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#### ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR:

#### ZAHRAA MADINET NASR SUBSTATION AND ITS INTERCONNECTING UNDERGROUND CABLES

#### Submitted by

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**Final Report**

**August 2017**

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### **Environmental and Social Impact Assessment (ESIA)**

**For Zahraa' Madinet Nasr Substation and its Interconnecting Underground Cables**

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## **LIST OF ABBREVIATIONS**

EEAA	Egyptian Environmental Affairs Agency
EEHC	Egyptian Electricity Holding Company
EETC	Egyptian Electricity Transmission Company
EIB	European Investment Bank
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FGD	Focus Group Discussion
IEA	International Energy Agency
MW	Mega Watt
NGO	Non-Governmental Organization
PS	Pumping Station
ARAP	Abbreviated Resettlement Action Plan
ROW	Right of Way
SS	Substation
SSI	Semi Structured Interview
ToR	Terms of Reference
WW	Wastewater
ZMN	Zahra' Madinet Nasr

## **Executive Summary**

### **I. Project Background**

Over the past period, the electricity demand in Egypt has increased forming additional pressure on the already existing and aging electricity infrastructure. Recurrent and persistent power cuts and planned outages on the electrical grid, peaked during 2011 and 2012. Such power cuts affected the daily life of citizens in addition to impacting production facilities. Since 2013 there have been constant efforts to meet the growing demand from the Egyptian government as well as by the private sector.

In order to meet the forecasted demand and secure the electricity stability in addition to the commitment to supply electricity to slum areas and informal buildings, the Egyptian Electricity Transmission Company (EETC) together with the distribution companies need to provide additional substations and their interconnections to evacuate newly produced energy and deliver to the final consumer.

The EETC is one of sixteen affiliated Companies under the Egyptian Electricity Holding Company (EEHC). The main role of the EEHC is the management, operation and maintenance of electric power transmission grids on extra high voltage and high voltage all over the country, for the optimal economic usage of those grids. EEHC's goal is to meet the growth in electricity demand while optimizing the use of all resources and maximizing the profit.

In response to the growing demand for electricity and in support for EEHC's plan to expand the existing electricity infrastructure of power stations, substations and interconnecting lines/cables, the European Investment Bank (EIB) is funding the construction of several substations and interconnecting lines in cooperation with the EETC.

In line with EIB environmental and social standards, EETC is committed to carrying out an ESIA of the Zahra' Madinet Nasr Substation (ZMN SS) and its interconnecting underground cables to different existing substations and a Resettlement Action Plan (RAP) should the project activities trigger Egyptian legislations and/or EIB instruments relevant to resettlement.

EcoConServ environmental services (hereinafter referred to as 'the consultant') has been contracted to carry out the ESIA study in accordance with national legislations as well as EIB standards.

The consultant proceeded to identify and assess the environmental and social conditions in the project's area. In addition, the management and monitoring plan, including the mitigation measures during construction and operation and maintenance phases are described in the ESIA report for all project components involved.

### **II. Methodology**

The ESIA focused on identifying and assessing the negative and positive impacts of the project on the environment and the socioeconomic characteristics of the impacted groups in addition to

developing necessary mitigations for the negative impacts. The identifications and assessments were conducted for each of the project components during construction and operation phases. The mitigation measures were developed and presented in Environmental and Social Management Plan matrix. In addition, the monitoring plan was developed to monitor implementation of the ESMP as well as identifying the necessary capacity building activities for the implementation team. The consultant proposed the necessary budget, to implement the ESMP and the monitoring plan. Similarly, the monitoring plan is presented in the form of a matrix.

The ESIA methodology included reviewing the secondary data sources from previous reports and studies about the environmental and socio-economic characteristics of the project area. The literature review (included both reports provided by the client as well as web based resources), contributed to elaborating the ESIA study's objectives mentioned above by assessing:

- The environmental and socio-economic characteristics of the project areas
- Project background and proposed interventions
- The legal, institutional and organizational framework and background of the electricity sector and the historical background
- Environmental and social standards and guidelines for related environmental and social issues

In addition to the literature review, structured site visits were undertaken to collect primary data from the site. The visits also were used as a tool to identify stakeholders' perceptions regarding some issues (especially social issues), such as:

- The current environmental and socioeconomic characteristics on the site and at the surrounding area
- The current electricity supply at the area and its impact on the families' livelihoods particularly on the vulnerable groups (children, women, the poor),
- Gender issues related to energy management on the level of household,
- The perception of the local community towards the existing electricity service provider,
- The environmental and socioeconomic short and long term impacts predicted from the project,
- Ideas for maximizing the positive benefits especially on people's livelihoods and the economic development of the project,
- Consult with project-affected groups and local non-governmental organizations about potential resettlement issues, and take their views into account.

### **III. Legislative and Regulatory Framework**

Laws and Regulations in Egypt

- Electricity Law 87/2015
- Environmental Law 4/1994
- Law 38/1967 on Public Cleanliness

- law 93/63 on Discharge of Liquid Waste
- Law 63/1974 on Electricity Installation
- Law 67/2006 Electricity Law for protecting the consumers

#### EIB Guidelines

- Environmental Statement, 1996
- Environmental Statement 2004
- Environmental and Social Handbook – 2013 EIB
- EIA Directive 85/337/EEC, amended by Directives 97/11/EC and 2003/35/EC for EIA requirement
- EIB Sourcebook on EU Environmental Law
- EIB Social Guidance Notes

#### **IV. Project Overview**

The construction of ZMN SS (3x175 MVA, 220/66 kV and 4x40 MVA 66/11 kV transformers GIS SS) and its interconnection underground cables (220 kV and 66 kV) will improve power capacity at the area with minimum losses of transferred power.

As part of the current project, the new substation will be connected with existing substations using interconnection underground cables (double circuits). The new SS (ZMN SS) will be connected to the existing underground cables and to the existing SSs. Once the establishment of the new SS is completed, the existing underground cables will be connected through open excavation at the surrounding roads and service road.

The site of the proposed substation at Zahraa Madinet Nasr will lay at an empty land with rectangular shape. The location is determined as the following coordinates:

- Latitude 30° 2'38.34"N
- Longitude 31°23'42.13"E

The main components of the project are, the construction of:

##### ZMN SS:

3x175 MVA and 4x40 MVA transformers 220/66/11 kV GIS SS

##### Underground interconnection cables between the existing SSs and the ZMN SS.

The existing underground cables will be connected to the proposed SS at ZMN to the existing SSs as described below:



- Connections with the 220 kV existing underground cables (networks):

Removal of the existing cables between East Cairo SS and Koraymat SS and extending the cables **5km** from East Cairo to ZMN to become ZMN/ Koraymat SS.

New Double circuit 220 kV underground cables to East Cairo SS

- Connections with the 66 kV existing underground cables (networks):

Removal of the existing cables between Alhagana SS and Old Zahraa SS and extending the cables **1km** from Old Zahraa SS to ZMN to become ZMN/ Alhagana SS.

New Double circuit 220 kV underground cables to Old Zahraa SS

## **V. Project Alternative**

### No Go Option

The main objective of the project is to connect Zahraa Madinat Nasr SS to the existing SSs. Environmental and social impacts from the project are assessed and no significant impacts are anticipated.

The site of the proposed SS at ZMN is a residential area within residential complexes and surrounded with public services, such as main road, water tank and pumping station, school, etc. therefore, the indoor GIS substation is the most appropriate technological alternative for subst. If the SS and interconnections underground cables were not built, the consequences would be as follows:

- Energy capacity will not increase
- Secure the demand of the new establishment as well as to cope with the demand increased from the residential / housings will not be achieved
- The power supply to the consumers will not be improved
- The consumers' financial losses from low quality power supply will decline
- As a result, an increase in the economic activities in the region is not expected.

### **Location/Route Alternatives**

The plot foreseen for the construction of ZMNSS has been allocated to the electricity company for the construction of an electricity facility since 1998. The land is fenced and was part of the lands allocated to the Armed Forces as per the presidential decree number 576 and has been allocated to EETC at no cost. A committee was formed to conduct a site visit by EETC and North Cairo Electricity Transmission company to the location and a decision was reached for EETC to use the land for the construction of a substation.

## VI. Environmental and Social Baseline

### Environmental Baseline

The project selected for construction of the SS at ZMN and routes of the underground interconnection cables with the existing SSs lies within same area of East Nasr City. Therefore, both project components sites (SS and interconnections underground cables) have similar environmental conditions Chapter 5 describes the relevant physical, biological, socioeconomic, health and labour conditions, including any changes anticipated before the project start.

### Social Baseline

This section begins by shortly describing the methodology used by the consultant to measure the **baseline conditions of the concerned** community in terms of socio-economic living conditions of the project area.

The methodology is followed by an overview of the findings from both primary and secondary sources, detailing the conditions of residents of the impacted areas as well as their perception of, and expectations from the project.

