local Communities and iv) train users.

The assessment of the baseline conditions (presented in Chapter 4) was based on the following:

- Field information and overview collected during site visits of both rail corridors carried out by the Consultant in February 2020 (See **Annex I**);
- Consultant's experience in projects located in Egypt;
- Secondary data sources;
- Previous ESIAs conducted for the ENRMP project.

The impact identification and assessment relied on a combination of project information provided by the Client, scoping activities, Consultant's experience with similar actions, census and vital statistics, secondary data and survey and field research. On this basis, impacts were identified through:

- Technical identification of the scope and nature of project activities required;
- Consultant's experience on similar projects; and
- Interactions with professionals and experts in the field.

Expected impacts were represented in an interaction matrix showing anticipated interactions between project activities and major environmental and social receptors.

5.2.2 Impact Assessment Methodology

Impacts identified are further assessed and discussed. The method used for the assessment of the relevant impacts is based on indicative scores given to the various aspects that play a role in the significance of the impact. The following four impact significance factors are considered:

- Probability of occurrence
- Spatial scale
- Temporal scale
- Intensity of the impact (also considers the sensitivity of the receptors)

Probability of occurrence

Three probability levels were used as shown in Table 5-1 below:

Table 5-1: Probability criterion adopted for the impact assessment.

Probability score	***Criterion***

1	*High and very high probability of occurrence, 75-100% confidence that the impact will take place*
0.5	*Medium probability of occurrence, 25-75% confidence that the impact will take place*
0.25	*Low probability of occurrence, less than 25% confidence that the impact will take place*

Spatial scale

Table 5-2 shows the different scores adopted by the Consultant in order to quantify the impact based on its area of influence.

Table 5-2: Spatial Scale criterion adopted for the impact assessment.

Score	***Criterion***
1 (Individual on site)	*Impact is on one or very limited number of individuals*
2 (Group on site)	*Impact is on multiple individuals within the project site*
3 (Surrounding Community)	*Impact could extend to surrounding community*
4 (Regional)	*Impact is on the city/country level*

Temporal scale

Table 5-3 shows the different scores adopted by the Consultant in order to quantify the impact based on its expected duration.

Table 5-3: Temporal Scale criterion adopted for the impact assessment.

Score	***Criterion***
1 (Temporary)	*Impact duration up to 1 month*
2 (Short-Term)	*Impact duration from 1 to 3 months*
3 (Medium-Term)	*Impact duration from 3 to 6 months*
4 ((Long-Term)	*Impact duration from 6 months to 2 years.*

Impact intensity

Table 5-4 shows the different categories for the expected impact intensity and the scoring criteria. The sensitivity of the receptor is considered when determining the relative intensity.

Table 5-4: Impact intensity criterion adopted for the impact assessment.

Score	***Criterion***
1 (Negligible)	*Nominal impact to the baseline environment (requires no mitigation or management plan)*
2 (Low)	*Low impact to the baseline environment*
3 (Medium)	*Medium impact to the baseline environment*
4 (High)	*Significant impact to the baseline environment*

Integrated Assessment of Impacts

The overall assessment (i.e. score) for the impact of concern will be the multiplication result of the probability score, spatial score, temporal score and intensity score. The overall score will determine the category of severity (i.e. impact significance) based on the score range it falls into. Table 5-5 shows the upper and lower limits of each impact significance category.

Table 5-5: Impact intensity criterion adopted for the impact assessment.

Impact Assessment Parameters				**Overall Score**	
Spatial scale	**Temporal scale**	**Impact intensity**	**Probability of occurrence**	**Score range**	**Impact significance**
Individual [1]	Short-term [1]	Negligible [1]	Low [0.25]	0.25-8	Minor
Group [2]	Medium-term [2]	Low [2]	Medium [0.5]		
Community [3]	Long-term [3]	Medium [3]	High [1]	9-27	Moderate
Regional [4]	Permanent [4]	High [4]		28-64	Major

5.3 Potential Environmental and Social Impacts during the Construction phase

5.3.1 Positive Impacts

During the construction phase, which will be around 2 years, the following positive impacts are expected:

- income generation through the creation of temporary jobs;
- development of small businesses (food, clothing etc.); and
- increased income through the procurement of local and imported materials sold on the domestic market.

During the Operation phase, the main positive impacts are the increased safety and reliability of the national railway service and decrease (or nearly elimination) of train-related accidents.

5.3.2 Negative Impacts

This Section presents the identification and assessment of the impacts on each environmental resource/receptor. Potential impacts are summarized in Table 5-6. For each resource/receptor, impacts have been identified and assessed distinguishing between those that occur during the construction phase and those that occur during the operational phase of the railway project. Most impacts have been identified during the construction phase, while the only activity during operation phase that showed possible impacts was maintenance of the ATP. Additionally, measures to strengthen the aims of the operation phase have been suggested. The assessment in this Section is made without considering the application of preventive and corrective measures that could attenuate the magnitude of the impact. Mitigation and monitoring measures for each impact assessed are presented in this Chapter.

Table 5-6: Potential Negative Environmental and Social Impacts.

	Impact / Project activity/aspect	(Hydro)Geology	Pollution of soils and water	Air quality	Noise & vibration	Resources and waste	Energy Efficiency & GHG emissions	Biodiversity**	Displacement of People, Property, Assets & Resources	Livelihood impacts	Cultural Heritage	Community Health, Safety & Security	Traffic and difficulty of access impacts	Workforce-Community Interactions	Labour & Working Conditions	Train trip delays
Construction Phase	Hauling of construction materials and equipment (if any*)															
	Storing of construction materials															
	Excavation, preparing and placing the cables and filling back the trench															
	Operation of Diesel-fuelled generators															
	Workers Influx															
	Building and operating on-site temporary contractors' offices															
	Removal of old cables cables															
	Disposal of old cables															
	Maintenance of ATP system:															

* It is expected that all the digging will be manual.

**Biodiversity impacts include severance of animal migration pathways, degradation/loss of habitat, direct impacts on flora and fauna, bush meat hunting, induced access and invasive species impacts.

***In case of work at night shifts, which cannot be confirmed before the contractor is on board

No impact | Limited impact- no significant change to baseline conditions | Relevant impact- to be further assessed

Pollution of Soils and Water

Soil may be affected in several ways during the construction. Soils may become contaminated during construction works due to leaks from temporary office septic tank, accidental spills of hydrocarbons from construction machinery and diesel generators (if used). To be noted that the project's activities do not include the use of hazardous substances and materials such as lubricants, paints, solvents, resins, or acids. Also, contamination of soils may occur if already contaminated soils are encountered during construction works (e.g. soils that could have been contaminated by spills of hazardous substances in a previous construction). In this case, the inadvertent mobilization of pollutants from the contaminated area could contaminate clean areas of soil.

Water bodies are vulnerable to pollution that reduces water quality and to changes in the flow characteristics (level and volume) from the project activities, during construction. Despite being very limited to a 2 or 3 m long trench, construction activities have a potential to introduce pollutants into surface waters including sediment, fuel and lubricants when the site is adjacent to a water body. These compounds directly impact the physical and chemical quality status of the water and indirectly influence the living organisms in water. The contamination of the water body may also occur indirectly, by leaching through soil until reaching the surface water body.

	Impact parameters				
Project phase	Occurrence Probability (P)	Temporal Scale (A)	Spatial Scale (B)	Intensity (C)	Overall Score (P)*(A)*(B)*(C)
Construction	0.50	1	3	3	4.5 (Minor)

Mitigation Measures

- For the contractor's temporary offices, use intact septic tanks, free of any leaks and to be regularly emptied before reaching its maximum capacity.
- In case of accidental spills of hydrocarbons, isolate and collect the contaminated soil and store as hazardous waste to be disposed of in hazardous waste landfills.
- Prepare and implement a **Solid Waste Management Plan** (to be approved by the supervising consultant and the environmental department) including but not limited to:
    - Completely prohibit dumping of solid and liquid waste in any water body;
    - Completely prohibit dumping of liquid or solid waste.
- When using diesel generators, place the generator on an impermeable protective base layer.
- Photo-documentation of the site conditions before entering the site.

- Inspection of the site for existing contamination from previous work/activities. Where inspection results were positive, carefully collect and isolate all the contaminated soil in sealed bags to be disposed in the nearest hazardous waste landfill/treatment facility.

Monitoring measures

- Regularly inspect the septic tank against any leaks due to physical damage and/or overfilling and record the sewage collection date and timing.
- Daily inspection of the construction and office sites for any hydrocarbon's spills.
- Photo documentation of the site conditions before entering the site and after completing the work including any adjacent water bodies.
- Investigate any complaints received with regards to soil and/or water pollution and record the time it took to solve them.

Air Quality

Impacts on air quality are expected during construction, as is the case of any construction activity. Exhaust gas emissions are expected from construction machinery (if used) and trucks used to transport construction materials and dispose of waste. Dust from the excavation and filling activities, and storage of construction materials could affect human health, vegetation and wildlife.

The impact severity of dust generation is directly proportional to the wind intensity.

	Impact parameters				
Project phase	Occurrence Probability (P)	Temporal Scale (A)	Spatial Scale (B)	Intensity (C)	Overall Score (P)*(A)*(B)*(C)
Construction	1	1	3	3	9 (Moderate)

Mitigation Measures

- Implement a Construction Activity Pollution Prevention Plan (to be approved by the supervising consultant and the environmental department) including but not limited to:
    - Store excavation and construction materials such as sand and other friable waste material in ENR designated places and cover them with suitable materials to control and prevent dust generation and minimise spillage.
    - All vehicles used by the contractor to deliver construction materials and/or collect waste materials to and from the site should be completely covered to avoid material spillage.

- Install a solid fence around the excavation site in all areas adjacent to residential clusters, roads, water bodies and agricultural lands.
- Implement a preventive maintenance program for vehicles and equipment working on site and promptly repair/replace vehicles, equipment and generators with any visible exhaust fume.
- Implement best practice site housekeeping measures.
- As much as practically possible, construction material and waste should be transported to and from construction sites using cargo trains.
- Vehicles uploading material should maintain the lowest possible fall height to reduce noise and dust generation.

Monitoring measures

- Daily inspection of the materials and friable waste storage areas and ensure they are properly covered.
- Visual inspection of vehicles, equipment and generators for any fume generation.
- Investigate any complaints received with regards to air quality and dust generation and record the time it took to solve them.

Noise and Vibration

Noise and vibration from construction equipment may disturb sensitive noise receptors, particularly settlements near the railway corridors. Since the digging will be mostly manual in the current project, the noise and vibration impacts are limited to sound of manual digging activity.

Noise and vibration could also be generated when a diesel generator is used (around 80 dB) and/or as a result of transport of materials in and out the construction site. When compared against the baseline noise levels presented in Chapter 4, the following is concluded:

- The resulting noise level from the project's construction activities is intermittent, with short duration, and will not exceed the baseline levels.
- Noise and vibration associated with diesel generators (if used) will exceed baseline level at certain durations of the day and in particular between 4 pm and 6 am.

	Impact parameters				
Project phase	Occurrence Probability (P)	Temporal Scale (A)	Spatial Scale (B)	Intensity (C)	Overall Score (P)*(A)*(B)*(C)
Construction	1	1	3	3	9 (Moderate)

Mitigation Measures

- Optimise the use of equipment and turn off any equipment when not in use;
- Use of modern, well maintained equipment fitted with abatement devices (e.g. mufflers, noise enclosures);
- Stop all noisy work at night (before 6 am after 6 pm);
- Workers exposed to noise exceeding permissible levels (e.g. ballast uploading) should wear hearing protection.

Monitoring Measures

- Investigate any complaints received with regards to noise associated with the construction work and record the time it took to solve them.

Resources and Waste

The project will not consume significant amount of resources. However, it will generate waste consisting of soil and debris, used wiring cables, organic waste and food residuals, paper, plastic, scrap cables, and spent oil. The NH wastes generated on site during the construction phase normally have a high recycling potential. If not recycled, they would be sent to landfills or randomly dumped and burned, which would be a loss of natural resources. Random dumping and accumulation of wastes on or around the site would cause a negative visual impact to the surrounding areas. Accumulated wastes may be burned, a practice commonly found in Egypt, which could emit toxic emissions especially if plastic substances were among the waste streams.

Accumulation and/or uncontrolled disposal of organic wastes (food residuals) would also result in potential impacts on the health and hygiene of both general public and on-site workers by attracting vermin to the site such as birds, rodents or insects which can act as disease vectors. Uncontrolled handling and disposal for spent oils, classified as hazardous waste, would cause soil and/or water contamination.

It is to be noted that many parts along the track in both routes already suffer from waste accumulation.

	Impact parameters				
Project phase/aspect	Occurrence Probability (P)	Temporal Scale (A)	Spatial Scale (B)	Intensity (C)	Overall Score (P)*(A)*(B)*(C)
Construction/ Non-hazardous waste	1	4	3	3	36 (Major)
Construction/ hazardous waste	1	4	3	4	48 (Major)

Mitigation Measures

- Prepare and implement a **Solid Waste Management Plan** (to be approved by the supervising consultant and the environmental department) including but not limited to:
    - Design a segregation system based on compatibility of different waste streams and based on the recycling services (if locally available);
    - Identify the types and dimensions of storage means at source;
    - Design and construct a central waste storage area for non-hazardous wastes which accommodate for the received segregated streams /or any alternative solution proposed by the contractor;
    - Identify the nearest landfill for the disposal of the non-recycled items and get the permits;
    - Identify an authorized recycling contractor preferably from the nearby villages;
    - Training for workers on sound environmental practices to manage solid wastes;
    - Store spent oils in sealed drums sheltered from the sun until collection by authorized service providers.

Monitoring Measures

- Recording the amount of waste generated on site;
- Regular inspection of the waste storage area;
- Regular inspection of the site to identify random disposal of waste materials;
- Record the amount of waste and collection time;
- For hazardous waste, record the amount of waste and collection time and collect disposal/treatment receipt;
- Investigate any complaints received with regards to noise and pollution associated with the construction work and record the time it took to solve it and report in the quarterly monitoring reports.

Energy Efficiency and GHGs

The project activities do not generally involve consumption of electricity or fuel since it adopts manual digging, except for the following:

1. Fuel consumed by vehicles transporting raw materials and/or collecting waste for disposal;
2. Fuel consumed by diesel generators;
3. Electricity consumed by the temporary site offices;

4. Fuel consumed by staff and workers commuting to the site.

For number 4, sub-contractors usually hire local workers from nearby villages, which will reduce associated fuel consumption and GHGs emissions otherwise generated by transportation means.

Opportunities for reducing GHG emissions, to be adopted by the contractor where technically and financially feasible:

- Adjust work schedule to daytime as much as possible;
- Design and construct thermally insulated temporary offices, with a natural ventilation option to reduce as much as possible the need for mechanical ventilation and reduce the associated electricity and GHG emissions;
- Design and install solar PV system on the roof of the temporary offices to cover basic electricity office needs.

Biodiversity

Construction activities itself (i.e. digging and filling activities) will take place adjacent to the track and within the railway right of way, leaving no impacts on flora and fauna other than those associated with waste and dust generation in areas adjacent to agricultural lands and water bodies, as previously discussed under air quality and waste impacts. In addition to those, excavation work will disturb the top layer of the soil.