- i. Methodology overview
- ii. Area profile
- iii. Demographic characteristics and human development profile
- iv. Social services

The details of the social baseline for the methodology and the findings are in chapter 5 section 5.2



## VII. Potential Environmental and Social Impacts

Table 1 Significance of Expected Impacts Assessment during Construction Phase of ZMN Substation and its interconnection underground cables

Impact	Likelihood and severity	Significance	Mitigation Measures
<b>During construction of ZMN Substation</b>			
Impact on Noise	High likelihood to occur – short term and temporary - Highly sensitive receptors includes construction workers and staff of wastewater pumping station. Receptors with low sensitivity include nearby projects/settlements (residential areas and schools)	Medium Impact on wastewater pumping station staff and the construction workers Minor impact on settlement and nearby establishment	Application of the normal precautions normally taken by construction workers. Notification to the surrounding establishment prior to the construction of the SS Time management and construction schedule according to the IFC regulation provided by the contractor prior to the construction phase
Impact on traffic	High likelihood to occur – short term, temporary and localized only on the main road	Low to medium impact	Time management for transporting the materials, equipment, debris, etc Clear sign surrounding construction site and the enter / exit gate Coordination with traffic department (ministry of interior) for vehicles route and movement.
Impact on Air Quality	High likelihood to occur – short term, temporary and localized - Highly sensitive receptors include construction workers. Receptors with low sensitivity include nearby projects/settlements.	Medium impact on construction workers Low impact on the residents, surrounding establishment and pedestrians passing by the construction site	Spraying the sandy soil with water (if needed, especially during the dry period). Maneuver area and the parking area should be well paved Management of the number of vehicles at the same time for specific location and the scheduling the intensity of vehicles

Impact	Likelihood and severity	Significance	Mitigation Measures
Impact on Vibration	Low likelihood to occur	Minor impact	Schedule and time plan for vehicles movements
Impact on Hazardous materials and waste generation	Uncertain likelihood – Uncertain impact duration - Highly sensitive receptors include soil pollution and workers. Receptors with low sensitivity include nearby projects/settlements. Physical environment receptors with low sensitivity include groundwater, surface water and drinking water	Low to Medium impact	Agreement should be reached prior to commencing construction work between the contractor and landfill for officially assigning a location for the disposal of construction waste. Waste management submitted by the contractor for waste management (solid waste; hazardous and non-hazardous) Protection of spillage including paved site for workshop or maintenance of vehicles Temporary storage of wastes including on site sanitation before the proper connection to the existing sewage network is installed. It is preferable to include the temporary onsite waste management for the workers in the ToR of the contractor.
Health and Safety	High likelihood to occur for the construction workers Low likelihood to occur for the surrounding establishment and sensitive receptors. Highly sensitive receptors include workers. Receptors with low sensitivity include nearby residents and existing establishments	Minor impact for sensitive receptors and medium to high / major impact for the workers	Standard protection by placing clear project signs. Time management for vehicles movement; especially avoiding the peak hours Standard protection for the workers especially working at elevated heights
Impact on natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation measures is prepared Technical specifications of the equipment is include the standard measures for natural disaster risks
Impact on visual Resources	Low likelihood to occur	Minor impact, localized and temporary	Following the standard protection for the ground and soil disturbance, air quality (and dust) measures and proper waste management described on the section of waste management measures Clear sign of the construction activities

Impact	Likelihood and severity	Significance	Mitigation Measures
Impact on water resource (ground water, surface water and drinking water)	Low likelihood to occur	Minor impact on groundwater, surface water and drinking water	Following standard protection for the ground and soil and proper waste management described on the section of waste management measures
Ecological Resources	Low likelihood to occur	No significant impact	No mitigation measures is prepared
Impacts on Fauna and Flora and bird migration	Low likelihood to occur	Negligible impact (no impact)	No mitigation measures are needed.
Impact on landscape	Low likelihood to occur	Negligible or no impacts	No mitigation measures is prepared
Impact on land use and Involuntary resettlement	Low likelihood to occur	Very low or no impacts	No mitigation measures is prepared
Impact on archeological and cultural sites	Low likelihood to occur	Very low or no impacts	No mitigation measures is prepared
Socio Economy	Temporary impacts on the temporary prayer area used instead of the mosque under renovation	Minor and temporary impacts	Coordination with the adjacent mosque prior to the start of the construction activities
Creation of Job opportunities and flourishing Economics of construction site	Creating job opportunities for members of the local community	High positive temporary impact	Coordination with the contractor to employ members of the local community as construction workers and guards

Impact	Likelihood and severity	Significance	Mitigation Measures
Culture and Privacy of Local Communities	Construction workers must respect the culture and privacy of members of the surrounding residential area	Minor and temporary	Respect from construction workers to the privacy of the surrounding houses
<b>During construction of underground cables (220 kV and 66 kV)</b>			
Impact on Noise	High likelihood to occur – short term and temporary - Highly sensitive receptors includes construction workers. Receptors with low sensitivity include nearby projects/settlements	Low Impact on residential and surrounding establishment and Medium impact on the construction workers	Application of the normal precautions normally taken by construction workers. Notification to the surrounding establishment prior to the construction of the underground cables Time management and construction schedule according to the IFC regulation provided by the contractor prior to the construction phase
Impact on traffic	High likelihood to occur – short term, temporary and localized only on the main road	Low to medium impact on the residents and surrounding establishment and medium impact on the main road and the inhabitant passing by the road during the construction phase	Time management for transporting the materials, equipment, debris, etc Clear sign surrounding construction site and the enter / exit gate Close coordination with traffic department (ministry of interior) for vehicles route and movement and additional space, if needed at the main road during the peak construction period (estimated within maximum 3 months period)
Impact on Air Quality	High likelihood to occur – short term, temporary and localized - Highly sensitive receptors include construction workers. Receptors with low sensitivity include nearby projects/settlements.	Medium impact on construction workers and inhabitants passing by the main road Low impact on the residents, surrounding establishment	Dust control (if needed, especially during the dry period). Standard protection of the workers to avoid inhalation problem Vehicles, machineries and equipment time management to reduce the accumulation of dust and exhaust gas. In addition, the regular maintenance of the machinery and equipment to ensure a minimum emission.
Impact on Vibration	Low likelihood to occur	Minor impact	Schedule and time plan for vehicles movements and work activities

Impact	Likelihood and severity	Significance	Mitigation Measures
Impact on Hazardous materials and waste generation	Uncertain likelihood – Uncertain impact duration - Highly sensitive receptors include soil pollution and workers. Receptors with low sensitivity include nearby projects/settlements. Physical environment receptors with low sensitivity include groundwater, surface water and drinking water	Low to Medium impact	Agreement should be reached prior to commencing construction work between the contractor and landfill for officially assigning a location for the disposal of construction waste. Waste management submitted by the contractor for waste management (solidwaste; hazardous and non-hazardous) Protection of spillage including paved site for workshop or maintenance of vehicles Temporary storage of wastes including on site sanitation before the proper connection to the existing sewage network is installed. It is preferable to include the temporary onsite waste management for the workers in the ToR of the contractor.
Health and Safety	High likelihood to occur for the construction workers and for the surrounding establishment and sensitive receptors.	Medium to Major impact for sensitive receptors and for the workers	Standard protection by placing clear project signs. Time management for vehicles movement; especially avoiding the peak hours Standard protection for the workers especially working with excavation and drilling Temporary construction fences to localize and privatize the construction sites. Proper management and monitoring done by contractor under supervision from the independent consultant and EETC
Impact on natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation measures is prepared Technical specifications of the equipment is include the standard measures for natural disaster risks
Impact on visual Resources	Low likelihood to occur	Minor impact, localized and temporary	Following the standard protection for the ground and soil disturbance, air quality (and dust) measures and proper waste management described on the section of waste management measures Clear sign of work activities

Impact	Likelihood and severity	Significance	Mitigation Measures
Impact on water resource (ground water, surface water and drinking water)	Low likelihood to occur	Minor impact on groundwater, surface water and drinking water	Following standard protection for the ground and soil and proper waste management described on the section of waste management measures
Ecological Resources	Low likelihood to occur	No significant impact	No mitigation measures is prepared
Impacts on Fauna and Flora and bird migration	Low likelihood to occur	Negligible impact (no impact)	No mitigation measures are needed.
Impact on landscape	Low likelihood to occur	Negligible or no impacts	No mitigation measures is prepared
Impact on land use and Involuntary resettlement	Low likelihood to occur	Very low or no impacts	No mitigation measures is prepared
Impact on archeological and cultural sites	Low likelihood to occur	Very low or no impacts	No mitigation measures is prepared
Socio Economy	Impact on socio-economic activities during excavation	Minor and temporary impact	Conducting the excavation in the shortest possible time Coordination with the traffic department to divert the route of the street during excavation activities
Creation of Job opportunities and flourishing Economics of construction site	Creating job opportunities for members of the local community	High positive temporary impact	Coordination with the contractor to employ members of the local community as construction workers and guards