	Impact parameters				
Project phase	Occurrence Probability (P)	Temporal Scale (A)	Spatial Scale (B)	Intensity (C)	Overall Score (P)*(A)*(B)*(C)
Construction	1	3	2	1	6 (Minor)

Mitigation Measures

- Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan;**
- Reuse the top-soil layer for filling the trench, which necessitate a method to differentiate between the different layers of excavated soil;
- Train workers on reusing the top-soil layer in filling back the trench.

Monitoring Measures

- Regular inspection of the excavation activities to ensure the top-soil is being re-used and not disposed of as waste.

Physical and Economic Displacement of People, Property, Assets and Resources

The project will not cause any physical nor economic displacement as it is limited to linking each semaphore to the railway track via a 2 m long cable within the right of way of the railway. The digging will be intermittent (every 1 km approximately) and not continuous.

Cultural Heritage

There are no archaeological structures in near proximity to the railway corridor. However, the possibility of chance-finds during site preparation activities or excavations cannot be excluded. In the unlikely event of encountering a chance-find the mitigation and monitoring measures described below are to be taken.

	Impact parameters				
Project phase	Occurrence Probability (P)	Temporal Scale (A)	Spatial Scale (B)	Intensity (C)	Overall Score (P)*(A)*(B)*(C)
Construction	0.25	2	1	4	2 (Minor)

Mitigation Measures

- Stop the construction activities in the area of the chance find and delineate the discovered site or area;
- Secure the site to prevent any damage or loss of discovered objects;
- Notify the (ENR's and Contractor's) site managers and EHS supervisors who in turn will notify the responsible local authorities and the Antiquities Authority immediately (within 24 hours). Responsible local authorities and the Antiquities Authority would be in charge of protecting and preserving the site before deciding on subsequent steps. Construction work can resume only after permission is given from the responsible local authorities and the Antiquities Authority.

Monitoring Measures

- Record any chance-finds and the detailed procedure followed to handle them.

Community Health, Safety and Security (including traffic and accessibility)

Poor construction management practices may lead to adverse effects on safety, human health and wellbeing of workers. Furthermore, risks to local communities from transport of construction materials and waste to and from the site do exist. The railway corridor cuts through a number of densely populated towns and villages. Homes, a variety of workplaces, schools and other establishments are located very close to the railway corridor. Because of their close proximity to the railway corridor, residents of these homes and users of other establishments are particularly vulnerable to adverse impacts associated with the construction work. However, it is unlikely that communities will experience impacts related to **access restrictions due to the limited project activities.**

Noise, dust and other types of air pollution associated with construction work may affect these people more than any other sectors of the community (possibly with the exception of the work crews). Transportation, storage and handling of construction material and waste are more likely to have an impact as well.

Trespassers on rail lines and facilities may incur risks from electrical lines and equipment, and hazardous substances, among other issues.

Related issues of reckless driving by truck drivers delivering construction materials to the site will be sources of potential accidents to road users and pedestrians, disturbance of normal living conditions to the local population, dust pollution, etc. during the construction phase.

It is unlikely that the small depth of the trench will affect the structural integrity of the buildings, but measures should be taken from the contractor to prevent any dispute with the residents.

	Impact parameters				
Project phase	Occurrence Probability (P)	Temporal Scale (A)	Spatial Scale (B)	Intensity (C)	Overall Score (P)*(A)*(B)*(C)
Construction	1	2	3	4	24 (Moderate)

Mitigation Measures

- Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan.**
- Clearly place a sign in Arabic language on each construction site stating the objective of the project, duration of the work and the phone number to receive grievances for both the contractor and ENR. The sign should also include a prominent warning to cross the fence boundaries;

- Securely surround the trench with a solid fence when working adjacent to residential clusters or any area where children are suspected to be present. Only in desert areas, that this fence could be substituted with an open one;
- Implementation of a health management system for the construction workforce, to ensure through medical check-ups, they are fit for work and that they will not introduce disease into local communities;
- Prohibit trespassing adjacent to construction sites;
- No exposed, hot power cables should be left unattended at any time;
- Storage of track units or construction material should be allowed on ENR's storage yards in a way that will not affect traffic or pose any risk to communities adjacent to the railway corridors;
- Instruct all vehicles drivers contracted by the project on safe driving guidelines;
- When working near residential clusters, photo-document the condition of the nearest residential building to the trench before beginning the construction work;
- Implement an Emergency Response Plan to manage major incidents if they should occur, such as train accidents in the vicinity of the construction site;
- Implementation of Grievance Redress Mechanism.

Monitoring Measures

- Investigate any complaints received from the community with regards to construction work in general and record the time it took to solve them.

Workers Influx / Workforce-Community Interactions

Real or perceived disruption to normal community life, through the physical presence of a workforce could occur although a small number of workers is expected to be present at each construction site (3-4 workers), due to the proximity of the project sites to schools, homes, agricultural lands and villages.

Risks pertaining to gender-based violence (GBV) could occur, as **Egypt** is considered a country with very high occurrences of GBV. Construction workers are predominantly young males, which could aggravate the problem.

	Impact parameters				
Project phase	Occurrence Probability (P)	Temporal Scale (A)	Spatial Scale (B)	Intensity (C)	Overall Score (P)*(A)*(B)*(C)
Construction	0.5	2	3	4	12 (Moderate)

Mitigation Measures

- Prepare and adopt a **Stakeholder Engagement Plan**, as a framework for early and ongoing community consultation.
- Implementation of **Grievance Redress Mechanism**.
- Develop work procedures, defining a **Code of Appropriate Conduct** for all workers, including acceptable behaviour with respect to community interactions.

Monitoring Measures

- Investigate any complaints received from the community with regards to workers' behaviour in general and record the time it took to solve them and report in the quarterly report.

Labour and Working Conditions

Poor management of occupational health and safety may lead to accidents, injuries and illnesses among workers. In the absence of an effective management system and OHS plans, the following risks/challenges may occur:

- Physical hazards from equipment and vehicles;
- Fire Hazard;
- Slippage and Falling;
- Excavation and trenching;
- Manual handling and lifting risks;
- Electrical hazards;
- Traffic and accessibility risks;
- Escalated concerns/complaints not managed properly;
- Train accidents;
- Poor working conditions including the presence of nearby and accessible sanitation services, breaks at appropriate timing, discrimination, forced and child labour.

Sanitation concerns for the construction crew could occur as workers at the construction site will require sanitation facilities during construction period, which if not well maintained and cleaned, may lead to outbreaks of illnesses. Furthermore, at the time of the assessment national and international measures related to the Covid-19 pandemic prevention needs to be strictly followed and all safety measures recommended by heath authorities taken and implemented.

Poor employment conditions may occur as well as exposure to exploitation. Forced or compulsory labour, child labour and discrimination may occur. Employees may be required to work for long hours in poor or difficult conditions.

Discrimination based on gender and/or physical abilities. It is not foreseen to hire women during the construction phase. However, if this occurs, they are likely to face discrimination if no preventive measures and supporting measures are taken, as Egypt ranks low in gender equity compared to other countries worldwide and classifies to be among countries with 'very high' gender discrimination ranking.

	Impact parameters				
Project phase	Occurrence Probability (P)	Temporal Scale (A)	Spatial Scale (B)	Intensity (C)	Overall Score (P)*(A)*(B)*(C)
Construction	1	3	3	4	36 (Major)

Mitigation measures

The Contractor shall prepare and adopt an **Occupational Health and safety plan** complying with the Egyptian Labour Law No. 12 for 2003 during the construction phase including but not limited to:

- Hiring a qualified OHS supervisor;
- Identification of hazard sources to workers and identifying solutions to eliminate them;
- Workers must be trained to recognise potential hazards including electrical hazards, use proper work practices and procedures, recognise adverse health effects, understand the physical signs and reactions related to exposures, and are familiar with appropriate emergency evacuation procedures. They must also be trained to how to use the Personal Protective Equipment (PPE);
- Inspection and testing of all equipment and machines;
- Preparation of an emergency response plan;
- Provision of appropriate and sufficient first aid equipment and fire extinguishers on site;
- No exposed, hot power cables should be left unattended at any time.

For the labour conditions:

- Develop and implement a **Labour Management Plan**, with clear employment requirements, transparent hiring and management procedures for the construction and operational/ maintenance workforce. Employment practices and working conditions should conform to International Labour Organization (ILO) Standards and national regulations;
- Provide rest and recreational facilities and time, and prohibit the consumption of alcohol and drugs on site, as defined and clearly communicated to workers;
- Clear and comprehensive health and safety reporting and grievance redress mechanism should be established, and be freely available to the entire workforce;

- Transparent and culturally appropriate communication with communities regarding employment opportunities.

Monitoring measures

- Regular reporting of any accidents, as well as records and reports on health, safety and welfare of workers;
- Continuous monitoring of all hazardous events;
- Regular inspection of workers against pathogenic agents and provision of immunization when needed.

Train trip delays

Reduction of train speed at the project's construction sites will result in longer train trip time and unexpected train delays. Some train users may become forced to use other, more costly modes of transportation. In addition, shifting to other transportation modes will reduce the number of train passengers, reducing demand on goods and services offered by businesses in the vicinity of train stations. The project's construction works are not likely to result in access restrictions as well as any obstructions on the track. However, it is expected that the train will reduce its speed when passing besides the construction site, which might cause a slight delay but a noticeable one. This is due to the fact that during stakeholder interviews and consultations of train users it was established that train delays are already a common occurrence due to technical failures or train accidents.

Mitigation measures

- Negotiate construction schedule with ENR to minimise train delays and associated adverse impacts;
- Communication campaign prior to construction kick-off to inform commuters;
- Re-schedule train timetable considering the expected delays where necessary and disclose the modified timetable to the public. This procedure is already being adopted by ENR for their current projects.

5.4 Potential Environmental and Social Impacts during the operation and maintenance phase

Following the completion of the ATP, maintenance may be necessary at regular or irregular intervals, or due to system failure. As a result, any of the construction impacts may re-occur. The same impact mitigation measures should be adopted by the contractor/owner during any maintenance works.

Furthermore, benefits of the project could be enhanced if followed by raising public awareness on trespassing and safe behaviour during railway journeys and at train stations, targeting communities near the two corridors and train users and workers.

During the public consultation, the issue of potential electromagnetic field impact of the cables has been identified as a potential risk. However, the current project design where the cables are installed at 0.8 to 1 m below ground level significantly minimise the electromagnetic field impact. This is in addition to the fact that the nearest receptor to the cable installation area ranges between 5 and 6 m, as concluded from analysing the satellite images and field trips.

	Impact parameters				
Project phase	Occurrence Probability (P)	Temporal Scale (A)	Spatial Scale (B)	Intensity (C)	Overall Score (P)*(A)*(B)*(C)
Operation	1	4	1	2	8 (Minor)

Table 5-7: Summary of Environmental and Social Impact Assessment Results

	Impact / Project activity/aspect	(Hydro)Geology	Pollution of soils and water	Air quality	Noise & vibration	Resources and waste	Energy Efficiency & GHG emissions	Biodiversity**	Displacement of People, Property, Assets & Resources	Livelihood impacts	Cultural Heritage	Community Health, Safety & Security	Traffic and difficulty of access impacts	Workforce-Community Interactions	Labour & Working Conditions	Train trip delays
Construction Phase	Hauling of construction materials and equipment (if any*)															
	Storing of construction materials															
	Excavation, preparing and placing the cables and filling back the trench															
	Operation of Diesel-fuelled generators															
	Workers Influx															
	Building and operating on-site temporary contractors' offices															
	Removal of old cables cables															
	Disposal of old cables															
	Maintenance of ATP system:															

Major Moderate Minor

5.5 Cumulative environmental and Social Impacts

Cumulative impacts are expected from the on-going implementation of other components of the ENRMP. Indeed, the overall project involves the railway service that is being used by millions of Egyptians. It also covers a very large geographical area along almost the entire length of the Egyptian Nile Valley. If all the component are being implemented in parallel at the same period, communities are expected to be affected by the project therefore, include those living in areas adjacent to the railway corridor, daily commuters using different sections of the lines, and the general populations of the areas linked by the lines who directly or indirectly benefit from the railway service to different degrees.

Most of the potentially adverse impacts of the project are expected to occur during the construction phase of the project mainly when several contractors and subcontractors are commissioned at the same time. Construction will involve activities that may affect the local communities and environmental conditions at the construction sites and may also directly or indirectly affect the surrounding areas. Construction process will also certainly result in temporary impacts that will affect users of the lines or those directly or indirectly dependent on the services rendered by these lines.

Environmentally important activities of the construction phase for the different ENRMP components are linked to the removal of old tracks and cables and installation of communication and power cables, installation of track-side and on-board locomotive equipment; transport of construction material, storage of construction material; finishing work (painting, tiling, plumbing, and electrical, noise pollution, storage and disposal of construction solid waste).

The ATP installation, subject of this ESIA, involves digging a 2 m long trench (relatively small trench) every approximately 1 km along the track. This activity is not expected to exaggerate the impacts resulting from the other components due to the fact that the associated risks and impacts are much less as compared with the other components. The potential impacts of ATP installation will therefore be fully diluted within ENRMP different activities. An inclusive and agreed work plan under the leadership of ENR will completely avoid any risk of potential cumulative impacts resulting from ATP installation

CHAPTER SIX: ANALYSIS OF ALTERNATIVES

This analysis is herein undertaken at two levels. The first level considers two project alternatives:

- project implementation alternative and;
- no action alternative.

These two alternatives were analysed in terms of both positive and negative impacts. At the second level of analysis, the preferred alternative is subjected to further analysis of alternatives. In this analysis, the relative environmental and social merits of elements and activities of the selected project alternative are considered. These alternatives are evaluated and compared, and the optimal one selected.

Alternative 1. **No action**. To continue operating the Benha – Port Said and Cairo – Beni Suef rail sections with the existing, mechanical Signalling system, with its safety challenges, poor reliability and poor capacity, which on the other hand places a major burden on the ENR's efforts to improve its services to the public and overcome its major financial difficulties. It is expected that difficulties facing ENR will aggravate and will become more difficult to resolve without the implementation of the proposed project. Without the project, the railway service line will further deteriorate affecting the safety and well-being of millions of users of those lines.

Alternative 2. **Implementation of the proposed scheme** for modernizing the Signalling system on Benha – Port Said and Cairo – Beni Suef rail sections and installing the Automatic Train Protection (ATP). The ATP system will electronically supervise the train, in terms of track profile ahead, which includes permissible speeds, allowable distance to be travelled by the train, stopping distances and section speed restrictions. In addition, where train crew do not comply with the ATP operation parameters, the system automatically takes over, and, where necessary under critical conditions, brings the train to a stop, to prevent potential accidents. Once completed, the project will improve the railway service and particularly railway safety considerably and play a significant role in the reduction of accidents.

Although the economic cost of the proposed project is high, the modernization of the outdated system is highly justifiable to ensure the safe and efficient operation of the railway service. On the other hand, the ENR sees the modernization of the Signalling system as an inevitable action that must be undertaken sooner or later. The operation of the highly efficient modern system will also reduce cost of operation per traffic unit and will contribute to the ENR's efforts to reduce loses and increase revenue generating potential.