Table 2 Significance of Expected Impacts Assessment during Operation Phase of ZMN Substation and its interconnection underground cables

Impact	Likelihood and severity	Significance	Mitigation Measures
<b>During operation and maintenance of ZMN Substation</b>			
Impact on Noise	High likelihood to occur – Highly sensitive receptors include nearby projects/settlements (residential areas and schools) especially during the night and the permanent workers at the substation.	Low to Medium Impact on settlement and nearby establishment especially during the night :Low to medium impact on permanent workers	Application of the normal precautions normally taken such as planting trees. Besides reducing the visual impact, the green environment will be achieved as well. Standard protection for the workers will be provided at the substation.
Impact on traffic	Low likelihood to occur	Low impact	No mitigation measure is prepared
Impact on Vibration	Low likelihood to occur	Low impact	No mitigation measure is prepared
	Minor or very low likelihood to occur	Very minor	No mitigation measure is prepared
Impact on wastes generated (hazardous and non-hazardous, solid and liquid wastes)	Uncertain likelihood – Uncertain impact duration - Highly sensitive receptors include soil pollution and workers. Receptors with low sensitivity include nearby projects/settlements. Physical environment receptors with low sensitivity include groundwater, surface water and drinking water	Medium impact on industrial wastes generated (hazardous and non-hazardous) Low impact on domestic wastes (solid and liquid wastes)	Waste management implemented according to EEA regulations, especially for industrial hazardous wastes (solid and liquid wastes) Regular monitoring for domestic sewage network and provision of waste bins for temporary storage before collected by municipality.
Impact on soil contamination	High likelihood to occur, only during the incident of oil	Low to medium impact	Standard design of precaution for the site of transformers Paved within surrounding site of substation especially at the area



Impact	Likelihood and severity	Significance	Mitigation Measures
	spillage from the transformers and possible vehicles.		for parking and movement of vehicles
Health and Safety	High likelihood to occur for the permanent workers Low likelihood to occur for the surrounding establishment and sensitive receptors. High risk likelihood impact during the emergency and accident	Minor impact for sensitive receptors (public and residents as well as existing establishment) and medium impact for the workers High risk likelihood impact during the emergency and accident	Standard protection by placing clear project signs. Time management for vehicles movement; especially avoiding the peak hours Standard protection for the workers especially working at elevated heights
Impact on natural disaster risks	Low likelihood to occur	Negligible impact	No mitigation measures is prepared Technical specifications of the equipment is include the standard measures for natural disaster risks
Impact on visual Resources	Low likelihood to occur	Very low impact or negligible impact	No mitigation measure is prepared
Impact on water resource (ground water, surface water and drinking water)	Low likelihood to occur	Minor impact on groundwater, surface water and drinking water	Proper waste management according to EEAA regulations Monitoring for pipeline of sewage network Provision of waste bins for temporary storage
Ecological Resources	Low likelihood to occur	No significant impact	No mitigation measures is prepared
Impacts on Fauna and Flora and bird migration	Low likelihood to occur	Negligible impact (no impact)	No mitigation measures are needed.
Impact on landscape and land use	Low likelihood to occur	Negligible or no impacts	No mitigation measures is prepared
Impact on archeological and cultural sites	Low likelihood to occur	No impacts	No mitigation measures is prepared
Socio Economy	Improving living conditions	High Positive impacts	The distribution and collection company at EETC should have

Impact	Likelihood and severity	Significance	Mitigation Measures
	Providing a stable electricity service Increasing illegal connections		an awareness plan to connect beneficiaries legally. Increase awareness about the importance of having official connections
Creation of Job opportunities and flourishing Economics of construction site	Increasing the opportunity for opening small business and shops as a result of having a stable electricity service	Moderate positive impact	No mitigation measures is prepared Awareness campaigns for community members to rationalize consumption of electricity service
<b>During operation of interconnection underground cables (220 kV and 66 kV)</b>			
Impact on operation and maintenance along the route	Low likelihood to occur – short term and temporary only during repaired or replacement of underground cables- Highly sensitive receptors includes construction workers. Receptors with low sensitivity include nearby projects/settlements	Low Impact on residential and surrounding establishment and Medium impact on the workers	Application of the normal precautions normally taken by workers. Notification to the surrounding establishment prior to the replacement or repaired of the underground cables
Impact on ROW along the underground cable routes	Low likelihood to occur	No impact	No mitigation measure is prepared
Impact on noise, traffic, air quality, ecological resources, hazardous wastes, health and safety, water resources, visual, landscape and land use	Low likelihood to occur, except during accident to occur, emergency situation and possible replacement and repaired of the underground cables	Low impact Temporary and localized low impact during accident, emergency situation and replacement or repaired	Time management for repair or replacement Clear sign surrounding site to be repaired or replaced Standard protection to workers Implementation of emergency plans and periodic trainings for accidents or emergency situations
Impact on EMF for	Low likelihood to occur	Low impact	Monitoring and regular tightening of the underground cables

Impact	Likelihood and severity	Significance	Mitigation Measures
public concern			connection to GIS substation
Impact on archeological and cultural sites	Low likelihood to occur	No impacts	No mitigation measures is prepared

## **VIII. Environmental and Social Management Plan (ESMP) and Monitoring Plan**

The Environmental and Social Management Plan (ESMP) consists of a set of mitigation, management and monitoring measures to be taken during implementation of the project to avoid, reduce, mitigate, or compensate or offset any adverse social and environmental impacts analyzed at the previous chapter. The ESMP has distinguished between mitigation measures that should be implemented during the construction and operation of the project.

**Table 3 ESMP Matrix during preparation and construction of the substation and its interconnection underground cables**

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
<b>During Preparation and Construction of the SS</b>				
Noise and vibration during site preparation, construction and installation of equipment	General measures for surrounding establishments and sensitive receptors			
	Notification letter of the introduction of project and duration to surrounding establishment and municipality	Contractor	-	Cover letter from EETC for approval of starting of the project
	Clear sign and warning sign (can be seen during day and night) of the project (including duration)	Contractor as a part of ToR for EHS general requirements	None as a part of tender process	
	Duration of the working on site (including uploading and loading) are during day only (between 7AM – 5 PM)	Contractor	-	
	Mitigation measures for construction workers during preparation and construction			
	Strictly standard procedures for health and safety of the workers according to IFC general EHS guidelines (including limitation of the duration and expose to high noise) and management of concentration works of heavy machineries	Contractor (through tendering activity)	None as a part of tender process	
	Strictly standard equipment especially for ear protection during the work	Contractor (through tendering activity) related to the EHS requirements during construction works	None as a part of tender process	
Traffic destruction or congestion during transportation of construction	Approval from traffic department prior to the construction	Contractor	-	Cover letter from EETC for approval of starting of the project
	Clear sign and warnings (including duration) of the project that can be seen during the day and night	Contractor as a part of the tender activities related to EHS requirements	None as a part of tender process	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
materials, construction waste, equipment and movement of project vehicles and machineries	Excavation of roads done section by section and during the end of the day the street should be covered from the excavation and other work activities	Contractor in assistance from traffic department and the EETC supervisor	-	
	Movement of vehicles (for transporting materials, construction waste and SS equipment done during the night and loading and unloading done during the day within the site of the SS.	Contractor in coordination with traffic department, if needed	None as a part of Contractor financial budget during the bidding activities	
	Agreement for temporary storage and the final disposal to the designated landfill	Based on the waste management plan submitted by the contractor and approval from EETC	None as a part of the ToR for waste management	
	Careful turn at the main road. The drivers and operators of the machineries should have training on safety utilization of their machines	Drivers and operators employed by the Contractor. It is the responsibility of the contractor for implementing regulations to the drivers and operators	None as a part of contractor responsibility	
Ambient Air Quality by dust emission and the air emission due to the exhaust gasses from the construction vehicles and machineries	Localize and minimize the vehicle movements including limiting the speed	Contractor	As a part of their financial budget during the bidding activities	Low impact and temporary
	If needed, spray the soil before any excavation, filling loading and unloading. Pavement (graveled) of access roads prior to usage in construction of the project components	Contractor	-	
	Maintaining the efficiency of the vehicles and machineries	Contractor	As a part of their financial budget during the bidding activities	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	Waste management of temporary stock piles, construction materials, construction waste. The periodic waste transportation to the designated landfill should be included on the waste management as well.	Contractor	As a part of the ToR for waste management	Implementing the waste management submitted by the contractor and approved by EETC prior to the preparation and construction phase
Waste generated (hazardous and non-hazardous, solid and liquid as well as construction waste and domestic waste)	Notification and contract, if needed for transporting hazardous and non-hazardous waste to their designated landfills.	Contractor	None, as a part of the contractor's offers and responsibilities during preparation and construction phase	Implementing the waste management submitted by the contractor and approved by EETC prior to the preparation and construction phase
	Separation of hazardous waste and non-hazardous waste for temporary storage			
	Designated area or location should be included at the waste management plan submitted by the contractor and approved by the EETC			
	Construction waste should be hauled at the end of each business day to the officially approved disposal sites			
	Adequate trucks with standard precaution (coverage of the waste, not overloaded, etc) for transporting the waste to the designated landfills. Regarding the hazardous waste transportation, the vehicles should be according to the standard mentioned on the EEAA regulations for hazardous waste transportation			
	Temporary onsite waste bins for solid	Contractor	None, as a part of	According to the waste



Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	waste before its collection and temporary onsite sanitation facilities should be provided within the construction site for the workers		waste management	management plan submitted to EETC
Safety impacts during excavation and trenching for the workers and surrounding communities and establishments	Excavation and trenching in accordance to the design and drawings.	Contractor	-	
	Protection and localized (by fences or barriers) the excavation and trenching sites to reduce the danger and prevent falling of materials and person and the other vehicles or machineries moving nearby the site	Contractor	None as a part of contractor offers related to EHS requirements	
	Standard helmet and safety boots for the workers	Contractor	None as a part of contractor offers related to EHS requirements	
Safety impacts during the mechanical and machineries use for the health and safety of the workers	Provision of authorized and licensed personnel for heavy machineries	Contractor	None as a part of contractor responsibilities	
	Maintaining the efficiency of the heavy machineries, including inspection before its use and following the design capacity and standard manuals of the heavy machineries, etc.			
Health and safety	Standard protection for the construction	Contractor	None as a part of	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
of the construction workers	site workers		contractor offers related to EHS requirements	
	Provided on job training for the construction workers prior to the preparation and construction phase (including working at the high construction)			
	Identification of the existing underground networks			
	Management of heavy equipment movement, especially nearby other existing underground networks			
Water resources and soil pollution during construction	Precaution and prevention of waste management to prevent the soil and further water resource (groundwater or nearby surface water or drinking water network) pollution	Contractor	None, as a part of waste management	According to the waste management plan submitted to EETC
<b>During Preparation and Construction of the interconnection underground cables</b>				
Noise during the preparation and construction	Notification letter to the surrounding establishments and municipality prior to the construction	Contractor	-	Cover letter from EETC for approval of starting of the project
	Fenced, localized and privatized the site	Contractor	None as a part of financial offer related to EHS requirements	Temporary and short term only during construction.
	Clear project signs and warning signs of the project (including duration of the project)			
	Construction activities concentrated during the day (7 AM to 5 PM) except during the transportation of equipment	Contractor	-	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	and materials. However, loading and unloading should be done during the day			
	Strictly standard procedures for health and safety of the workers according to IFC general EHS guidelines (including limitation of the duration and expose to high noise) and management of concentration works of heavy machineries	Contractor	-	
	Strictly standard equipment especially for ear protection during the work	Contractor	None as a part of financial offer related to EHS requirements	
Traffic disturbance	Coordination with the traffic department for traffic management during the construction of tunnel (construction site will be at the middle of the and the excavation of the affected roads.)	Contractor	-	Cover letter from EETC for approval of starting of the project
	Temporary storage area for the construction materials, construction waste and standby machineries.	Contractor	None as a part of ToR for waste management	According to waste management plan submitted to EETC prior to preparation and construction phase
	Additional lane, if needed to be provided at one side of the road	Contractor in coordination with EETC	-	Approval or permission, if needed might be obtained for using the temporary empty land area for storage
	Management of excavation has to be done section by section and filled and covered up at the end of working day	Contractor, if needed in coordination with traffic department		If approval needed, it must be obtained prior to the construction
	Management of vehicles movement for	Contractor	-	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	transportation of the equipment, materials and waste (transportation of big vehicles done during the night. However, loading and unloading done during the day time)			
	Careful turns especially at the main road to avoid accident that can congest the traffic	Contractor	-	If necessary, the coordination with the traffic department for traffic management during the turns of vehicles
	Licensed and trained drivers and operators	Contractor, as a part of their responsibility	-	
Ambient air due to dust emission and exhaust gaseous from vehicles and heavy machineries	Maintain the efficiency of the vehicles and heavy machineries	Contractor, as a part of their responsibility	-	
	Limiting speed of the construction vehicles and machineries	Operators or drivers hired by Contractor	-	It is a responsibility of the contractor to hire the trained, qualified and licensed drivers and operators
	Management of stock piles (including temporary storage, covering up the stock piles and the transportation to the designated landfill, etc.)	Contractor	None as a part of ToR for waste management	According to waste management plan submitted to EETC prior to preparation and construction phase
Waste generated from the construction and domestic (workers); management of wastes	Separation of hazardous and non-hazardous waste and identification of recycle, sell or dump it to the landfill.	Contractor	None as a part of ToR for waste management	According to waste management plan submitted to EETC prior to preparation and construction phase
	Agreement with the landfill for transporting wastes to their designated	Contractor	None as a part of ToR for waste management	According to waste management plan submitted to EETC prior to

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	landfills (construction non-hazardous waste and hazardous waste)			preparation and construction phase
	Temporary storage of the waste (separate areas for hazardous and non-hazardous waste)	Contractor	None as a part of ToR for waste management	According to waste management plan submitted to EETC prior to preparation and construction phase
	Transportation of wastes should follow the safety regulations (not overloaded, covered and not midway dumping). Especially for the hazardous waste, the EEAA regulations should be followed	Contractor	None as a part of ToR for waste management	According to waste management plan submitted to EETC prior to preparation and construction phase
	Temporary onsite sanitation for construction workers and provision of waste bins within the project site	Contractor	None as a part of ToR for waste management	According to waste management plan submitted to EETC prior to preparation and construction phase
Safety during excavation and trenching	Following the designs and drawings accordingly	Contractor in coordination with EETC	-	
	For tunneling, the trained operators should be hired to reduce the risks of accident and injuries	Operators hired by Contractor	-	It is a responsibility of the contractor to hire the trained, qualified and licensed operators
	Prevention and precaution due to the excavation by providing sloping, emergency ladders, barriers, rejected of the vehicles to the nearby excavation area (min 2 m), etc.	Contractor	As a part of the financial offer related to EHS requirements	
	Standard protection to the workers	Contractor	As a part of the financial offer related to EHS requirements	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
Safety for mechanical and machineries used during construction	Licensed and trained operators for heavy machineries	Operators hired by Contractor	-	It is a responsibility of the contractor to hire the trained, qualified and licensed operators
	Maintenance of the mechanical and heavy machineries and general inspection before using them.	Contractor	-	
Health and safety of the construction workers	Localized the site, securely guarded, clear signs and warning signs, especially for the tunneling of 220	Contractor	As a part of the financial offer related to EHS requirements	
	Standard protection of the construction workers including working at high construction	Contractor	As a part of the financial offer related to EHS requirements	
	Training for safety at the construction sites including working at high construction	Contractor	As a part of the financial offer related to EHS requirements	
	Identification of exact location of existing utilities and networks	Contractor	-	
	Avoid the heavy equipment operating above the underground existing utilities and networks. Otherwise, the additional foundations (if needed) or additional soil covered might be provided above the existing networks	Contractor	-	
Water resources and soil contamination	Precaution and prevention of waste management to avoid spillage and leakage	Contractor	-	
Impacts on culture and privacy of local	Maximize the use of local workers as much as possible.	Construction supervisor consultant	None – part of the TOR	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
communities	All activities related to the construction have to be placed within the EETC premises in order to avoid interference with the community privacy.			
Illegal electricity connections	Awareness campaigns to encourage legal connections Awareness campaigns to rationalize consumption	Social Development officer, Distribution company	Print material and posters, community meetings 5000 EGP	These activities can start on the last period of construction

Table 4 Monitoring Plan during preparation and construction of the substation and its interconnection underground cables

Project activities	Parameters to be monitored	Locations	Measurements (methods and equipment)	Frequency of measurements	Cost Estimates (\$)**	Responsibilities
<b>During Pre-Construction / Preparation and Construction phase</b>						
Site clearance	Worker's injuries	Construction site location	Preparation of recording form of workers injury during the construction	Monthly	None	Contractor On the preparation stage, the tendering has been done to purchase the standard procedure for site clearance. However, the contractor shall put into consideration on their budget proposal
Base camp preparation for the workers	Neighbors' complaints	Project construction sites	Recording of complaint and type of complaint	Once during the preparation and prior to start the construction phase	None	
Monitoring the traffic disturbance due to the vehicles and machineries movement and other related	Traffic complaint	Within 500 m from the construction site (especially at the main road, El Nasr rd)	Visual observation and recording complaint received	During the duration of the construction activities		