Within the framework of this alternative, a number of negative impacts are expected to occur during the construction phase of the project. These impacts are all temporary in nature, lasting only during the construction process and can be readily mitigated or tolerated. Project elements and activities that are expected to result in these negative impacts are herein considered in terms of possible alternatives to mitigate their adverse impacts. From an environmental and social impact perspective, the main alternative option would be to install the cables over ground to save the time and resources associated with the digging and filling activities. However, based on the scoping sessions held with the Signalling technical team of ENR, this turned to be an impossible alternative as it subjects the cables to damage due to weather, physical interactions and increase the probability of stealing the cables.

CHAPTER SEVEN: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

7.1 ESMP approach

The Environmental and Social impact reduction plans are compilation of the mitigation and monitoring measures for the impacts previously identified and assessed in Chapter 5, while indicating the implementation and supervision responsibilities for the both the mitigation and monitoring measures. There is one plan, that is for the construction phase, but is applicable to any maintenance works that include construction activities of all 5 lines. For each impact, verifiable monitoring indicators, reporting requirements, responsibilities and an estimate of the budget required are included. Internal monitoring measures indicated in the ESMP tables refer to **auditing measures** to be taken on a regular basis by the contractor, supervising consultant and ENR to ensure the correct implementation of impact mitigation measures. External monitoring visits/measures are yet to be determined depending on agreements between the concerned parties (Owner/Lender), in addition to any regulatory visits.

As per the Bank ISS, mid-term and project completion E&S compliance and performance Audits should be conducted by the project management unit through a contracted independent Consultant. Indeed, Projects which have been effectively implemented for at least one year is due for E&S performance Audit. As such they are due for an Environmental and Social Compliance Audit in order to ensure that the projects are being implemented in compliance with the loan conditions/agreements; applicable national regulations and AfDB's Integrated Safeguard System operational safeguard policies and their requirements. As such the E&S Compliance and Performance Audits will have to be undertaken before the end of the second year and each following year afterwards.

The budget given for each management measure is an estimate, calculated based on an average man-day costs in EGP. It also considers the material costs of implementing measures, wherever possible. The budget is presented in both investment expenditure (CAPEX) and operational expenditure (OPEX).

7.2 Roles and Responsibilities

This section describes the overall organisation of environmental and social management for implementation of the ESMP during construction and operation phases. Detailed roles and responsibilities are clarified in the ESMP table.

Project Owner (ENR):

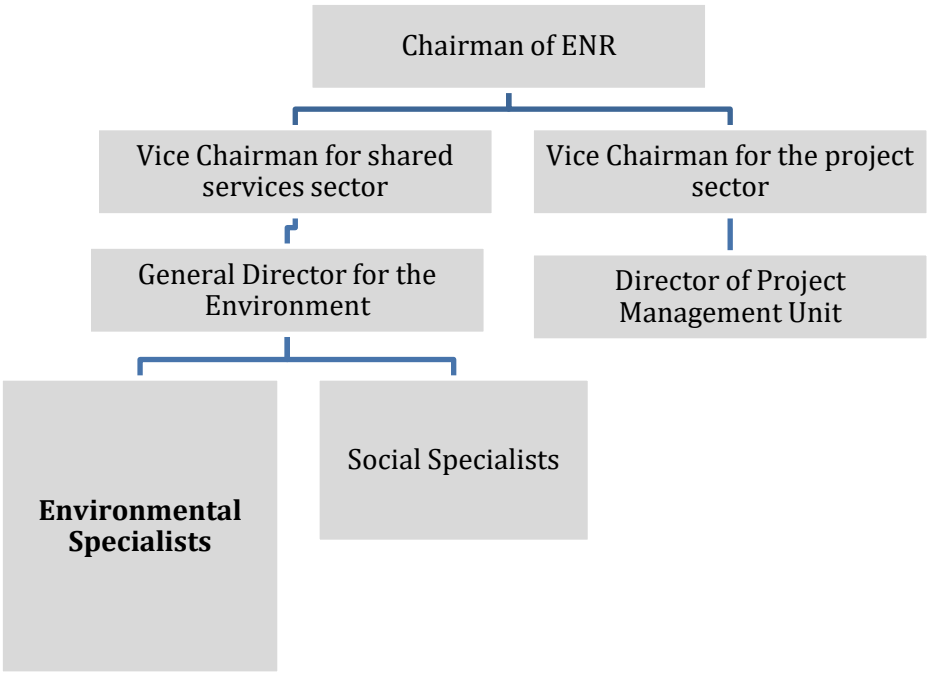
As Project developer and owner, ENR will take general responsibility for correct application of the ESMP and provision of necessary resources for its implementation via its Environmental Department, the Project Management Unit (PMU), and contractors. The latter shall hire an EHS Manager(s), with at least 8 years of experience demonstrating sufficient level of expertise and should have proper accreditation. During the construction phase, the Environmental Department will be responsible for the supervision of the correct implementation of the ESMP as per the Bank ISS requirements and national regulations and conditions

laid on the environmental permit delivered by EEAA, by reviewing Contractor's EHS reports, conducting site visits where required and preparing reports to Lending institutions or regulatory authorities as required. This will be performed in full coordination with the PMU.

The General Director of the Environment Department, along with four environmental and social specialists, will be notably responsible for:

- Implementing and monitoring the ESMP;
- Coordinating and leading awareness campaigns and capacity building needs;
- Coordinating with main contractor with regard to ESMP requirements;
- Responding to the results of internal and external (lenders or regulatory) monitoring visits/ inspections;
- Supervising the reception, registration and correct processing of any complaints/ grievances received from the different stakeholders;

  Prepare and deliver reports on the ESMP and EHS performance as required to Lending and/or regulatory institutions.



The environmental and social specialists have been involved in managing the ENRMP previous phases and will be able to manage the current project based on their previous experience. However, capacity building and training will be required as a fresher and also in order to train them of the AfDB safeguards and national legal requirements. Please refer to the section below for the proposed training and capacity building topics.

Contractor Clauses

Suggested contractor ESMP compliance clauses to be included in the construction contractor's contract(s) are included under Annex II. These clauses should be considered as guidelines and shall be revised by the Owner's legal department before their inclusion in any contracts as the loan agreement will enclosed E&S covenants.

Trainings and capacity building

Training shall take place for both the Environmental Department and hired contractor on the implementation and monitoring of the ESMP. The contractor shall train his workers on the ESMP implementation including EHS requirements during the induction session or by conducting additional sessions, this shall be performed before the commencement of any work to prevent exposure to construction activities associated risks. Examples of types of training include:

- Understanding significant risks and activities associated the project;
- Awareness of the requirements of this ESMP and associated plans/procedures;
- Roles, responsibilities and accountabilities, including who to contact with any questions or concerns;
- Project's GRM;
- Incident management and reporting requirements;
- Workers code of conduct;
- Emergency response procedures.

Training shall be delivered by experienced trainers, based on the competency requirements and in the relevant language of the attendee, or else translation shall be provided.

7.3 List of required plans and procedures

Below is a list of the plans (and procedures) which shall be developed by the contractor and ENR in order to implement the ESMP during the construction and operation phases.

- Waste Management Plan;
- Construction Activity Pollution Prevention Plan;
- Emergency preparedness and response plan (to include fire, medical, train accidents, security emergencies and environmental incidents);
- Occupational Health and Safety Plan;
- Workers code of conduct;
- Project and Workers Grievance Redress Mechanism;
- Stakeholders Engagement Plan.

Guidance on the content of the different plans and procedure is given in relevant sections within the ESMP tables. All plans should **at minimum** specify the following in addition to the management requirements: applicable local and international legal standards, roles & responsibilities of the plan/ implementation procedures, non-conformity management, review and monitoring and training requirements where applicable. Where needed, separate plans should be prepared for the construction and

operation phase (maintenance work) in order to take into account, the difference of activities and site arrangements of both phases (e.g. differences in waste collection/storage points and disposal frequencies).

7.4 Budget estimate for ESMP implementation

Table 7-1: Budget estimate for ESMP implementation for the 5 lines.

Project Phase	Aspect	Fixed/Annual cost	Mitigation and Monitoring costs	
			EGP	USD
Pre-Construction	Training workshop for ENR Staff on ESMP mitigation measures, supervision and monitoring	Fixed	30,000	1,900
Pre-Construction	Waste Management Plan for all lines	Fixed	90,000	5,700
Pre-Construction	Construction Pollution Activity Prevention Plan for all lines	Fixed	90,000	5,700
Pre-Construction	Stakeholders Engagement Plan for all lines	Fixed	150,000	9,600
Public awareness and sensitization	Local communities at level crossings and trains users at train station	Before and during construction	750,000	48,000
Total (Fixed costs)			**1,110,000**	**70,900**
Construction	Ambient Air Quality for all lines	Annual	144,000	9,000
Construction	Ambient Noise for all lines	Annual	18,000	1,140
Construction	Refresher training workshop for ENR Staff on ESMP mitigation measures, supervision and monitoring	Annual	30,000	1,900
Construction	E&S compliance and performance audits by an independent consultant for all lines (each year)	Annual	240,000	15,400
Total (Annual costs)			**432,000**	**27,500**
Total (Annual costs – Total for 5 years)			**2,160,000**	**137,500**
Total (Fixed +Annual costs for 5 years)			**3,270,000**	**208,400**

7.5 ESMP implementation schedule

This section provides a work plan indicating the timing of environmental and social mitigation, monitoring and reporting activities in relation to the project timeline during the construction phase. Details on the mitigation measures, internal monitoring and reporting can be found in the corresponding ESMP tables.

Table 7-2: Implementation schedule of the construction ESMP.

Aspect	**Timeline**	**Frequency**	**Institutional Responsibility**	
			Enforcement	**Coordination**
Preparation of required plans and procedures	Before the start of construction or as soon as reasonably practicable	Once; reviewed annually; updated as deemed necessary	Contractor	ENR
Consultation and Coordination with other components of the ENRMP	Before the start of construction or as soon as reasonably practicable	Continuously/ as needed		ENR
Hiring staff involved in the implementation and monitoring of this ESMP	Before the start of construction or as soon as reasonably practicable	Once/as needed	Contractor	ENR
Workers inductions (emergency procedures, health and safety plan; workers code of conduct and GRM)	Before the start of work on site	Once per worker/employee	Contractor	ENR
Special EHS trainings (related to specific roles and responsibilities in the ESMP implementation)	Before the start of work on site	Once before the start of work; biannual refresher trainings	Contractor	ENR
Implementation of mitigation measures	Throughout construction	Daily; or as indicated in the ESMP	Contractor	ENR

Monitoring activities (e.g. waste inspections and pollution prevention inspections)	Throughout construction	Daily; or as indicated in the ESMP	Contractor	ENR
Reporting to Project Owner on the implementation of the ESMP	Throughout construction	Monthly	Contractor	ENR
Conducting and reporting on ambient air quality and noise measurements	Throughout construction	Quarterly	Contractor	ENR
Internal assurance visits by Owner EHS department representative(s)	Throughout construction	Quarterly	Contractor	ENR
E&S compliance and performance audits	Throughout construction	Each year	Independent Consultant	ENR
External reporting to Lenders and/or regulators	Throughout construction	Quarterly and as required	Contractor	ENR

7.6 Grievance Mechanism

Given the nature of the project activities, the most effective mitigation measure for the identified risks will be ensuring that project beneficiaries and project-affected people are actively involved. In this regard, there are two main tools through which this can be achieved: (i) raising public awareness and carrying out mandatory public displays; and (ii) establishment of a viable grievance redress mechanism (GRM).

***Raising public awareness*:** Information about the grievance handling system described below will be distributed at an early stage of the project to all project affected people through regular information channels used by the project, including initiating meetings at the start of the project where feasible, public meetings during project implementation, brochures/pamphlets in Arabic Language, posting on notice boards and online when necessary. The process of raising a complaint should be explained by reaching out the community or by conducting a meeting with community representatives. It is important that community representatives include women at all times.

Grievance Redress Mechanism: Transparency and accountability should be core elements of the Project. Comprehensive GRM will be set up for all subprojects to account for all potential complaints arising from the project's potential impacts. In addition to the main project GRM, two additional GRMs will be developed by the contractor; one for the community and the second for the workers.

The goal of the GRM will be to increase transparency and accountability and to reduce the risk of the project inadvertently affecting citizens and serves as an important feedback and learning mechanism that can help improve project impact. The objective will be to provide channels for project stakeholders to provide feedback on project activities via a mechanism that allows for the identification and resolution of issues affecting the project, promptly and effectively in a culturally appropriate manner and at no cost.

This includes safeguards-related complaints pertaining to this ESIA and the AfDB safeguards policies as a whole.

A project specific GRM for complaints handling will be developed at ENR with dedicated personnel from the Environmental and Social departments and made accessible to all.

As a minimum, the project will establish the following channels through which citizens/beneficiaries/ PAPs can make complaints regarding project-funded activities:

g) A dedicated email address;

h) A dedicated phone line;

i) A dedicated address to send written letters;

j) Feedback boxes located at project sites;

k) Verbal or written complaints to community leaders, or project staff directly or through project meetings. If project stakeholders provide verbal feedback/complaint, project staff will lodge the complaint on their behalf, and it will be processed through the same channels;

l) Periodic project meetings, each of which shall include women.

At the moment, the management of the Grievance Mechanism is the responsibility of the Complaints and Customer Service Directorate affiliated to the Presidential Affairs Central Directorate. Below are the main complaint channels:

- A group on WhatsApp with the Ministry of Transport and journalists (used for distribution of news and receipt of urgent complaints);
- A group on WhatsApp with journalists (used for distribution of news and receipt of urgent complaints);
- Complaint boxes in all railway stations, where people can submit their Complaints;
- An email address linked to the website of ENR (support@enr.gov.eg);
- A landline on the website of ENR (+20 2 25748279);
- A digital complaint form linked to the website of the Ministry of Transport, where People type in their complaint or suggestion and register their names, contacts (Phone number and email address), the sector, the complaint/suggestion, and other details);
- ENR has also dedicated two phone lines (01274422925 - 0225753555) in addition to a hotline (15047) for complaints related to ENR in general.
- Additionally, the Government of Egypt applies a Government Complaints Portal (GCP) is an online portal which applies an integrated administration system and replicates world best

practices in dealing with people's complaints. Several mechanisms are featured through the System including receiving, examining and processing complaints as well as making use of such complaints in improving performance. The portal site is http://www.shakwa.eg and the hotline is 16528.

Those channels are widely used by any person who might have issues related to the operation of the trains or internal issues related to ENR. Project affected people shall be made aware of the existing channels. Those in addition to a multistage grievance mechanism developed and implemented by the contractor as described below.

ENR shall ensure that the indicated project channels are working effectively. The GRM should comprise of a set of operating procedures to ensure successful implementation. The procedures would include the following set of measures as a minimum:

- Receive and register complaints;
- Grievance's document verification;
- Conduct field inspections in order to verify and confirm the authenticity and eligibility of the reported grievance. The field inspection could include interviews with different parties involved;
- Referring cases to other GRMs, if necessary and/or to the courts;
- Referring cases to a third party;
- Track, and evaluate the process and results.

In case an agreement could not be reached, the borrower could play the role of a mediator via well-trained voluntary mediators following a pre-set time frame.

Contractor's Grievance Mechanism

The borrower will include the construction related GRMs into the contractor's terms of references and contracts. Accordingly, the contractor will establish an external GRM (for the community) and an internal one for the workers. The respective Contractor shall disclose the GRM on a board that is easily legible and accessible at all worksites. For the community GRM, a multi-stage mechanism will be used comprising of but not necessarily limited to the stages listed below:

Stage 1, any person aggrieved by any aspect can lodge a grievance to the Contractor, which in turn should provide resolution within 10 calendar days;

Stage 2, if the aggrieved person is not satisfied with the decision of the Contractor during Stage 1, she (he) can present the case to the supervising company to resolve within 10 calendar days.

Stage 3, if the complainant is still dissatisfied with the outcome of stage 2, she (he) can escalate the complaint to ENR to resolve the issue within 15 calendar days.

7.7 Environmental and Social Management and Monitoring Plans

Table 7-3 shows the project's ESMP including the required mitigation and monitoring measures and indicates the roles and responsibilities associated with implementation and supervision. The contractor shall implement all the mitigation measures and monitor their effectiveness according to the plan. The contractor shall submit a monthly Environmental and Social progress report and quarterly Environmental Measurement reports to ENR highlighting the implementation of ESMP commitments as stated in the different sections of the plan. The quarterly reports shall highlight non-conformances (in case of exceedances of Egyptian and/or WBG EHS standards).

For parts of the railway routes, an ESIA have already been conducted, whereas other parts have not been addressed earlier. Therefore, for this project, an ESMP has been done for the parts of the railway that have not been addressed earlier. As for Beni Suef – Asyut – Nagh Hammadi as well as Cairo – Alexandria, an ESIA has earlier been conducted. Therefore, these parts of the railway have their separate ESMPs, which have been updated to this project. Thus, there are 3 ESMPs, for the different parts of the railway track. However, there is only one budget with the total ESMP expected implementation costs, which are summarised in Table 7-1.

Table 7-3: Environmental and Social Management Plan (ESMP)

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
a) Pollution of Soils & Water							
Pollution of Soils & Water bodies due to poor solid and liquid waste management practices	Prepare and implement a **Solid and Hazardous Waste and Materials Management Plan** which include arrangements for managing solid and liquid hazardous and non-hazardous waste (to be approved by the supervising consultant and the environmental department before the start of the construction) including but not limited to: ○ Waste minimisation and prevention hierarchy ○ Design a segregation system based on compatibility of different waste streams and based on the recycling services (if locally available) ○ Identification of the types and dimensions of storage means at source for hazardous and non-hazardous wastes ○ Design and construct a central waste storage area for non-hazardous wastes which accommodate for the received segregated streams/or any alternative solution proposed by the contractor ○ Identify the nearest landfill for the disposal of the	1- Submission and approval of the waste management plans covering at minimum all the aspects detailed in this ESMP (once at the beginning of the project). 2- Submission and approval of the of hazardous substance management procedure	Visual inspection of the site and proper use of PPEs	Construction sites	Daily throughout construction	**Contractor:** Development of the required plans. Implementation of plans, internal monitoring and reporting to ENR **ENR:** Reviewing Contractor's	Included in the waste section below
			Dated Photo documentation of the site conditions	Construction sites	before entering the site and as necessary during the work		

[20] Cost estimate refers to the additional cost which the contractor/ENR will need to consider as compared to the conventional

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
	non-recycled items ○ Identify a recycling contractor preferably from the nearby villages ○ Waste contractors' certifications and compliance assurance. All waste streams should be transported and disposed of by certified service providers, in compliance with Egyptian regulations and disposed of in licensed landfills/dump sites, including. ○ Training for workers on sound environmental practices to manage solid wastes. ○ Storage spent oils in sealed drums sheltered from the sun until collection ○ Record keeping (waste inventory, waste disposal registers and consignment notes) ○ Complete prohibition dumping of solid and liquid waste in any water body ○ When using diesel generators, place the generator on an impermeable protective base layer. ○ In case of accidental spills of hydrocarbons, isolate and collect the contaminated soil and store as hazardous waste to be disposed of in hazardous waste landfills. ○ For the contractors' temporary offices, use intact septic tanks, free of any leaks and to be regularly emptied before reaching its maximum capacity. ○ Development and implementation of a hazardous substances' management procedure. The procedure should at minimum address the following aspects: operational procedures, procurement, prohibited substances, inventory,	(standalone or included in EHS plan) covering at minimum all the aspects detailed in this ESMP. 3- All mitigation measures have been implemented 4- Amounts of solid and hazardous waste sent to landfill/ month 5- Amount of total solid and hazardous waste generated/month 6- Amount of total solid and hazardous waste reused and/or recycled/month 7- Record of the sewage collection date and amount. 8- Number of Environmental and OHS incidents related to soil and water	Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	weekly	plans to ensure their compliance to ENR's EHS and ESMP requirements. Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
	risk assessments, labelling, storage, Safety Data Sheets and control measures. The procedure should mention specific measures for the control of risks associated with the use of the diesel fuel for power generation. The management plans and procedures can be standalone documents or part of an overall construction EHS management plan. This shall also include a note on accidental spills of hydrocarbons, and methods of isolation and collection of the contaminated soil and storage as hazardous waste to be disposed of in hazardous waste landfills. ○ Inspection of the site for existing contamination from previous work/activities. Where inspection results were positive, carefully collect and isolate all the contaminated soil in sealed bags to be disposed in the nearest hazardous waste landfill/treatment facility.	pollution 9- Number of Environmental and OHS incidents related to hazardous substance management 10- Valid Certificates for all waste contractors and chain of custody 11- Number of complaints related to soil and/or water pollution and time it took to solve them 12- Number of unresolved complaints					

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
b) Ambient Air Quality							
Dust/PM10 emissions from construction and vehicles movement on unpaved roads PM10, TSP, NOx, SO_2, CO emissions from Diesel-fuelled generators and transport vehicles	Implement a **Construction Activity Pollution Prevention Plan** (to be approved by the supervising consultant and the environmental department before the construction work start) including but not limited to: ○ Store excavation and construction materials such as sand and other friable waste material in ENR designated places and cover them with suitable materials to control and prevent dust generation and minimise spillage. ○ All vehicles used by the contractor to deliver construction materials and/or collect waste materials to and from the site should be completely covered to avoid material spillage. ○ Install a solid fence around the excavation site in all areas adjacent to residential clusters, roads, water bodies and agricultural lands. ○ Implement a preventive maintenance program for vehicles and equipment working on site and promptly repair/replace vehicles, equipment and generators with any visible exhaust fume. ○ Implement best practice site housekeeping measures. ○ Regular maintenance and inspection of equipment and vehicles used on site ○ Favour the purchase of low-sulphur diesel. ○ As much as practically possible, construction material and waste should be transported to and from construction sites using cargo trains. ○ Vehicles uploading material should maintain the	1- Construction Activity Pollution Prevention Plan has been prepared and approved 2- All mitigation measures have been implemented 3- Number of complaints received with regards to air quality and dust generation the time it took to solve them. 4- Number of unresolved	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily	**Contractor** Implementation of mitigation measures, internal monitoring and reporting to ENR May hire a third party for the quarterly monitoring measurements or use calibrated instruments approved by ENR. **ENR:** Ensuring the correct implementation of the mitigation and monitoring	EGP 48,000 (USD 3,000) for 8 measurement points (two measurement points per quarter) EGP 30,000 (USD 1,900) for preparing the Construction Pollution Prevention Plan
			Measure ambient air quality parameters (PM10, NOx, SO_2, CO and TSP)	Construction Sites at nearest sensitive receptor and central to the major construction activities	Quarterly		
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		
			Complete a compliance checklist for	Construction sites	Weekly		

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
	lowest possible fall height to reduce noise and dust generation.	complaints 5- Results of measurements and % not compliant with applicable legal standards including reasons for non-compliance	mitigation actions and measures and conduct a Documents and records review			measures Review and assurance of Contractor's reports	

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
			c) Noise & Vibration				
Impacts on ambient noise levels	Develop and implement a **noise management procedure** as a standalone document or as a part of an OHS plan. The following measures as a minimum should be covered: o Optimise the use of equipment and turn off any equipment when not in use. o Use of modern, well-maintained equipment fitted with abatement devices (e.g. mufflers, noise enclosures). o Control exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure. o Stop all noisy work at night (before 6 am after 6pm)	1- Development of the noise management procedure/OHS plan 2- All mitigation measures have been implemented 3- Number of complaints received with regards to noise associated with the construction work and the time it took to solve them. 4- Number of unresolved complaints 5- Results of noise ambient measurements including reasons for non-compliance (if any)	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to the ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review of Contractors reports	EGP 6,000 (USD 380) for 8 measurements (2 per quarter)
			Measure ambient Noise (in case of use of mechanical/electrical digging equipment and machinery)	Construction Sites at nearest sensitive receptor and central to the major construction activities	Quarterly		
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		
			Complete a compliance checklist for mitigation actions and measures and	Construction sites	Weekly		

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
			conduct a Documents and records review				
d) Resources & Waste							
Impacts associated with increased consumption of resources and waste generation	Prepare and implement a **Solid and Hazardous Waste and Materials Management Plan** which include arrangements for managing solid and liquid hazardous and non-hazardous waste (to be approved by the supervising consultant and the environmental department before the start of the construction) including but not limited to: ○ Waste minimisation and prevention hierarchy ○ Design a segregation system based on compatibility of different waste streams and based on the recycling services (if locally available) ○ Identification of the types and dimensions of storage means at source for hazardous and non-hazardous wastes ○ Design and construct a central waste storage area for non-hazardous wastes which accommodate for the received segregated streams /or any alternative solution proposed by the contractor ○ Identify the nearest landfill for the disposal of the non-recycled items and get the required permits. ○ Identify an authorized recycling contractor preferably from the nearby villages ○ Waste contractors' certifications and compliance assurance. All waste streams should be transported and disposed of by certified service	1- Submission and approval of the waste management plans covering at minimum all the aspects detailed in this ESMP (once at the beginning of the project). 2- Submission and approval of the of hazardous substance management procedure (standalone or included in EHS plan) covering at minimum all the aspects detailed in this ESMP. 3- All mitigation measures have been implemented	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Development of the required plans. Implementation of plans, internal monitoring and reporting to ENR **ENR:** Reviewing Contractor's plans to ensure their compliance to ENR's EHS and ESMP requirements.	EGP 30,000 (USD 1,900) for preparing the waste management plan
			Dated Photo documentation of the site conditions	Construction sites	before entering the site and as necessary during the work		

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
	providers, in compliance with Egyptian regulations and disposed of in licensed landfills/dump sites, including. ○ Training for workers on sound environmental practices to manage solid wastes. ○ Storage of spent oils in sealed drums sheltered from the sun until collection by authorized service providers ○ Record keeping (waste inventory, waste disposal registers and consignment notes) ○ Complete prohibition dumping of solid and liquid waste in any water body ○ When using diesel generators, place the generator on an impermeable protective base layer. ○ For the contractors' temporary offices, use intact septic tanks, free of any leaks and to be regularly emptied before reaching its maximum capacity. ○ Development and implementation of a hazardous substances' management procedure. The procedure should at minimum address the following aspects: operational procedures, procurement, prohibited substances, inventory, risk assessments, labelling, storage, Safety Data Sheets and control measures. The procedure should mention specific measures for the control of risks associated with the use of the diesel fuel for power generation. The management plans and procedures can be standalone documents or part of an overall construction EHS management plan. This shall also include a note on accidental spills of hydrocarbons, and methods of isolation and	4- Amounts of solid and hazardous waste sent to landfill/ month 5- Amount of total solid and hazardous waste generated/month 6- Amount of total solid and hazardous waste reused and/or recycled/month 7- Record of the sewage collection date and amount. 8- Number of Environmental and OHS incidents related to soil and water pollution 9- Number of Environmental and OHS incidents related to hazardous substance management 10- Valid Certificates for all waste contractors and chain of custody	Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	weekly	Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
	collection of the contaminated soil and storage as hazardous waste to be disposed of in hazardous waste landfills.	11- Number of complaints with regards to waste and resources and time it took to solve them 12- Number of unresolved complaints					
e) Energy Efficiency & GHGs							
Impacts associated with low energy efficiency and increased GHGs.	Opportunities for reducing GHG emissions, to be adopted by the contractor where **technically and financially feasible**. ○ Adjust work schedule to daytime as much as possible ○ Design and construct thermally insulated temporary offices, with a natural ventilation option to reduce as much as possible the need for mechanical ventilation and reduce the associated electricity and GHG emissions. ○ Design and install solar PV system on the roof of the temporary offices to cover basic electricity office needs	Total amount of fuel used on site and electricity consumption where applicable	Visual Site inspection and records review	Construction sites	At the beginning of the construction work and monthly after that	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures	Covered in construction cost
			Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	Weekly		

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
						Review and assurance of Contractors reports	
f) Biodiversity							
Flora and Fauna Impacts	○ Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan (please refer to section b and d)** ○ Reuse the top soil layer for filling the trench, which necessitate a method to differentiate between the different layers of excavated soil. ○ Train workers on reusing the top soil layer in filling back the trench.	1- All mitigation measures have been implemented 2- Number of complaints related to biodiversity and time it took to solve them 3- Number of unresolved complaints	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct	Covered in construction cost
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
			○ Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly	implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
g) Cultural Heritage							
Impacts associated with chance finds	In the unlikely event of encountering a chance-find the following measures are to be taken: - Stop the construction activities in the area of the chance find and delineate the discovered site or area - Secure the site to prevent any damage or loss of discovered objects. - Notify the (ENR's and Contractor's) site managers and EHS supervisors who in turn will notify the responsible local authorities and the Antiquities Authority immediately (within 24 hours). - Responsible local authorities and the Antiquities Authority would be in charge of protecting and preserving the site before deciding on subsequent steps - Construction work can resume only after permission is given from the responsible local authorities and the Antiquities Authority.	Chance Finds reports	- Dated Photo documentation of the site conditions	Construction sites	before entering the site and as necessary during the work	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and	EGP 20,000 (USD 1,300) /day and estimated duration is 4 days
			Conduct a Documents and records review	Construction sites	In case of chance-finds		

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
	Record any chance-finds and the detailed procedure followed to handle them.					monitoring measures Review and assurance of Contractors reports	
h) Community Health, Safety and Security (including traffic and accessibility)							

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
Poor construction management practices Noise, dust and other types Trespassers on rail lines Level Crossings Safety Impacts related to	○ Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan.** ○ Prepare and adopt a **Stakeholder Engagement Plan** ○ Clearly place a sign in Arabic language on each construction site stating the objective of the project, duration of the work and the phone number to receive grievances for both the contractor and ENR. The sign should also include a prominent warning to cross the fence boundaries. ○ Securely surround the trench with a solid fence when working adjacent to residential clusters or any area where children are suspected to be present. Only in desert areas, that this fence could be substituted with an open one. ○ Public awareness and sensitization campaign ○ Implementation of a health management system for the construction workforce, to ensure through medical check-ups, they are fit for work and that they will not introduce disease into local communities. ○ Prohibit trespassing adjacent to construction sites. ○ Instruct all vehicles drivers contracted by the project on safe driving guidelines.	1- Stakeholder Engagement Plan prepared and approved 2- All mitigation measures have been implemented 3- Number of community health and safety-related complaints received and the time it took to resolve them 4- Number of unresolved complaints 5- % drivers trained on safe driving procedures	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of	EGP 50,000 (USD 3,200) for preparing a SEP Other measures should be Covered in the construction costs and by other sections of this plan EGP750,000 (USD48,000) For sensitization campaign (Poster,
			Dated Photo documentation of the site conditions Photo of poster, Add on newspaper, etc	Construction sites	Before entering the site and as necessary during the work		