Project activities	Parameters to be monitored	Locations	Measurements (methods and equipment)	Frequency of measurements	Cost Estimates (\$)**	Responsibilities
construction activities						
Monitoring ambient Air Quality during construction works	Ambient air (gas emissions) PM, dust complaint	Within the site and surrounding establishments	Visual investigation and recording of the dust and ambient air increased due to construction activities Recording and reporting of the complaints (monthly report)	during the construction activities at different locations	As a part of contractor's financial offer	
Monitoring Noise and vibration Impacts at the project sites	Noise complaints from the neighboring communities	Project locations	Visual investigation and recording and documentation of complaints	during the construction activities at different locations	As a part of contractor's financial offer	Contractor
Management of construction waste and handling of hazardous waste	Amount of hazardous and nonhazardous waste generated	Project site locations	Estimation of the hazardous waste and non-hazardous waste in relation to the handling and transporting to the landfill	Weekly or monthly depending on the volume of waste	As a part of contractor's financial offer for wastes handling	Contractor during construction and EETC SS staff during operation
Monitoring soil contamination and water resource contaminations	Area of spillage	Project sites	Visual observation Recording and documentation of spillage	weekly	As a part of contractor's financial offer for environmental monitoring	Contractor
Monitoring health and safety of the workers during the construction of the project components	Health records about occupational injuries	Clinic / hospital referred by the contractor	Medical reporting on received cases	on received case	The cost is undefined, depending on the cases	contractor

Project activities	Parameters to be monitored	Locations	Measurements (methods and equipment)	Frequency of measurements	Cost Estimates (\$)**	Responsibilities
Storage of the machines and construction materials of the project components	Complaints from neighboring communities and records and documentation of the temporary area for storage of materials or machineries	Project sites	Recording and documentation	monthly	-	contractor
Impacts of culture and privacy of local communities	% of local labor to total labor	Construction site	Reporting labor origin governorates and calculating the natives ratio	Quarterly	-	Construction contractor

**Table 5 ESMP Matrix during operation and maintenance of the substation and its interconnection underground cables**

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
<b>During Operation and Maintenance of the SS</b>				
Noise	General measures for surrounding establishments and sensitive receptors			
	Planting trees at surrounding the SS site. Besides reducing the noise, the measures will reduce the impact on vibration and visual or aesthetic.	Operators of ZMN SS	10,000 LE for annual maintenance of the trees (including cutting, watering, etc)	
	Mitigation measures for operators and staff of SS			
	Standard procedures for health and safety of the workers according to IFC general EHS guidelines (including limitation of the duration and expose to high noise) and management of concentration works of heavy machineries	EETC	Around 5,000 LE annually for standard protection of staff	

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
	Standard equipment especially for ear protection during the work	EETC		
Waste generated (hazardous and non-hazardous, solid and liquid industrial wastes as well as domestic waste)	Proper waste management (industrial wastes) including separation of waste, separate area for temporary waste, transporting and disposing the industrial waste to their designated landfills	EETC	Undefined as the amount of wastes generated, especially for the industrial non-hazardous and hazardous waste are uncertain.	
	Especially for hazardous waste, the storage, collection, transportation and disposal of hazardous waste should follow the EEAA regulations for hazardous waste.			
	Concerning domestic waste, the standard procedures for maintenance of the networks (including provision of waste bins) should be maintained			
Public and operators and staff safety of the EMF exposure	Periodic maintenance of the GIS SS and its interconnections. This includes the regular tightening, SS efficiency, oil quality, gas pressure, etc.	EETC operators of the SS	-	
	EMF reading at the SS and surrounding site	EETC	100-150 USD per EMF meter	The cost estimation is based on one time purchased for one meter. It is advisable to purchase two machines for standby purposes.

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
Trainings provided for potential risks during accidents (firefighting training, oil spillage, smoke detector, etc)	Provision of trainings provided by EETC as a general requirements	EETC	Undefined as the type of trainings and the duration of trainings are vary.	The cost estimation is included at annual trainings provided by EETC for their SS and interconnection staffs.
Health and safety of the staff	Standard protection for the SS operators and staffs	EETC	None as a part of precaution of noise protection	
	Provided on job training for the staff for general health and safety			
During operation and maintenance of the interconnection underground cables				
There is no specific maintenance of the underground cables, unless there is incident when the connection is cut, un-function or need to be replaced. If there is any repair needed, the additional mitigation measures for electrical shock for the workers, including the disconnecting the power temporarily will be applied during the maintenance period. However, regular and periodical trainings of emergency during operation and maintenance is provided by EETC for SS staffs.				

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
<b>During Operation and Maintenance of the SS and interconnection underground cables</b>				
<p>In general, the administration works, recording of accidents, injuries and other complaints from the surrounding establishment will be done during the monitoring of the operation and maintenance of the SS and interconnection underground cables.</p>				

Potential Impacts	Proposed Mitigation Measures	Institutional Responsibilities (enforcement and coordination)	Cost Estimates (\$)*	Comments
<p>The record includes the recording and monitoring of the waste management on the SS (especially industrial waste management). Regarding the EMF exposure, the monitoring of the interconnection line surrounding the SS will be done similar and at the same time with the measurements of EMF exposure of the SS.</p>				

## **IX. Consultation Activities**

### Consultation during the scoping phase

The scoping activities for this project took place during the second half of May 2016. Primary data was collected by conducting several meetings with relevant governmental bodies, including EETC and its Cairo Zone as well as East Nasr City district. Residents of the project area were consulted as well; 20 individual interviews and 3 focus group discussions were conducted by the research team. An additional tool to confirm collected data was on-site observations and informal meetings and discussions which were held with people residing and working in the project area. A total of 45 individuals have been interviewed during the scoping phase of this study; 31 males and 14 females.

The scoping phase served to introduce the project within the project area as well as to identify the main characteristics of the project area and the views of the consulted group.

Respondents showed concern that the substation would negatively affect the quiet nature of their neighborhood with the generated noise and dust in addition to concerns about the project causing visual disturbance. Additional concerns were shared by the respondents about the potential impacts of the electromagnetic field on the neighborhood, especially the nearby schools complex. These concerns have been taken into consideration in the management plan.



**Focus group Discussion with women around project area**





## Arabic Non-Technical Summary

### 1 مقدمة

في إطار مشاريع التنمية في زيادة الطاقة الكهربائية والتي توليها الدولة إهتمام كبير في هذه المرحلة، تقوم الشركة المصرية لنقل الكهرباء بعدة مشاريع تنموية منها إنشاء عدة محطات محولات وربطها بالشبكة القومية لسد الفجوة الموجودة من الطاقة .

وطبقاً لشروط ولوائح جهاز شئون البيئة فعلى مالك المشروع إجراء دراسة تقييم للأثار البيئية لأى مشروع خدمي والحصول على موافقة بيئية قبل البدء في أي أعمال بالموقع.

وعليه تعاقدت الشركة المصرية لنقل الكهرباء التابعة للشركة القابضة لكهرباء مصر مع شركة إكوكنسرف للحلول البيئية لإعداد دراسة تقييم أثر بيئي للمشروع والذي يتكون من محطة محولات زهراء مدينة نصر و ربطها من خلال الكابلات الأرضية لتوصيلها بالمحطات القائمة في (شرق القاهرة - الكريمت - الهجانة)

### 2 أهداف الدراسة

تهدف الدراسة إلى بحث جميع جوانب وأنشطة المشروع من حيث التأثير على العناصر البيئية وتقديم البدائل الأفضل للحفاظ على البيئة وتجنب التأثيرات السلبية المحتملة أثناء إنشاء وتشغيل المشروع. كما تهدف الدراسة إلى التوافق مع المتطلبات القانونية واللوائح والإرشادات العامة التي تحدد أساليب التنمية المستدامة.

### 3 المنهجية

تم الاعتماد على العديد من الأساليب من أجل تحديد الآثار البيئية وتقييمها. من تلك الأساليب إجراء مسوحات حقلية للبيئة البرية والجيولوجية كما تم إجراء مقابلات مع الجهات ذات الصلة. وقد تم مراجعة المراجع البيئية التي تغطي منطقة الدراسة. أضف إلى ذلك الاعتماد على فريق عمل مكون من خبراء في مجالات البيئة مثل الحياة البرية والجيولوجيا بالإضافة إلى خبير دراسة تقييم الآثار البيئية وخبير القانون البيئي وخبير في المرافق.