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
access restrictions and commuting disruptions Construction works induced traffic: Train trips delays	○ When working near residential clusters, photo-document the condition of the nearest residential building to the trench before beginning the construction work. ○ Implement an Emergency Response Plan to manage major incidents if they should occur, such as train accidents in the vicinity of the construction site. ○ Prepare and implement a project and workers **Grievance Redress Mechanism (GRM)** ○ Negotiate construction schedule with ENR to minimise train delays and associated adverse impacts. ○ Re-schedule train timetable considering the expected delays where necessary and disclose the modified time-table to the public. This procedure is already being adopted by ENR for their current projects. ○ A public awareness campaign on railway safety, ○ Ongoing identification, evaluation and monitoring of potential community health and safety risks ○ No exposed, hot power cables should be left unattended at any time. ○ Storage of track units or construction material should be allowed on ENR's storage yards in a way that will not affect traffic or pose any risk to communities adjacent to the railway corridors. ○ Conduct a communication campaign prior to construction kick-off to inform commuters.	6- Number of sensitization campaign (Poster, radio, Adds,) 7- Number of accidents associated with community, trespassers, or railway users. Serious injuries and fatalities are to be reported to relevant authorities and ENR immediately/as soon as practicable.	Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly	Contractors reports	radio, Adds, Cost by ENR) EGP750,000 (USD48,000) for the public awareness and sensitization campaign

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
i) Workers Influx/Workforce-Community Interactions							
Temporary Labour Influx Increased risk of illicit behaviour and crime Risk of social conflict	- Prepare and adopt a **Stakeholder Engagement Plan (SEP)**, as a framework for early and ongoing community consultation. - Prepare and implement a project and workers **Grievance Redress Mechanism (GRM)** - Develop work procedures, defining a **Code of Appropriate Conduct** for all workers, including acceptable behaviour with respect to community interactions and train workers - Provision of information regarding Worker Code of Conduct in local language. - Address risks in Workers Code of Conduct - Contractor to avoid hiring "at the gate" to discourage spontaneous influx of job seekers. - Train all workers on GBV risks and related sanctions. - Ensure that management and security staff are adequately trained to identify and eradicate all forms pertaining to GBV and gender-based discrimination. - Introduction of strict sanctions (e.g. dismissal) for workers involved in any form of abuse, inappropriate behaviour or GBV	1- The Code of Conduct has been prepared and formally adopted 2- Number of complaints received from the community with regards to workers' behaviour in general and the time it took to solve them. 3- Training records 4- All mitigation measures have been implemented (in specific those related to the code of conduct including GBV and other labour influx risks,) 5- % of workers trained on Code of Conduct	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	Covered in the construction costs and by other sections of this plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		
			Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
		6- % of workers trained on GBV					
j) Labour & Working Conditions							

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
Occupational health & safety impacts - Physical hazards from demolition waste - Physical hazards from equipment and vehicles - Fire Hazard - Slippage and Falling & Working at heights - Manual handling and	The Contractor shall prepare and adopt an **Occupational health and safety plan** (OHS) and an **Emergency preparedness and response plan** (EPRP) to include fire and medical emergencies, complying with the Egyptian Labour law No. 12 for 2003 during the construction phase and addressing the following aspects as minimum: o Hire an accredited Health & Safety professional o Identification of hazard sources to workers and identifying solutions to eliminate them o Workers must be trained to recognise potential hazards including electrical hazards, use proper work practices and procedures, recognise adverse health effects, understand the physical signs and reactions related to exposures, and are familiar with appropriate emergency evacuation procedures. They must also be trained to how to use the Personal Protective Equipment (PPE). o Inspection and testing of all equipment and machines o Preparation of an emergency response plan o Provision of appropriate and enough first aid equipment, fire extinguishers in good working conditions on site and sand buckets o Create strictly No-Smoking zones in fire risk areas such as fuel storage areas and excavations o Strictly avoid excavations in areas with residential natural gas connections or works near	1- The OHS and EPRP have been prepared and formally adopted 2- All mitigation measures have been implemented Undertake checks on workers right to work (including work permits, age etc.); 3- Reports on any accidents, hazardous events, as well as records and reports on health, safety and welfare of workers 4- Condition of fire extinguishing instruments	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	Covered in the construction costs and by other sections of this plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
lifting - Electrocution - Traffic and accessibility <u>Sanitation concerns for the construction crew:</u> Illnesses and Covid-19 Fatigue	natural gas piping o Follow latest WHO and national measures on Covid-19 as relevant o Regular inspection of workers against pathogenic agents and provision of immunization when needed o Identify and provide contacts of closest authorities and emergency services to contact in case of emergencies o Provision of full PPE including suitable footwear to avoid slippage and to protect o Workers exposed to noise exceeding permissible levels (e.g. ballast uploading) should wear hearing protection.	5- Condition of flammable material containers & storage 6- Availability & usage of PPEs 7- Condition of Rest Facilities 8- Workers right to work (including contracts, age etc.) and Inclusion of minimum labour standards in all workers contracts 9- % of site employees trained on OHS, emergency procedures and GRM 10- OHS statistics such as fatalities, injuries, lost time incidents, first aid cases. 11- Development of the Ethical Procurement Policy 12- Contractor-workers'	Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		

E&S Impacts	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[20]
		contracts. 13- Number of complaints received, number solved and the time it took to solve them. 14- Number of unresolved complaints					
Total cost of the ESMP (Estimated overall budget (itemized matrix) for the implementation of all environmental and social measures (in local currency, EGP, and U.S. dollars, by source of funds) including provisions for E&S compliance and performance audits by an independent consultant for all lines estimated at an annual cost of EGP 240000 (USD 15400) and also including an initial training session for ENR Staff on ESMP implementation estimated at a cost of EGP 30,000 (USD 1900) , to be repeated annually during construction at a cost of EGP 30,000 (USD 1900))						**Fixed costs** EGP 890,000 (USD 56,700) **Annual costs** EGP 324,000 (USD 20,500) **Total Annual costs (for 5 years)** EGP 1,620,000 (USD 102,500)	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
PRE-CONSTRUCTION /DESIGN PHASE							
Land acquisition/ Livelihood or assets impacts due to Land allocation for CTC and MTBs along the railway corridor	ENR to maintain their avoidance strategy for any land with any uses as a priority action. RPF was prepared stipulating the principles to be followed in case this impact is encountered. RAPs and ARAPs should be prepared as needed for individual cases where land and livelihoods loss will be encountered as an impact. All efforts be made to allow for harvesting of crops prior to any land-related impacts. The contractor should comply with the avoidance strategy of ENR and should provide regular reporting supporting that to ENR. If the technical requirements of certain location made it impossible for the contractor to secure full avoidance, the various options should be discussed with ENR and reported to the Bank and actions should be taken accordingly (including preparing safeguards instrument such as RAP/ARAP) A robust and multi-channels project level Grievance Redress Mechanism (GRM[22]) to be developed and used	Documentation of the sharing sessions and consultations ESMP in Arabic GRM in place and known to local community - Number of complaints that were resolved and the time it took to resolve them Number of unresolved complaints Preliminary assessment report of land and livelihoods/assets loss for	Review and audit	Construction sites	At the beginning of the construction phase then weekly	**Contractor:** Implementation of avoidance strategy and mitigation measures Reporting to ENR **ENR:** PMU with support from the WB will maintain land avoidance strategy, Reviewing Contractor's performance	Included in the waste section below

[21] Cost estimate refers to the additional cost which the contractor/ENR will need to consider as compared to the conventional

[22] **Grievance Redress Mechanism**

ENR has a department for complaints at their headquarters in Cairo, to which any person can file a complaint. ENR has also dedicated 2 phone lines (01274422925 - 0225753555) in addition to a hotline (147) for complaints related to ENR in general. There is no specific channel dedicated for the project; and since the project's geographic scope will be extended, the following multi-stage mechanism shall be adopted.

g) Stage 1, any person aggrieved by any aspect of the resettlement document can lodge an oral or written grievance to the Contractor, which in turn should provide resolution within 10 calendar days;

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
	ENR to conduct site specific information sharing session and consultation prior to the commencement of any works. Ensure that the local communities have access to the ESMP, RPF and subsequent Plans in local language and are aware of the contractors' commitments. ENR to ensure dissemination of the GRM to local communities and potential PAPs prior to starting construction activities.	selected locations for MTBs ESIAs				and ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

h) Stage 2, if the aggrieved person is not satisfied with the decision of the Contractor at Stage 1, he can present the case to the Consulting/Supervision Company to resolve within 15 calendar days.
i) Stage 3, if the complainant is still dissatisfied with the Consulting/Supervision Company's decision, he can escalate the complaint to ENR to resolve the issue in 15 calendar days.

The respective Contractor shall disclose the grievance redress mechanism on a board that is easily legible and accessible at all worksites.

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
a) Pollution of Soils & Water							
Pollution of Soils & Water bodies due to poor solid and liquid waste management practices	Prepare and implement a **Solid and Hazardous Waste and Materials Management Plan** which include arrangements for managing solid and liquid hazardous and non-hazardous waste (to be approved by the supervising consultant and the environmental department before the start of the construction) including but not limited to: o Waste minimisation and prevention hierarchy o Design a segregation system based on compatibility of different waste streams and based on the recycling services (if locally available) o Identification of the types and dimensions of storage means at source for hazardous and non-hazardous wastes o Design and construct a central waste storage area for non-hazardous wastes which accommodate for the received segregated streams /or any alternative solution proposed by the contractor o Identify the nearest landfill for the disposal	1- Submission and approval of the waste management plans covering at minimum all the aspects detailed in this ESMP (once at the beginning of the project). 2- Submission and approval of the of hazardous substance management procedure (standalone or included in EHS plan) covering at minimum all the aspects detailed in this ESMP. 3- All mitigation measures have been implemented 4- Amounts of solid and hazardous waste sent	Visual inspection of the site and proper use of PPEs	Construction sites	Daily throughout construction	**Contractor:** Development of the required plans. Implementation of plans, internal monitoring and reporting to ENR **ENR:** Reviewing Contractor's plans to ensure their compliance to ENR's EHS	Included in the waste section below
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
	of the non-recycled items o Identify a recycling contractor preferably from the nearby villages o Waste contractors' certifications and compliance assurance. All waste streams should be transported and disposed of by certified service providers, in compliance with Egyptian regulations and disposed of in licensed landfills/dump sites, including. o Training for workers on sound environmental practices to manage solid wastes. o Storage spent oils in sealed drums sheltered from the sun until collection o Record keeping (waste inventory, waste disposal registers and consignment notes) o Complete prohibition dumping of solid and liquid waste in any water body o When using diesel generators, place the generator on an impermeable protective base layer. o In case of accidental spills of hydrocarbons, isolate and collect the contaminated soil and store as hazardous waste to be disposed of in hazardous waste landfills. o For the contractors' temporary offices, use intact septic tanks, free of any leaks and to be regularly emptied before reaching its maximum capacity. o Development and implementation of a hazardous substances' management procedure. The procedure should at	to landfill/ month 5- Amount of total solid and hazardous waste generated/month 6- Amount of total solid and hazardous waste reused and/or recycled/month 7- Record of the sewage collection date and amount. 8- Number of Environmental and OHS incidents related to soil and water pollution 9- Number of Environmental and OHS incidents related to hazardous substance management 10- Valid Certificates for all waste contractors and chain of custody 11- Number of complaints related to soil and/or water pollution and time it took to solve them 12- Number of unresolved complaints	Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	weekly	and ESMP requirements. Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
	minimum address the following aspects: operational procedures, procurement, prohibited substances, inventory, risk assessments, labelling, storage, Safety Data Sheets and control measures. The procedure should mention specific measures for the control of risks associated with the use of the diesel fuel for power generation. The management plans and procedures can be standalone documents or part of an overall construction EHS management plan. This shall also include a note on accidental spills of hydrocarbons, and methods of isolation and collection of the contaminated soil and storage as hazardous waste to be disposed of in hazardous waste landfills. o Inspection of the site for existing contamination from previous work/ activities. Where inspection results were positive, carefully collect and isolate all the contaminated soil in sealed bags to be disposed in the nearest hazardous waste landfill/treatment facility.						