وسوف يشمل هذا التقرير التنفيذي ملخص غير فني للدراسة الكاملة لوصف مكونات المشروع والأنشطة وتأثيراتها المتوقعة على البيئة وكيفية منع أو تقليل تلك التأثيرات

#### 4 الاعتبارات التشريعية والقانونية

تضم التشريعات المصرية المتعلقة بالجوانب البيئية ما يلي:

- قانون التشريع البيئي الوطني 4 لسنة 1994، والمعدل بالقانون 9 لسنة 2009 بالمرسوم رقم 1095 لسنة 2011
- التوجيهات الإرشادية ومتطلبات جهاز شئون البيئة الخاصة بتقييم الأثر البيئي، المواد 19، 20، 21، 23، في القانون 4 لسنة 1994
- التوجيهات الإرشادية لمبادئ وإجراءات تقييم الأثر البيئي، الطبعة الثانية - يناير 2009
- قوانين السلامة والصحة لمهنية
- قوانين المرور والتخطيط العمراني

تضم التشريعات المصرية المتعلقة بالجوانب الاجتماعية ما يلي:

- التوجيهات الإرشادية لجهاز شئون البيئة الخاصة بعملية التشاور العام، التوجيهات الإرشادية لمبادئ وإجراءات تقييم الأثر البيئي، الطبعة الثانية - يناير 2009
- التشريعات المصرية المرتبطة بنزع ملكية الأرض وإعادة التوطين القسري وتضم القانون 2003/94 في شأن تأسيس المجلس القومي لحقوق الإنسان والقانون 1990/10 الخاص بنزع الملكية للمنفعة العامة
- التشريعات المصرية الخاصة بحماية حقوق الإنسان القانون رقم 94 لسنة 2003 في شأن تأسيس المجلس القومي لحقوق الإنسان
- القوانين والتشريعات المرتبطة بالآثار (القانون رقم 119 لسنة 2008، القانون رقم 117 لسنة 1983
- قانون المناقصات رقم 1998/89 المرتبط بالمناقصات وتنظيم أنشطة المشتريات
- كثير من مؤسسات التمويل الدولية تنتظر في تمويل المشروع المقترح ومنها البنك الأوروبي لإعادة الإعمار والتنمية، هيئة التمويل الدولية، وبنك الاستثمار الأوروبي، وأفرسيز للاستثمارات الخاصة، و FMO ، Proparco, OPEC. جميع هذه المؤسسات لها متطلبات بيئية واجتماعية يجب أن تنفذها الشركات التي تطلب التمويل. لهذه الأغراض يشير التقرير إلى سياسات البنك الأوروبي لإعادة الإعمار والتنمية ومتطلبات الأداء العشرة الخاصة به، وهيئة التمويل الدولية ومعاييرها الثمانية، وبنك الاستثمار الأوروبي ومعايير البيئة والاجتماعية.

## 5 وصف المشروع

### 1-5 بيانات المشروع

4x40 MVA و 3x175 MVA 220/66/11 kV إنشاء محطة محولات زهراء مدينة نصر بسعة (GIS) والمهمات جهد 66 من النوع المعزول بالغاز على ان تكون المهمات جهد 220 ك ف ربط المحطة من خلال الكابلات الأرضية لتوصيلها بالمحطات القائمة في (شرق القاهرة - الكريمت - الهجانة) ○ الربط على شبكة 220 كيلو فولت:

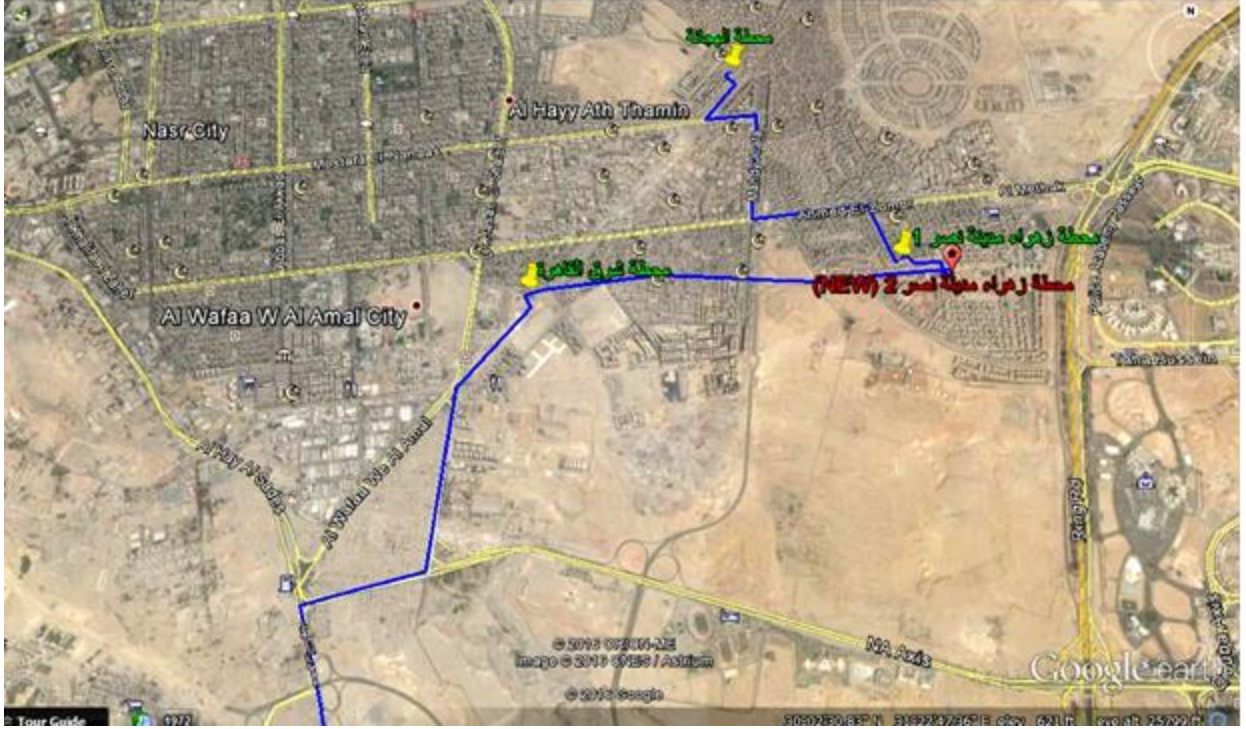
- فك كابلات شرق القاهرة/ الكريمت قطاع 1200 مم<sup>2</sup> من شرق القاهرة ومدها حتى زهراء مدينة نصر بطول 5 كم لتصبح زهراء مدينة نصر/ الكريمت
- كابلات الربط الأرضية - دورة مزدوجة 220 كيلو فولت إلى محطة محولات شرق القاهرة

○ الربط على شبكة 66 كيلو فولت:

- فك دائرتي الكابل المزدوج الدائرة الهجانة/ زهراء مدينة نصر من داخل محطة محولات زهراء مدينة نصر و مده الى زهراء مدينة نصر من النوع XLPE 400 مم<sup>2</sup> بطول حوالي 1 كم
- انشاء الكابل المزدوج الدائرة من النوع XLPE 800 مم<sup>2</sup> من زهراء مدينة نصر الى محطة زهراء مدينة نصر بطول حوالي 1 كم

### 2-5 مكان وموقع المشروع

تقع محطة محولات زهراء مدينة نصر بجوار مساكن القوات المسلحة و بالقرب من رافع و خزان زهراء مدينة نصر, كما يوجد مدرسة تحت الإنشاء، بالإضافة إلي ذلك تقع مدرسة الشهيد يحيى الرسمية المتميزة بجوار موقع المحطة.



شكل 1 . موقع محطة زهراء مدينة نصر



شكل 2 موقع المحطة بالنسبة للأنشطة المجاورة



## 6 الوصف البيئي والاجتماعي

سوف يتم إقامة المحطة والكابلات في منطقة تتميز بالمناخ الخاص بمنطقة محافظة القاهرة وتتميز بالشتاء الدافئ والصيف الحار وانخفاض معدل هبوط الأمطار وارتفاع معدلات البخر، وتتميز المنطقة بالارتفاع المتوسط في الرطوبة النسبية كما تهب في المنطقة الرياح المتوسطة ويصل المعدل السنوي لسقوط الأمطار ما بين 25 إلى 45 ملمتر، يتراوح الحد الأدنى والحد الأقصى لدرجات الحرارة في المنطقة ما بين 13 إلى 28 درجة مئوية، بينما تصل درجة الحرارة في الصيف إلى 40 درجة مئوية.

### الجيومورفولوجيا

تتميز القاهرة الكبرى بأن التربة تتكون من الصخور الفيضية الكلسية، والتي ترجع إلى السهل الفيضي القديم من العصر الثلاثي، وبالتالي لن تكون هناك أي تأثيرات نتيجة إنشاء المحطة على أنشطة الزراعة في المنطقة نظراً لأن التربة غير خصبة من الأساس ولا تستخدم في أنشطة زراعية .

### التربة

تتميز التربة في المنطقة التي سيقام عليها المحطة بأنها تتكون في الأغلب من الرمل والحصباء وبالتالي فإن الخزان الجوفي عميق - لن تكون هناك أي تأثيرات على خزان المياه الجوفية.

بالنسبة للمياه السطحية فإنه لا تمر أي مجاري مائية بالقرب من موقع المشروع (نهر النيل أو قنوات الري)، أقرب مسطح مائي هو نهر النيل ويبعد عن الموقع حوالي 7.6 كم، وبالتالي لن تكون هناك أي تأثيرات مباشرة أو غير مباشرة على المياه السطحية.

### الجيولوجيا

تتنتمي المنطقة الظاهرة من السطح في موقع المشروع بالكامل تقريباً إلى العصر الجيولوجي الرباعي وتتكون في الأساس من السحنات الكلسية، وتوجد أيضاً في المنطقة بعض صخور عصر المايوسين والعصر الكريتاسي الكربونية وترتبط بحركة الصدوع، كما توجد الصخور التي تعود لعصر الأوليجو - مايوسين المكونة من البازلت في الجزء الجنوبي كما هو موضح في الصخور تحت السطحية.

يتميز النشاط الزلزالي في المنطقة بحدوث بعض الزلازل الصغير والمتوسطة والكبيرة والتي تتزايد في السنوات الأخيرة ولكنها ظلت مقتصرة على منطقة القشرة الأرضية ولم يتم ملاحظة سوى الزلازل الصغيرة فقط. لم تسجل مؤخرا أية زلازل حتى المنخفضة في الشدة.

#### الكساء النباتي والحيواني

لم تسجل أية أنواع من الكائنات الحية معرضة للمخاطر في منطقة المشروع خلال الدراسة، كما أن الموئل الطبيعي الخاص بهذه الحيوانات ليس نادراً أو مقتصراً على منطقة معينة وبالتالي يمكن للكائنات الحية بسهولة الانتقال إلى موقع بديل في المنطقة المجاورة وإن تتابع دورة حياتها بنفس الأسلوب السابق.

#### قياسات الهواء و الضوضاء

قد قام فريق عمل الاستشاري بقياس جودة الهواء و جودة الضوضاء في منطقة زهراء مدينة نصر و اخذت عينات الهواء و الضوضاء و تشير قياسات الهواء و الضوضاء في المنطقة انها اقل من الحدود المسموح بها قانونا

#### الخصائص الاقتصادية - الاجتماعية

تعد زهراء مدينة نصر من المناطق الأقل ازدحاماً نظراً لكونها محدودة على ضباط القوات المسلحة وعائلاتهم لفترة كبيرة مع العلم أن الوحدات الجديدة أصبحت متاحة للمواطنين المدنيين من خلال صندوق الإسكان. طبيعة المنطقة سكنية بشكل كبير مع أنشطة تجارية محدودة كما تضم مجمع للمحاكم ومجمع محاكم. المنطقة تتميز بالتخطيط الجيد وتتوفر بها الخدمات الأساسية من خدمات صحية وتعليم وصرف صحي ومياه وشبكة طرق ومجمع محاكم. وقد عبر البعض من عينة المبحوثين من سكان المنطقة عن تمسكهم بالمنطقة لما تتميز به من أمان وهدوء في حين أشار البعض لتدهور بعض الطرق في الفترة الأخيرة.

### 7 بدائل المشروع

لم يتم اقتراح موقع بديل للمشروع، وقد تم اختيار المواقع لبناء محطات المحولات واختيار مسارات خطوط الربط بناء على المحددات التي تحقق الأهداف الفنية والاقتصادية والاجتماعية للمشروع

### 8 تأثيرات المحتملة على البيئة وإجراءات التخفيف

يتضمن التقرير تفاصيل التأثيرات المحتملة على البيئة وإجراءات التخفيف المقترحة خلال مرحلة أعمال الإنشاءات و خلال مرحلة التشغيل لمحطات المحولات و لخطوط نقل الكهرباء كلاً على حدة. مثال على ذلك التأثير الناتج عن

الضوضاء الناتجة من المركبات/المعدات أثناء أعمال الإنشاءات والحفر، انبعاثات الهواء الناتجة من المركبات/المعدات ونقل التربة أثناء أعمال الإنشاءات، التأثير على الموارد الثقافية والموارد الأيكولوجية، التعامل مع المخلفات (الخطرة والغير خطرة) الناتجة عن أعمال الإنشاءات، الصحة والسلامة المهنية للعمال، التأثير على استخدام الأراضي، التأثير على المواقع الأثرية والثقافية، التأثيرات الاجتماعية، التأثير على حركة المرور، التأثير على الكساء النباتي والحيواني، التأثير على مصادر المياه الجوفية، التأثير على الطيران والاتصالات، فقدان بعض المميزات البيئية نتيجة قطع الأشجار لإقامة خطوط نقل الكهرباء، التأثيرات على مسار وأنماط هجرة الطيور وتأثير المشروع على المجتمع من خلال خلق فرص العمل وازدهار الاقتصاد.

يمثل الجدول التالي عينة من ملخص التأثيرات المحتملة لأنشاء محطة المحولات وخطوط الربط خلال مرحلتى الانشاء و التشغيل

#### التأثيرات المحتملة على البيئة خلال مرحلة الإنشاءات

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
التعامل مع مخلفات أعمال الإنشاءات	تأثيرات متوسطة غير مؤكدة	متوسط	الحد من شدة التأثير ليصبح تأثيراً محدوداً
انبعاثات الهواء الناتجة أعمال الإنشاءات	احتمال منخفض لتأثيرات كبرى أو متوسطة - احتمالات مرتفعة لتأثيرات محدودة	محدود	الحد من شدة التأثير في الأراضي التي تتكون من تربة رملية
الضوضاء الناتجة عن أعمال الإنشاءات	احتمال منخفض لتأثيرات كبرى أو متوسطة - احتمالات مرتفعة لتأثيرات محدودة	محدود	الحد من شدة التأثير
التأثير على حركة المرور	احتمال منخفض لتأثيرات كبرى أو متوسطة	محدود	الحد من شدة التأثير
التأثيرات على الكساء النباتي والحيواني	احتمال منخفض	محدود	الحد من شدة التأثير
التأثير على مصادر المياه الجوفية	احتمال منخفض	محدود	الحد من شدة التأثير
مخاطر حدوث كوارث طبيعية	احتمال منخفض لتأثيرات كبرى أو متوسطة	محدود	الحد من شدة التأثير
التأثير على ثقافة وخصوصية المجتمعات المحلية	احتمال منخفض لتأثيرات كبرى أو متوسطة	محدود	الحد من شدة التأثير



التأثيرات المحتملة على البيئة خلال مرحلة التشغيل

التأثير	مدى احتمالية وفداحة التأثير	الشدة	تأثيرات إجراءات التخفيف
المخاطر الناتجة عن الخردة والمخلفات الخطرة	احتمال منخفض لتأثيرات كبرى	متوسط	الحد من شدة التأثير ليصبح تأثيراً محدوداً
السلامة في محطات المحولات الفرعية والكابلات الأرضية	احتمال منخفض لتأثيرات كبرى	متوسط	الحد من شدة التأثير ليصبح تأثيراً محدوداً
التعرض للمجال الكهرومغناطيسي	احتمال منخفض لتأثيرات كبرى أو متوسطة	محدود	الحد من شدة التأثير
المخاطر المرتبطة بتلوث التربة	احتمال منخفض لتأثيرات كبرى أو متوسطة	محدود	الحد من شدة التأثير
التأثيرات على استخدام الأراضي والمناظر المفتوحة	احتمال منخفض لتأثيرات كبرى أو متوسطة	محدود	الحد من شدة التأثير
التأثيرات على مسار وأنماط هجرة الطيور	احتمال منخفض	محدود	لا توجد حاجة لإجراءات التخفيف

**9 خطة الإدارة البيئية**

يتضمن هذا الفصل مصفوفات الإدارة البيئية خلال مرحلة أعمال الإنشاءات و خلال مرحلة التشغيل لكلاً من محطات المحولات وخطوط نقل الكهرباء، ويشمل التأثيرات المحتملة، إجراءات التخفيف المقترحة، مرحلة المشروع، المسؤولية الإدارية عن التنفيذ، المسؤولية المباشرة عن الإشراف، وأسلوب الإشراف. كما يتضمن هذا الفصل أيضاً مصفوفات خطة المتابعة البيئية خلال مرحلة الإنشاءات و خلال مرحلة التشغيل لكلاً من محطات المحولات وخطوط نقل الكهرباء، ويشمل التأثيرات المحتملة، مؤشرات المتابعة، موقع المتابعة، أسلوب المتابعة، دورية المتابعة، و مسؤولية المتابعة.