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
b) Ambient Air Quality							
Dust/PM10 emissions from construction and vehicles movement on unpaved roads PM10, TSP, NOx, SO_2, CO emissions from Diesel-fuelled generators and transport vehicles	Implement a **Construction Activity Pollution Prevention Plan** (to be approved by the supervising consultant and the environmental department before the construction work start) including but not limited to: o Store excavation and construction materials such as sand and other friable waste material in ENR designated places and cover them with suitable materials to control and prevent dust generation and minimise spillage. o All vehicles used by the contractor to deliver construction materials and/or collect waste materials to and from the site should be completely covered to avoid material spillage. o Install a solid fence around the excavation site in all areas adjacent to residential clusters, roads, water bodies and agricultural lands. o Implement a preventive maintenance program for vehicles and equipment working on site and promptly repair/replace vehicles, equipment and generators with any visible exhaust fume. o Implement best practice site housekeeping measures. o Regular maintenance and inspection of equipment and vehicles used on site o Favour the purchase of low-sulphur diesel.	1- Construction Activity Pollution Prevention Plan has been prepared and approved 2- All mitigation measures have been implemented 3- Number of complaints received with regards to air quality and dust generation the time it took to solve them. 4- Number of unresolved complaints 5- Results of measurements and % not compliant with applicable legal standards including reasons for non-compliance	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily	**Contractor** Implementation of mitigation measures, internal monitoring and reporting to ENR May hire a third party for the quarterly monitoring measurements or use calibrated instruments approved by ENR. **ENR:** Ensuring the correct implementation of the mitigation and monitoring	EGP 48,000 (USD 3,000) for 8 measurement points (two measurement points per quarter) EGP 30,000 (USD 1,900) for preparing the Construction Pollution Prevention Plan
			Measure ambient air quality parameters (PM10, NOx, SO_2, CO and TSP)	Construction Sites at nearest sensitive receptor and central to the major construction activities	Quarterly		
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		
			Complete a compliance checklist for mitigation actions and measures and conduct a	Construction sites	Weekly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
	○ As much as practically possible, construction material and waste should be transported to and from construction sites using cargo trains. ○ Vehicles uploading material should maintain the lowest possible fall height to reduce noise and dust generation. ○ Old, often contaminated ballast basalt should be removed to a government-designated dumpsite for disposal or for decontamination for future use. ○ Transportation of old ballast should be only in covered tracks to avoid spillage		Documents and records review			measures Review and assurance of Contractor's reports	
c) Noise & Vibration							
Impacts on ambient noise levels	Develop and implement a **noise management procedure** as a standalone document or as a part of an OHS plan. The following measures as a minimum should be covered: ○ Optimise the use of equipment and turn off any equipment when not in use. ○ Use of modern, well-maintained equipment fitted with abatement devices (e.g. mufflers, noise enclosures). ○ Control exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of	1- Development of the noise management procedure/OHS plan 2- All mitigation measures have been implemented 3- Number of complaints received with regards to noise associated with the construction work and the time it took to solve them. 4- Number of unresolved complaints 5- Results of noise	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to the ENR **ENR:** Ensuring the	EGP 6,000 (USD 380) for 8 measurements (2 per quarter)
			Measure ambient Noise (in case of use of mechanical/ electrical digging equipment and machinery)	Construction Sites at nearest sensitive receptor and central to the major construction	Quarterly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
	exposure. o Stop all noisy work at night (before 6 am after 6pm)	ambient measurements including reasons for non-compliance (if any)		activities		correct implementation of the mitigation and monitoring measures Review of Contractors reports	
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		
			Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	Weekly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
d) Resources & Waste							
Impacts associated with increased consumption of resources and waste generation	Prepare and implement a **Solid and Hazardous Waste and Materials Management Plan** which include arrangements for managing solid and liquid hazardous and non-hazardous waste (to be approved by the supervising consultant and the environmental department before the start of the construction) including but not limited to: o Waste minimisation and prevention hierarchy o Design a segregation system based on compatibility of different waste streams and based on the recycling services (if locally available) o Identification of the types and dimensions of storage means at source for hazardous and non-hazardous wastes o Design and construct a central waste storage area for non-hazardous wastes which accommodate for the received segregated streams /or any alternative solution proposed by the contractor o Identify the nearest landfill for the disposal of the non-recycled items and get the required permits. o Identify an authorized recycling contractor	1- Submission and approval of the waste management plans covering at minimum all the aspects detailed in this ESMP (once at the beginning of the project) 2- Submission and approval of the of hazardous substance management procedure (standalone or included in EHS plan) covering at minimum all the aspects detailed in this ESMP 3- All mitigation measures have been implemented 4- Amounts of solid and hazardous waste sent to landfill/month 5- Amount of total solid and hazardous waste	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Development of the required plans. Implementation of plans, internal monitoring and reporting to ENR **ENR:** Reviewing Contractor's plans to ensure their compliance to ENR's EHS and ESMP requirements.	EGP 30,000 (USD 1,900) for preparing the waste management plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
	preferably from the nearby villages o Waste contractors' certifications and compliance assurance. All waste streams should be transported and disposed of by certified service providers, in compliance with Egyptian regulations and disposed of in licensed landfills/dump sites, including. o Training for workers on sound environmental practices to manage solid wastes. o Storage of spent oils in sealed drums sheltered from the sun until collection by authorized service providers o Record keeping (waste inventory, waste disposal registers and consignment notes) o Complete prohibition dumping of solid and liquid waste in any water body o When using diesel generators, place the generator on an impermeable protective base layer. o For the contractors' temporary offices, use intact septic tanks, free of any leaks and to be regularly emptied before reaching its maximum capacity. o Development and implementation of a hazardous substances' management procedure. The procedure should at minimum address the following aspects: operational procedures, procurement, prohibited substances, inventory, risk assessments, labelling, storage, Safety Data Sheets and control measures. The procedure	generated/month 6- Amount of total solid and hazardous waste reused and/or recycled/month 7- Record of the sewage collection date and amount. 8- Number of Environmental and OHS incidents related to soil and water pollution 9- Number of Environmental and OHS incidents related to hazardous substance management 10- Valid Certificates for all waste contractors and chain of custody 11- Number of complaints with regards to waste and resources and time it took to solve them 12- Number of unresolved complaints	Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	weekly	Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
	should mention specific measures for the control of risks associated with the use of the diesel fuel for power generation. The management plans and procedures can be standalone documents or part of an overall construction EHS management plan. This shall also include a note on accidental spills of hydrocarbons, and methods of isolation and collection of the contaminated soil and storage as hazardous waste to be disposed of in hazardous waste landfills.						
e) Energy Efficiency & GHGs							
Impacts associated with low energy efficiency and increased GHGs.	Opportunities for reducing GHG emissions, to be adopted by the contractor where **technically and financially feasible**. o Adjust work schedule to daytime as much as possible o Design and construct thermally insulated temporary offices, with a natural ventilation option to reduce as much as possible the need for mechanical	Total amount of fuel used on site and electricity consumption where applicable	Visual Site inspection and records review	Construction sites	At the beginning of the construction work and monthly after that	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR	Covered in construction cost

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
	ventilation and reduce the associated electricity and GHG emissions. o Design and install solar PV system on the roof of the temporary offices to cover basic electricity office needs		Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	Weekly	**ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
f) Biodiversity							
Flora and Fauna Impacts	o Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan (please refer to section b and d)** o Reuse the top soil layer for filling the trench, which necessitate a method to	1- All mitigation measures have been implemented 2- Number of complaints related to biodiversity and time it took to solve them	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting	Covered in construction cost

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
	differentiate between the different layers of excavated soil. o Train workers on reusing the top soil layer in filling back the trench.	3- Number of unresolved complaints	Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
			Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		
g) Cultural Heritage							
Impacts associated with chance finds	In the unlikely event of encountering a chance-find the following measures are to be taken: - Stop the construction activities in the area of the chance find and delineate the discovered site or area - Secure the site to prevent any damage or loss of	Chance Finds reports	- Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	**Contractor:** Implementation of mitigation measures, internal monitoring	EGP 20,000 (USD1,300) /day and estimated duration is 4 days

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
	discovered objects. - Notify the (ENR's and Contractor's) site managers and EHS supervisors who in turn will notify the responsible local authorities and the Antiquities Authority immediately (within 24 hours). - Responsible local authorities and the Antiquities Authority would be in charge of protecting and preserving the site before deciding on subsequent steps - Construction work can resume only after permission is given from the responsible local authorities and the Antiquities Authority. - Record any chance-finds and the detailed procedure followed to handle them.		Conduct a Documents and records review	Construction sites	In case of chance-finds	and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
h) Community Health, Safety and Security (including traffic and accessibility)							
Poor construction management practices Noise, dust and other types Trespassers on rail lines Level Crossings Safety Impacts related to access	○ Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan.** ○ Prepare and adopt a **Stakeholder Engagement Plan** ○ Clearly place a sign in Arabic language on each construction site stating the objective of the project, duration of the work and the phone number to receive grievances for both the contractor and ENR. The sign should also include a prominent warning to cross the fence boundaries. ○ Securely surround the trench with a solid fence when working adjacent to residential clusters or any area where children are suspected to be present. Only in desert areas, that this fence could be substituted with an open one. ○ Implementation of a health management system for the construction workforce, to ensure through medical check-ups, they are fit for work and that they will not introduce disease into local communities. ○ Prohibit trespassing adjacent to construction	1- Stakeholder Engagement Plan prepared and approved 2- All mitigation measures have been implemented 3- Number of community health and safety, and train delays - related complaints received and the time it took to resolve them 4- Number of unresolved complaints 5- % drivers trained on safe driving procedures 6- Number of accidents associated with community, trespassers, or railway users. Serious injuries and fatalities are to be	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of	EGP 50,000 (USD 3,200) for preparing a SEP Other measures should be Covered in the construction costs and by other sections of this plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work **aa**		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
restrictions and commuting disruptions Construction works induced traffic: Train trips delays	sites. o Instruct all vehicles drivers contracted by the project on safe driving guidelines. o A plan for making alternative means of transportation available in case of significant train delay should be developed and implemented. o Work should be so planned as to avoid the complete blockage of level crossing, as much as practical. o Concentrating work in level crossings during times of reduced traffic, possibly during the night, as long as noise level can be kept at an acceptable level. o In cases where a level crossing has to be completely closed during construction, an alternative crossing should be identified and advertised to the public in advance. Traffic detours will have to clearly marked and provided with proper direction signage for incoming traffic. o Law enforcement authorities (Traffic Police) should take charge of controlling vehicular and pedestrian traffic flow and preventing illegal track crossings o When working near residential clusters, photo-document the condition of the nearest residential building to the trench before beginning the construction work. o Implement an Emergency Response Plan to manage major incidents if they should occur, such as train accidents in the vicinity of the	reported to relevant authorities and ENR immediately/as soon as practicable. 7- Assess traffic flow across level crossings and their vicinity at selected level crossings and population centres. 8- Revised train schedule announced and applied 9- Document the Conditions of railway corridor walls 10- Availability and cost of alternative transportation	Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly	Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
	construction site. o Prepare and implement a project and workers **Grievance Redress Mechanism (GRM)** o Negotiate construction schedule with ENR to minimise train delays and associated adverse impacts. o Re-schedule train time-table considering the expected delays where necessary and disclose the modified time-table to the public. This procedure is already being adopted by ENR for their current projects. o Ongoing identification, evaluation and monitoring of potential community health and safety risks o No exposed, hot power cables should be left unattended at any time. o Storage of track units or construction material should be allowed on ENR's storage yards in a way that will not affect traffic or pose any risk to communities adjacent to the railway corridors.						
i) Workers Influx/Workforce-Community Interactions							
Temporary Labour Influx	- Prepare and adopt a **Stakeholder Engagement Plan (SEP)**, as a framework for early and ongoing community consultation. - Prepare and implement a project and workers **Grievance Redress Mechanism (GRM)** - Develop work procedures, defining a **Code of Appropriate Conduct** for all workers,	1- The Code of Conduct has been prepared and formally adopted 2- Number of complaints received from the community with regards to workers'	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting	Covered in the construction costs and by other sections of this plan

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
Increased risk of illicit behaviour and crime Risk of social conflict	including acceptable behaviour with respect to community interactions and train workers - Provision of information regarding Worker Code of Conduct in local language. - Address risks in Workers Code of Conduct - Contractor to avoid hiring "at the gate" to discourage spontaneous influx of job seekers. - Train all workers on GBV risks and related sanctions. - Ensure that management and security staff are adequately trained to identify and eradicate all forms pertaining to GBV and gender-based discrimination. - Provision of substance abuse prevention and management programs. - Introduction of strict sanctions (e.g. dismissal) for workers involved in any form of abuse, inappropriate behaviour or GBV	behaviour in general and the time it took to solve them. 3- Training records 4- All mitigation measures have been implemented (in specific those related to the code of conduct including GBV and other labour influx risks,) 5- % of workers trained on Code of Conduct 6- % of workers trained on GBV	Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
			Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
j) Labour & Working Conditions							
Occupational health & safety impacts - Physical hazards from demolition waste - Physical hazards from equipment and vehicles - Fire Hazard - Slippage and Falling & Working at heights - Manual handling and lifting	The Contractor shall prepare and adopt an **Occupational health and safety plan** (OHS) and an **Emergency preparedness and response plan** (EPRP) to include fire and medical emergencies, complying with the Egyptian Labour law No. 12 for 2003 during the construction phase and addressing the following aspects as minimum: o Hire an accredited Health & Safety professional o Identification of hazard sources to workers and identifying solutions to eliminate them o Workers must be trained to recognise potential hazards including electrical hazards, use proper work practices and procedures, recognise adverse health effects, understand the physical signs and reactions related to exposures, and are familiar with appropriate emergency evacuation procedures. They must also be trained to how to use the Personal Protective Equipment (PPE). o Inspection and testing of all equipment and machines o Preparation of an emergency response plan o Provision of appropriate and enough first aid equipment, fire extinguishers in good working conditions on site and sand	1- The OHS and EPRP have been prepared and formally adopted 2- All mitigation measures have been implemented Undertake checks on workers right to work (including work permits, age etc.); 3- Reports on any accidents, hazardous events, as well as records and reports on health, safety and welfare of workers 4- Condition of fire extinguishing instruments 5- Condition of flammable material containers & storage 6- Availability & usage of PPEs 7- Condition of Rest Facilities 8- Workers right to work	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	Covered in the construction costs and by other sections of this plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
- Electrocution - Traffic and accessibility <u>Sanitation concerns for the construction crew:</u> Illnesses and Covid-19 Fatigue	buckets o Create strictly No-Smoking zones in fire risk areas such as fuel storage areas and excavations o Strictly avoid excavations in areas with residential natural gas connections or works near natural gas piping o Follow latest WHO and national measures on Covid-19 as relevant o Regular inspection of workers against pathogenic agents and provision of immunization when needed o Identify and provide contacts of closest authorities and emergency services to contact in case of emergencies o Provision of full PPE including suitable footwear to avoid slippage and to protect o Workers exposed to noise exceeding permissible levels (e.g. ballast uploading) should wear hearing protection. The contractor shall also develop and implement a **Labour Management Plan**, with clear employment requirements, transparent hiring and management procedures for the construction and operational/ maintenance workforce. Employment practices and working conditions should conform to International Labor Organization (ILO) Standards and national regulations, including but not limited to: o Provide rest and recreational facilities and time, and prohibit the consumption of	(including contracts, age etc.) and Inclusion of minimum labour standards in all workers contracts 9- % of site employees trained on OHS, emergency procedures and GRM 10- OHS statistics such as fatalities, injuries, lost time incidents, first aid cases. 11- Development of the Ethical Procurement Policy 12- Contractor-workers' contracts. 13- Number of complaints received, number solved and the time it took to solve them. 14- Number of unresolved complaints	Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
	alcohol and drugs on site, as defined and clearly communicated to workers; o Ensure fair hiring procedures are in place in order to ensure non-discrimination and equal opportunity are provided for all project workers. o Include clear and explicit measures in the contractors' contract to 1) prohibit labor under 18 years old in the main contract, 2) stipulate that this contract should go to all the sub contract as a binding condition. o Communicate and make clear to the workers their contracts terms and (working hours, wages, overtime, compensation and benefits…) o Ensure timely and sufficient payment to the contractors and sub-contractor's workers o Provide workers with annual holiday and other benefits as per the labour law. o Provide all types of workers with appropriate social insurance and health insurance schemes. The Insurance should also cover work-related accidents. o Copies of national IDs for all types of laborers, including casual laborers hired by subcontractor and contractor should be recorded						
Total cost of the ESMP (Estimated overall budget (itemized matrix) for the implementation of all environmental and social measures (in local currency, EGP, and U.S. dollars, by source of funds) not including provisions for E&S compliance and performance audits by an independent						**Fixed costs** EGP 110,000 (USD 7,100)	

Updated ESMP for Beni Suef – Asyut – Nagh Hammadi

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[21]
consultant nor the trainings , since these have been added to the costs of the main ESMP table)						**Annual costs** EGP 54,000 (USD 3,500) **Total Annual costs (for 5 years)** EGP 270,000 (USD 17,500)	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
PRE-CONSTRUCTION /DESIGN PHASE							
Land acquisition/ Livelihood or assets impacts due to Land allocation for CTC and MTBs along the railway corridor	ENR to maintain their avoidance strategy for any land with any uses as a priority action. RPF was prepared stipulating the principles to be followed in case this impact is encountered. RAPs and ARAPs should be prepared as needed for individual cases where land and livelihoods loss will be encountered as an impact. All efforts be made to allow for harvesting of crops prior to any land-related impacts. The contractor should comply with the avoidance strategy of ENR and should provide regular reporting supporting that to ENR. If the technical requirements of certain location made it impossible for the contractor to secure full avoidance, the various options should be discussed with ENR and reported to the Bank and actions should be taken accordingly (including preparing safeguards instrument such as RAP/ARAP) A robust and multi-channels project level Grievance Redress Mechanism (GRM[24]) to be developed and used	Documentation of the sharing sessions and consultations ESMP in Arabic GRM in place and known to local community - Number of complaints that were resolved and the time it took to resolve them Number of unresolved complaints Preliminary assessment report of land and livelihoods/assets loss for	Review and audit	Construction sites	At the beginning of the construction phase then weekly	**Contractor:** Implementation of avoidance strategy and mitigation measures Reporting to ENR **ENR:** PMU with support from the WB will maintain land avoidance strategy, Reviewing Contractor's performance	Included in the waste section below

[23] Cost estimate refers to the additional cost which the contractor/ENR will need to consider as compared to the conventional

[24] **Grievance Redress Mechanism**

ENR has a department for complaints at their headquarters in Cairo, to which any person can file a complaint. ENR has also dedicated 2 phone lines (01274422925 - 0225753555) in addition to a hotline (147) for complaints related to ENR in general. There is no specific channel dedicated for the project; and since the project's geographic scope will be extended, the following multi-stage mechanism shall be adopted.

j) Stage 1, any person aggrieved by any aspect of the resettlement document can lodge an oral or written grievance to the Contractor, which in turn should provide resolution within 10 calendar days;

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
	ENR to conduct site specific information sharing session and consultation prior to the commencement of any works. Ensure that the local communities have access to the ESMP, .in local language and are aware of the contractors' commitments. ENR to ensure dissemination of the GRM to local communities and potential PAPs prior to starting construction activities.	selected locations for MTBs ESIA				and ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

k) Stage 2, if the aggrieved person is not satisfied with the decision of the Contractor at Stage 1, he can present the case to the Consulting/Supervision Company to resolve within 15 calendar days.
l) Stage 3, if the complainant is still dissatisfied with the Consulting/Supervision Company's decision, he can escalate the complaint to ENR to resolve the issue in 15 calendar days.