يمثل الجدول التالي عينة من خطة الإدارة البيئية لإنشاء محطة المحولات وخطوط الربط خلال مرحلتى الانشاء و التشغيل

مصفوفة الإدارة البيئية خلال مرحلة أعمال الإنشاءات

التأثيرات المحتملة	إجراءات التخفيف المقترحة	مرحلة المشروع	المسئولية الإدارية عن التنفيذ	المسئولية المباشرة عن الإشراف	أسلوب الإشراف
التأثيرات الناتجة عن تراكم مخلفات البناء	تحديد المواقع المقترحة للتخلص من مخلفات البناء التي توافق عليها السلطات المحلية	قبل البدء في أعمال الإنشاءات	الشركة المصرية لنقل الكهرباء	الشركة المصرية لنقل الكهرباء	مراجعة موافقات السلطات المحلية
	تحديد أماكن داخل الموقع لتخزين مخلفات البناء بشكل مؤقت	الإنشاء	مقاول الإنشاء	استشاري الإشراف على الإنشاء	الإشراف على الموقع
	النقل السليم والتخلص من مخلفات الإنشاءات	الإنشاء	مقاول الإنشاء	استشاري الإشراف على الإنشاء	الإشراف على الموقع والتفتيش غير الدوري على موقع التخلص من المخلفات
	تخصيص وتجهيز منطقة للتخزين المؤقت للخرردة	قبل بدء أعمال الإنشاءات	الشركة المصرية لنقل الكهرباء	الشركة المصرية لنقل الكهرباء	مراقبة كافة مواقع التخزين
	الحفاظ على نظافة كافة منشآت التخزين	الإنشاء	عمال النظافة الذين تختارهم الشركة المصرية لنقل الكهرباء	الشركة المصرية لنقل الكهرباء	مراقبة كافة مواقع التخزين
الحفر	وضع علامات واضحة للسلامة وتحديد مناطق الحفر	قبل الإنشاء الإنشاء	مقاول الإنشاء	مشرف الإنشاءات	الإشراف على الموقع والتفتيش غير الدوري
	إتباع تعليمات السلامة وإخلاء المناطق المحيطة بموقع الحفر وتشمل ضرورة ارتداء العمال خوذات السلامة والأحذية الملانمة				
انبعاثات الهواء	رش التربة قبل الحفر لتفادي تطاير الرمال	انبعاثات الهواء	رش التربة قبل الحفر لتفادي تطاير الرمال	انبعاثات الهواء	رش التربة قبل الحفر لتفادي تطاير الرمال
الضوضاء الناتجة عن العمل	استخدام سدادات الأذن لعمال البناء بالقرب من الماكينات التي تصدر ضوضاء	الضوضاء الناتجة عن العمل	استخدام سدادات الأذن لعمال البناء بالقرب من الماكينات التي تصدر ضوضاء	الضوضاء الناتجة عن العمل	استخدام سدادات الأذن لعمال البناء بالقرب من الماكينات التي تصدر ضوضاء

التأثيرات المحتملة	إجراءات التخفيف المقترحة	مرحلة المشروع	المسئولية الإدارية عن التنفيذ	المسئولية المباشرة عن الإشراف	أسلوب الإشراف
التأثيرات على حركة المرور في الطرق	تنظيم ساعات العمل للحد من تعرض العمال للضوضاء	الإنشاء	مقاوم الإنشاءات	استشاري الإشراف على الإنشاءات	الإشراف على الموقع
	تفادي تخزين مواد ومعدات البناء في الحارات المرورية	قبل الإنشاء وأثناء الإنشاء	مقاوم الإنشاءات	استشاري الإشراف على الإنشاءات	الإشراف على الموقع
	تسهيل وجود طرق بديلة للوصول لمنطقة زهراء مدينة نصر خلال الإشغال المؤقت للشارع الرئيسي	الإنشاء	مقاوم الإنشاءات	استشاري الإشراف على الإنشاءات	الإشراف على الموقع
	الحفر النفقي لطريق الحفر لتفادي التأثير على حركة المرور	الإنشاء	مقاوم الإنشاءات	استشاري الإشراف على الإنشاءات	الإشراف على الموقع
	يجب أن يتلقى سائقو معدات البناء تدريبات على موضوعات السلامة	الإنشاء	مقاوم الإنشاءات	استشاري الإشراف على الإنشاءات	الإشراف على الموقع
سلامة المعدات الميكانيكية	يجب أن يحصل السائقين على رخصة قيادة سارية	الإنشاء	مقاوم الإنشاءات	استشاري الإشراف على الإنشاءات	مراجعة تقارير المشرف
	يجب فحص كافة المعدات قبل الاستخدام				
	يجب وضع لافتات واضحة لكافة المعدات الميكانيكية أثناء الاستخدام أو في حالة عدم الاستخدام				
التأثيرات على ثقافة وخصوصية المجتمعات المحلية	التوسع في الاعتماد على تشغيل العمالة المحلية كلما أمكن	الإنشاء	مقاوم الإنشاءات	استشاري الإشراف على الإنشاءات	مراجعة تقارير المقاوم
	يجب أن تتم كافة الأنشطة المرتبطة بأعمال الإنشاءات في مقر الشركة المصرية لنقل الكهرباء لتفادي أية تداخلات مع خصوصية المجتمع				

مصفوفة خطة الإدارة البيئية خلال مرحلة التشغيل

التأثيرات المحتملة	إجراءات التخفيف المقترحة	مرحلة التنفيذ	المسئولية الإدارية عن التنفيذ	المسئولية المباشرة عن الإشراف	أسلوب الإشراف
إنتاج المخلفات من الخردة والمخلفات الخطرة	تحديد وتجهيز مناطق في موقع المحطة الفرعية للتخزين المؤقت للخردة	قبل الإنشاء			مراقبة المواقع التي تم تحديدها للتخزين
	الحفاظ على نظافة وتجميل مخزن الأدوات	التشغيل	مسئولي النظافة	القائم بالتشغيل الشركة المصرية لنقل الكهرباء/ قطاع البيئة	مراقبة أماكن التخزين
	التحكم في المخلفات الخطرة والخاصة (بالببيع أو إعادة التدوير)	التشغيل	القائم بالتشغيل الشركة المصرية لنقل الكهرباء	القائم بالتشغيل الشركة المصرية لنقل الكهرباء/ قطاع البيئة	توثيق إدارة المخلفات
	التحكم في المخلفات الخطرة غير الصلبة والمخلفات خاصة	التشغيل	القائم بالتشغيل الشركة المصرية لنقل الكهرباء	القائم بالتشغيل الشركة المصرية لنقل الكهرباء/ قطاع البيئة	مراجعة الوثائق والتفتيش المتقطع على موقع التخلص من المخلفات
	تضمين مرحلة التصميم والإنشاءات إجراءات للحد من المخلفات خلال مرحلة التشغيل	التصميم والإنشاء	استشاري التصميم والمقاول خلال مرحلة الإنشاءات	استشاري الإشراف على الإنشاءات	الإشراف على الموقع
	تنفيذ حملات التوعية بشأن إجراءات السلامة بالتركيز على فئات الطفل والمرأة	التشغيل	فريق التوعية بالجمعيات الأهلية المحلية واستشاري التدريب	الشركة المصرية لنقل الكهرباء	مراجعة برامج تدريب المدربين بالجمعيات وزيارة فريق التوعية المحلي
مخاطر تلوث التربة	يجب توخي الحذر خلال مرحلة تغيير الزيوت المستخدمة في محطة التحويل حيث يجب تغطية التربة بطبقة غير مسامية	التشغيل	القائم بالتشغيل الشركة المصرية لنقل الكهرباء	الشركة المصرية لنقل الكهرباء/ قطاع البيئة	الزيارات المتقطعة لمحطة المحولات الفرعية وخاصة إلى موقع محطة المحولات
	جمع والتخلص من الأتربة الملوثة	التشغيل	القائم بالتشغيل الشركة المصرية لنقل الكهرباء	الشركة المصرية لنقل الكهرباء/ قطاع البيئة	الزيارات المتقطعة لمحطة المحولات الفرعية وخاصة

التأثيرات المحتملة	إجراءات التخفيف المقترحة	مرحلة التنفيذ	المسئولية الإدارية عن التنفيذ	المسئولية المباشرة عن الإشراف	أسلوب الإشراف
			الكهرباء	قطاع البيئة	إلى موقع محطة المحولات النقل

## 10 الخلاصة

بعد تحليل أنشطة المشروع المختلفة خلال مرحلتى الإنشاء والتشغيل والتأثيرات البيئية المختلفة المترتبة عليها، إلى أن اختيار تلك المواقع المحددة للمشروع تمت بناء على المحددات التي تحقق الأهداف الفنية والاقتصادية والاجتماعية للمشروع. أما بالنسبة للتأثيرات البيئية السلبية في مرحلتى الإنشاء والتشغيل فهي محدودة ويمكن تخفيفها إلى الحد الأدنى الذي يمكن به جعل هذه التأثيرات مهملة بتطبيق خطة الإدارة والرصد البيئي المقترحة.

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