The respective Contractor shall disclose the grievance redress mechanism on a board that is easily legible and accessible at all worksites.

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
a) Pollution of Soils & Water							
Pollution of Soils & Water bodies due to poor solid and liquid waste management practices	Prepare and implement a **Solid and Hazardous Waste and Materials Management Plan** which include arrangements for managing solid and liquid hazardous and non-hazardous waste (to be approved by the supervising consultant and the environmental department before the start of the construction) including but not limited to: o Waste minimisation and prevention hierarchy o Design a segregation system based on compatibility of different waste streams and based on the recycling services (if locally available) o Identification of the types and dimensions of storage means at source for hazardous and non-hazardous wastes o Design and construct a central waste storage area for non-hazardous wastes which accommodate for the received segregated streams /or any alternative solution proposed by the contractor o Identify the nearest landfill for the disposal	1- Submission and approval of the waste management plans covering at minimum all the aspects detailed in this ESMP (once at the beginning of the project). 2- Submission and approval of the of hazardous substance management procedure (standalone or included in EHS plan) covering at minimum all the aspects detailed in this ESMP. 3- All mitigation measures have been implemented 4- Amounts of solid and hazardous waste sent	Visual inspection of the site and proper use of PPEs	Construction sites	Daily throughout construction	**Contractor:** Development of the required plans. Implementation of plans, internal monitoring and reporting to ENR **ENR:** Reviewing Contractor's plans to ensure their compliance to ENR's EHS	Included in the waste section below
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
	of the non-recycled items o Identify a recycling contractor preferably from the nearby villages o Waste contractors' certifications and compliance assurance. All waste streams should be transported and disposed of by certified service providers, in compliance with Egyptian regulations and disposed of in licensed landfills/dump sites, including. o Training for workers on sound environmental practices to manage solid wastes. o Storage spent oils in sealed drums sheltered from the sun until collection o Record keeping (waste inventory, waste disposal registers and consignment notes) o Complete prohibition dumping of solid and liquid waste in any water body o When using diesel generators, place the generator on an impermeable protective base layer. o In case of accidental spills of hydrocarbons, isolate and collect the contaminated soil and store as hazardous waste to be disposed of in hazardous waste landfills. o For the contractors' temporary offices, use intact septic tanks, free of any leaks and to be regularly emptied before reaching its maximum capacity. o Development and implementation of a hazardous substances' management procedure. The procedure should at	to landfill/ month 5- Amount of total solid and hazardous waste generated/month 6- Amount of total solid and hazardous waste reused and/or recycled/month 7- Record of the sewage collection date and amount. 8- Number of Environmental and OHS incidents related to soil and water pollution 9- Number of Environmental and OHS incidents related to hazardous substance management 10- Valid Certificates for all waste contractors and chain of custody 11- Number of complaints related to soil and/or water pollution and time it took to solve them 12- Number of unresolved complaints	Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	weekly	and ESMP requirements. Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
	minimum address the following aspects: operational procedures, procurement, prohibited substances, inventory, risk assessments, labelling, storage, Safety Data Sheets and control measures. The procedure should mention specific measures for the control of risks associated with the use of the diesel fuel for power generation. The management plans and procedures can be standalone documents or part of an overall construction EHS management plan. This shall also include a note on accidental spills of hydrocarbons, and methods of isolation and collection of the contaminated soil and storage as hazardous waste to be disposed of in hazardous waste landfills. o Inspection of the site for existing contamination from previous work/ activities. Where inspection results were positive, carefully collect and isolate all the contaminated soil in sealed bags to be disposed in the nearest hazardous waste landfill/treatment facility.						

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
b) Ambient Air Quality							
Dust/PM10 emissions from construction and vehicles movement on unpaved roads PM10, TSP, NOx, SO_2, CO emissions from Diesel-fuelled generators and transport vehicles	Implement a **Construction Activity Pollution Prevention Plan** (to be approved by the supervising consultant and the environmental department before the construction work start) including but not limited to: o Store excavation and construction materials such as sand and other friable waste material in ENR designated places and cover them with suitable materials to control and prevent dust generation and minimise spillage. o All vehicles used by the contractor to deliver construction materials and/or collect waste materials to and from the site should be completely covered to avoid material spillage. o Install a solid fence around the excavation site in all areas adjacent to residential clusters, roads, water bodies and agricultural lands. o Implement a preventive maintenance program for vehicles and equipment working on site and promptly repair/replace vehicles, equipment and generators with any visible exhaust fume. o Implement best practice site housekeeping measures. o Regular maintenance and inspection of equipment and vehicles used on site o Favour the purchase of low-sulphur diesel.	1- Construction Activity Pollution Prevention Plan has been prepared and approved 2- All mitigation measures have been implemented 3- Number of complaints received with regards to air quality and dust generation the time it took to solve them. 4- Number of unresolved complaints 5- Results of measurements and % not compliant with applicable legal standards including reasons for non-compliance	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily	**Contractor** Implementation of mitigation measures, internal monitoring and reporting to ENR May hire a third party for the quarterly monitoring measurements or use calibrated instruments approved by ENR. **ENR:** Ensuring the correct implementation of the mitigation and monitoring	EGP 48,000 (USD 3,000) for 8 measurement points (two measurement points per quarter) EGP 30,000 (USD 1,900) for preparing the Construction Pollution Prevention Plan
			Measure ambient air quality parameters (PM10, NOx, SO_2, CO and TSP)	Construction Sites at nearest sensitive receptor and central to the major construction activities	Quarterly		
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		
			Complete a compliance checklist for mitigation actions and measures and conduct a	Construction sites	Weekly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
	○ As much as practically possible, construction material and waste should be transported to and from construction sites using cargo trains. ○ Vehicles uploading material should maintain the lowest possible fall height to reduce noise and dust generation. ○ Old, often contaminated ballast basalt should be removed to a government-designated dumpsite for disposal or for decontamination for future use. ○ Transportation of old ballast should be only in covered tracks to avoid spillage		Documents and records review			measures Review and assurance of Contractor's reports	
c) Noise & Vibration							
Impacts on ambient noise levels	Develop and implement a **noise management procedure** as a standalone document or as a part of an OHS plan. The following measures as a minimum should be covered: ○ Optimise the use of equipment and turn off any equipment when not in use. ○ Use of modern, well-maintained equipment	1- Development of the noise management procedure/OHS plan 2- All mitigation measures have been implemented 3- Number of complaints received with regards	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting	EGP 6,000 (USD 380) for 8 measurements (2 per quarter)

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
	fitted with abatement devices (e.g. mufflers, noise enclosures). o Control exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure. o Stop all noisy work at night (before 6 am after 6pm)	to noise associated with the construction work and the time it took to solve them. 4- Number of unresolved complaints 5- Results of noise ambient measurements including reasons for non-compliance (if any)	Measure ambient Noise (in case of use of mechanical/ electrical digging equipment and machinery)	Construction Sites at nearest sensitive receptor and central to the major construction activities	Quarterly	to the ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review of Contractors reports	
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		
			Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	Weekly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
d) Resources & Waste							
Impacts associated with increased consumption of resources and waste generation	Prepare and implement a **Solid and Hazardous Waste and Materials Management Plan** which include arrangements for managing solid and liquid hazardous and non-hazardous waste (to be approved by the supervising consultant and the environmental department before the start of the construction) including but not limited to: o Waste minimisation and prevention hierarchy o Design a segregation system based on compatibility of different waste streams and based on the recycling services (if locally available) o Identification of the types and dimensions of storage means at source for hazardous and non-hazardous wastes o Design and construct a central waste storage area for non-hazardous wastes which accommodate for the received segregated streams /or any alternative solution proposed by the contractor o Identify the nearest landfill for the disposal of the non-recycled items and get the required permits. o Identify an authorized recycling contractor	1- Submission and approval of the waste management plans covering at minimum all the aspects detailed in this ESMP (once at the beginning of the project) 2- Submission and approval of the of hazardous substance management procedure (standalone or included in EHS plan) covering at minimum all the aspects detailed in this ESMP 3- All mitigation measures have been implemented 4- Amounts of solid and hazardous waste sent to landfill/month	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Development of the required plans. Implementation of plans, internal monitoring and reporting to ENR **ENR:** Reviewing Contractor's plans to ensure their compliance to ENR's EHS and ESMP requirements.	EGP 30,000 (USD 1,900) for preparing the waste management plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
	preferably from the nearby villages o Waste contractors' certifications and compliance assurance. All waste streams should be transported and disposed of by certified service providers, in compliance with Egyptian regulations and disposed of in licensed landfills/dump sites, including. o Training for workers on sound environmental practices to manage solid wastes. o Storage of spent oils in sealed drums sheltered from the sun until collection by authorized service providers o Record keeping (waste inventory, waste disposal registers and consignment notes) o Complete prohibition dumping of solid and liquid waste in any water body o When using diesel generators, place the generator on an impermeable protective base layer. o For the contractors' temporary offices, use intact septic tanks, free of any leaks and to be regularly emptied before reaching its maximum capacity. o Development and implementation of a hazardous substances' management procedure. The procedure should at minimum address the following aspects: operational procedures, procurement, prohibited substances, inventory, risk assessments, labelling, storage, Safety Data Sheets and control measures. The procedure	5- Amount of total solid and hazardous waste generated/month 6- Amount of total solid and hazardous waste reused and/or recycled/month 7- Record of the sewage collection date and amount. 8- Number of Environmental and OHS incidents related to soil and water pollution 9- Number of Environmental and OHS incidents related to hazardous substance management 10- Valid Certificates for all waste contractors and chain of custody 11- Number of complaints with regards to waste and resources and time it took to solve them 12- Number of unresolved complaints	Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	weekly	Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
	should mention specific measures for the control of risks associated with the use of the diesel fuel for power generation. The management plans and procedures can be standalone documents or part of an overall construction EHS management plan. This shall also include a note on accidental spills of hydrocarbons, and methods of isolation and collection of the contaminated soil and storage as hazardous waste to be disposed of in hazardous waste landfills.						
e) Energy Efficiency & GHGs							
Impacts associated with low energy efficiency and increased GHGs.	Opportunities for reducing GHG emissions, to be adopted by the contractor where **technically and financially feasible**. o Adjust work schedule to daytime as much as possible o Design and construct thermally insulated temporary offices, with a natural ventilation option to reduce as much as possible the need for mechanical	Total amount of fuel used on site and electricity consumption where applicable	Visual Site inspection and records review	Construction sites	At the beginning of the construction work and monthly after that	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR	Covered in construction cost

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
	ventilation and reduce the associated electricity and GHG emissions. o Design and install solar PV system on the roof of the temporary offices to cover basic electricity office needs		Complete a compliance checklist for mitigation actions and measures and conduct a Documents and records review	Construction sites	Weekly	**ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
f) Biodiversity							
Flora and Fauna Impacts	o Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan (please refer to section b and d)** o Reuse the top soil layer for filling the trench, which necessitate a method to	1- All mitigation measures have been implemented 2-Number of complaints related to biodiversity and time it took to solve them 3-Number of unresolved	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting	Covered in construction cost

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
	differentiate between the different layers of excavated soil. o Train workers on reusing the top soil layer in filling back the trench.	complaints	Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
			Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		
g) Cultural Heritage							
Impacts associated with chance finds	In the unlikely event of encountering a chance-find the following measures are to be taken: - Stop the construction activities in the area of the chance find and delineate the discovered site or area - Secure the site to prevent any damage or loss of	Chance Finds reports	- Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	**Contractor:** Implementation of mitigation measures, internal monitoring	EGP 20,000 (USD1,300) /day and estimated duration is 4 days

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
	discovered objects. - Notify the (ENR's and Contractor's) site managers and EHS supervisors who in turn will notify the responsible local authorities and the Antiquities Authority immediately (within 24 hours). - Responsible local authorities and the Antiquities Authority would be in charge of protecting and preserving the site before deciding on subsequent steps - Construction work can resume only after permission is given from the responsible local authorities and the Antiquities Authority. - Record any chance-finds and the detailed procedure followed to handle them.		Conduct a Documents and records review	Construction sites	In case of chance-finds	and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
h) Community Health, Safety and Security (including traffic and accessibility)							
Poor construction management practices Noise, dust and other types Trespassers on rail lines Level Crossings Safety Impacts related to access	○ Prepare and implement both the **Solid Waste Management Plan** and the **Construction Activity Pollution Prevention Plan.** ○ Prepare and adopt a **Stakeholder Engagement Plan** ○ Clearly place a sign in Arabic language on each construction site stating the objective of the project, duration of the work and the phone number to receive grievances for both the contractor and ENR. The sign should also include a prominent warning to cross the fence boundaries. ○ Securely surround the trench with a solid fence when working adjacent to residential clusters or any area where children are suspected to be present. Only in desert areas, that this fence could be substituted with an open one. ○ Implementation of a health management system for the construction workforce, to ensure through medical check-ups, they are fit for work and that they will not introduce disease into local communities. ○ Prohibit trespassing adjacent to construction	1- Stakeholder Engagement Plan prepared and approved 2- All mitigation measures have been implemented 3- Number of community health and safety, and train delays - related complaints received and the time it took to resolve them 4- Number of unresolved complaints 5- % drivers trained on safe driving procedures 6- Number of accidents associated with community, trespassers, or railway users. Serious injuries and fatalities are to be	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of	EGP 50,000 (USD 3,200) for preparing a SEP Other measures should be Covered in the construction costs and by other sections of this plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
restrictions and commuting disruptions Construction works induced traffic: Train trips delays	sites. o Instruct all vehicles drivers contracted by the project on safe driving guidelines. o A plan for making alternative means of transportation available in case of significant train delay should be developed and implemented. o Work should be so planned as to avoid the complete blockage of level crossing, as much as practical. o Concentrating work in level crossings during times of reduced traffic, possibly during the night, as long as noise level can be kept at an acceptable level. o In cases where a level crossing has to be completely closed during construction, an alternative crossing should be identified and advertised to the public in advance. Traffic detours will have to clearly marked and provided with proper direction signage for incoming traffic. o Law enforcement authorities (Traffic Police) should take charge of controlling vehicular and pedestrian traffic flow and preventing illegal track crossings o When working near residential clusters, photo-document the condition of the nearest residential building to the trench before beginning the construction work. o Implement an Emergency Response Plan to manage major incidents if they should occur, such as train accidents in the vicinity of the	reported to relevant authorities and ENR immediately/as soon as practicable. 7- Assess traffic flow across level crossings and their vicinity at selected level crossings and population centers. 8- Revised train schedule announced and applied 9- Document the Conditions of railway corridor walls 10- Availability and cost of alternative transportation	Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly	Contractors reports	

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
	construction site. o Prepare and implement a project and workers **Grievance Redress Mechanism (GRM)** o Negotiate construction schedule with ENR to minimise train delays and associated adverse impacts. o Re-schedule train time-table considering the expected delays where necessary and disclose the modified time-table to the public. This procedure is already being adopted by ENR for their current projects. o Ongoing identification, evaluation and monitoring of potential community health and safety risks o No exposed, hot power cables should be left unattended at any time. o Storage of track units or construction material should be allowed on ENR's storage yards in a way that will not affect traffic or pose any risk to communities adjacent to the railway corridors.						
i) Workers Influx/Workforce-Community Interactions							
Temporary Labour Influx	- Prepare and adopt a **Stakeholder Engagement Plan (SEP)**, as a framework for early and ongoing community consultation. - Prepare and implement a project and workers **Grievance Redress Mechanism (GRM)** - Develop work procedures, defining a **Code of Appropriate Conduct** for all workers,	1- The Code of Conduct has been prepared and formally adopted 2- Number of complaints received from the community with regards to workers'	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting	Covered in the construction costs and by other sections of this plan

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
Increased risk of illicit behaviour and crime Risk of social conflict	including acceptable behaviour with respect to community interactions and train workers - Provision of information regarding Worker Code of Conduct in local language. - Address risks in Workers Code of Conduct - Contractor to avoid hiring "at the gate" to discourage spontaneous influx of job seekers. - Train all workers on GBV risks and related sanctions. - Ensure that management and security staff are adequately trained to identify and eradicate all forms pertaining to GBV and gender-based discrimination. - Provision of substance abuse prevention and management programs. - Introduction of strict sanctions (e.g. dismissal) for workers involved in any form of abuse, inappropriate behaviour or GBV	behaviour in general and the time it took to solve them. 3- Training records 4- All mitigation measures have been implemented (in specific those related to the code of conduct including GBV and other labour influx risks,) 5- % of workers trained on Code of Conduct 6- % of workers trained on GBV	Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work	to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	
			Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
j) Labour & Working Conditions							
<u>Occupational health & safety impacts</u> - Physical hazards from demolition waste - Physical hazards from equipment and vehicles - Fire Hazard - Slippage and Falling & Working at heights - Manual handling and lifting	The Contractor shall prepare and adopt an **Occupational health and safety plan** (OHS) and an **Emergency preparedness and response plan** (EPRP) to include fire and medical emergencies, complying with the Egyptian Labour law No. 12 for 2003 during the construction phase and addressing the following aspects as minimum: o Hire an accredited Health & Safety professional o Identification of hazard sources to workers and identifying solutions to eliminate them o Workers must be trained to recognise potential hazards including electrical hazards, use proper work practices and procedures, recognise adverse health effects, understand the physical signs and reactions related to exposures, and are familiar with appropriate emergency evacuation procedures. They must also be trained to how to use the Personal Protective Equipment (PPE). o Inspection and testing of all equipment and machines o Preparation of an emergency response plan o Provision of appropriate and enough first aid equipment, fire extinguishers in good working conditions on site and sand	1- The OHS and EPRP have been prepared and formally adopted 2- All mitigation measures have been implemented Undertake checks on workers right to work (including work permits, age etc.); 3- Reports on any accidents, hazardous events, as well as records and reports on health, safety and welfare of workers 4- Condition of fire extinguishing instruments 5- Condition of flammable material containers & storage 6- Availability & usage of PPEs 7- Condition of Rest Facilities 8- Workers right to work	Visual Inspection of the site, workers, equipment and vehicles	Construction sites	Daily throughout construction	**Contractor:** Implementation of mitigation measures, internal monitoring and reporting to ENR **ENR:** Ensuring the correct implementation of the mitigation and monitoring measures Review and assurance of Contractors reports	Covered in the construction costs and by other sections of this plan
			Dated Photo documentation of the site conditions	Construction sites	Before entering the site and as necessary during the work		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
- Electrocution - Traffic and accessibility <u>Sanitation concerns for the construction crew:</u> Illnesses and Covid-19 Fatigue	buckets o Create strictly No-Smoking zones in fire risk areas such as fuel storage areas and excavations o Strictly avoid excavations in areas with residential natural gas connections or works near natural gas piping o Follow latest WHO and national measures on Covid-19 as relevant o Regular inspection of workers against pathogenic agents and provision of immunization when needed o Identify and provide contacts of closest authorities and emergency services to contact in case of emergencies o Provision of full PPE including suitable footwear to avoid slippage and to protect o Workers exposed to noise exceeding permissible levels (e.g. ballast uploading) should wear hearing protection. The contractor shall also develop and implement a **Labour Management Plan**, with clear employment requirements, transparent hiring and management procedures for the construction and operational/ maintenance workforce. Employment practices and working conditions should conform to International Labor Organization (ILO) Standards and national regulations, including but not limited to: o Provide rest and recreational facilities and time, and prohibit the consumption of	(including contracts, age etc.) and Inclusion of minimum labour standards in all workers contracts 9- % of site employees trained on OHS, emergency procedures and GRM 10- OHS statistics such as fatalities, injuries, lost time incidents, first aid cases. 11- Development of the Ethical Procurement Policy 12- Contractor-workers' contracts. 13- Number of complaints received, number solved and the time it took to solve them. 14- Number of unresolved complaints	Complete a compliance checklist for mitigation actions and measures and conduct a documents and records review	Construction sites	Weekly		

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
	alcohol and drugs on site, as defined and clearly communicated to workers; o Ensure fair hiring procedures are in place in order to ensure non-discrimination and equal opportunity are provided for all project workers. o Include clear and explicit measures in the contractors' contract to 1) prohibit labor under 18 years old in the main contract, 2) stipulate that this contract should go to all the sub contract as a binding condition. o Communicate and make clear to the workers their contracts terms and (working hours, wages, overtime, compensation and benefits…) o Ensure timely and sufficient payment to the contractors and sub-contractors' workers o Provide workers with annual holiday and other benefits as per the labour law. o Provide all types of workers with appropriate social insurance and health insurance schemes. The Insurance should also cover work-related accidents. o Copies of national IDs for all types of laborers, including casual laborers hired by subcontractor and contractor should be recorded						
Total cost of the ESMP (Estimated overall budget (itemized matrix) for the implementation of all environmental and social measures (in local currency, EGP, and U.S. dollars, by source of funds) not including provisions for E&S compliance and performance audits by an independent						**Fixed costs** EGP 110,000 (USD 7,100)	

Updated ESMP for Cairo – Alexandria

E&S Impact	Mitigation Measure(s) and requirements	Monitoring parameters and Objectively verifiable Indicators (OVIs)	Monitoring Methods	Monitoring Location	Frequency of monitoring	Mitigation and monitoring Responsibilities	Cost estimate[23]
consultant nor the trainings , since these have been added to the costs of the main ESMP table)						**Annual costs** EGP 54,000 (USD 3,500) **Total Annual costs (for 5 years)** EGP 270,000 (USD 17,500)	

CHAPTER EIGHT: PUBLIC PARTICIPATION AND CONSULTATION

8.1 Approach and Objectives of Public Consultation

Public participation aims to involve, inform and consult the public in planning, management and other decision-making activities. The key focus of meaningful consultation is equity and inclusivity; namely, the approach taken needs to ensure that all groups (including those that are disadvantaged or vulnerable) are embraced within the consultation process on equal terms, and that all groups are given the capacity to express their views with the knowledge that these views will be properly considered. Furthermore, public consultation is considered an ongoing process, as was conducted throughout different stages of the ESIA preparation, through scoping sessions, focus group discussions, key informant interviews, and finally a public consultation hearing. The public consultation process has the following aims:

- To inform Stakeholders about the proposed project and its objectives;
- Strengthen social acceptance of the project;
- Inform the concerned parties that the environmental and social impacts will be minimised to levels that are low as reasonably practical and achieve the balance between legitimate requirements for development and environmental protection;
- To inform stakeholders of Environmental and Social Impacts and their mitigation measures;
- To seek views, concerns and opinions of people in the area concerning the project;
- To integrate those opinions and concerns into the final alternative and mitigations measures, and;
- To establish if stakeholders foresee any positive or negative environmental impacts from the project and if so, how the impacts can be addressed.

8.2 Identification of Stakeholders and methods of consultation

For the purposes of this consultation stakeholders were grouped into two categories. The first group comprised core stakeholders who are likely to benefit from or be affected by the proposed development. It includes people who would be directly served by the project or directly influenced by it, such as residents along the corridors, train users, villages and rail station and rail workers.

This study also identified a second group of stakeholders comprised of government officers, researchers, academics, NGOs, media and consultants in addition to ENR PMU and Environmental and technical teams. This category was also consulted as key informants on sectorial policy and to advise the ESIA consultant on mitigation measures to be put in place so as to minimise adverse impacts in respective sectors.

Each Stakeholders called for a different approach to consultation. The first group was consulted through key informant interviews and focus group discussions. Due to the circumstances surrounding the Covid-19 pandemic in the past few weeks, the key informant interviews and

focus group discussions were conducted via phone and/or remote communication tools. However, the latter proved not to be efficient due to the limited internet connectivity and was replaced by conference calls and one to one phone calls. Table 8-1 shows the size of the sample communicated with during the field trip. This has been performed on one to one brief interviews, without allowing people to gather. Majority of the people expressed their concern regarding publishing their names or photos. Photographs have not been taken accordingly and contact details have been kept confidential. In addition, phone interviews were conducted with the following NGOs:

- Together for Development in Beni Suef;
- Port Said Dream Foundation.

While the first and second group were both consulted during a public consultation session. The public consultation event was held on March 16th, 2020 and was communicated, through three primarily different channels: Direct invitation letters, Facebook event on Masader's Facebook Page and Newspaper advertisement An Arabic non-technical Summary of the ESIA study was uploaded to the Consultant's website and referred to in all communications. **Annex III** includes a copy of the Newspaper advertisement; Facebook event link; invitation Template; list of attendees; list of invitees remotely communicated with and to whom the presentation has been sent; Arabic non-technical Summary; and public consultation's presentation.

Direct invitations were sent followed by a phone call to confirm attendance. The newspaper announcement was added on El Gomhuriya Weekly Newspaper, which reaches all Egypt's governorates. The choice of having the public consultation announced on the weekly newspaper (Thursday, Friday & Saturday), as oppose to the daily newspaper, was primarily to reach a greater number of readers, with a higher circulation of approximately between 350,000 - 500,000 readers (almost an additional 30% readership over the weekend).

In addition to the public consultation, three scoping sessions with ENR environmental and technical teams were conducted, at ENR premises, in order to clearly identify the project's boundaries, components, description of each component, previous experience with similar projects in addition to evaluating the current performance of the contractor and communication tools used with previous ENR projects (**Annex IV** includes photo documentation of the scoping sessions).

Table 8-1: Composition of population sample interviewed.

Markaz	**Village/Municipality**	**Sample**
Residents close to railroad corridor/Level crossings frequent users (15 February to 10 March 2020)		
	Cairo – Ramsis Station	3
	Beni Suef	2
	Port Said	5
	Benha	4
	Total Residents	**14**

Trains users/commuters		
	Cairo – Ramsis Station	15
	Beni Suef	10
	Port Said	13
	Benha	7
Total train users/commuters		**45**
Total sample		**59**

8.3 Public Consultation session

The public consultation meeting (public hearing) was convened at Pyramisa Hotel in Dokki/Cairo on Monday 16th of March 2020, at 10:30 am. The participants included Researchers from the Environmental Research Institutes, technical experts, consultants, media and NGO.[25] (See **Annex III** for documentation).

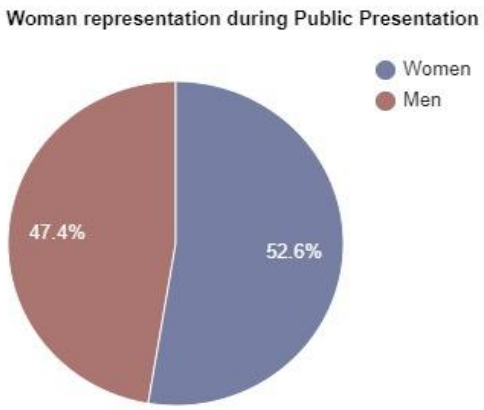


Figure 8-1: *Representation of women and men during Public Consultation session.*

During the introductory session, the attendees were informed with the importance that they clearly state their opinions and identify any impacts/risks that the project's team may have omitted. It was also clearly stated that their opinions will be taken into consideration and the ESIA Study will be modified accordingly where applicable.

The following table summarized the main points raised during the discussion round and their incorporation into the assessment and answers to questions raised.

Table 8-2: Discussion points during Public discussion session.

Concerns and Issues raised	Incorporation in the assessment
Will the proposed modernization of the Signalling system improve the capacity of the railway corridors?	The project was clearly introduced as a part of a larger modernization scheme that will also increase the capacity, however the particular component of concern for this ESIA is only intended for safety and automatic train protection.
Could an increase in capacity affect efficiency of services at the railway stations, or even cause migration to railway corridors?	ENR confirmed that component (ii) of the ENRMP project, which is the subject of this ESIA, will mainly increase the safety of trains and not the capacity. Nevertheless, the increase in capacity on the short and medium term will not high enough for such a transformational change to take place.
How will ENR ensure that the contractors follow the ESMP, when it is known that contractors in Egypt usually work under bad conditions, especially when it comes to OHS?	The ESMP will be included in the contractor clauses and will have to be contractually passed down to any subcontractors. This impact was addressed in the ESMP.
Why were these sections of the railway line chosen in particular?	This was done based on a needs assessment, mainly considering the sections with most accidents and unsafe conditions. However, the aim will be to make these improvements along the entire railway line in the long term.
Why is the depth of the cables 80 cm in particular?	ENR: This is a standard depth, which protects cables from environmental factors, as well as from theft.
Will there be an archive of where the cables are located, in order to protect them against future generations digging activities.	ENR keeps a map in its archives of all the lines and their exact locations, which can be accessed by the public.
How will the project deal with traffic problems when heavily used level crossings are completely or partly closed due to construction activities.	This project (the subject of this ESIA) is different from the modernization project (mainly the Signalling project). The former only involves very limited digging activities and will not cause any complete or partial closing of level crossings and thus it will not have any considerable traffic impacts.
Construction work on the railway corridor will	Measures to mitigate the potential impacts due

result in the generation of noise and dust that will affect residents close to the work area.	to excessive noise and air quality impacts have been included in the ESMP
Is there a baseline for the status of the number of accidents that can be compared later to assess the efficiency of the program?	There are statistics available and they have been added to the ESIA study.
Has the electromagnetic field impact of the cables been assessed?	ENR: the depth of the cables and the isolation procedures result in no magnetic field that would impact residents, crops or other factors.

LIST OF ANNEXES